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Exhibit A
Greg Wendt
EXH-2002

EXHIBIT A



April 12, 2022



Benton County Comprehensive Plan

Updated by:
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Kennewick WA 99337

Updated April 12, 2022

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Comprehensive Plan
FOR
BENTON COUNTY

Adopted on February 13, 2018
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AMENDMENTS:

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Resolution # 2022-265	Text Change/UGA Maps/Corrections	April 12, 2022

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ABBREVIATIONS

2013 Plan	<i>2013 Benton County Comprehensive Solid Waste Management and Moderate Risk Waste Management Plan</i>
AADT	Annual Average Daily Trip
ARRA	American Recovery and Reinvestment Act
AVA	American Viticultural Area
BCC	Benton County Code
Benton PUD	Benton County Public Utility District
Benton REA	Benton Rural Electric Association
BFCG	Benton-Franklin Council of Government
BFT	Ben Franklin Transit
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CIP	Capital Improvement Plan
Comprehensive Plan	Benton County Comprehensive Plan Update
CWPP	Countywide Planning Policies
Du/acre	dwelling unit per acre
Ecology	Washington State Department of Ecology
FEMA	Federal Emergency Management Agency
GMA	Washington State Growth Management Act
KID	Kennewick Irrigation District
LAMIRD	limited area of more intense rural development
LOS	level of service
MPR	Master Planned Resort
OFM	Washington State Office of Financial Management
Parks Plan	Benton County Comprehensive Parks Plan
PD	Planned Development
PL	Public Lands designation
RCW	Revised Code of Washington
RM MSP	Red Mountain AVA Master Site Plan
RMSF	Rattlesnake Mountain Shooting Facility
Roza	Roza Irrigation District
SEPA	State Environmental Policy Act
SMA	satellite management agency
SMP	Shoreline Master Program
SSRT	Small-scale Recreational or Tourist
TCSA	Tri-Cities Shooting Association

UGA	urban growth area
VSP	Voluntary Stewardship Program
WAC	Washington Administrative Code
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WUTC	Washington Utilities and Transportation Commission
Yakima Integrated Plan	Yakima River Basin Integrated Water Resource Management Plan

1 Introduction

The Washington State Growth Management Act (GMA), adopted by the state legislature in 1990, requires local governments to develop comprehensive plans to address local and statewide planning issues. *“The legislature finds that uncoordinated and unplanned growth, together with a lack of common goals expressing the public's interest in the conservation and wise use of our lands, pose a threat to the environment, sustainable economic development, and the health and safety, and high quality of life enjoyed by residents of this state”* (Revised Code of Washington [RCW] 36.70A.010).

The Benton County Comprehensive Plan Update (Comprehensive Plan) was developed to reflect the County's values and plan for future growth consistent with the GMA and guide County decisions on land use, transportation, infrastructure, housing, economic development, and the environment.

1.1 Purpose and Intent of the Benton County Comprehensive Plan

The County's Comprehensive Plan was originally developed in 1985 and amended in 1998 and 2006. The Comprehensive Plan's purpose and intent is to provide for local needs relating to the use of land and infrastructure, including the protection of property and water rights, and in so doing, to meet the State's minimum planning law requirements. This Comprehensive Plan builds on the last update completed by the County in 2006, the amended Hanford Comprehensive Land Use plan, and includes updates to all plan elements. These updates address citizen input during visioning, refine goals and policies, incorporate recent analyses and findings in applicable plan elements, and reflect changes to more fully address the latest GMA requirements.



Benton County

This Comprehensive Plan seeks to preserve the natural environment, local customs, culture, and quality of life for County residents. Simultaneously, it seeks to facilitate and encourage economically productive use of the land and resources base to enable economic growth, prosperity, and enjoyment of a quality life.

Cities in Benton County have developed individual city comprehensive plans for urban area planning. These comprehensive plans implement the specific city's and community's vision and goals for the future. The Benton County Comprehensive Plan largely addresses planning in the unincorporated and urban areas that are not yet annexed to the cities. However, the Countywide Planning Policies (CWPP; see Section 1.5.1) address regional planning issues and coordinate growth among all jurisdictions.

1.1.1 *Managing Growth: Plan, Prepare, and Facilitate*

The Comprehensive Plan and adopted Land Use Designations Map (Appendix A: Map Folio, Figure 5 – Future/Proposed Land Use Designations Map) provides a predictable and certain system upon which citizens, various business interests, special districts, and public entities can plan and invest their resources. The Plan and maps also support the rural and urban citizen's and stakeholders' desired goals for growth and development.

The Comprehensive Plan coordinates land use, transportation, and capital facilities by focusing planning, scheduling, financing, and construction provisions to provide the identified levels of service (LOS) in advance of development, or upon demand. The County must have the financial ability to provide these services as planned.

1.1.2 *Goals and Required Elements*

The GMA has planning goals and mandatory plan "elements" to guide the development of plans and regulations. The 14 GMA goals per RCW 36.70A.020 are as follows:

1. Urban Growth - Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
2. Reduce Sprawl - Reduce inappropriate conversion of undeveloped land into sprawling, low-density development.
3. Transportation - Encourage efficient multi-modal transportation systems based on regional priorities and coordinated with county and city comprehensive plans.
4. Housing - Encourage the availability of affordable housing to all economic segments of the population of the state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock.
5. Economic Development - Encourage economic development throughout the state consistent with adopted comprehensive plans, promote economic opportunity for all citizens of the state,

especially for the unemployed and the disadvantaged, and encourage growth in areas experiencing insufficient economic growth, all within the capacity of the state's natural resources, public services, and public facilities.

6. Property Rights - Private property shall not be taken for public use without just compensation. The property rights of landowners shall be protected from arbitrary and discriminatory action.
7. Permits - Application for state and local government permits should be processed in a timely and fair manner.
8. Natural Resource Industries - Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.
9. Open Space and Recreation - Encourage the retention of open space and development of recreation opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks.
10. Environment - Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
11. Citizen Participation and Coordination - Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to resolve conflicts.
12. Public Facilities and Service - Ensure that public facilities and services necessary to support development are adequate to serve the development at the time the development is available for occupancy and use, without decreasing the current service levels below locally established minimum standards.
13. Historic Preservation - Identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance.
14. Shoreline Management – Develop a Shoreline Master Program (SMP) pursuant to the Shoreline Management Act. The goals and policies of a SMP for a county or city approved under chapter 90.58 RCW shall be considered a part of the county or city's comprehensive plan.

County Comprehensive Plans must include the following required elements (RCW 36.70A.070):

- **Land Use Element** with designated land uses and intensities that all other elements must serve. Citizens and private and public-sector service providers can use this element to plan future uses of their properties and to project and meet future locational demands;
- **Rural Element** that shows rural land use and densities for unincorporated lands outside of urban growth areas (UGAs) and agricultural lands designations;
- **Housing Element** that integrates the rural housing supply with the housing type and locational needs of rural land uses including agriculture.
- **Transportation Element** that provides public transportation facilities appropriately matched to the County's land use and density—as defined in the Land Use Element. This element must be monitored and maintained over time;

- **Capital Facilities Element** that identifies capital facilities project planning as well as funding mechanisms to construct necessary public services to meet the demands of the Land Use Designations Map as it builds-out;
- **Utilities Element** that enables utility providers to assess with certainty the location and intensity of future land use so that they may cost effectively plan, schedule, capitalize, and construct sufficient utility capacity;

1.2 Planning Under the Growth Management Act

1.2.1 *Growth Management and the State Environmental Policy Act*

The GMA requires compliance with both the State Environmental Policy Act (SEPA) and GMA in the comprehensive planning process. Due to their similarities, integration of SEPA with GMA eliminates duplication of effort and assures consistency between them.

The Comprehensive Plan Environmental Impact Assessment Addendum (Appendix B) provides an environmental analysis of two alternatives to support the Comprehensive Plan: a “No Action” alternative and a “Proposed Action” alternative. Alternative 1, the “No Action” alternative, calls for keeping the County’s existing Comprehensive Plan without modifications. Alternative 2, the “Proposed Action” alternative, allows for changes in the Comprehensive Plan to land use designations and other plan elements consistent with public input received during visioning, updated analyses for the plan, and development trends.

1.2.2 *Public Involvement*

The County updated its Public Participation Plan in 2015 (Appendix C). Cities and counties planning under the GMA must establish “...procedures providing for early and continuous public participation in the development and amendment of comprehensive land use plans and development regulations implementing such plans.”

In 2016 and 2017, the County conducted multiple opportunities for public involvement in the form of public workshops, group discussions, open houses, and citizen surveys. The County established a Comprehensive Plan webpage to disseminate information to, and gather input from, the public. The County also held Planning Commission and County Commissioners’ workshops. Planning Commission and County Commissioners’ hearings were held on December 12, 2017, and February 13, 2018, with published notices. The Comprehensive Plan’s goals and policies directly reflect the input received from the public.

1.2.3 *Community Vision*

The County conducted two open houses in September 2016 to gather public input. An online survey was also conducted from August 30, 2016 to October 11, 2016 (Appendix D). County priorities based

on the public input include preservation of rural character; protection of natural resources, hillsides, and open spaces; an increase in the number of quality parks; improved access to rivers; opportunities for more hiking and biking trails; improvements of rural facilities; maintenance of public safety; and opportunities for affordable housing. The public input also prioritizes limiting sprawl and protecting farmland.

1.3 Benton County Profile

Benton County is located in southeastern Washington and is bounded by the Columbia River on three sides (north, east, and south). The County is bordered to the west by Klickitat and Yakima counties. Benton County consists of a total of 1,115,673 acres, or 1,743 square miles. Of this, 416 square miles of its northern portion, or 24 percent of Benton County, is occupied by the U.S. Department of Energy's Hanford Reservation (see Appendix A: Map Folio, Figure 1 – Vicinity Map and Figure 2 – Publicly Owned Lands Map).

The County is predominantly rural and agricultural in nature, with unincorporated areas making up most of the County territory. There are unincorporated communities with housing and industry in areas such as Plymouth, Paterson, and Finley. Incorporated cities include Benton City, Kennewick, Prosser, Richland, and West Richland. Each city has an assigned UGA in which the County retains governance until the area is annexed. The County coordinates planning in the UGAs with each city. The current population of Benton County, based on Washington State Office of Financial Management's (OFM) 2017 estimate, is 193,500. Population in the unincorporated portions of Benton County constitutes 35,085 persons, while 158,415 persons live in the incorporated areas.

The County is located at the confluence of three rivers: the Columbia, Yakima, and Snake rivers. The Yakima River runs through the middle of the County, to its confluence with the Columbia River at Richland. The County also consists of mountains and ridges such as Horse Heaven Hills, Rattlesnake Mountain, Badger Mountain, and Candy Mountain.



Rural and agricultural lands in Benton County



Columbia River – Lake Wallula
Source: Washington State Department of Ecology

The U.S. Bureau of Reclamation’s Yakima Basin Project serves a portion of the agricultural economy of the County. In addition, Lake Wallula was created when the U.S. Army Corps of Engineers’ McNary Dam was completed in 1954. As a result, irrigation now extends across a large portion of Benton County, helping the Tri-Cities region, which includes the cities of Richland and Kennewick in Benton County and the city of Pasco in Franklin County, grow as an agricultural center. The County economy was also enhanced by the Hanford Nuclear Reservation’s operation, established in 1943 during World War II. Environmental restoration

and cleanup of the Hanford site, which began in the late 1980s and continues today. Research and development at the Pacific Northwest National Laboratory and other facilities in the Hanford Reservation comprise a major employment source in the County.

1.4 Plan Framework

This Comprehensive Plan consists of 8 plan elements and several appendices that address the vision, goals, policies, and analysis for plan elements.

The progression of each chapter generally flows in the following order:

- Introduction
- Existing Conditions
- Current Trends
- Future Considerations

This Comprehensive Plan is designed to be user-friendly and includes maps, figures, and an introductory outline of the County's goals and policies (Chapter 2).

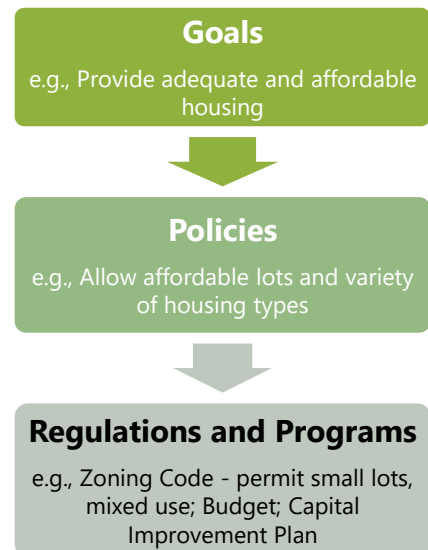
Plan Elements

Land Use
Natural Resources*
Economics
Housing
Transportation
Parks and Recreation
Capital Facilities
Utilities
* non-mandatory element

1.4.1 Definition of Terms

In concert with the Future Land Use Designation Map (Appendix A: Map Folio, Figure 5 – Future/Proposed Land Use Designations Map), the vision, goals, and policies within the Comprehensive Plan are the primary directives for land use decision-making and long-range planning and guide the development of regulations. These terms are generally defined as:

- **Vision** is a collective value and target of a county, it is what a county wants to become.
- **Goals** are broad statements of intent and philosophy expressing countywide values and attitudes. Goals are used as a general guide for action by the County. A goal may never be completely attained but is a target towards which to strive over time.
- **Policies** provide the basis for decision-making and specific courses of action, which move the County toward the attainment of its adopted goals. Policies have major influence because decisions, actions, and programs should neither conflict, nor be inconsistent with adopted policy. Policies should be operable on a continuous basis and applied consistently over time.
- **Regulations**, codes, and ordinances implement policies.



Vision, goals, and policies are also the principal directives to County decision-makers and staff relative to what planning and public works actions, studies, and other projects should be undertaken

during the plan's 20 year "horizon" to address current and future growth and development and resource issues.

1.5 Consistency and Relationship of the Plan to Other Documents

The GMA requires that the Comprehensive Plan be internally consistent across objectives, goals, policies, text, and maps. At the same time, the comprehensive plans of adjacent jurisdictions must also be consistent and capital budget decisions must conform to each jurisdiction's adopted comprehensive plan.

Consistency progresses from the broad goal, through its policies, and then to specific actions. The maps of the Comprehensive Plan augment the text, goals, and policies.

1.5.1 Countywide Planning Policies

Managing growth can be ineffective if it is carried out in a patchwork fashion. Therefore, the GMA provides a framework for regional coordination. Counties planning under the GMA prepare CWPP and establish UGAs. Cities and Counties are required to be consistent with the CWPP in their comprehensive planning. Benton County and the cities in the County coordinate their planning to avoid conflicts and ensure that infrastructures that cross jurisdictional boundaries are functionally integrated.

The Benton County Board of Commissioners adopted the *Benton Countywide Planning Policies* in 2016 (Appendix E). This Comprehensive Plan, with associated goals and policies, maintains consistency with Benton County's adopted CWPP.

1.5.2 Shoreline Master Program

The County adopted an SMP update in 2014 pursuant to the Shoreline Management Act. The goals and policies of the SMP are considered a part of the Comprehensive Plan's goals and policies included in Chapter 2 and along with the rest of the SMP are adopted by reference (Appendix F). The Policy Chapter provides the framework for future decision-making and is a guide for future development of lands within the County's shoreline jurisdiction boundaries. Detailed regulations are also included in the SMP.

1.5.3 Voluntary Stewardship Program

Benton County is in the process of developing a work plan under the Voluntary Stewardship Program (VSP), a new, non-regulatory, incentive-based approach that balances the protection of critical areas on agricultural lands, while promoting agricultural viability, as an alternative to managing agricultural activities in the County under the Critical Areas Ordinance (CAO). The VSP Work Plan under development intends to protect critical areas, maintain and enhance agricultural viability, and

promote voluntary enhancement of critical areas through the promotion of incentive-based measures.

1.5.4 *Hanford Comprehensive Land Use Plan and Environmental Impact Statement*

Although planning in the Hanford area is not under the County's jurisdiction, this federally funded and operated area largely influences the local economy and land use. A Comprehensive Land Use Plan and Environmental Impact Statement for the Hanford Site was prepared and adopted by the U.S. Department of Energy in 1999, with participation by the County, state agencies, tribes, and other stakeholders. Several supplemental analyses and amendments have been approved since 1999, with the most recent in 2015. The plan includes Industrial-Exclusive, Industrial, Research and Development, High-Intensity Recreation, Low-Intensity Recreation, Conservation (Mining), and Preservation land uses. These land uses were identified by the public, cooperating agencies, and consulting Tribal governments as being important to the region (DOE 1999). The land use indicates Preservation lands on the north and south sides, Conservation lands and Industrial Exclusive lands at the center. Industrial and Research lands are located on the southern edge of the Hanford Site.

1.5.5 *Yakima River Basin Integrated Water Resource Management Plan*

The Yakima River Basin Integrated Water Resource Management Plan (Yakima Integrated Plan) was developed by the U.S. Bureau of Reclamation and the Washington State Department of Ecology (Ecology) in conjunction with the Yakima Basin stakeholders and the Yakama Nation in 2011. The Yakima Integrated Plan addresses a variety of water resource and ecosystem concerns affecting fish passage and habitat and agricultural, municipal, and domestic water supplies within the Yakima Basin, which contains Benton County. See Section 4.5.5.2 for additional discussion on the relationship of Benton County water resources with the Yakima Integrated Plan elements.

1.5.6 *Other Planning Documents in the County*

The Benton County Comprehensive Plan maintains consistency with other planning and facilities documents and relies on the data and resources of some of these documents. These include the County's Biennial Budget document and other utilities and facilities inventories and plans.

County planning and facilities documents adopted by reference include:

- Red Mountain American Viticultural Area (AVA) Master Site Plan, 2012 (Appendix G)
- Benton County Road Program, 2016 – 2021 (Appendix H-1) and the most recently adopted Six-Year Transportation Improvement Programs¹
- Benton County Comprehensive Parks Plan (Parks Plan), 2014 – 2020 (Appendix I)

¹ Available at: <http://www.co.benton.wa.us/pview.aspx?id=10589&catid=0>

- Benton County Capital Improvement Plan (CIP), 2017 – 2022 (Appendix J) and future amendments
- 2013 Benton County Comprehensive Solid Waste Management and Moderate Risk Waste Management Plan (Appendix K)

Additionally, as referenced in Section 1.5.2 and Chapter 2, the goals and policies of the County’s SMP are included as part of the Comprehensive Plan goals and policies.

1.5.7 *Development Regulations*

All development regulations within the County are required to be consistent with the Comprehensive Plan. These include, but are not limited to the zoning code, subdivision code, CAO, SMP, and permit review process. All codes related to traffic and utilities also implement the Comprehensive Plan goals and policies.

1.6 Concurrency

The GMA defines concurrency to mean that needed improvements for water, sewer, and transportation are in place at the time of development; or in the case of transportation, that a financial commitment exists to complete the improvements within 6 years.

There must be a baseline standard established to use when evaluating the anticipated impacts of new development to determine if concurrency can be met. The minimum acceptable performance level has been chosen as the baseline and is defined as the LOS. LOS should be realistic. Setting them too high could result in little or no growth and would be contrary to the GMA. Setting them too low could cause unmanaged growth without optimum service.

Based upon variables, including the projected levels of traffic from build-out of the Land Use Map, the County has designated LOS on its major traffic routes and programs its capital expenditures to maintain that LOS as traffic demand on those routes increases. LOS has also been established for County parks and recreation facilities, recognizing these standards serve more as guidelines than strict standards to meet.

1.7 Amendments to this Comprehensive Plan

Amendments to the Comprehensive Plan are legislative actions requiring County Commissioners’ approval. Amendments must be approved as prescribed by the GMA. With a few exceptions, they cannot be considered more often than once per year and in accordance with specific procedures. Major updates occur by legislative action on an 8-year cycle as established by RCW 36.70A.130 (4)(c).

Amendments can be requested by the County or by private individuals. Multiple applications for amendments will be considered in a single legislative review process in order to evaluate the

potential cumulative effect of the requests. All amendment requests require a public hearing with the Planning Commission, which then makes a recommendation to the County Commission. The County Commission will approve or deny the amendments in a public hearing. Public involvement with this process is required and encouraged through direction of the County Public Participation Plan.

Annual amendments will address the issues of major or minor land use classification changes; changes to the goals, policies, and text of the Comprehensive Plan; changes to supporting data and implementation; changes to the Land Use Maps; and changes to the inventories and technical documents.

Every 8 years, the annual amendment review may be combined with the required review of the UGAs to determine the next 20-years' anticipated growth. This review will use the County and individual City comprehensive plans and the permitted densities of the incorporated and unincorporated areas pursuant to RCW 36.70A.130(3).

Exceptions to the annual amendment limitation, according to RCW 36.70A.130, include the adoption of a subarea plan; the development of an initial subarea plan for economic development located outside of the 100-year floodplain in a county that has completed a state-funded pilot project that is based on watershed characterization and local habitat assessment; SMPs; or the amendment of the capital facilities element occurring concurrently with the adoption or amendment of the County's budget.

Counties are allowed under RCW 36.70A.130(2)(b) to consider emergency amendments that conform with Chapter 36.70A, after appropriate public participation has been observed, whenever an emergency exists. During the 2006 Comprehensive Plan Update, the Board of Commissioners adopted a definition of emergency as, "The declaration by the Board of County Commissioners, based upon circumstances and facts at hand, that there is an eminent or expectant threat to one or more of: life, property, public health and safety, air or water resources, or the realization of economic objectives evident in the County Comprehensive Plan, and for which immediate action is necessary to end the threat."

2 Goals and Policies

2.1 Planning Process

PP Goal 1: Develop a Comprehensive Plan that reflects the community’s vision and objectives, is consistent with the State’s planning laws, and is implemented through various local development regulations.

Policy 1: Use zoning and subdivision ordinances, performance standards, and related measures to implement the plan.

Policy 2: Use and maintain County-wide resource inventories to assist in determining the suitability and capability of the land and its resources to support future development.

Policy 3: Make land use decisions consistent with the Land Use Map and with the inherent capability of the land to sustain uses without creating problems that require a publicly funded solution (e.g., flooding, landslides).

Policy 4: Coordinate the County’s plans and programs with those at local, regional, and state levels.

PP Goal 2: Develop and maintain a Comprehensive Plan responsive to growth and economic trends which can be readily adapted to changing conditions.

Policy 1: Base amendments to the Comprehensive Plan on facts and findings that respond to public needs, are beneficial to the public interest, and are consistent with the vision and goals of the County.

Policy 2: Review and update the Comprehensive Plan according to the GMA.

PP Goal 3: Continue citizen involvement that insures full citizen participation in public decision-making according to the County’s adopted Public Participation Plan.

Policy 1: Maintain opportunities for citizen involvement and input on issues in advance of making land use decisions.

Policy 2: Provide information to citizens through the news media and other outreach processes as indicated in the Public Participation Plan to allow maximum citizen involvement.

2.2 Land Use

LU Goal 1: Ensure that land uses are compatible with surrounding uses that maintain public health, safety, and general welfare.

Policy 1: Maintain a mix of land uses that supports the character of each rural community.

- Policy 2: Promote compatible mixed uses of urban intensity that are appropriate in UGAs where community sewer and water are available or provided, and outside of UGAs within designated Rural Community Center areas and Commercial zones, and Planned Developments (PDs).
- Policy 3: Maximize the opportunities for compatible development within land use designations to serve a multitude of compatible uses and activities.
- Policy 4: Establish regulations for site planning and design to avoid or reduce potential impacts associated with "land use incompatibility" of proposed non-farm developments on parcels adjacent to lands designated GMA Agriculture, Rural Resource, or adjacent to lands being farmed commercially within other rural designations.
- Policy 5: Encourage multi-modal connectivity between land uses that enhances community access and promotes healthier and more active lifestyles for residents.
- Policy 6: Encourage compact development within UGAs.
- Policy 7: Encourage "green infrastructure" in new developments and redevelopments to address flooding and storm water runoff.

LU Goal 2: Follow controlling law and constitutional requirements, both state and federal, to ensure the appropriate protection of private property rights.

- Policy 1: Prevent regulations that create undue adverse economic impacts, or unnecessarily restrict the use of private property.
- Policy 2: Monitor evolving state and federal statutory amendments and judicial precedent so that timely amendments or changes can be made in implementing Comprehensive Plan policies and development regulations.

2.2.1 Urban Growth

LU Goal 3: Concentrate urban development in and adjacent to existing urban areas.

- Policy 1: Promote urban growth within the UGA and incorporated areas where urban services are available.
- Policy 2: Encourage well-designed, compact development in UGAs to save taxpayers and ratepayers money, conserve water, reduce water pollution, and support transit use.

LU Goal 4: Establish UGAs adjacent to incorporated areas, within which an orderly and cost-effective transition from rural to urban land uses and authority can be coordinated within the next 10 to 20 years.

Policy 1: Consider UGA expansions according to the process identified in the Benton CWPP.

Policy 2: Facilitate the realization of regional transportation and other infrastructure and public facilities plans.

Policy 3: Designate zoning and promote development on unincorporated lands within the UGAs consistent with the cities' Comprehensive Plan land use designations.

Policy 4: Promote outreach to established citizen interest groups regarding significant developments proposed within or adjacent to their communities.

2.2.2 *Communities Outside UGAs*

LU Goal 5: Identify the location, site planning, and density of new non-farm development outside of UGAs to protect existing agriculture from incompatible adjacent land uses.

Policy 1: Establish compatible land uses adjacent to areas designated as GMA Agriculture to minimize conflicts associated with farm activities such as spray, dust, noise, odors, and liability.

2.2.3 *Rural Lands*

LU Goal 6: Preserve rural lifestyles outside UGAs and incorporated areas while accommodating new population growth consistent with the protection of rural character.

Policy 1: Maintain overall residential densities within rural residential areas that reflect rural character as defined by the GMA and are low enough to perpetuate rural lifestyles, which are typically characterized locally by a predominantly open landscape inhabited by households engaged in diverse and recreational land use activities related to livestock and crop production; protect surface and ground water; and that can be supported by available public services.

Policy 2: Development in rural areas is typified by large lots and less dense development. Favoring development that is less dense and has larger lots helps maintain the rural character of designated rural areas and supports the protection of ground and surface water.

Policy 3: Designated rural areas will be utilized to reduce the inappropriate conversion of agricultural lands, prevent sprawling low-density development and assure that rural development is compatible with surrounding rural and agricultural areas.

- Policy 4: Encourage low impact recreational uses and protect open spaces that preserve rural character.
- Policy 5: Provide public services consistent with rural character. Rural developments will not impact existing public facilities/services to the extent that the level of service for that facility is reduced below the adopted threshold and/or acceptable operation capacity. Rural developments should occur where adequate access to transportation systems, and rural levels of utilities and facilities, such as domestic water, power, and fire and police protection are available.
- Policy 6: Rural development shall minimize potential adverse impacts to water quality, slope stability, vegetation, wildlife and aquatic life as implemented through the County's critical area regulations, shoreline master program, and hydrology manual.
- Policy 7: Support the availability of sufficient water to maintain the agricultural industry and agricultural processing and value-added manufacturing.
- Policy 8: Encourage long-term conservation, adequate water supply, and the wise stewardship of natural resources within Benton County for the benefit of current and future residents.
- Policy 9: Encourage the continued communication with irrigation districts, legislature, and other responsible entities to ensure that adequate irrigation water is available for agricultural uses.
- Policy 10: Limit impervious surface in rural lands by implementing maximum lot coverage in the development regulations.
- Policy 11: Encourage the use of low-impact development (LID) measures in the Eastern Washington Low Impact Development Guidance Manual and their application to urban development, urban and rural subdivisions, and large rural developments in Benton County.
- Policy 12: Support on-site infiltration in rural areas for new lots, subdivisions and developments by promoting storm water best management practices. Promote the retention of existing native vegetative cover in landscaping plans for areas zoned Rural Lands One Acre (RL-1), Rural Lands Five Acre (RL-5), Rural Lands Twenty Acre (RL-20), and Planned Development (PD) zones applied to any of these zones. Where the proposed development will not be precluded, limit impervious surfaces that are not infiltrated on-site for all new development in the zoning districts listed above to no more than ten percent and require the retention of 45 percent vegetative cover, which may include native or non-native species, provided soil infiltration/filtration properties are maintained.

Policy 13: Encourage the reduction of fire risk and urban/wildland interface through fire-wise principles, prevention measures, and other programs.

Policy 14: Support and encourage the use of and application of Firewise principles and other fire risk reduction measures consistent with the Benton County Natural Hazard Mitigation Plan and Community Wildfire Protection Plan to reduce fire risk for urban development, urban subdivisions, rural subdivisions and large rural developments susceptible to wildfires. Encourage the implementation of the Firewise principles, or similar best management measures, applicable to individual lots on all lots at risk from wildfires.

Policy 15: Encourage new rural development away from the 100-year floodplain, and as guided in the County's Flood Damage Prevention Ordinance, CAO, and SMP.

2.2.4 *Master Plan Resorts and Small-scale Recreational or Tourist Use*

LU Goal 7: Provide opportunities for Master Planned Resorts (MPRs) and Small-scale Recreational or Tourist (SSRT) uses consistent with the GMA.

Policy 1: Provide MPR and SSRT development regulations that are consistent with provisions of RCW 36.70A.360, the Comprehensive Plan, and County regulations.

Policy 2: Locate MPR and SSRT Uses outside the vicinity of UGAs according to the provisions of the GMA.

Policy 3: Develop a master site plan that functionally integrates various land uses with motorized and non-motorized circulation systems that are accessible to public transportation where available and connect with open spaces for public use.

Policy 4: Ensure that infrastructure, such as roads, water supply, and utility standards are consistent with rural densities and uses.

Policy 5: Prepare a capital facilities plan. Necessary capital facilities, utilities, and services may be provided to a MPR by service providers from outside the boundary of the MPR, including municipalities and special service districts, provided that all costs associated with service extensions and capacity increases directly attributable to the MPR are fully borne by the resort.

Policy 6: Ensure that developments contain open space and open space amenities (paths, trails, scenic overlooks, and viewpoints) that are open to the public.

2.3 Natural Resource Lands

NR Goal 1: Conserve and maintain agricultural land of long-term commercial significance as the local natural resource most essential for sustaining the County's agricultural economy.

Policy 1: Conserve areas designated "GMA Agriculture" in the Comprehensive Plan for a broad range of agricultural uses to the maximum extent possible and protect these areas from the encroachment of incompatible uses.

Policy 2: In the event of a conflict between residential uses and normal and routine practices of commercial agriculture on lands designated as GMA Agriculture, support the agricultural use where it is evident that the agricultural practice is consistent with or equivalent to recognized Best Management Practices.

Policy 3: Recognize that only uses related or ancillary to, supportive of, complimentary to, and/or not in conflict with agricultural activities are appropriate in areas designated GMA Agriculture.

Policy 4: Apply development standards that conserve water resources when reviewing proposed new non-agricultural developments to sustain the ability of the regional agricultural economy to expand and respond to new market conditions and opportunities.

NR Goal 2: Identify and protect mineral resource lands of commercial significance and from being significantly compromised by encroaching land uses that are incompatible with mining activity uses.

Policy 1: Protect mineral and aggregate resources of commercial significance from compromise by applying the County's Mineral Resources Protective Ordinance and BCC Title 15, Mineral Resource Lands when the owner of the resource requests such protection and use of the site has not already been compromised by incompatible adjacent land uses or development.

Policy 2: Discourage incompatible uses from encroaching upon and compromising the exploitation of protected mineral and aggregate resources.

Policy 3: Reclaim sites used for the extraction of mineral and aggregate resources in a manner consistent with applicable laws and ordinances.

2.4 Water Resources

WR Goal 1: Conserve, maintain, and manage existing ground and surface water resources to meet existing and future water supply needs for cities, farms, industry, and rural growth.

2.4.1 *General Policies*

Policy 1: Support efforts to secure long-term, sustainable water supplies that are consistent with the Benton County Comprehensive Land Use Plan or the Comprehensive Land Use Plans of the municipalities within Benton County.

Policy 2: Encourage water reuse, conservation, and responsible stewardship through the development of voluntary conservation programs, educational outreach, and alterations to current water policy that provide incentives for common sense approaches to stewarding water resources.

Policy 3 Support increasing water storage by increasing capacity in existing reservoirs, developing new above ground water storage capacity, and the development of storage capacity through aquifer storage and recovery, enhanced water recharge, and other groundwater management strategies.

Policy 4 Support ground water management strategies that permit the responsible development of ground water resources, while protecting the long-term sustainability of aquifers.

Policy 5: Encourage water management practices that will allow and provide incentives for reclaiming water resources that retain economic and recreational resources. Such practices include reclaiming waters used for food processing to irrigate crops or reclaiming wastewater to support developed open spaces, such as parks or golf courses.

Policy 6: Encourage voluntary conservation of water resources through xeriscape (low water use landscape plantings) and other low water use methods.

Policy 7: Encourage water marketing, the trading of water rights as commodities, providing there are sufficient controls in place to protect the basic needs of Benton County citizens and industries.

Policy 8: Support the formation and utilization of Water Conservancy Boards to review water rights transfer applications.

Policy 9: Support selective continued issuance of new water rights from groundwater sources where new water rights will not impair existing rights and are consistent with the long-term sustainability of aquifers.

2.4.2 *Municipal Water Supply Policies*

Policy 1: Endorse responsible stewardship of municipal water supplies.

- Policy 2: Work to identify opportunities for water conservation on County property and at County facilities.
- Policy 3: Encourage the use of irrigation water for non-potable uses in housing units, parks, and other developed lands within water service areas.
- Policy 4: Acknowledge that municipal governments and other water utilities, as applicable, are the best long-term water supply service providers within designated UGAs.
- Policy 5: Consider existing public or private water purveyors first when the need arises for a rural domestic water supplier.
- Policy 6: Look to Satellite Management Agencies (SMA) first for assistance with operations and management of failing or troubled water systems throughout the County. Encourage an increase in the number of approved SMAs in the County.

2.4.3 *Rural Domestic Water Policies*

- Policy 1: Public and private purveyors, along with exempt wells operated by individual households, adequately provide for water needs in rural areas of the County. The County will not seek to become a residential water purveyor except where mandated by the state under RCW 43.70.195.
- Policy 2: Recognize that new rural water right permit exempt wells are junior to senior surface and ground water rights and may have the potential to impair these water rights. Support the implementation of water management and mitigation strategies to avoid or offset impacts from exempt wells, as applicable, that allow for continued growth and development consistent with the land use plan.
- Policy 3: Rural development shall provide adequate water for domestic use. When feasible, rural developments will be encouraged to utilize existing community systems with adequate availability for domestic water and sewage disposal.
- Policy 4: New groundwater uses must provide evidence that the proposed water source is physically and legally available. Groundwater uses and withdrawals, including the issuance of building permits and the approval of land divisions, must be consistent with RCW 90.44.050, and with applicable rules adopted pursuant to RCW 90.22 and 90.54.

2.4.4 *Industrial Policy*

Policy 1: Support efforts to secure long-term sustainable water supplies sufficient to provide for industrial activity on the Hanford site, in the Finley area, and in other industrial designated areas.

2.4.5 *Agriculture Policies*

Policy 1: Encourage efforts to secure long-term water supplies to support the County's strong and diverse agriculture economy.

Policy 2: Support the withdrawal of additional water from the John Day and McNary pools, under reserved and new water rights, and water right changes and transfers, to service additional agricultural needs, including direct irrigation, food processing, and related ag-industrial needs.

Policy 3: Encourage the continued development of water transfers and changes to meet changing agricultural production needs.

Policy 4: Support strategies that improve water supply during drought conditions for irrigation districts and other water right holders on the Yakima River consistent with the Yakima Integrated Plan (Ecology and USBR 2011).

WR Goal 2: Protect and enhance surface and groundwater water quality for human health, drinking water supply, and to meet water quality standards.

Policy 1: Prohibit developments which have the potential for significant individual or cumulative impacts on ground and surface water quality; or alternatively, site and design developments to avoid or mitigate such impacts.

Policy 2: Protect surface and groundwater quality as a resource essential to the public health, safety and welfare, economic growth, and prosperity of Benton County.

Policy 3: Support development and management of County-owned storm water systems that protect surface and ground water quality consistent with local conditions.

Policy 4: Support the Benton-Franklin Health District to develop and implement septic tank and drain field standards that protect surface and ground water quality and human health.

Policy 5: Encourage educational programs and voluntary efforts of agricultural producers, processors, irrigation districts, and municipal users to responsibly manage return flows to improve surface and ground water quality.

Policy 6: Support application of state standards in a manner that reflects climate differences in Benton County compared to other regions of Washington State.

WR Goal 3: Support continued multi-purpose uses of the Columbia River.

Policy 1: Encourage use of the Columbia River and its reservoirs as a key element in ensuring long-term availability of water supply, barge transportation, power generation, and flood control and support for population growth, agricultural production, industry, fisheries, and economic development. Pursuant to the U.S. Army Corps of Engineers John Day reservoir drawdown study, the reservoirs should also be maintained to protect wildlife habitat.

Policy 2: Support the designation and allocation of reserved water for municipal, commercial, industrial, and irrigation use from the John Day and McNary pools as per the authority under the RCW (90.54) and Washington Administrative Code ([WAC]173-531A.040) to allocate Columbia River water resources.

Policy 3: Support water resource policy decisions based on defensible science to meet the needs of people and fish and wildlife. Evaluate strategies for challenging policies that may not be scientifically defensible.

Policy 4: Support off-stream reservoirs to augment river flows.

WR Goal 4: Protect and enhance surface water resources to support rivers, streams, and wetlands that support fish and wildlife species and associated habitats.

Policy 1: Support strategies that improve flows for anadromous fish and other fish and wildlife during all types of water years on the Columbia and Yakima rivers, and for the Yakima River ensure actions are consistent with the Yakima Integrated Plan (Ecology and USBR 2011).

Policy 2: Promote a balanced response to listings of threatened and endangered species that provides improved conditions for species maintenance and recovery, while maintaining and allowing sustainable development of water resources for economic growth.

Policy 3: Equitably apply the Endangered Species Act by establishing specific, measurable recovery goals and addressing human factors, economic costs, and opportunity costs when preparing science-based species recovery and species protection plans.

Policy 4: Protect and enhance water quality to improve habitat conditions for salmonids.

2.5 Critical Areas

CA Goal 1: Protect the functions and values of critical areas within the county with land use decision-making and development review.

Policy 1: Apply standards, regulations, and mitigation strategies to development during the permitting and development approval process that protects critical areas functions and values.

Policy 2: Encourage new development and redevelopment in UGAs and large developments outside of UGAs to comply with low impact development standards as applicable.

CA Goal 2: Protect life and property and avoid or mitigate significant risks to public and private property and to public health and safety that are posed by frequently flooded and geologic hazard areas.

Policy 1: Limit developments in areas with higher risk for natural disaster or geologic hazard unless it can be demonstrated by the project proponent that the development is sited, designed, and engineered for long term structural integrity and that life and property on- and off-site are not subject to increased risk as a result of the development.

Policy 2: Prevent developments within floodways and inherently unstable slopes as they are not suitable for developments.

Policy 3: Locate and designate lands subject to natural disasters and hazards for uses which avoid or minimize exposure of life and property to risk.

CA Goal 3: Protect the County's natural areas, shorelines, and critical areas as unique assets to the community.

Policy 1: Use the CAO, SMP, SEPA, and other ordinances, as applicable, to designate and protect critical areas and the natural environment.

Policy 2: Identify and protect river, stream, wetlands, and fish and wildlife habitat conservation area functions and values.

Policy 3: Encourage development of water-oriented recreational, cultural, and commercial facilities in certain shoreline locations, consistent with SMP goals and policies and its criteria of no net loss of ecological functions, to enhance and diversify community recreational resources and its attractiveness to tourists.

Policy 4: Ensure public access to shorelines on public land, subject to regulations protecting public safety, sensitive habitat areas, and wildlife.

Policy 5: Encourage public agency acquisition of natural areas of scientific, research and educational significance for public benefit.

Policy 6: Identify and designate habitats of local importance to protect locally important habitats and species under the County CAO.

Policy 7: Any developments, uses, and/or activities in the channel migration zone should be consistent with the standards in the SMP.

Policy 8: Protections associated with landslide areas should be maintained according to the standards in the County CAO and SMP.

CA Goal 4: Sustain a diverse, productive, and high-quality natural environment for the use, health, and enjoyment of County residents.

Policy 1: Work with private and public property owners during development to ensure protection and appropriate use of the County's natural resources.

Policy 2: Integrate natural resources and critical areas such as rivers, creeks, ridges, and slopes into a linked pattern of open lands where feasible, to serve multiple open space functions such as buffers, visual resources, recreation, and wildlife habitat/corridors.

Policy 3: Provide necessary trails or linkages between natural features when feasible.

CA Goal 5: Achieve balance among economic uses of land and critical areas protection.

Policy 1: Work with state, federal, and local agencies and other County stakeholders regarding the application of environmental protection laws and regulations.

Policy 2: Maintain and enhance the viability of agriculture while voluntarily protecting and enhancing critical areas through the County VSP on agricultural lands.

Policy 3: Apply Best Management Practices and the conservation practices outlined in the County VSP Work Plan to lands historically and currently used for the production of food, agricultural products, and grazing of livestock.

Policy 4: Continue to consistently apply Best Management Practices to lands used for the extraction of minerals.

2.6 Economic Development

ED Goal 1: Create a balanced and diverse economy that provides an opportunity to make economic and lifestyle choices for Benton County residents.

Policy 1: Promote industries that are diverse and support an agriculture-based economy.

Policy 2: Promote and protect tourism related to viticulture and other agricultural activities.

Policy 3: Provide adequate, accessible commercial areas while minimizing impact on surrounding uses.

Policy 4: Facilitate economic growth and prosperity while preserving the existing rural quality of life and character, as it is defined by rural residents.

ED Goal 2: Expand employment opportunities in unincorporated Benton County.

Policy 1: Maintain and protect the agricultural economic base of Benton County.

Policy 2: Locate commercial retail and service activities serving urban and regional markets within UGAs. Commercial development serving rural communities is appropriate on commercially designated lands within or adjacent to the communities of Finley, Plymouth, Paterson, and Whitstran. Evaluate MPRs and tourist-oriented visitor destinations for appropriate siting countywide.

Policy 3: Develop commercial activities in "nodes" or clusters as opposed to strip-type configurations.

Policy 4: Designate uses within "Rural Commercial" areas as those which either serve interstate freeway traffic or are located at the center of rural communities to serve their needs.

Policy 5: Plan, construct, and landscape commercial developments to be visually and physically compatible with surrounding areas and uses.

ED Goal 3: Provide areas for the location of light and environmentally acceptable heavy industrial uses, while minimizing impacts on surrounding rural uses.

Policy 1: Establish industrial sites on lands designated for industrial use to protect from incompatible uses by using performance and/or site design criteria.

Policy 2: Do not locate non-agricultural related industry on "GMA Agriculture" designated land.

Policy 3: Identify diverse industrial land uses in the Plan and locate these uses where minimal environmental impact occurs.

Policy 4: Encourage light and heavy industrial uses to locate in areas where:

1. Access can be provided by major transportation networks such as road, rail, air, and water
2. Existing development is characterized by and/or compatible with industrial activity
3. Utilities, including electric, gas, water, and sewer, can be adequately provided, either as extensions of municipal facilities (e.g., by service contract) or by on-site facilities

2.7 Housing

HE Goal 1: Provide for a variety of residential uses and densities consistent with the rural character and lifestyles and a choice of housing types for people of all income levels.

Policy 1: Include a variety of dwelling unit types and densities within the rural housing stock.

Policy 2: Allow and regulate manufactured homes in the same way as site-built homes.

Policy 3: Work with Cities to provide housing for all economic segments of the population and seek to create the conditions necessary for the construction of affordable housing at appropriate densities within each of the jurisdiction types (i.e., rural and urban).

Policy 4: Follow RCW 36.70A.350 with regard to approving urban densities located outside of urban growth boundaries and outside of existing Rural Community Center areas, unless they are encompassed by the expansion of an existing UGA.

Policy 5: Locate higher than rural densities in appropriate areas within the Rural Community Center areas, Rural Transition Areas, or adjacent to the communities of Finley, Plymouth, Paterson, and Whitstran, per the adopted Land Use Map.

Policy 6: Keep plan provisions for the location of rural residential development consistent with preserving agricultural lands and maintaining the rural lifestyles of the County while also minimizing conflicts with commercial agricultural activities.

Policy 7: Consider accessory dwelling units as an affordable housing option and look for flexible and innovative ways of integrating accessory dwelling units into single family residential zones.

HE Goal 2: Adequate housing should be available to meet the housing needs for the existing and projected population.

Policy 1: Preserve existing, viable, rural residential areas and protect single-family residential areas from incompatible land uses.

Policy 2: Allow new housing in the unincorporated County consistent with densities maintained in the Land Use Element and map.

2.8 Transportation Element

TE Goal 1: Provide safe, convenient, efficient, economic, and multi-modal transportation networks compatible with the rural character and which serve the transportation demands consistent with the Land Use Element, and all other relevant provisions of the Comprehensive Plan.

Policy 1: Provide adequate roads that safely handle anticipated traffic and serve a diversified area of industrial, agricultural, and residential uses.

Policy 2: Encourage transportation planning and projects that:

1. Conform with and serve the Land Use Element of the Comprehensive Plan
2. Facilitate the flow of people, goods, local products, and services to strengthen and assist the expansion of the local and regional economy
3. Enable the conservation of energy

Policy 3: Improve the cost effectiveness of capital spending by coordinating new road construction with all jurisdictions and service districts/providers.

Policy 4: Minimize the segmentation, loss, and compromising of agricultural lands and productivity resulting from new road construction.

Policy 5: Plan for the need to expand the existing road system to accommodate future growth in farm to market and industrial transport and overall traffic.

Policy 6: Use a frontage road or a circulation system, where practical, for commercial development to prevent the occurrence of numerous driveways opening onto arterial roadways.

Policy 7: Plan to expand transportation capacity by using existing facilities and rights-of-way, where practical and feasible.

Policy 8: Minimize the number of railroad crossings for public safety by using frontage roads, underpass installation, or signals.

Policy 9: Create an integrated network of safe pedestrian ways and/or bicycle routes along arterial and other roadways.

Policy 10: Construct pedestrian ways and bicycle routes in conformance with uniform design standards for trails and paths as described in the Washington State Department of Transportation (WSDOT) Design Manual or standards developed and adopted by Benton County.

Policy 11: Review new development under the County's designated LOS on County owned roads.

Policy 12: Support the development of a complete streets policy that would make accommodations for pedestrian, bicycle, and transit users on appropriate roadways.

Policy 13: Maintain location and alignment of all proposed streets within a subdivision compatible with existing and planned streets, topographical conditions, public convenience and safety,

and the proposed uses of the land to be served by such streets. Limit dead-end streets to 600 feet in maximum length as a means of protection to property, owners, residents, and emergency personnel.

Policy 14: Encourage short-range local vehicular trips to use the local street system to assist in preserving the functionality of state highways.

TE Goal 2: Provide an integrated network of trails and paths for non-motorized circulation throughout rural areas connecting to urban trails and paths to promote active lifestyles.

Policy 1: Provide safe pedestrian ways and bicycle routes, separate from vehicle roadways where feasible.

Policy 2: Provide County road rights-of-way wide enough for off-road walking, jogging, bicycling, and horseback riding where feasible.

Policy 3: Include local resident needs for pedestrian, bicycle, and recreational, and equestrian travel when those needs are identified in the Comprehensive Plan.

TE Goal 3: Maintain the integrity of the transportation system while minimizing environmental and other impacts.

Policy 1: Avoid and/or minimize adverse social, economic, and environmental impacts and costs.

Policy 2: Avoid or mitigate conflicts and adverse impacts to rural character that may occur due to the transportation network and its improvements.

TE Goal 4: Coordinate the transportation system with neighboring cities and other transportation providers.

Policy 1: Promote regional transportation plans.

Policy 2: Work with transit, rail, port authorities, and other transportation agencies to promote a coordinated transportation system.

TE Goal 5: Protect public safety and property by establishing development regulations that discourage the siting of incompatible uses and airspace obstructions adjacent to general aviation airports that serve the public.

Policy 1: Preserve, maintain, and develop air, barge, and railway transportation facilities which serve the County.

2.9 Parks, Recreation, Open Space, and Historic Preservation

PL Goal 1: Develop and maintain a park system for Benton County residents and visitors that provides a variety of recreational opportunities in regional and local parks and open space.

Policy 1: Develop and maintain a regional park and trail system integrated with city recreational resources.

Policy 2: Encourage the development of a system of bicycling, hiking, recreational, and equestrian trails in the County that coordinates with existing and/or proposed city systems.

Policy 3: Encourage developers of low density, large lot subdivisions and plats to provide access easements for bicycle and horse riding within and between contiguous developments, connecting to regional trails and to establish a means of maintaining such easements through coordination between the County, developers, and homeowners.

Policy 4: Offer a broad range of recreational opportunities for various abilities and needs of County residents (e.g., fishing, hiking, playfields).

PL Goal 2: Work with cities and agencies to protect greenways and open spaces along the riverine corridor of the lower Yakima River.

Policy 1: Identify and consider acquisition of natural open space preserves, wildlife corridors, and critical areas as part of the park system.

Policy 2: Work with cities to promote the protection of natural resources and open spaces.

PL Goal 3: Conserve visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods.

Policy 1: Identify and preserve historically significant structures and sites whenever feasible.

Policy 2: Encourage the public and/or private acquisition of the prominent ridges within unincorporated Benton County as Open Space Conservation, in order to preserve views, protect native habitat, and provide for public access and recreation associated with these landscapes.

Policy 3: Pursue a variety of means and mechanisms such as the preparation of specific and area plans, conservation easements, clustered developments, land acquisitions and trades, statutory requirements to protect the natural landform and vegetative cover of the Rattlesnake uplift formation, notably Rattlesnake, Red, Candy, and Badger mountains and the Horse Heaven Hills.

Policy 4: Consider the preservation of the ridges and hillside areas through various development regulations.

PL Goal 4: Preserve significant historic structures, districts, and cultural resources that are unique to Benton County.

Policy 1: Coordinate with local tribes to protect historic and cultural resources.

Policy 2: Preserve archaeologically significant sites by siting and designing development to avoid or mitigate impacts.

PL Goal 5: Identify, preserve, and protect historic, cultural, and archaeological resources found to be significant by recognized local, state, tribal or federal processes.

Policy 1: Identify known, recorded archaeological, cultural, and historic resources.

Policy 2: Update and refine the local process for evaluating the significance of historic, cultural, and archaeological resources.

Policy 3: Preserve areas that contain valuable historical or archaeological sites of federal, state, tribal, or local significance including those maintained in the Department of Archaeology and Historic Preservation's database, areas known only to tribes and areas of higher risk potential. Maintain and enforce development code provisions that require conditioning of project approval on findings made by a professional archaeologist for development activities on sites of known cultural, historical, or archaeological significance.

Policy 4: Prior to demolition, moving, or alteration to any designated historic, cultural, and archaeological landmark, ensure that due consideration is given to its preservation or, at a minimum, documentation of its historic, cultural, or archaeological value.

2.10 Capital Facilities and Public Services

CF Goal 1: Anticipate the need and location of and plan for the timely and cost-effective provision of public facilities and services based upon the Land Use Element,

Policy 1: Expand and diversify the rural economy and employment base by constructing public facility capacity to serve as a framework and incentive for rural development consistent with land use designations.

Policy 2: Plan for the location and protection of anticipated and existing public uses such as parks, playgrounds, schools, essential public facilities, and other public, state, or federal activities or facilities owned and operated for the benefit of the public.

Policy 3: Eliminate existing service level deficiencies in existing facilities before expending capital funds for new uses. Capital facilities planning should integrate all of the County's capital project resources (grants, bonds, general County funds, donations, real estate excise tax, conservation futures property tax, fees and rates for public utility services, and any other available funding).

Policy 4: Prioritize and evaluate public capital facilities annually for funding for capital projects that are necessary to accommodate existing and projected demands of the Land Use Element of the Comprehensive Plan.

Policy 5: Prioritize capital facilities planning and expenditures consistent with this Comprehensive Plan for projects that accomplish one or more of the following:

1. Are essential for public health, safety, and welfare
2. Address and/or improve the quality and level of regional government services
3. Maintain designated transportation LOS
4. Improve public and private sector productivity
5. Facilitate the maintenance and growth of the rural/agricultural economy

Policy 6: Explore public facilities and infrastructure investment options that use Hanford site resources and benefit the region beyond the Hanford area.

Policy 7: Promote compatible development of land adjacent to existing and proposed school and other public facilities.

CF Goal 2: Provide for the siting of “Essential Public Facilities” using siting criteria that are consistent with statutory requirements applicable to these facilities and within appropriate land use designations,

Policy 1: Locate capital facilities identified as essential public facilities in a manner that will provide necessary service to intended users while minimizing the impact to surrounding land uses.

2.11 Utilities

UE Goal 1: Ensure utilities support the land use and economic development goals of the County.

Policy 1: Siting of proposed public facilities should be consistent with adopted land use policies.

UE Goal 2: Maintain public and private household water and sewer systems that are consistent with the rural character of the County.

Policy 1: Develop joint service agreements between special districts, counties, and cities for lands within UGAs.

UE Goal 3: Facilitate efficiency in utility land use and development.

Policy 1: Support development regulations that are flexible and receptive to innovations and advances in cellular technology and act upon the knowledge that moving information rather than people yields benefits of conservation and cost efficiencies.

Policy 2: Encourage multiple uses, including passive recreational use, in utility corridors where practical.

Policy 3: Facilitate maintenance and rehabilitation of existing utility systems and facilities and encourage the use of existing transmission/distribution corridors.

UE Goal 4: Develop and adopt provisions as necessary that support future demand for alternative energy vehicles.

Policy 1: Permit electric vehicle charging stations equipped with slow and medium speed charging equipment as an accessory or ancillary use to any principal use in all zoning districts.

Policy 2: Allow electric vehicle "rapid charging stations" designation in commercial, industrial, and agricultural zones as regulated in the zoning code and exclude in areas identified as critical resource areas.

3 Land Use Element

3.1 Introduction

This Chapter contains the GMA required land use element to create a framework upon which future growth and development will occur consistent with community objectives and the requirements of law. Consistent with GMA requirements, the land use element designates the proposed general distribution, location, and extent of land uses for agriculture, timber production, housing, commerce, industry, recreation, open spaces, general aviation airports, public utilities, public facilities, and other functions, as applicable, and describes development densities and projections for future population growth.

Within all elements of the Comprehensive Plan, project planning, scheduling, and financing are targeted to provide the basic infrastructure services that enable the public to realize designated land use. The relationship between elements is one of functional interdependence and internal consistency where the Comprehensive Plan Elements and land use designations are:

- Consistent with and carry forth the Comprehensive Plan's policies
- Depict scale and densities consistent with the carrying capacity of the land, surrounding area, and infrastructure
- Cost effective relative to the expenditure of public revenues to construct and maintain public infrastructure/service
- Reflect the suitability of the land for the designated land uses in terms of capacity, compatibility, and availability of services

The land use element should undergo a major review every 8 years to reaffirm both the legitimacy of the "Vision" and to make necessary adjustments in response to new conditions or changing attitudes. Annual review enables the County to monitor the progress of meeting objectives and to keep objectives current relative to emerging issues and needs.

The purpose of the land use element in conjunction with the rural element, is to:

- Provide a description of the outcomes the community expects from growth and development
- Provide certainty and predictability for development and financial interests, residents, and service providers
- Serve as the policy and regulatory framework which ensures that through the passage of time and successive political administrations the cumulative outcome of growth and development consistently moves toward that chosen by the rural community
- Demonstrate how local interests meet the mandates of state planning law and other requirements consistent with local needs and preferences

3.2 Existing Land Uses in the County

Benton County consists of over 1,715 square miles. The U.S. Department of Energy's Hanford Reservation occupies 416 miles, or 24 percent, of Benton County's northern area (see Appendix A: Map Folio, Figure 2 – Publicly Owned Lands Map). An additional 93,299 acres are owned or managed by other public entities (port districts, state, federal, and local government lands). Total public ownership represents 33 percent of the acreage in Benton County.

The existing land use activities within unincorporated Benton County are principally agriculture, agricultural related industry, rural residential, rangeland, open space, and Hanford industrial uses (see Appendix A: Map Folio, Figure 3 – Existing Land Use Activities Map). The current allocation of land use within the County is presented in Table 3-1.



Dryland agriculture in Benton County

Table 3-1 indicates that GMA agriculture (irrigated and dryland) is the largest single land use within the County. It occupies approximately 59 percent of the total land area. Next largest is Hanford, which accounts for approximately 25 percent, followed by rural land uses (approximately 7 percent). The five cities and their UGAs occupy 72,245.37 acres (113 square miles), or over 6 percent of the total land area. See Appendix A: Map Folio, Figure 4 – Existing Land Use Designations Map.

**Table 3-1
Current Land Use in Benton County (City annexations updated 2016)**

Land Use Type	Acres	Square Miles	Percent
Cities and Urban Growth Areas	72,245	113	6.58
Hanford	266,351	416	24.27

Land Use Type	Acres	Square Miles	Percent
Hanford Reach	12,443	19	1.13
Unincorporated Area			
Growth Management Act Agriculture	647,107	1,011	58.96
Open Space Conservation	2,108	3	0.19
Public	15,163	24	1.38
Rural Lands 1	1,182	2	0.11
Rural Lands 1-3	318	0	0.03
Rural Lands 5	74,039	116	6.75
Rural Lands 20	1,813	3	0.17
Community Center	500	1	0.05
Community Commercial	26	0	0.00
Interchange Commercial	325	1	0.03
General Commercial	202	0	0.02
Light Industrial	1,333	2	0.12
Heavy Industrial	2,344	4	0.21
Total Unincorporated Area	746,460	1,166	68.01
Total County Area	1,097,499	1,715	100

Source: Benton County GIS data

3.2.1 Land Use Pattern and Compatibility

Benton County's land use can be described in broad categories: urban, rural, agricultural, industrial, public, and open space. Agriculture is the predominant land use in Benton County. Much of the urban land is concentrated in the eastern portion of the County which comprises the Tri-Cities area—Kennewick, Richland, and West Richland—with Benton City and Prosser comprising the urban land in central and western Benton County. The rural residential lands are mostly along the Interstate-82 corridor and in the urban fringes with some located in the Patterson and Plymouth areas. Industrial lands are minimal in the unincorporated County, located near Finley and Prosser. Other industrial lands are mostly located within the Hanford area or within the UGAs. Public and open space lands are located throughout the County.



Compatibility is based on the intensity of land uses. Generally speaking, the most intense use is industrial due its operational impacts (e.g., noise, light, dust), supporting facility needs, and overall land impact. Natural areas are considered the least intense as there are no developments or improvements on such areas. Therefore, a low density residential area next to a heavy industrial land use would be considered incompatible because of the negative impacts industrial uses may have on the residential areas. Appropriately designed buffers, landscaping, and transition areas between uses should be considered between incompatible land uses.

3.2.1.1 Military Training Routes

When planning for new development within Benton County, it is important to consider the critical role of military training areas in support of national defense. Within Benton County there are several military training routes that function as ‘highways in the sky’ used by military aircraft to practice high- and low-altitude training exercises and to traverse between military installations. Any development or new construction that seriously impacts or hinders the military training routes’ function and viability is considered incompatible land use. Future land use compatibility planning must be an overarching goal of the Comprehensive Plan.

The GMA requires the County to provide notice to the military when it intends to amend its “comprehensive plan or development regulations to address lands adjacent to military installations to ensure those lands are protected from incompatible development.” Per the RCW 36.70A.530:

1. Military installations are of particular importance to the economic health of the state of Washington. It is a priority of the state to protect the land surrounding military installations from incompatible development.
2. A comprehensive plan, amendment to a comprehensive plan, a development regulation, or amendment to a development regulation, should not allow development in the vicinity of a military installation that is incompatible with the installation's ability to carry out its mission requirements.

3.2.2 Population and Land Use Trends

Beginning in the 1990s there has been a condition of sustained population and economic growth in eastern Washington. For the present, the cyclic booms and busts in the local economy characteristic of the 1960s through late 1980s have been replaced with a seemingly steady and prolonged period of population growth and conversion of raw land to agriculture and related industries, urban uses, and rural residential development.

Locally, since the early 1990s both the farm and construction/development sector of the non-farm economy have enjoyed relatively favorable market conditions. The economy was less impacted by the recession in 2008 than the rest of the nation due to the increase in employment at the Hanford Site as part of the American Recovery and Reinvestment Act (ARRA) investment in expedited cleanup

activities in 2009 and beyond. Table 3-2 indicates the historic population growth in Benton County by decades.

**Table 3-2
Historic Population Growth in Benton County**

Year	Benton County	% Change Benton County
1970	67,540	8.81%
1980	105,800	56.65%
1990	112,560	6.39%
2000	142,475	26.58%
2010	175,177	22.95%

Benton County’s current population, based on the 2017 OFM data, is 193,500. The unincorporated County population constitutes 35,085 persons, or approximately 18 percent of the total County population. At present, the agricultural sector is experiencing significant economic growth in the County, as the global markets for eastern Washington farm products continue to expand. At the local level, the commercial retail sector within the Tri-Cities has reached a scale of regional significance with new retail stores being constructed regularly and serving an area within an approximate 100-mile circumference of the Tri-Cities. Hanford Cleanup budgets continue to play a major role in supporting local economic and population growth, and this is expected to continue into the future.

The land use trend on the Hanford Site can be broadly described as the gradual reintegration of major portions of Hanford's resources (land, water, and infrastructure) into the economy, custom and culture, and regulatory authority of local jurisdictions within which the Hanford Site lies. Today, the Hanford Site is being cleaned up for future uses that, in addition to federal missions, will likely include non-defense related private and public sector uses.

Recently, 1,641 acres of Hanford land was transferred from the U.S. Department of Energy to the City of Richland, the Port of Benton, and Energy Northwest for industrial uses. The Hanford Reach National Monument, created by President Clinton in 1999, has also generated additional visitors and tourists to the site and the surrounding communities.

3.2.3 *Future Considerations*

Accommodating land needs of both agricultural and non-agricultural uses, while maintaining the potential of all economic sectors, is important for Benton County. Key considerations for land use in the County are to preserve and protect agricultural and resource lands, allow rural lifestyle in rural lands, and allow growth where services are available, primarily in the urban areas. With the County

situated at the confluence of three rivers and its mountainous and ridged geological characteristics, protection of the County's environmental resources is also an important aspect for future planning.

As the agriculture economy continues to grow in Benton County, properly locating sites and providing basic services for agriculture related industries, facilitating the growth of "agri-tourism" and "value-added" processing sectors will be important.

3.3 Land Use Categories

As noted above, land use in Benton County is organized into designation categories: urban, rural, agriculture, industrial, public, and open space lands. Some of these designations also have sub-categories. Table 3-3 indicates the proposed land uses and distribution of lands within Benton County (see Appendix A: Map Folio, Figure 5 – Future/Proposed Land Use Designations Map).

**Table 3-3
Proposed Land Uses and Land Distribution in Benton County**

Land Use Type	Acres	Square Miles	Percent
Cities and Urban Growth Areas	72,245	111	6.58
Hanford Site	265,576	415	24.19
Hanford Reach	12,443	19	1.13
Unincorporated Area			
Growth Management Act Agriculture	649,153	1,014	59.12
Open Space Conservation	2,169	3	0.20
Public	15,563	24	1.42
Rural Transition	3,507	5	0.32
Rural Remote	66,402	104	6.05
Rural Resource	7,214	11	0.66
Rural Community Center	448	1	0.04
Rural Commercial	423	1	0.04
Rural Industrial	2,870	4	0.26
Total Unincorporated Area	747,749	1,168	
Total County Area	1,098,013	1,716	100

Benton County implements its various land uses through zoning designations as shown in Table 3-4 below.

**Table 3-4
Land Use Implementation by Zoning**

Land Use	Zoning
Urban	Urban Growth Area Residential
Hanford	Unclassified
Hanford Reach	Unclassified
Growth Management Act Agriculture	Growth Management Act Agriculture
Open Space Conservation	Rural Lands 5
Public	Park District
Rural Transition	Rural Lands 1
Rural Remote	Rural Lands 5
Rural Resource	Rural Lands 20
Rural Community Center	Community Center Residential, Community Commercial
Rural Commercial	Interchange Commercial, General Commercial
Rural Industrial	Light Industrial, Heavy Industrial

Designations under each category are further discussed below.

3.3.1 *Urban Lands*

Urban lands are lands located within, adjacent to, or as in the case of existing unincorporated islands, surrounded by existing city limits.

A key component of the GMA and the Comprehensive Plan is to allow growth within the UGAs. These areas include cities and other areas characterized by urban growth or adjacent to such areas, and are designed to accommodate the projected population growth for 20 years. The GMA further specifies that urban growth should first be located in areas that already have adequate existing public facilities and service capacity and second, be located in areas where such services if not already available, can be served adequately by a combination of both existing and future public and private sector facilities and services.

The CWPP establish a process between the County and cities to manage development within the cities and their UGAs, and a process of annexation of UGAs into the cities.

3.3.1.1 Urban Land Use Designation

Urban lands in Benton County include land within the city limits and the UGAs. There are five designated and approved urban growth areas (UGA's) in Benton County: Benton City (Appendix A-Figure 18), Kennewick (Appendix A-Figure 19), Prosser (Appendix A-Figure 20), Richland (Appendix A-Figure 21), and West Richland (Appendix A-Figure 22). The densities, uses, and development

provisions allowed within this land use assure that development patterns are consistent with city comprehensive plans.

3.3.2 *Rural Lands and Element*

The GMA requires counties to include a rural element in their comprehensive plans to permit appropriate land uses that are compatible with the rural character of such lands and provide for a variety of rural densities. This element has been incorporated as a part of the land use element of the County's plan.

Rural lands are those areas outside of UGAs, excluding agricultural, public, open space, and other specifically designated lands in this Comprehensive Plan. Land uses in rural areas include a variety of densities for rural, commercial, and industrial use consistent with the rural character. Rural areas are traditionally used for small-acreage farms, orchards, agricultural crops, livestock, mineral extraction and processing, and low-density residential development. The low intensity use of rural land also provides fish and wildlife habitat, open space, and other environmental benefits. Recreational uses which preserve open space and protect the natural environment are encouraged in rural lands. The County's goals and policies, through the rural element in this Comprehensive Plan and associated development regulations, aim to identify and guide land use designation of rural lands in a manner t [Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.] hat preserves rural character.



3.3.2.1 Rural Character

The rural areas of Benton County are places where open space, the natural environment, and vegetation dominate over the built environment. The rural area is a place where one can find wildlife habitats and a historic heritage characterized by low-intensity land uses that include small farms or

scattered homesteads. Rural areas vary in Benton County and differ based on physical characteristics and community preferences based on their customs, culture, outlook, and living environments.

Rural character embodies a quality of life based upon traditional rural landscapes, activities, lifestyles, and aesthetic values. This includes more open landscapes where the setting is quiet, peaceful, and natural. The residents may enjoy a slower paced lifestyle, closeness with nature, and access to recreational opportunities, acknowledging that larger acreage areas may also require more time for maintenance and management of the land, animals, and other responsibilities often associated with a more rural lifestyle. Rural areas are typically separated from urban areas.

3.3.2.2 Rural Communities

Rural communities, such as Paterson, Plymouth, Whitstran, and Finley are designated as Rural Community Centers to reflect a localized pattern of residences on less than 5-acre lots and a variety of small-scale local commercial service areas such as: grocery stores, service stations, eateries, taverns, post offices, and auto repair, that serve the surrounding rural population. The Comprehensive Plan Rural Community Center designation reflects this pattern and equals 1 to 3 dwelling units per acre (Du/acre). Rural Community Centers are "limited areas of more intensive rural development" (LAMIRDs) authorized by RCW36.70A.070 (5)(d). The County's RL-1 "Rural Lands One Acre District" lands are not LAMIRDs but may developed at an intensity similar to a LAMIRD based on historical development patterns and plats approved prior to the GMA. The size of the Rural Community Centers in Paterson, Plymouth, and Finley are 36, 89, and 189 acres, respectively. Whitstran Rural Community Center contains 67 acres.

Other areas that are considered the equivalent of limited areas of more intense rural development are pre-existing urban/suburban areas designated rural lands one acre (RL-1). These RL-1 areas are located throughout the County and are characterized by locations adjacent to major travel corridors (e.g., state routes); smaller parcel sizes relative to the GMA "rural" designation; cultures associated with "neighborhoods" or landowner associations; and densities that allow for infill that would not negatively impact adjacent rural or agriculturally designated lands.

3.3.2.3 Rural Land Use Designations

Rural lands designations are based upon a required "minimum" lot size. A larger than minimum lot size may be required, when necessary, to satisfy Washington State Department of Health requirements for water and domestic waste disposal and code requirements (e.g., setbacks, easements).

Rural Transition is designated to areas that are in close proximity to UGAs and have experienced steady growth in the last decade. The intent of the Rural Transition designation is to enable rural residential living in conjunction with providing a transition area between the rural and urban

environments, and potentially suitable for future inclusion into UGAs. Maximum allowable density in this land use category is 1 DU/acre.

There are currently six areas in the County designated as Rural Transition. One is surrounded by Richland urban areas on all sides near the Columbia Park Trail. All other Rural Transition areas abut Kennewick, Richland, and Prosser UGAs on at least one side or adjoin a higher intensity land use between a UGA and the Rural Transition land use. A significant portion of the future population growth within the County is anticipated to occur in these areas.

Rural Remote is the predominant rural land use in the County. This land is located mostly between the agricultural lands (GMA Agriculture), Rural Transition, and the UGAs. Rural Remote land use is intended to enhance and preserve the County's rural character, which includes rural open space, low densities, wildlife habitat, public open space for outdoor recreational activities, and rural home sites on which a limited range of agricultural activities may be conducted. Allowable density in Rural Remote land use is 1Du/5acres.

Rural Resource is designated in areas where existing topography or geological conditions can be protected and where a very low density of residential or other uses may be allowed. It is designed to enhance and preserve Benton County's rural character, which includes rural open space, low densities, wildlife habitat, public open space for outdoor recreational activities; ridges, slopes, and bluffs; and rural home sites on which a range of agricultural activities may be conducted. Allowable density in Rural Resource 1DU/20acres.

Rural Community Center – see discussion above in Section 3.3.2.2.

Master Planned Resorts per RCW 36.70A.360, MPRs are developments with urban characteristics that may be located outside of UGAs. A MPR is a fully integrated, self-contained planned unit development in a setting of significant natural amenities, with its primary focus on destination resort facilities consisting of short term visitor accommodations and a range of developed on-site indoor and/or outdoor recreational facilities. Capital facilities, utilities, and services, including those related to sewer, water, security, fire suppression, and emergency medicine provided on-site shall be limited to meet the needs of the MPR.

The primary purpose of MPRs is to provide for carefully planned, self-contained, and integrated destination resort facilities and amenities that are centered upon unique and commanding natural resource settings. MPRs may be amended to the Comprehensive Plan as Sub Area Plans.

Small-scale Recreation or Tourist Use per RCW 36.70A.070 (5) (d) (ii) can be an intensification of recreation or tourist uses on existing lots, or new development of SSRT uses, including commercial facilities to serve those recreational or tourist activities that rely on a rural location and setting, but

that do not include new residential development and are not intended to principally serve the existing or projected rural population.

Significant differences between the MPR and the SSRT uses are: scale, the MPR is perceived as a destination resort of potentially very large size whereas the SSRT is relatively small and concentrated; residents, the MPR can have them as a secondary use, but the SSRT cannot; municipal services, although MPRs can be outside of a UGA, at the developer's expense, a MPR can connect to city services, whereas the SSRT cannot.

Rural Commercial encompasses all commercial lands in Benton County. This includes general commercial uses and commercial areas primarily along Interstate 82. The purpose of this land use is to provide retail goods and services to regional trade areas, serve highway travelers, and provide convenience services to residents. Uses include motels, truck stops, service stations, restaurants, and fast food.

Rural Industrial includes both heavy and light industrial uses in the County. The primary purpose of this land use to provide land for industrial and supporting uses that will not present unmanageable conflicts with other land uses, that have access to necessary utilities and public facilities, and that have less environmental constraints. Some of the heavy industrial uses function at the fundamental economic level: rail transport and facilities operations, chemical products manufacturing and shipment for agriculture, sand and gravel operations for construction, raw products processing, and waste products recycling.



3.3.2.4 Agricultural Lands

Agricultural land is defined as land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees, finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production (RCW 36.70A.030(2)). Long-term commercial significance includes the growing capacity, productivity, and soil composition of the land for long-term commercial production, in consideration with the land’s proximity to population areas, and the possibility of more intense uses of the land. GMA requires each county to designate appropriate agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products (RCW 36.70A.170(1)(a)). Table 3-5 summarizes agricultural lands in the County by dryland, irrigated and rangeland.

**Table 3-5
Agricultural Lands by Land Type**

GMA Agriculture Land Type	Acres
Dry land	304,839
Irrigated	296,432
Rangeland	112,190

Source: BERK Consulting 2016

Dryland agricultural activities primarily consist of dryland wheat production, principally in the Horse Heaven and Rattlesnake Hills. Dryland production has an economy of scale requiring large operations, typically in the thousands of acres.

Crops grown in Benton County includes "specialty" berries and orchard crops, mint, hops, and juice and wine grapes. Corporate acreages of asparagus, potatoes, wine grapes, and corn are grown in large operations under "circle" irrigation systems found throughout the County, but most notably on the south slope of the Horse Heaven Hills above the Columbia River. Significant acreages of hillside orchards are found in the Red Mountain/Badger Canyon and Kennewick/Finley areas.

Benton County designates agricultural land as GMA Agriculture based on primary factors below, as well as other factors discussed in Appendix L:

- Urban Growth. The land is not already characterized by urban growth.
- Production Capability. The land is used or capable of being used for agricultural production.
- Long-Term Commercial Significance. This is determined by classification of prime and unique farmland soils, availability of public facilities including roads used in transporting agricultural products, tax status, public service availability, proximity to UGAs, predominant parcel size,

land use settlement patterns, intensity of nearby land uses, history of nearby land development permits, land values under alternative uses, and proximity to markets.



3.3.2.5 Agricultural Land Use Designation

GMA Agriculture (GMA AG) includes agricultural land (such as dryland and irrigated land) identified by the County based on the criteria established by the GMA. A GMA Agricultural District zone conserves agricultural lands by establishing a 20-acre minimum parcel size and (with exceptions e.g., resort destinations, wineries) limits the range of other land uses to those which are dependent upon, supportive of, ancillary to, or compatible with, agricultural production as the principal land use. This land constitutes about 59 percent of the total land in Benton County as shown in Table 3-3.

The county-wide review and designation of these lands was updated in this Comprehensive Plan, as described below and in more detail in Appendix L.

WAC 365-190-050(3) states that “lands should be considered for designation as agricultural resource lands based on three factors:” 1) specifically is not characterized by urban growth; 2) is used or is capable of being used for agricultural production; and 3) has long-term commercial significance for agriculture.

Per the first factor, the urban and UGAs mapped in the County were excluded from the agricultural resource lands analysis as by their definitions, these are areas characterized by urban growth.

Agricultural land production capability (factor two) was evaluated based on physical and geographic characteristics of resource lands in Benton County, using the land-capability classification system of the U.S. Department of Agriculture Natural Resources Conservation Service as defined in relevant Field Office Technical Guides consistent with WAC 365-190-050(3)(b)(ii).

The Natural Resources Conservation Service land-capability classification was applied to Benton County lands, splitting eight soil type classes into suitable, suitable with management, and non-suitable land for cultivation. Strictly applied, both the suitable and suitable with management lands have the potential for remaining as GMA Agriculture lands, while non-suitable areas would not. However, many non-suitable areas are often adjacent to or surrounded by suitable or suitable with management lands often in existing agricultural production. Adjusting the designation of some these non-suitable areas from GMA Agriculture – primarily draws and canyons – was determined not to be necessary at this time, but a change of designation could be possible in the future, as other considerations come into play. Additionally, many of the areas near the fringe of the current areas designated as agricultural land and nearer to population centers that may be classified as suitable or suitable with management may also have the possibility of more intense land uses in the long-term. In some instances, these are also the more marginal lands, particularly when considering dryland production areas in concert with factor 3 considerations, i.e., lands of long-term commercial significance.

Long-term commercial significance for agriculture was evaluated by applying several different considerations determined to be most applicable to Benton County resource lands, and generally consistent with guidance provided in (WAC 365-190-050(3)(c), but also supplemented by information important to local conditions such as precipitation patterns. These considerations included:

- Water availability/precipitation
- Parcel size
- Nearby UGAs, settlement patterns, land use, land values, and development permits
- Land in the Conservation Reserve Program or conservation land
- Prime farmlands
- Pesticide restrictions
- Public facilities and proximity to markets
- Tax status

Each of these considerations was reviewed on a county-wide, comprehensive basis of both existing GMA Agriculture and other lands to determine their relevance or contribution to long-term commercial significance of agriculture. Through this evaluation, multiple areas in the County were considered for reclassification.

In general, it was deemed important to maintain continuity in agricultural resource land designation; unless there are sufficient reasons that the agricultural resource land should be de-designated, land should remain as agricultural resource land to protect the resource. Additionally, there are many areas that had potential to be removed from designation through some analysis considerations but not others. For example, there are several areas north of Prosser that have small parcel sizes but are currently designated as agricultural resource land. However, these areas are irrigated lands with suitable soils, so it would not be appropriate to remove them from the agricultural resource land designation.

The areas that were removed from agricultural resource land designation are areas south of Richland, Kennewick, and West Richland. These areas are near population centers, adjacent to growing areas, proximate to utilities and roads, have low precipitation without irrigation, are outside of AVAs, and follow the recent settlement pattern of the County. Some of these areas also have more restrictive pesticide regulations, making it more expensive to treat agricultural lands. Together these considerations threaten or have already reduced the viability for the long-term commercial significance of the land as agricultural land, which fits the considerations noted in *Lewis County v Western Washington Growth Management Hearings Board* (2006).

Areas that should be added to agricultural resource land designation are areas south of Finley, west of Benton City, and near Prosser. These areas are currently farmed, are irrigated and often have permanent crops in place, are large parcels, exist outside of UGAs, and are near existing land that is already designated as agricultural resource land and other rural uses.



Agricultural lands above Lake Wallula (Columbia River)

Additionally, approximately 7,130 acres are proposed to be changed from higher density rural residential designations to a lower density Rural Resource designation. This change in designation will preserve these lands for rangeland uses and agricultural production opportunity areas, such as vineyards and orchards. This can be considered an innovative zoning technique that fits RCW 36.70A.177(1) as being designed to conserve agricultural lands and encourage the agricultural economy.

In addition to the re-designation of lands described above, the comprehensive agricultural lands analysis resulted in 6,051 acres to be added to the GMA Agriculture designation and 4,565 acres removed from the agricultural land designation.

3.3.3 *Industrial Lands*

Outside of the Hanford Site, there are currently 3,312 acres of industrially designated land within unincorporated Benton County. Though a broad range of industrial uses is appropriate for these lands, the principle current use is for agriculturally related industries such as chemicals processing and shipping, cold storage, and fruit and vegetable processing and shipping.



Industrial development in Benton County

The Hanford Site has land suitable for industrial development. A percentage of this land will be developed to federally "programmed" industrial uses, including the Hanford industrial land recently transferred to the City of Richland, the Port of Benton, and Energy Northwest, as noted previously. The City of Richland and Port plan to market the property to industrial developers as "mega-sites" of 200 acres or larger (Oneza & Associates 2017). The proximity of this land to highways, rail, and utility services together with the large acreages available provide development opportunities for industries that exist in very few places throughout the Pacific Northwest. As a result, 901 acres of Hanford land is in the process of being added to the Richland UGA. This and other industrial lands within the cities augment the County's supply of industrial designated lands.

Current industrial lands in unincorporated Benton County are located in the vicinities of Paterson and Plymouth, east and north of the City of Prosser on County Route 12, within the Community Center of Whitstran, and in the south Finley area.

Development of industrial land requires careful consideration of environmental constraints and associated mitigation strategies, availability of infrastructure and utility services and their capacity; access to rail, roads, and navigable water; proximity to the market, supplies, labor pool and other considerations.

Port Districts are major players in the industrial land base of Benton County. The industrially zoned acreage is predominantly owned by the Benton and Kennewick port districts, which are taxing districts under Washington State Law. Port districts are authorized to purchase lands for marketing, development, lease, and eventual sale to commercial interests with the objective of improving the

local economy. Port district holdings include lands in the rural areas of Paterson, Plymouth, and Finley, and in or adjacent to the cities of Richland, Kennewick, Prosser, and Benton City.

Typical port enterprises include the construction of industrial and office space for start-up businesses; the lease of land or buildings to commercial enterprises, which may in turn purchase the real property from the Port; and facilitating the assemblage of major industrial/commercial projects requiring collaboration by numerous interests such as utilities, local and regional governments, and private enterprise.

Descriptions of the County's industrial land resources can be found in Chapter 5 (Economic Element).

3.3.3.1 Industrial Land Use Designation

Rural Industrial is intended for a wide range of industrial land uses including light and heavy industrial uses. These lands require access and infrastructure for heavy industrial uses; rail and waterborne transportation access are critical. Other important criteria include separation of such land from residential and commercial uses and availability of large acreages for outside storage and maneuvering of trucks and rail equipment. Industrial lands play a key role in the local and regional economy by offering manufacturing and various other types of jobs.

3.3.4 Public Lands Designation

The Public Lands (PL) designation is found throughout the County, but most generally along the Columbia River corridor. PL designated lands are intended for public uses such as parks, playgrounds, greenways, open spaces, and wildlife habitats owned and operated by a local, state, or federal government. Although approximately 15,563 acres of land are currently designated PL in the Land Use Map, there are about 93,299 acres of additional land in Benton County currently owned by public entities, including the Washington Department of Fish and Wildlife, Bureau of Land Management, Department of Natural Resources, and U.S. Army Corps of Engineers.

3.3.5 Open Space Conservation

Open Space Conservation lands are recognized as areas having critical resources and ecosystems with unique characteristics that support: significant habitats for migratory birds, fish, and wildlife; natural riverine functions and aquatic environments; botanical inventory; water quality and flood retention. Open Space Conservation designated areas provide significant natural functions and benefits to natural resources and the public and should be protected from destruction, conversion, and encroachment by incompatible uses. These areas may also provide limited recreational and educational opportunities for the public. These areas are held under conservation easements with state or federal agencies. Barker Ranch, which is located adjacent to the Yakima River near West Richland, is the only area in the County that currently has this designation.

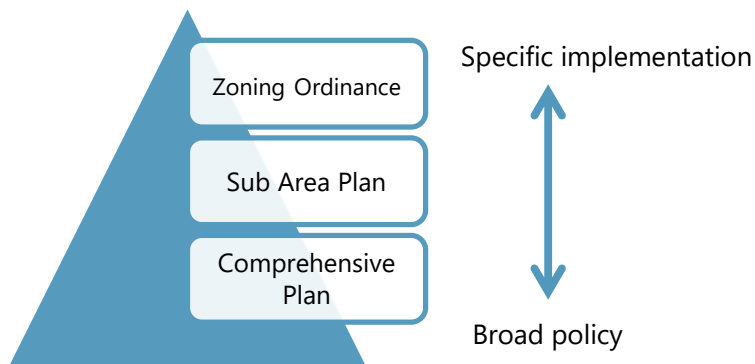
3.4 Sub Area Plans

The purpose of a sub area plan is to provide a framework for future decision-making for select and unique geographical areas within Benton County. These plans may regard areas with special features, such as shorelines that provide important functions and values or lands with exceptional soils and climate characteristics suitable for prime agricultural production, as valuable or unique for preservation, protection, or certain development. Sub area plans contain statements of guiding principles to be followed, recommendations for strategies to achieve desired goals and objectives, and a plan of action to guide future land use development decisions in the area. Sub area plans are prepared with substantial public involvement.

3.4.1 *Hierarchy of a Sub Area Plan Document*

The sub area plan document fits between the broad policies of the Benton County Comprehensive Plan and the Benton County Zoning Ordinance with specific implementation tools as shown in Figure 3-1 below.

Figure 3-1
Sub Area Plan



The following sub area plans are listed by their adopted title as found in the corresponding Benton County Planning Department files and are adopted by reference and incorporated as if fully set forth within.

3.4.2 *Red Mountain American Viticultural Area Master Site Plan*

The provisions of the Red Mountain AVA Master Site Plan (RM MSP; Appendix G) represent many hours of effort by the Red Mountain Alliance and interested citizens who live and work or have a vested interest in the development of the area described by the RM MSP. Red Mountain's topography, soils, and solar aspect have made it suitable for viticulture, an important economic resource for the region.

The purpose of the RM MSP is to provide a "viticultural park" concept that reinforces the existing and future qualities of the Red Mountain AVA. The RM MSP and its provisions are advisory in nature and intended to guide future development of the Red Mountain site plan area.

3.4.2.1 How the Plan Is Organized

The RM MSP is divided into seven chapters that reflect the fundamental components of this Sub Area Plan. The chapters are as follows:

1. Introduction
2. Master Site Plan Elements
3. Visitor Projections
4. Design Guidelines
5. Steps toward Sustainability
6. Zoning
7. Next Steps

Each chapter refers to items and issues related to that category only. Endnotes and references are provided in Chapter 8, and an appendix follows.

The Red Mountain AVA Master Site Plan Map (RM MSP Map Figure 4-14) shows the boundaries of the RM MSP, the Red Mountain AVA boundary, existing vineyards and wineries, potential vineyards and wineries, existing roads, and other proposed infrastructure.

3.4.2.2 Land Use Designations

The land use designation in the current Comprehensive Plan shows the area designated as GMA Agriculture, with the land bordering south of State Route 225 and land adjacent to the east side of Demoss Road designated for Rural Remote. Land characteristics include suitable soils, farmable topography, un-platted acreages of significant size, and existing or potential availability of water, suitable slope exposure, and the absence of existing land uses that are known to be incompatible with agricultural operations.

3.4.2.3 Proposed Uses

3.4.2.3.1 Red Mountain GMA Agricultural District

The area is planned to conserve and protect agricultural lands of long-term commercial significance as required by the GMA (RCW 36.70A) and more particularly to protect the unique agricultural character and attributes of these lands on Red Mountain. This area is within the federally designated Red Mountain Viticulture Wine Appellation. Vineyards and wineries are the predominant uses within this area.

3.4.2.3.2 The Wine Village

Red Mountain's "Wine Village" will provide an interpretive center with welcoming, educational, recreation, and support functions. The Wine Village is designed to both welcome and introduce visitors to Red Mountain and prepare them for what they will see, experience, and enjoy, as well as offering other tourist-related support services. Allowed uses within the Wine Village include a visitor interpretive center, small restaurants, bistros, casual food shops, art studios and galleries, wine retail, antique shops, demonstration vineyards, wineries, gardens, and small lodging facilities. Under current planning law these uses will most likely occur via an MPR designation.

3.4.2.3.3 Tourist Serving Area

In the southeast corner of the Red Mountain AVA, outside the AVA boundary and within the Rural Lands Five designation, the RM MSP identifies an important future entry way into the Red Mountain AVA area. A coordinated site-specific planning effort in this area is needed to provide a development plan that allows for a limited range of short-term "visitor serving" activities, recreational, commercial, and wine related conveniences for tourists and visitors to the vineyards and wineries of the Red Mountain AVA.

3.5 Countywide Planning Policies

Benton County and the five cities within it have jointly adopted a set of CWPPs (Appendix E), which form the framework for the preparation, implementation, and amendment of their comprehensive plans in a manner that provides for integration and consistency among the County and city plans in terms of services, designations, and other elements as applicable.

Included within the CWPPs are a uniform methodology to calculate the amounts of additional land needed by each city to accommodate the population growth projections provided by the OFM. Other CWPPs establish standards for selecting additional lands to be included within the UGAs and for joint county and city planning on lands within UGAs.

3.6 Expansion of Urban Growth Areas

Two aspects are important for UGA expansion: meeting the required need for future land in urban areas and maintaining low density land outside the UGA to enable logical and cost-effective expansion.

Currently, the County is updating the UGA boundary in two areas as follows:

1. City of Richland UGA expansion. As discussed before, 1,641 acres of Hanford land was transferred from the U.S. Department of Energy to the City of Richland, the Port of Benton, and Energy Northwest. As a result, the City has applied for an UGA expansion to add 1,184 acres of

Hanford land to its UGA and remove 283 acres from the Richland UGA (for a net increase of 901 acres). This request has been incorporated into the County's Comprehensive Plan update.

2. City of Prosser UGA amendment. Based on the City of Prosser's OFM population projection and land needed to accommodate this population, a reduction of 483.96 acres of UGA land and an addition of 100.44 acres of industrial land (for a net reduction of 383.52 acres) has been applied for and is incorporated into this Comprehensive Plan update.

Within the Comprehensive Plan, four principal factors apply to future connections between cities and the County relative to the build-out of and expansion of UGAs. These include the availability of vacant lands in the municipalities; urban densities within the cities and UGAs; appropriate sizing of UGAs compared to future population growth; and consideration of site planning that preserves rural lands outside of UGAs for future expansion.

3.6.1 *Total Vacant Land Within Benton County's Metropolitan Planning Area*

The cities of West Richland, Richland, and Kennewick are contiguous. Some of the cities already have annexed unincorporated lands that are adequate to meet future demand. For instance, the City of Richland had placed significant amount of land within its UGA under the Urban Reserve land use category. Each City assesses their own land use demand based on vacant land and developable land to identify future needs before any UGA expansion is proposed.

The adoption of the County's Comprehensive Plan, and the adoption of each of the cities' plans, require that the expansion of urbanization, with its conversion of rural lands to urban uses be an orderly, cost-efficient process, based on population projections and protection of rural neighborhoods and natural resource lands. The UGA process is intended to, and has, influenced a reduction of urban sprawl, increased annexation of unincorporated islands with the cities, and achieved greater cost effectiveness for development within UGAs.

3.6.2 *Urban Densities within Cities and Their Urban Growth Areas*

In response to market demands, the development of urban densities within UGAs is essential if the UGA is to function as a tool to achieve cost effective provision of urban services, and to protect agricultural lands and the rural community outside of the UGAs. To achieve this, densities within the UGAs should be high enough and encourage infill of existing UGAs.

3.6.3 *Objective Criteria for Determining When and How to Expand Urban Growth Areas*

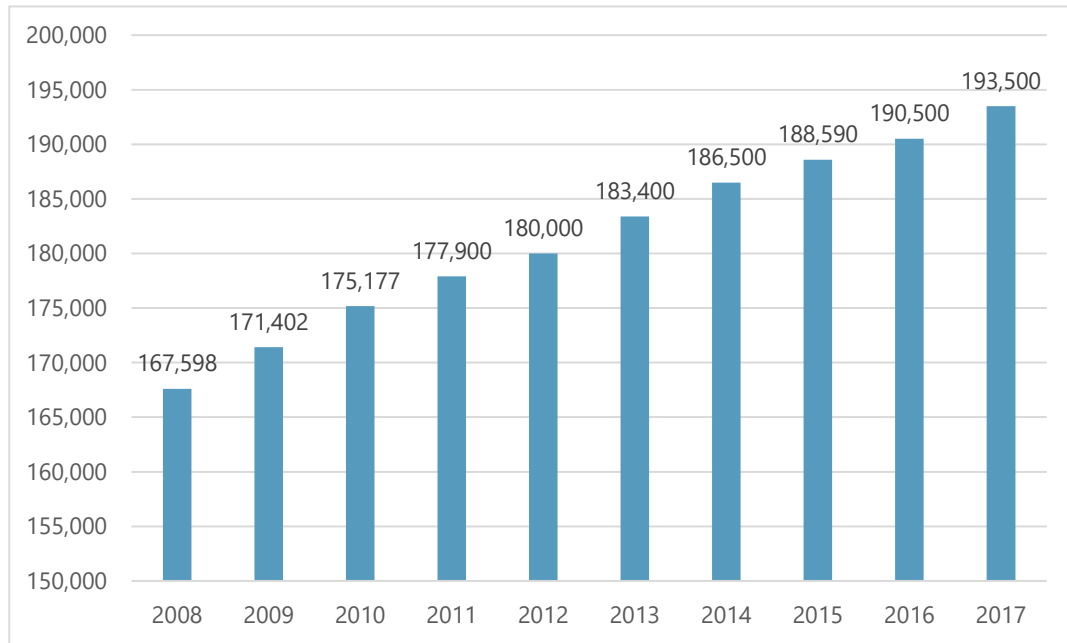
The CWPPs sets forth uniform criteria and methodology for calculating the amounts of land necessary in a UGA to accommodate projected population growth. The policies reflect

methodologies identified in current planning literature (as well as recent GMA Regional Hearings Board decisions) for identifying the appropriate size of UGAs relative to population projections. Other CWPPs direct how locations of new UGAs are to be selected to avoid rural communities and agricultural lands.

3.7 Population Projections for Benton County

Population growth in Benton County from 2011 to 2016 grew at a rate reflective of the slow growth in the nation’s economy, the improved national economy of 2017 has provided a rebound in growth reminiscent of the growth in 2009. Figure 3-2 reflects the population trend in the last 10 years in Benton County.

**Figure 3-2
Ten Year Population in Benton County**



The latest population projections from OFM, using the "high" series estimates, indicate that Benton County can expect a population increase of 86,609 over the next 20 years. This will result in a year 2037 population of 280,109, which is an increase of 45 percent over the current population of 193,500. The County will review the future growth trends and adjust population projections if necessary.

Approximately 18 percent of the total County population, or 35,085 people (OFM 2017), reside in the unincorporated area of Benton County. The 20-year OFM projection also indicates the unincorporated County population will grow to 53,220 persons in 2037. This will add 18,135

additional people in the next 20 years who are projected to seek housing in unincorporated areas of the County between now and the year 2037. This growth represents a 52 percent increase over the current rural population. Table 3-6 indicates the population estimates in Benton County and the unincorporated areas of the County.

**Table 3-6
Population Estimates in Benton County**

Year	Population in Unincorporated Benton County	Population in All Benton County
2017	35,085	193,500
2037 Projection	53,220	280,109
20 Year increase	18,135	86,609

Source: Washington State Office of Financial Management and U.S. Census Bureau

3.8 New Housing Units Needed for Projected Rural Population Growth

At an estimated 2.7 residents per household, the increased population in unincorporated Benton County would require approximately 6,716 new homes in the next 20 years. This growth will be accommodated mostly in the Urban lands of the UGAs, Rural Transition areas, and Rural Remote areas. Some growth will also take place in the Rural Community Centers and Rural Resource areas.

There are currently 78,952 acres designated for the rural residential uses within the four rural land use designations of Benton County (outside of Hanford and the agricultural areas).

A land capacity analysis on vacant and existing units in the Rural Transition land (1 du/acre) and Rural Remote land (1 du/5 acre) indicates adequate land supply to accommodate future housing demand. However, additional growth is also anticipated to occur in the Rural Community Centers and Urban areas. Table 3-7 indicates potential allocation of future population in these two land use categories:

**Table 3-7
Potential Allocation of Future Population Per Land Use Category**

Land Use	New Units	
Urban	134	
Rural Transition	1,142	
Rural Remote	5,652	
Rural Community Centers	34	
Total	6,961	

Notes:

1. Does not include UGAs
2. Lot size is determined by minimum lot size requirements; i.e., how many units are allowed per given acreage.

4 Natural Resources Element

4.1 Introduction

This Chapter describes the physical and biological setting of the County. Critical resources within the County are identified, including their "functions and values," and the current trends associated with regulatory protections for those resources. This Chapter also presents Benton County's approach for the protection of critical resources.

4.2 Natural Setting of Benton County

The natural setting of Benton County typifies that of the larger Columbia Basin area. The County is located in southeastern Washington and encompasses approximately 1,715 square miles. The Columbia River borders the north, east, and south sides of the County and the Yakima River intersects the middle of the County, flowing from Prosser to its confluence with the Columbia River at Richland. The County contains portions of three Water Resource Inventory Areas (WRIAs), including the eastern portion of the Lower Yakima Watershed (WRIA 37), the Rock-Glade Watershed (WRIA 31), and the Alkali-Squilchuck Watershed (WRIA 40).

4.2.1 *Climate*

Benton County is located in the central part of the Columbia Basin, which is surrounded by the Cascade and Rocky mountain ranges to the west and east, respectively. These ranges have a pronounced effect on the region's climate, which is dry and arid. The growing season in the region is approximately 185 days from mid-April to mid-October, with high temperatures exceeding 90 °F during the summer months and as low as 6 °F or colder during the winter months. Mean annual precipitation in the area ranges from 5 to 10 inches, with mean annual precipitation levels ranging from 10 inches or greater in discrete areas in Horse Heaven and Rattlesnake Hills (see Appendix A: Map Folio, Figure 6 – Precipitation Map). Approximately 70 percent of the precipitation in the region occurs between November and April with intermittent thunderstorms and other precipitation events occurring between March and October. Winter season snowfall accumulation ranges between 4 to 21 inches during the winter months, with snow melt and/or river icing during the winter and spring seasons occasionally causing flooding of the Yakima River.

4.2.2 *Topography*

The topography of Benton County is characterized by basin and valley lowlands, separated by the upland plateaus and ridges of the Yakima Folds Belt. The landscape is the product of seismic upheavals, volcanic eruptions, magmatic flows, glacial epochs, and cataclysmic floods. The legacy of this history is the present geologic landscape that includes the Hanford area, productive soils on the

flanks of anticlinal ridges, the Horse Heaven plateau, Rattlesnake Hills, Saddle Mountain, water resources of three major rivers, and the basaltic vertical columns and outcrops.

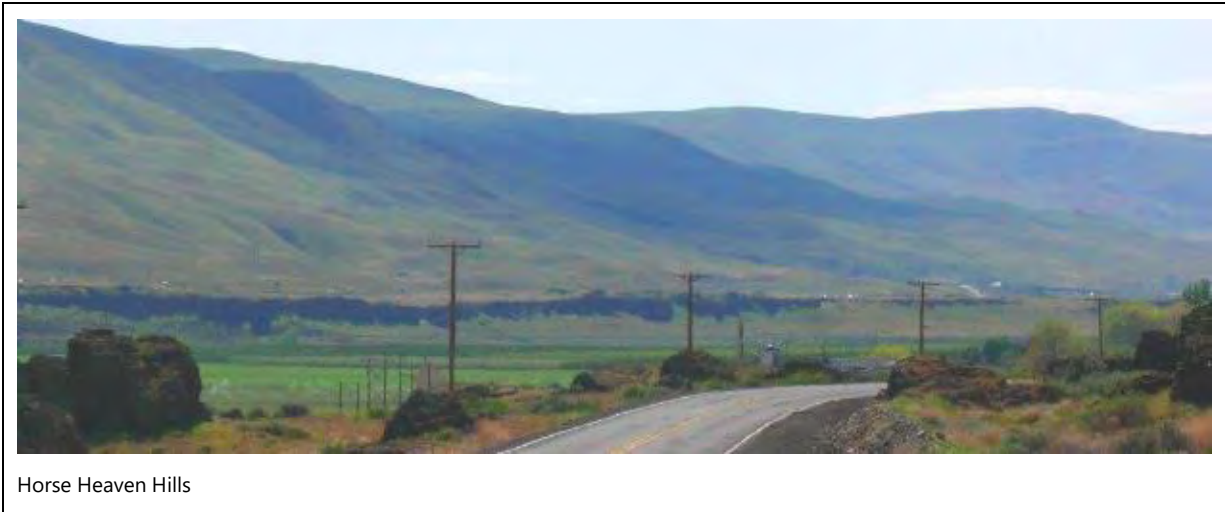
A thin layer of biology has adapted to the area's geologic base. The layer is relatively sparse and fragile on the dry uplands of shrub-steppe and bunch grasses, but diverse and resilient along reaches of rivers, tributaries, and creeks that flow throughout the County. From north to south, the major topographic features of Benton County are as follows:

Pasco Basin. A basal plane that comprises most of what is now the Hanford Site. Topography is flat to hilly, with elevations ranging from around 300 feet in the east to nearly 1,000 feet at the base of Rattlesnake Mountain.

Rattlesnake Hills. This segment of the Yakima Folds separates the Pasco Basin from the Yakima Valley. The ridge extends in a southeasterly-northwesterly alignment from its beginning in eastern Yakima County to a point where it merges with the Horse Heaven Hills south of Finley. Rattlesnake Ridge is discontinuous through the middle of the County where it has been perforated by the Yakima River (resulting in Red, Candy, and Badger mountains) and contains Rattlesnake Mountain, the highest unforested "peak" in Washington State. At 3,629 feet, Rattlesnake Mountain is also the highest point in Benton County.

Yakima River. The river bisects the County into north and south portions and is responsible for much of the varied topography of central Benton County. The river has been cutting the valley sediments in this syncline that separates Rattlesnake Ridge from the Horse Heaven Hills for tens of thousands of years. The present valley floor ranges from about 300 feet above sea level, at its confluence with the Columbia River at the City of Richland, to around 700 feet at the Yakima County line.

Horse Heaven Hills. This plateau constitutes the southern half of Benton County. The elevations of the Horse Heaven Hills rise from the County's low point of 265 feet near Crow Butte to 1,600 to 2,200 feet along the ridgeline which overlooks the Yakima Valley and the Badger Coulee. The Horse Heaven Hills are unique among the Yakima Folds: it is the southern-most and longest running ridge in the system at some 60 miles; it is the most severely "lop-sided" of the ridges, becoming more of a monocline than an anticline in areas; and it takes a definitive, 90 degree turn to the south at Kiona, which is the geographic center of the County. The ridgeline is highest at Jump Off Joe Butte south of Kennewick, and the plateau slides southward toward the Columbia River.



4.3 Soils and Agricultural Resources

Benton County has highly productive agricultural soils with over \$900 million generated by Benton County crops and livestock per year (BERK Consulting 2017). Designated agricultural resource lands make up a majority of the County. (See Appendix A: Map Folio, Figure 4 and 5 for existing and proposed Land Use Designations Maps and Appendix L Agricultural Resource Land Reclassification Memo.) The soils in Benton County are generally suitable for both agriculture and structural development, with localized constraints relating to slope, geo-hydrology, and pockets of sandy soils and fines. Soils in the region are very susceptible to wind and water erosion once stripped of their natural cover. However, in undisturbed condition, the indigenous shrub-steppe and bunch grass vegetative cover has adapted to hold basin soils in place. When stripped of natural cover, prevention of erosion requires the application of deliberate and aggressive management techniques.

4.3.1 *Agricultural Soils*

Agricultural lands in Benton County are primarily used for dryland agriculture (47 percent), with the remaining areas used for irrigated agriculture (40 percent) and rangelands (13 percent; BERK Consulting 2017). The primary crop grown in Benton County is wheat and wheat fallow (BERK Consulting 2017). Generally, but with some notable localized exceptions, the addition of water and fertilizer to soils in Benton County will result in productive agriculture. The principal exceptions are on steep erosive slopes, in pockets of very sandy soils, or where near surface basalt formations are accompanied by thin soils and poor hydrologic conditions.

Agricultural lands of long-term commercial significance are located throughout Benton County. These lands are characterized in RCW 36.70A.030(10) as land that “includes the growing capacity, productivity, and soil composition of the land for long-term commercial production, in consideration

with the land's proximity to population areas, and the possibility of more intense uses of the lands." As described in Appendix L, these lands are determined by assessing a variety of factors including, but not limited to, classification of prime and unique farmland soils, proximity to urban areas, proximity to markets, and other factors. Areas containing soils of long-term commercial significance are described in more detail in Section 3: Land Use Element. Appendix A: Map Folio, Figure 7 – General Soils Map provides a generalized depiction of the soils types and their locations within Benton County. Figure 9 in Appendix L shows lands having a Prime Farmland designation, including farmland of statewide importance, farmland of unique importance, and prime farmland if irrigated.



4.3.2 *Soil Construction Limitations*

Development in Benton County is generally not constrained by soil types, with few exceptions. For the purposes of structural development, soil limitations and development in geologically hazardous areas are addressed in the County's CAO (BCC Title 15). The ordinance requires that developments avoid or maintain setbacks from potentially unstable areas or adequately assess the degree of instability and locate, design, and engineer the development to address the level of hazard.

Soil ratings developed by the Natural Resources Conservation Service are used to indicate the potential degree of limitations for different types of development on different soil types. For example, a soil type might be rated as having slight, moderate, or severe limitations for the development of roads or dwellings. A variety of criteria are used in making such determinations, including such factors as depth to bedrock, shrink-swell potential, permeability, and slope.

It should be noted that even a "severe" rating does not preclude construction from occurring. Rather, it means that the potential limitation should be recognized and that the construction techniques employed may have to take the special soil conditions into consideration. In all cases, Natural

Resources Conservation Service emphasizes that an on-site inspection or soil survey would be necessary before it can be determined for certain if such soil characteristics are present.

4.3.3 *Current Trends*

Agricultural production is expected to continue to be a major activity and to play a vital role in the Benton County and Washington State economies. Population growth in the region will require proper management of soils and agricultural resources to protect them from development-induced erosion, contamination, and other impacts.

4.3.4 *Future Considerations*

Benton County currently requires a 150-foot setback for residential dwellings from agricultural districts to protect agricultural lands of long-term commercial significance and to avoid future land use conflicts. Because of their importance to the local and state economy, agricultural lands of long-term commercial significance should continue to be protected from future development. Additionally, the implementation of the VSP, a new, non-regulatory, incentive-based approach that balances the protection of critical areas on agricultural lands, while promoting agricultural viability, will encourage conservation practices such as erosion control measures that will protect and enhance agricultural soils.

4.4 Mineral Resources

4.4.1 *Existing Conditions*

In Benton County, mineral resources are aggregates (i.e., sand and gravel deposits and crushed quarry rock). Mineral resource areas in Benton County include lands with commercially viable mineral resource deposits. Most of the mineral resource areas in Benton County are located along the Columbia and Yakima rivers. Mineral resource lands are required to be protected under provisions of GMA. Constraints for the extraction of these resources typically include incompatible land uses (e.g., residential or commercial) on adjacent lands or biologically sensitive areas.

The major use of aggregate resources is for urban and rural residential developments. Construction of both dwellings and road networks consumes substantial amounts of sand and gravel as well as quarried and crushed basalt, which is used in local landscaping. The Mineral Resource lands scattered throughout the County represent an important economic opportunity because sourcing these materials locally is more cost effective than importing them from other regions.

At the Hanford site, active borrow pits provide mineral resources used for remediation, restoration, and closure activities (DOE 2015). State law requires that such mineral resources of long-term commercial significance be protected from having their future exploitation affected by adjacent

developments that may be incompatible with the mining and processing activities associated with these resources on the site.

4.4.2 *Current Trends*

Mineral resources in Benton County will continue to be responsibly extracted from commercially viable sites to support local business and development. Mineral resources at the Hanford site will continue to be used to support ongoing remediation, restoration, and closure activities.

4.4.3 *Future Considerations*

The principal considerations for the future use of these resources are: i) the identification of additional sites; and ii) providing the owners of known commercially viable sites the opportunity to apply the provisions of the County's Mineral Resources Protection Ordinance in BCC Title 15 to the sites. Such protection can prevent the sites from having their future exploitation compromised by the location of incompatible land uses on adjacent lands. Mineral resource extraction on the Hanford Site will follow the U.S. Department of Energy *Draft Hanford Industrial Mineral Resource Management Plan* (2001).

4.5 Water Resources

4.5.1 *Introduction*

Benton County includes portions of three major WRIAs: Rock-Glade Watershed (WRIA 31), Lower Yakima Watershed (WRIA 37), and Alkali-Squilchuck Watershed (WRIA 40). Water resources are a key component to maintaining a vibrant and growing county. As with much of the West, water in Benton County serves competing, and at times, conflicting uses. Securing certainty in the water supply is a major issue for the County for the foreseeable future. See Appendix A: Map Folio, Figure 8 – Water Resources Map.

Water is one of Benton County's most valuable natural resources. Reliable access to surface and ground water is necessary for household uses, irrigated agriculture, recreation, commercial and industrial development, and for fish and wildlife. Today, irrigated agriculture is the biggest user of water in the County, with supplies coming from the Columbia and Yakima rivers as well as from groundwater. The County's water resources also provide benefits for the natural environment and aesthetic amenities that contribute to the ambiance and lifestyle of the area. Water is a limited resource under numerous competing and changing demands, but improved management of the water resource system will allow for managed growth.



Irrigated agriculture in Benton County
Source: Washington State Department of Ecology

4.5.2 Existing Conditions

4.5.2.1 Surface Water

Benton County is located where the Snake and Yakima rivers flow into the Columbia River. Vast quantities of water, approximately 191,000 cubic feet per second or over 100 billion gallons each day, flow past Benton County on the way to the Pacific Ocean. This river system serves multiple uses, including power generation, fisheries, endangered species habitat, agriculture, and recreation. The system is culturally relevant for and connected to native and non-native Americans of the Pacific Northwest. The purpose of the following policies, however, is to focus on the needs of Benton County residents specifically.

Within the County, approximately 330 miles of shorelines meet the jurisdiction criteria of the Benton County SMP. The total acreage of upland shoreline area regulated by the SMP is approximately 15 square miles (The Watershed Company and BERK Consulting 2012). Critical areas within shoreline jurisdictions are also protected under the Benton County SMP (Appendix F).

The Columbia and Yakima rivers and their tributaries and creeks are the most prominent water resources within Benton County. Both rivers are classified as Shorelines of Statewide Significance by Washington State. The Columbia and Yakima rivers are directly related to critical area functions throughout the County as a water source for critical aquifer recharge areas and provide floodplain, wetland, and fish and wildlife habitat. Within the central Columbia Basin's desert environment, it is estimated that up to 75 percent of indigenous wildlife species depend upon these riverine corridors for cover and other sustenance essential to their lifecycles.

A major overriding issue for both the Columbia and Yakima rivers is the survival of salmon and steelhead. The principal impacts to salmonids are:

- Water quality and habitat conditions within watersheds and estuaries
- Passage conditions and predation concerns at diversion dams
- Hydroelectric dams and pools on the Columbia which have an impact on out-migrating smolt mortality
- Fishing pressures in the ocean as well as the local river system

Pressures on salmon and other aquatic species may be further exacerbated as increased variation in both ocean and freshwater hydrologic conditions occurs from changes in climactic conditions.

Several anadromous species within the river system are listed as threatened, endangered, or candidates under the federal Endangered Species Act. Recovery efforts are ongoing to help reverse these trends, with many projects being implemented in both the Yakima and Columbia rivers to help improve passage, flow, and habitat conditions.

4.5.2.1.1 *Columbia River*



Columbia River
Source: Washington State Department of Ecology

The Columbia River bounds the north, east, and south sides of Benton County, flowing through the Alkali-Squilchuck and Rock-Glade watersheds. Besides the Yakima River, tributaries within the County are primarily small, ephemeral streams that flow through confined canyons. In the mid-Columbia region, the Columbia River hydrology is regulated by dams, with the highest flows occurring between April and June. The McNary Dam, located along the County's southern boundary, is operated by the U.S. Army Corps of Engineers for navigation, hydroelectric power

generation, recreation, and irrigation (The Watershed Company and BERK Consulting 2012).

4.5.2.1.2 *Yakima River*

The Yakima River within the County flows east to west from the City of Prosser to its confluence with the Columbia River located on the southeast side of the City of Richland. Most of the streams within the Yakima River watershed originate at elevations where annual precipitation is higher. Five major reservoirs and one smaller reservoir (Clear Creek) operated by the U.S. Bureau of Reclamation are located upstream of Benton County in the upper Yakima and Naches watersheds. These reservoirs

contribute to recent higher summer flows in the Yakima River compared to historical conditions, particularly in the upper Yakima. Lower Yakima flows are often lower in the summer than historical conditions, primarily due to irrigation diversions. Backwater effects from the McNary Dam on the Columbia River limit channel migration on the Yakima River within Benton County (The Watershed Company and BERK Consulting 2012).

The current condition of the Yakima River, especially in its lower reaches in Benton County, is degraded and poor due to high ambient air temperatures, lower summer flows, non-point source pollution, and areas of high water temperatures, all of which are functionally related. This condition jeopardizes both the native and anadromous fisheries, it threatens the long-term survival of the agricultural economy, reduces recreational opportunities, may lower real estate values of river front property, and limits the utility of the river for municipal and industrial uses.

4.5.2.2 Groundwater

Benton County is located in the central portion of the Columbia River flood basalt area, which includes basalt flow layers such as the Saddle Mountain, Wanapum, and Grande Ronde basalt layers (EA West 2017). The Columbia River basalts of the Columbia Plateau provide a locally important aquifer system, along with the unconfined, alluvial aquifers primarily along rivers and streams in the County, but also in sediments on top of the upper basalt layers. Groundwater production occurs in the sediments and the upper and lower basalt layers, which can often extend several hundred feet below ground.

Today, the reduction in flood frequency and floodplain connectivity resulting from reservoir management and diversion of irrigation water has altered the timing and character of streamflow and groundwater recharge through the Yakima watershed (The Watershed Company and BERK Consulting 2012). Additionally, nitrate groundwater contamination is a documented public health issue in Benton County (EA West 2017). The potential contaminant sources and pathways on the County's groundwater supply have not historically been well characterized nor have their effects been fully understood. As a result, the Benton Conservation District has developed the *Benton County Groundwater Nitrate Monitoring Study* "to help develop an essential foundation for groundwater quality restoration in Benton County with regard to elevated nitrates" (Benton Conservation District 2015). This study was followed up with the 2017 *Groundwater Nitrate Characterization Report* (EA West), which includes a description of geology, hydrogeology, and elevated nitrate risk areas throughout Benton County, along with potential sources and suggested management and mitigation actions.

4.5.3 *Current Trends*

4.5.3.1 Surface Water

Current trends regarding protection of rivers and creeks continue to improve. Regulatory requirements such as the GMA, Shoreline Management Act, and federal and state water quality laws require protection of these resources. Problems are recognized as essentially "watershed-wide," cumulative, and more complex than can be dealt with by the State unilaterally, or by individual jurisdictions, even if they "coordinate" efforts. Efforts continue both for the Columbia and Yakima river basins to address water management to meet in and out of stream needs and manage hydropower operation. The Columbia River Treaty renegotiations may further modify operations on the Columbia River, and this could impact river uses and how flow is managed for fisheries and out of stream water uses. Additionally, climatic variation could affect the levels of snowpack in the upper Columbia River and, in particular, in the lower elevation mountains of the Yakima River, and the associated timing of runoff, further potentially impacting the amount of water available for fish, farms and cities in the spring and summer months, and existing and future drought resiliency.

What is required in the Yakima River Basin is an integrated plan covering all aspects of water and land use that potentially impact water quantity and quality. In 2013, the U.S. Bureau of Reclamation signed a Record of Decision for the Yakima Integrated Plan, a 30-year, \$3.8 billion program to restore the Yakima River System and accommodate agricultural, municipal, and domestic needs (USBR 2013). The Yakima River Basin occupies portions of Benton, Kittitas, Klickitat, and Yakima counties. Since that time, state and federal funding has been obtained to implement several projects to improve conditions within the Yakima River Basin under the Yakima Integrated Plan.

4.5.3.2 Groundwater

Regionally, the trend is one of declining ground water levels in lower aquifers and declining water quality in both the upper and some of the lower aquifers. This regional phenomenon is largely attributed to expansions in the amount of acreage under irrigated agricultural production, along with other anthropogenic factors. Specific areas are identified and evaluated in the 2017 study by EA West on groundwater conditions in Benton County.

4.5.4 *Future Considerations and Water Resource Management*

The protection and management of water resources is expected to continue under the County's CAO, SMP, and the VSP, along with regional management plans including the Yakima Integrated Plan and various salmon recovery plans. Implementation of watershed-level management programs such as the Yakima Integrated Plan will help to address water supply issues in the region, particularly during drought conditions, and improve flows and habitat conditions for fish.

The purpose of the water resource guiding principles, goals, and policies in this Comprehensive Plan are to guide Benton County as it interacts with the federal government, Washington State, external local government agencies, and residents throughout Benton County. The principles and policies herein will provide a guide for Benton County elected officials and staff in addressing water and water-related responsibilities and issues affecting Benton County.

It is the intent of Benton County to protect the quantity and quality of water resources for the many uses that make Benton County a desirable place to live, now and in the future.

4.5.4.1 Guiding Principles

Following are the guiding principles and beliefs the County will consider in addressing water resource issues:

1. Support and promote sustainable water resource management. Sustainable water resource management will allow for the preservation of current economies, population growth with improved quality of life, and future economic expansion and diversification, all while protecting the quality and quantity of water necessary to support and enhance native fish and wildlife.
2. Use water resources to promote economic and social wellbeing in concert with reasonable environmental objectives. There must exist a realistic balance among water use benefits and economic costs.
3. Focus on improving water resource management at all jurisdictional levels by supporting the efforts of municipal and special purpose governments within Benton County and a legislative agenda at the federal and state level. Though limited in some geographical areas, water resources physically exist within most areas in Benton County to meet current and future needs. Effective water management and innovative strategies are required to allow beneficial use of these water resources.
4. Intervene in state and federal decision-making processes as required to promote the best interests of the citizens of Benton County. This intervention may include policy, planning, administrative, and legal processes.
5. Support sustainable water resource management in rural and municipal areas and take a leadership role in unincorporated areas. Work with municipalities to develop joint standards in unincorporated UGAs.
6. Maintain policies that support the belief that a water right is a property right.
7. Develop county regulations and policies in full consultation with local governments that support federal and state regulations where they meet the needs of the local population and municipalities.
8. Support securing long-term, sustainable water supplies sufficient to realize the build out of the land uses designated in the Comprehensive Plan as well as the Hanford Comprehensive Land Use Plan.

9. Maintain good working relationships with water users upstream and downstream from Benton County.

4.5.5 *Focus on the Yakima River Basin*

4.5.5.1 Yakima River Basin Water Rights

A large portion of the Benton County irrigated agriculture within the Yakima River Basin, including both the Kennewick (KID) and Roza (Roza) irrigation districts, receives irrigation surface water through the U.S. Bureau of Reclamation's Yakima Project. Roza and KID have 1905 water rights that are junior and subject to pro-rationing in droughts and other low water years. In years of drought these supplies are curtailed to an amount that is based upon total water supply available. Roza only received 47 percent of its supply in the 2015 drought, and KID also had a reduced supply. These reduced supplies can have significant impacts on crops and the regional economy.

The Yakima River Basin has been involved in a water rights adjudication process for more than 40 years. The adjudication and other state and federal court decisions have determined that water supply in the Yakima River Basin is over appropriated. Ecology settled with the U.S. Bureau of Reclamation and the Yakama Nation in the late 1990s over proposed groundwater permits in the Blackrock area and Rattlesnake Ridge. In September 2011, the U. S. Geological Survey released the final report of a 12-year, multi-million-dollar study confirming that some groundwater and surface water are directly connected, which means some groundwater withdrawals have the potential to impair senior surface water rights.

Ecology, in cooperation with the U.S. Bureau of Reclamation and the Yakama Nation, has determined that groundwater management in some areas may need to occur in order to protect senior water rights, flows for fish, and economic development. Ecology has stated they will seek solutions that address uncertainty and exposure faced by existing post-1905 groundwater users. In seeking water management solutions, Ecology will build upon the broad-based support for the Yakima Integrated Plan (Ecology 2017).

4.5.5.2 Yakima River Basin Integrated Water Resource Management Plan

The Yakima Integrated Plan (Ecology and USBR 2011) was developed by a diverse Work Group made up of tribal, federal, state, local, private, and nonprofit entities to address a variety of water resource and ecosystem problems affecting fish passage and habitat and agricultural, municipal, and domestic water supplies. The Yakima Integrated Plan provides a balanced approach to address water shortages through increased water storage, enhanced water conservation, water marketing, and better use of existing infrastructure. The Yakima Integrated Plan also improves the overall ecological integrity of the Yakima River Basin by protecting and enhancing riparian and headwaters habitat, providing fish passage at reservoirs, and making targeted land acquisitions on a willing-seller basis.

The Yakima Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. Benton County supports the seven elements of the Yakima Integrated Plan and efforts by Kennewick Irrigation District and Roza Irrigation District to secure water supply during drought conditions to reduce drought impacts. The County supports other efforts in the Yakima River Basin and in the lower Yakima River to improve water supply, flow, and habitat conditions, including improving water quality.

4.5.5.3 Addressing Exempt Wells to Meet Long-term Growth Needs

The County recognizes the need for developing and implementing a long-term strategy for addressing permit exempt wells needed to support rural development consistent with State law (RCW 19.27.097, RCW 58.17.110, and others), meet the goals of the Comprehensive Plan and Yakima Integrated Plan, and ensure future domestic water supplies (see Section 3.7 for Population Projections) are both physically and legally available for water withdrawal.

Demand for water to serve the County's growing urban and rural areas is projected to significantly increase. Since surface waters within the Yakima River Basin are over appropriated, dependence on groundwater for domestic uses is likely to continue. To sustain growth, residents of Benton County must meet the ongoing challenge of protecting and managing our water resources.

It is understood that some surface and ground water in the Yakima River Basin are hydrologically connected. Rural domestic water supply is generally provided from groundwater sources (i.e., private wells). The withdrawal of water from groundwater sources hydrologically connected to surface water may have an adverse impact on senior water rights established before and including 1905.

4.5.5.3.1 Exempt Wells Legal Framework

RCW 90.44.050 provides for the supply of rural domestic water through the use of "exempt wells," which can pump up to 5,000 gallons per day for residential use. The permit well exemption also allows pumping of 5,000 gallons per day for industrial use, 5,000 gallons per day for irrigation up to half an acre, and an unlimited amount for stock water purposes. Permit exempt groundwater withdrawals do not require a water right permit. However, to the extent the groundwater is beneficially used, the water user withdrawing groundwater under the exemption establishes a water right that enjoys the same privileges as a water right permit or certificate obtained directly from Ecology. Though such withdrawals are "permit exempt," they are still subject to Washington State law regarding the seniority of water withdrawals. Water use of any sort is subject to the "first in time, first in right" clause, originally established in historical western water law and now part of Washington State law. This means that a senior right cannot be impaired by a junior right. Seniority is established by priority date—the date an application was filed for a permitted or certificated water right or the

date that water was first put to beneficial use in the case of claims and exempt groundwater withdrawals. Although exempt groundwater withdrawals don't require a water right permit, they are subject to state water law.

In some instances, Ecology has had to regulate, stop, or reduce groundwater withdrawals when they interfere with prior or "senior" water rights, including instream flow rules. Recent state court decisions on the requirements of the GMA and County land use plans have resulted in a duty for Benton County to ensure that water for development is legally and physically available.

Closure of the portions of the Yakima River Basin to exempt well construction has already occurred in Kittitas County, which in turn has had effects on the development patterns and a large effect on the value and marketability of legal lots which can now only be developed with the use of a mitigation program for exempt wells operated by Kittitas County. Benton and Yakima counties face similar risks. Benton County is committed to taking the necessary steps to secure future domestic water supply and associated mitigation for projected rural population growth.

4.5.5.4 Developing a Yakima River Basin Rural Water Supply Program

Benton County understands that groundwater withdrawal may have effects on Yakima River Basin senior water rights, including the Yakama Nation Water right for protecting fish. Thus, the potential effects of future groundwater withdrawals within the Yakima drainage on senior water users and habitat conditions will be addressed in the next several years by the County. This work will include identifying mitigation strategies for providing water for rural development in the basin, while avoiding impacts to flows in mainstem reaches and the few Yakima River tributaries that exist in Benton County. The specific next steps planned for Benton County include:

1. Confirming baseline groundwater conditions
2. Developing future growth projections and water demands for future groundwater supply
3. Developing mitigation strategies
4. Formulating the County rural water supply program for areas that will be served through permit-exempt wells, including considering policy options and selecting elements for the establishment of the rural groundwater supply program in Benton County, to ensure water supply risks are mitigated for the next 20 to 50 years, and beyond if possible

The County will complete this work in coordination with Ecology, the Yakama Nation, the U.S. Bureau of Reclamation, and stakeholders in the County and Yakima River Basin.

4.5.6 Columbia River

The County will comply with the 2018 law passed by the Washington State Legislature addressing rural exempt well development for the portion of the County that drains to the Columbia River.

4.6 Critical Areas

Critical areas include ecosystems, landforms, or processes that are protected or enhanced under the GMA for the biological or physical functions and values that they provide. Critical areas are located throughout Benton County.

According to RCW 36.70A.030, the five critical areas protected by the GMA include:

- Wetlands
- Critical Aquifer Protection Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas
- Fish and Wildlife Conservation Areas

Many critical areas provide habitat for species listed as threatened, endangered, sensitive, or candidates by the federal or state government. Figures 8 through 13 of Appendix A: Map Folio depict the general location of critical areas in Benton County. The key functions and values provided by the five critical areas in the County can be summarized into the following four major functions: 1) water quality; 2) hydrology; 3) soil; and 4) habitat. Each critical area provides one or more of these key functions and values, which are summarized in Table 4-1.

**Table 4-1
Critical Area Functions**

Critical Areas	Key Functions			
	Water Quality	Hydrology	Soil Health	Habitat
Wetlands	•	•		•
Critical Aquifer Recharge Areas	•	•		
Frequently Flooded Areas	•	•	•	•
Geologically Hazardous Areas (Erosion)	•	•	•	•
Fish and Wildlife Habitat Conservation Areas	•	•	•	•

The following includes a description, current trends, and future considerations for each of the critical areas. Section 4.6.6 includes additional information on the VSP and the intersection of critical areas with agricultural lands.

4.6.1 Wetlands

4.6.1.1 Existing Conditions

Wetlands in Benton County are concentrated within the floodplain of the Yakima and Columbia rivers. Similar to stream flows, irrigation drainage may contribute to wetland conditions in some

areas where wetland conditions did not historically occur. Many wetlands have formed adjacent to irrigation conveyance systems and in low-lying areas where irrigation occurs (see Appendix A: Map Folio, Figure 9 – Wetlands, River, and Streams). A wetland is considered artificial, and not subject to state or local regulation as a wetland, only if it meets both of the following characteristics:

- Intentionally created
- Formerly non-wetland (upland) site

In irrigated agricultural areas, wetlands can result from localized conditions (e.g., a leaking irrigation ditch) or from a region-wide rise in groundwater resulting from regional irrigation projects. These types of wetlands are regulated by state wetland law and cannot be filled or drained without appropriate permits and mitigation (Ecology 2010). However, if the irrigation practices that led to the incidental wetland creation are changed (for example through implementation of water conservation practices), and the wetland dries up and no longer performs wetland functions, then no mitigation is required (Ecology 2010).

4.6.1.2 Current Trends

The current regulatory trend is for the protection of wetlands as a resource vital to sustaining biological productivity and water quality.

Within Benton County, the most noticeable trend is the gradual loss of artificial wetlands resulting from water conservation projects by irrigation districts and more efficient irrigation practices by farmers. Though there is no clear evidence of it to date, if the result of these efforts is to leave more water in the rivers as instream flow, then the natural wetlands along the riverine corridor should benefit.

4.6.1.3 Future Considerations

By both policy and ordinance, the Comprehensive Plan protects natural wetlands from non-agricultural developments. It also protects previously unfarmed wetlands from new agriculture. It is expected that the database for wetlands within the County will be improved over time and that such resources will be protected consistent with the requirements of state law and local interest.

4.6.2 Critical Aquifer Recharge Areas

4.6.2.1 Existing Conditions

The Columbia River basalts of the Columbia Plateau provide a locally important aquifer system. Within the lower Yakima River Basin, from the western County border east to Horn Rapids, the mainstem channel of the river flows through a relatively narrow inner valley of basalt bedrock covered with an unknown thickness of coarse alluvium. Downstream from Horn Rapids, the river flows through the broad alluvial fill of the Columbia River.

Within Benton County, the majority of wells and wellhead protection areas (Appendix A: Map Folio, Figure 10 – Critical Aquifer Recharge Areas) are concentrated along the Yakima River Valley and in the incorporated cities of Richland and Kennewick. Other Group A water system wells are located near irrigated lands in the southern portion of the County near Paterson. Studies have found nitrate concentrations exceeding drinking water quality standards in shallow wells in eastern and southern Benton County (WSIGC 1996; Ecology 2016). Based on the number of wells and the percentage of wells exceeding 10 milligrams per liter of nitrate, Ecology identified eastern Benton County as one of the top ten nitrate priority area candidates for improved water management within Washington. Actions implemented under the VSP, along with other management measures can help to prevent further degradation and potentially improve conditions.

4.6.2.2 Current Trends

Nitrate contaminations occur principally in upper aquifer wells drilled in the lower lying areas of the County. The spatial correlation between elevated concentrations of nitrates in groundwater and irrigated lands indicates that the major source of contamination is applied fertilizers on irrigated lands including crops, lawns, golf courses, and parks.

A complicating factor in the nitrate picture is evidence that suggests currently seepage from irrigation district canals actually serves to dilute what would otherwise be higher nitrate levels within groundwater (USGS 1993). As federal and State sponsored conservation projects reduce or eliminate this seepage, nitrate concentrations in the upper aquifer may actually rise.

4.6.2.3 Future Considerations

The protection and management of critical aquifer recharge areas in and around Benton County should continue to reduce pollution and maintain water storage levels for future use.

Benton Conservation District is also leading efforts to improve groundwater conditions through additional management measures. The Conservation District has been collecting sampling data from approximately 200 groundwater wells throughout the County to identify the influence of potential nitrate sources or nitrate dilution sources, as well as seasonal fluctuations in nitrate levels (Benton Conservation District 2015). These efforts are helping the County to build a more effective and targeted management program, including developing a stakeholder group, supporting a public health campaign and outreach activities, and implementing groundwater quality improvement efforts countywide, as documented in a 2017 report (EA West) and described in Section 4.5: Water Resources.

4.6.3 *Frequently Flooded Areas*

4.6.3.1 Existing Conditions

There are several types of landforms in Benton County that are subject to flood hazards. Most notably, the low-lying lands along the Yakima River flood significantly under varying winter and spring conditions. However significant flooding and flood damage can occur off the river as well in the Yakima's tributary streams, "dry" canyons, and other natural drainage features throughout the County, which are susceptible to "flash floods" or heavy run-off from snow melt.

The entirety of the Yakima River is mapped as a floodplain and floodway. The floodplain of the Yakima River is widest downstream (east) of Benton City. Floodplains are also mapped along the Columbia River, particularly in the northwest corner of the County, along the southeast near Kennewick and Richland, and along the south side of the County. Designated floodplains are shown in Appendix A: Map Folio, Figure 11 – Frequently Flooded Areas.

Flood areas pose constraints to development because construction within them can put both life and property at risk and require frequent and recurring expenditures of public and/or private funds for the repair of public and private property.

The most damaging floods in Benton County are associated with the Yakima River. This is because Benton County is the most downstream county in the entire Yakima River drainage, which contains 6,155 square miles, or four million acres, and the basin has limited flood control facilities. Annually, the snowpack on the east side of the Cascade Range melts and passes through Benton County within a river channel ("floodway") that is in some places less than 60 feet across. Depending upon the size of the snowpack, the rate and timing of its melt, and the ground conditions within the watershed, the lower Yakima River floodway may or may not be sufficient to carry the flow. When it is insufficient to carry the flow, water leaves the floodway and moves overland onto the floodplain.

If the snowpack melts gradually over the spring months the river channel may be full, but not flood. However, if a warm Chinook wind melts a portion of the snowpack in January, while the river and ground in Benton County are still frozen, the melt water will reach its ice clogged channel and leave the river to spread overland; or if warm temperatures come suddenly in early spring the entire watershed may thaw simultaneously and inundate the lower river valley.

The areas along the lower Yakima in Benton County are especially vulnerable to flooding annually and extend from Benton City downstream through West Richland to the delta where the Yakima empties into the Columbia River. This area is characterized by low-lying river bottom lands and ancient river channels which are historically the river's natural floodway and floodplain.

4.6.3.2 Flood Management

One of the products of the Federal Emergency Management Agency's (FEMA) flood insurance program has been the mapping of flood hazard areas throughout the nation. The primary area of concern in this effort has been the 1% annual chance floodplain (formerly known as the 100-year flood hazard area). The 1% annual chance floodplain has been adopted by FEMA and, by extension, the County as the base flood for purposes of floodplain management measures.

Encroachment on floodplains, such as placing artificial fill, reduces the flood-carrying capacity and increases flood heights, thus expanding the area susceptible to flooding and increasing flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1% annual chance floodplain is divided into a "floodway" and a "floodway fringe." The floodway is the channel of a river, plus any adjacent floodplain areas that must be kept free of encroachment to carry the 1% annual chance floodplain without substantial increases in flood heights. As a minimum standard, the Federal Insurance Administration limits such increases in flood heights to one foot, provided that hazardous velocities are not produced.

The area between the floodway and the boundary of the 1% annual chance floodplain is termed the "floodway fringe." The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1% annual chance floodplain more than one foot at any point.

4.6.3.3 Current Trends

The maximum known flood of the Yakima River occurred in December of 1933, with a depth of approximately 9.5 feet above the top of the riverbank at Benton City. Its estimated recurrence interval is approximately 170 years. Severe flooding of the Yakima River recently occurred in 1996, resulting in the largest and most devastating floods in recent history. More recently, flooding occurred in 2015 and 2017 in parts of Benton County. The likely trend is for the frequency and magnitude of floods within the lower reaches of the Yakima River to stabilize or even reduce as the upper watershed restores natural storage capacity through levee setbacks, watershed restoration, and other measures.

4.6.3.4 Future Considerations

Any new development located within the floodway will be reviewed by Benton County to meet current FEMA and BCC Title 15 development standards.

4.6.4 *Geologically Hazardous Areas*

4.6.4.1 Existing Conditions

Geologically hazardous areas encompass channel migration zones, steep slopes with moderate to severe erosion potential, landslide hazard areas, and seismic hazard areas. Channel migration in the Lower Yakima watershed is limited by a low gradient (average one percent gradient in the lower 47 miles of the river; BERK Consulting 2017) and geologic and structural controls in the eastern portion of Benton County. Similarly, the geology and topography of the Columbia River in Benton County, combined with dam regulations and shoreline stabilization measures, substantially limit channel migration.

Although the Department of Natural Resources identifies few landslide hazard areas within Benton County, steep slopes with erodible soils intersect agricultural areas along the northern face of the Horse Heaven Hills and eastern drainages within the Rock-Glade watershed, including along the Columbia River shoreline at Wallula Gap. Steep slopes with erodible soils are also mapped as intersecting rangelands in the northwestern (Blackrock) portion of the County. See Appendix A: Map Folio, Figure 12 – Geologically Hazardous Areas for steep slopes and erosion hazard areas mapped within Benton County.

Steep sloped areas have the potential for mass movement and slope erosion hazards. Mass movement is the movement of rock or soil material down slope in response to gravity. Slope erosion is the removal of soil or weathered bedrock that occurs as a result of sheet wash (no conspicuous channels), rill erosion (numerous small rivulets), or gully erosion (larger, more nearly permanent channels).

Steeply sloped and unstable geologic structures pose a constraint to development because associated developments require more expensive design and engineering work. Additionally, a much greater land area per structure is necessary on steep slopes. Left in their undeveloped condition, the opportunities provided by these resources range from aesthetic (visual), to open space (for recreation), and, for basalt outcroppings and steep canyons, important habitats (nesting areas for birds of prey).

Slopes of fifty percent can be found in both the Rattlesnake and Horse Heaven Hills. Due to the unique problems inherent in developing steeply sloping areas, special care must be exercised in the planning and development of such areas.

4.6.4.2 Current Trends

As land use intensifies over the landscape with agriculture and residential developments competing for ground, and as higher income households target view lots on slopes and ridges, new residential

developments will increasingly occupy the more geologically difficult terrain. These are the areas which present problems associated with geologic hazards.

4.6.4.3 Future Considerations

Future development should be consistent with the Benton County CAO in BCC Title 15.

4.6.5 *Fish and Wildlife Conservation Areas*

4.6.5.1 Existing Conditions

Due to the arid nature of Benton County, many streams classified by mapping as streams are dry washes that follow topographic lows and only transport water during large runoff events and therefore are not conducive to aquatic species habitat. Outside of irrigated areas, only streams modeled as greater than 7th order are likely to carry stream flow (even on an intermittent or ephemeral basis) and, in irrigated areas, streams that are greater



than 3rd order are likely to carry at least ephemeral flows (BERK Consulting 2017). Often the source of water for flow in streams in the County is from irrigation as many otherwise dry washes are used for irrigation water conveyance as part of an irrigation district system. Per RCW 36.70A.030(5), fish and wildlife habitat conservation areas do not include artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company. Field evaluation would still be necessary to verify stream occurrence at the site scale. Additionally, anadromous fish in Benton County use the Yakima and Columbia rivers to migrate, spawn, and rear. Anadromous salmon spawning is documented in some tributaries to the Yakima and Columbia rivers. See Appendix A: Map Folio, Figure 9 for a map of streams and rivers within the County.

Shrub-steppe habitat is identified as a priority habitat in the County. The Blackrock area, which consists of a patchwork of private and publicly owned lands used predominantly for rangeland agricultural activities, is of significance for shrub-steppe habitat conservation. Additionally, State-threatened ferruginous hawk is of importance on agricultural lands. See Appendix A: Map Folio, Figure 13 for mapped priority habitats within the County.

Several managed and protected fish and wildlife habitat areas are located in the County as described below:

Umatilla National Wildlife Refuge. The Umatilla National Wildlife Refuge is intensively managed to provide habitat for migratory birds and resident wildlife. Management practices include restoration

of wetlands, manipulation of seasonal wetlands to encourage native food supplies, farming, prescribed burning, native planting in riparian areas, removal of exotic weed species, and planting native grasses in upland areas. Approximately 1,400 acres of refuge lands are irrigated croplands which provide food and cover for wildlife. Local farmers grow corn, wheat, alfalfa, and other crops under a cooperative agreement whereby the refuge's share of the crop is left in the field for wildlife.

McNary National Wildlife Refuge. Established in 1956, the McNary National Wildlife Refuge was created to replace wildlife habitat lost to construction of the McNary Dam downstream. The 15,000 acres of sloughs, ponds, streams, and islands include islands north of the City of Richland. Seasonal wetlands are managed to promote diverse wetland plant growth. Upland areas are managed with prescribed burning, removal of exotic weed species, and planting of native grasses. Native willows and cottonwoods are planted in riparian areas. Approximately 700 acres of refuge lands managed in agriculture specifically provide waterfowl with winter forage opportunities.

Barker Ranch. Barker Ranch is approximately 2,400 acres of alluvial and glacial floodway and floodplain with extensive riparian shoreline and wetlands that are a product of variously applied water, upwelling from subsurface hydrology, and seasonal river flooding. The ranch is located within the Yakima River migration zone primarily on the north side of the river extending up and down river from the Twin Bridges and the intersection of Snively and Twin Bridges roads. The north boundary is the Horn Rapids Ditch, the south boundary is the ordinary high-water line at the north side of the Yakima River. Today under the federal Wetland Reserve Program easement, approximately 1,865 acres of the ranch is under permanent conservation easement, with waterfowl and habitat production the primary management objectives. Limited grazing continues under a grazing management plan that is wildlife and habitat driven rather than cattle driven.

Hanford Reach National Monument. In 2000, the Hanford Reach National Monument was established by Presidential Proclamation to protect, preserve, and expand critical shrub-steppe habitat and other cultural and biological resources.

4.6.5.2 Current Trends

The current trends relative to sustainability of fish and wildlife resources in Benton County is a mix of success and failure. On the successful side, the Hanford site, occupying five percent of the County's land area is a large and functional habitat area of indigenous biological resources. Under federal ownership for the past 50 years, it has been left untouched by the far-reaching developments that have converted the off-site landscape. The shrub-steppe and wetlands complex of the Wahluke Slope to the north of the Columbia River and the U.S. Army's Yakima Training Facility to the west add hundreds of additional square miles of indigenous habitat, potentially "connectable" as a single unit.

Within the lower, flood prone reaches of the Yakima River, where private development is relatively sparse and large acreages are within local or federal ownership, a rich riverine environment of

islands, wetlands, braided channels, and back water provide lush habitat and breeding and nursery areas for aquatic species.

Additionally, shore lands owned by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service in the south of the County along the Columbia river's hydroelectric pools provide significant fish and wildlife resources.

In contrast, biological resources generally found outside of the Hanford Site experience pressure from development, farming, recreation, and other activities, specifically, native shrub-steppe habitat that is being eliminated by the expansion of urban and agricultural developments. Additionally, the Yakima River's anadromous and resident fisheries are threatened by poor water quality due in large part to non-point source pollution combined with low summer flows. Overall, outside of publicly held lands, the current regional and local trend further threatens biological resources and wet environments as habitat through development and land conversion, including on Department of Natural Resources lands in eastern Washington.

The continuing loss of biological resources is evidenced by fragmentation of natural habitat, declining water quality, and the growing number of terrestrial and aquatic species listed as candidate, threatened, and endangered by the federal and state governments.

Within the larger watershed, there are also sub-trends. For example, there are projects for the conservation of surface water resources by irrigation districts under federal and state sponsored water conservation projects. The typical project is the lining or piping of antiquated irrigation water delivery infrastructure to reduce leakage loss. Additional programs seek to reduce the total of "applied" water. The impact of these programs is likely to be improved flow and water quality in river mainstems and tributaries, while eliminating the significant acreage of wetlands created by conveyed or applied water run-off.

4.6.5.3 Future Considerations

As the trend to convert raw land continues, fragmentation of natural habitats will further reduce biological productivity and diversity. Remaining productive terrestrial and aquatic habitats will be confined largely to floodways and floodplains, canyons, undevelopable terrain, undeveloped areas designated "Rural" on the Land Use Plan Map, and on lands in government ownership (other than Washington Department of Natural Resources).

Maintaining public holdings, because of their size and uncomplicated ownerships, holds promise for successfully protecting eastern Washington's natural wildlife heritage. The acreage of these holdings may be augmented by private lands protected and enhanced through the VSP and other programs.

Actions for protecting habitats on public lands should be pursued under a federal, state, and local partnership, with non-impactive recreational uses a goal secondary to wildlife protection:

- Conserve suitable acreages of existing public lands for habitat purposes, augmented where needed by additional purchases, exchanges, conservation easements to "connect" large tracts of habitat into functional systems.
- Apply and monitor for effectiveness regulatory provisions to protect and enhance near-shore riverine and wetland environments.
- Apply water conservation standards to non-farm developments.
- Increase upper watershed storage capacity to provide additional low season flows and reduce the competition between in- and out-of-stream uses for available water supplies.
- Encourage land use practices that eliminate or significantly reduce non-point source pollution.
- In concert with state resources agencies, undertake local educational outreach programs including grant monies for demonstration projects on private lands associated with sensitive resource issues.

4.6.6 *Voluntary Stewardship Program*

In 2011, the Legislature amended the GMA with the intent to protect and/or voluntarily enhance critical areas in places where agricultural activities are conducted, while maintaining and improving the long-term viability of agriculture. This amendment established the VSP, a new, non-regulatory, and incentive-based approach that balances the protection of critical areas on agricultural lands, while promoting agricultural viability, as an alternative to managing agricultural activities in the County under the Critical Areas and Resources Protection Ordinance.



Agricultural lands mostly have small intersections with critical areas in Benton County. Frequently flooded areas, geologically hazardous areas, and wetlands all have less than a 2 percent intersection with agricultural lands. Most critical aquifer recharge areas have small intersects with agricultural areas (less than 2.5 percent of agricultural lands); only areas with alluvial parent material or hydrologic soil group A have a moderate intersect (12.7 percent of agricultural lands). Fish and wildlife habitat conservation areas have the largest intersect (22.1 percent of agricultural lands). The Benton County VSP Work Plan (draft) provides additional information regarding the intersect of agricultural lands with critical areas (BERK Consulting 2017).

4.6.6.1 Future Considerations for Critical Areas Under the Voluntary Stewardship Program

Critical areas goals and protection benchmarks are included in the VSP Work Plan as measures that may be taken by agricultural producers to protect and/or enhance critical areas functions and values through voluntary, incentive-based measures. The plan is currently under development and the draft goals and protection benchmarks are provided as future considerations for each of the critical areas below. These goals and protection benchmarks may be updated as the Work Plan is finalized with the Work Group in coordination with Benton County.

- Wetlands
 - Manage runoff and erosion associated with agricultural activities through voluntary maintenance of conservation practices.
 - Maintain riparian vegetation to support biofiltration and bank stability in areas of agricultural intersect through voluntary practices, including managing livestock access to streams and wetlands.
 - Manage invasive species in and around wetlands, and maintain native species diversity.
 - Encourage voluntary enhancement of surface water quality in streams, wetlands, and agricultural drains in hydrologic study areas.
- Critical Aquifer Recharge Areas
 - Protect groundwater recharge in areas of declining water tables or where recharge can help maintain base flows for rivers and streams.
 - Maintain practices that limit leaching of nitrogen and other contaminants into groundwater.
 - Encourage implementation of groundwater recharge by passive infiltration or direct injection.
 - Promote voluntary on-farm water conservation practices, such as irrigation water management and efficient irrigation systems in areas with agricultural wells.
 - Promote voluntary conservation practices that minimize leaching of nitrogen and other contaminants into groundwater.
- Frequently Flooded Areas
 - Maintain floodplain connectivity in areas of agricultural intersect.
 - Maintain or reduce hazards to physical safety associated with flooding. New agriculture in floodplains should not require alterations that diminish floodplain functions or increase safety risks.
- Geologically Hazardous Areas
 - Maintain integrity of steep slopes in areas of agricultural intersect through the following:
 - Avoid increases in erosion
 - Avoid steep slopes or help to stabilize steep slopes where practical

- Avoid irrigating unstable slopes
- Fish and Wildlife Conservation Areas
 - Maintain shrub-steppe habitat through voluntary management and protection measures, examples include, but are not limited to the following:
 - Timed/less intense grazing at appropriate times
 - Native vegetation propagation
 - Advanced fire protection strategies, including managed grazing and maintaining firebreaks
 - Voluntary protection of set-asides (e.g., easements, acquisition, federal conservation programs, and other strategies)
 - Manage invasive species on agricultural lands and maintain native species diversity.
 - Promote voluntary measures to enhance shrub-steppe habitat and shrub-steppe corridors with the first priority being basins where the benchmark of shrub-steppe protection of functions and values is at risk of degrading compared to baseline. Within basins, enhancement opportunities should first include current blocks and currently utilized corridors and then historical or likely suitable corridors that could be established or renewed.
 - Encourage diversity of native grasses in place of cheatgrass to promote resiliency.

5 Economics Element

5.1 Introduction and Purpose

The purpose of the Economic element is to synthesize the various components within the Comprehensive Plan that relate to current and emerging land use, growth, and economic issues into a summary from which deliberate and sustained action toward economic objectives can be formulated and pursued. A strong diversified economy provides a high quality of life for the citizens of Benton County and the region. This in turn, generates the resources through which local governments provide for the health, safety, and welfare of its citizens. The Economic element has been developed to provide direction and specific actions consistent with other plan elements, goals and policies (Section 2.6), and the *2017 Comprehensive Economic Development Strategy* for Benton and Franklin counties (BFCG 2017a). The *2017 Comprehensive Economic Development Strategy* is designed to create employment opportunities, improve local conditions, foster more stable and diversified local economies, and provide a mechanism for guiding and coordinating the efforts of local organizations and individuals concerned with the economic development of this area.

The economy in the region has been largely dependent on federal funding for Hanford projects. Employment in the Hanford area decreased in the last few years as part of federal spending cuts. This decrease was part of a region-wide decline in employment from 2012 and 2013 and the end of ARRA funding. However uncertain the employment in the Hanford area is, it still plays a vital role in the County's regional economy.

5.2 Hanford Nuclear Reservation

The establishment of the Hanford Reservation in 1943—just a decade or so after irrigation and reclamation district water began to make a difference in farming profitability—instantly transformed the local economy from uni-modal to bi-modal, i.e., agriculture outside the site and defense related construction and activities on the site.

At first glance, this instant transformation to a bi-modal economy in 1943 would appear to be a "pump primer" for the more complex and diversified urban economies that naturally grow out of resource based communities. However, the reality is that the circumstances of the development of the Hanford Reservation, such as the secret and hazardous nature of its federal projects, the non-exportability and limited marketability of its product, its transient work force, chaotically inflating and deflating funding cycles, and the high wage and benefits scale of Hanford workers relative to private sector employment, actually served to discourage local private sector investment (not dependent on Hanford), other than housing and retail/service.

Consequently, for the almost 50 years of Hanford's nuclear defense mission, the non-farm leg of the local economy did not grow much beyond its narrow beginnings as a federally funded public works

project with its off-site "bedroom" communities and a service sector. The typically gradual processes whereby urban communities weave a rich and stable socio-economic fabric did not occur in the non-farm sector during the Cold War years.

This situation remained until the end of the Cold War in the late 1980s, which enabled a new mission of cleanup of the Hanford Site. The current mission of waste cleanup is fundamentally different in scope, purpose, and effect, driving new science and technologies that are often marketable worldwide.

The local economy, however, is still largely dependent on Hanford, especially in the Tri-Cities area. For example, a Hanford work force of approximately 12,000 in 1990 ballooned to 18,100 workers in 1994. This accounted for 19.5 percent of Tri-Cities employment and 38 percent of all payroll income in the Tri-Cities (SWOT 1996). The local economy was less impacted by the recession in 2008 than the rest of the nation due to the increase in employment at Hanford and the Pacific Northwest National Laboratory as part of the ARRA of 2009. The total output declined from \$10.3 billion in 2010 to \$8.6 billion in 2014, partly due to the end of ARRA and partly reflecting the national recession trends. However, more recent data have indicated that economic conditions have continued to improve over the past two years (Oneza & Associates 2017).

There has been a gradual reduction in the Hanford work force over time. A Tri-Party Agreement was signed in 1989 by the State of Washington, the Environmental Protection Agency, and the U.S. Department of Energy. This document sets forth Site cleanup objectives, projects, and milestones, which if funded by congress annually, does extend but gradually reduces Hanford employment levels as cleanup is achieved over time.

The Hanford area's B Reactor, consisting of historic facilities at Hanford, was authorized by Congress in December 2014 to be included in the Manhattan Project National Historical Park. The Hanford area and the Vernita Bridge area's public access to recreational facilities attract Hanford based tourism in the region.

5.3 Existing Conditions

In large measure, current trends at the regional level indicate growth and resurgence of the region's historic economies (agriculture and food processing, water and rail transportation for commerce). Additional trends that are related to historic activities and the natural resource base of this area are agri-tourism, anchored by an emerging viticulture (wine) industry and specialty crop farming and retailing, and visitor-serving commercial and recreational activities, with the center attractions being the riverine environments at the confluence of the Snake, Columbia, and Yakima rivers in the Tri-Cities. The trend on the Hanford Site is as been to open the site for a much broader range of uses

and activities than what was permitted under the old Cold War mission of weapons grade plutonium production, which ended in 1989.

A presentation of the history of the County's economic foundations of natural resource trade and commerce as it has evolved, and as it may be applicable to emerging economic opportunities and trends in Benton County and the region, occurs in the Land Use element (Chapter 3).

5.3.1 *State and Regional Growth*

As required by state planning law, the focus within this Element is on "regional" and even global economic issues. The Pacific Northwest region of the country is experiencing rapid population and economic growth. The state of Washington has been growing at an average of over 70,000 persons per year in the last decade and is projected to continue that pace. A regional growth trend can be seen in the Benton and Franklin counties' cumulative population growth shown in Figure 3-2. Benton County also continues to experience high levels of growth. In unincorporated Benton County, the farm economy has been very strong, with steady increases in "farm gate" and "value added" dollars, as well as employment numbers. Table 5-1 presents population and economic indicators in Benton and Franklin counties.

**Table 5-1
Population Growth and Economic Indicators**

County	Population ¹		Civilian Labor Force ² (% of total population)	
	2010	2015	2010	2015
Benton	175,177	188,590	67.1	62.9
Franklin	75,500	87,150	63.8	75.0

Notes:

1. Washington State Office of Financial Management
2. U.S. Census Bureau

Notwithstanding the local effects from the Hanford Site, the regional focus is a natural one for the County, which is a "regional service provider." The local and regional history (the custom and culture) has been one of resource based commodities trade (fisheries, fur, livestock, agriculture, minerals, and hydroelectric power), and related regional road, water, and rail transportation.

The custom and culture is largely the same today, except that some technologies have evolved into their own industries (e.g., irrigation systems and technology), and productivity has increased. The transportation systems that move these products have also undergone changes in technology and scale; they now serve global markets.

Within the last decade there have been local economic spin-offs (e.g., agri-tourism) from these traditional economic activities and new regional economies (visitor-serving commercial and recreation), which have expanded economic opportunities locally.

Agriculture grew rapidly in the 1960s and 1970s as the Columbia Basin Project was completed. The associated growth was not only in agricultural production, but also in value-added areas such as food processing and chemical fertilizer development. Over the past 10 years, the region has again seen more growth in agriculture than all other industries in terms of total job creation. Between 2005 to 2014, agricultural growth has outpaced all other industries in Benton and Franklin counties, at a 2.5 percent growth rate compared to a 1.8 percent growth rate in all other industries (Suljic 2016). During the same period, agricultural employment increased from 9,352 jobs to 12,029 jobs. Major contributors to this growth are agricultural support activities (8 percent) and crop production (0.9 percent) employment growth rates (Suljic 2016).



Agricultural lands in Benton County

5.3.2 *Benton County Economic Conditions*

Based on the 2015 American Community Survey, the median household income in Benton County is \$60,251 (U.S. Census Bureau 2015). The Washington State Employment and Security Department is forecasting all industries in Benton and Franklin counties to have a positive growth rate between 2014 and 2024. Short term non-farm growth is projected at 1.9 percent between 2014 and 2019 and 1.31 percent between 2019 and 2024 (Anchor 2016).

New specialty crop plantings have increased, along with innovations in harvesting, storage, and transport. Viticulture and agri-tourism continue to grow in the agricultural economy. Value added processing plants, as well as cold storage and transport facilities have been constructed.



Both the County and its farm products remain advantageously situated to serve expanding Asian markets.

**Table 5-2
Fastest Growth in Employment**

Major Growth Sectors	Growth Rate Short Term (2014 - 2019)	Growth Rate Long Term (2019 - 2024)
Construction	2.99	0.81
Financial, professional, and business occupations	2.58	2.13
Education and health care	2.26	1.8
Leisure and hospitality	1.9	1.6
Wholesale trade	2.31	1.06

Source: Washington State Employment and Security Department (Suljic 2016)

5.3.3 *Economic Diversification*

Despite the above optimistic outlook in the eastern Washington region, the need remains to reduce the local non-farm economy's dependence on federal funding of Hanford projects. This must be done before those projects begin to wind down as cleanup milestones are completed, or before congressional budgetary considerations negatively affect project outlays. Meaningful strides toward a diversified local economy, independent of federal budgets for Hanford, have been made and these efforts must continue.

5.4 Summary of Economic Development Priorities

Items 1 through 9 on the following pages are currently the highest priorities for the commitment of County resources toward the objective of economic growth and development.

Though the items are shown as discrete economic activities, many in fact are naturally interrelated. For example, agriculture, agri-tourism, and visitor-serving recreational and commercial activities are mutually supportive and related, especially when located in the same geographic area of the County (e.g., the Tapteal Greenway and Red Mountain Wineries). These symbiotic relationships should be identified, facilitated, and encouraged for economic growth.

Each of the priorities listed is a "regional" activity. For example, vineyards and wineries dot the regional landscape of Benton, Franklin, and Yakima counties. The recently constructed viticulture center, the Walter Clore Wine & Culinary Center, in Prosser which showcases regional wines and wineries would be an appropriate project for County involvement.



All the priorities listed below should be pursued simultaneously, with the overall level of effort allocated to each at any point in time being a reflection of its timeliness and cost/benefit outlook. For example, the local opportunities and demands of an expanding rail and waterborne transportation system for global commerce, and linked to area agricultural commodities, is currently significant and will likely continue to increase.

Where appropriate, partnering with local jurisdictions and other private, public, and governmental entities for planning, public processes, and financing capital improvements is preferred.

1. Commodities, Trade, and Transport

Engage other public entities (e.g., the State of Washington, the federal government regarding Hanford and the Columbia River, and local port and utility districts) in planning for the provision of land and infrastructure capacities that anticipate the expanding demands of commerce, trade, and transport.

Locations: Opportunities for enhancing local employment through this economic sector exist in:

- The Ports of Benton and Kennewick properties and other properties within both urban and rural areas of the County

- The area in north Richland, recently transferred from the U.S. Department of Energy to the City of Richland, the Port of Benton, and Energy Northwest for industrial use

2. Agriculture, Processing, and Value-Added Industries

Assure through coordination with other public entities (e.g., the State of Washington, the federal government regarding Hanford and the Columbia River, and local port and utility districts) that the complexity of land and infrastructure resources necessary to support the expanding demands for agricultural products and food processing and value-added industries exists. Essential components are all season farm to market roads, utilities service, and multi-modal transportation access to processing, shipping, and storage areas; water resources for irrigation and processing; and industrial waste disposal facilities.

Locations: Opportunities to meet these needs exist in:

- Prosser industrial area
- Rural areas of the County next to agriculture production areas

Locational requirements that can be integrated with those of Priority No. 1 above should be fully maximized.

3. Agri-tourism

Work with agricultural and related interests whose focus is on visitors and tourism (e.g., specialty retail, wineries, breweries, bed and breakfasts, farmers markets) to assure that zoning, development standards, and improved road access facilitate such activities.

Locations: Commercial agriculture in Benton County is ubiquitous over the landscape; any farmer or resident may seek to engage in agri-tourism enterprises. There are, however, locations that provide notable opportunities due to location and/or the stated intent of the farmers to engage in agri-tourism. These are:

- The Prosser area, Wine Country Road, and Wittkopf Loop
- East of Benton City, in the Red Mountain AVA vineyards and wineries
- South Finley vineyards and orchards
- Paterson area vineyards and wineries

4. Visitor-Serving Recreation and Commercial

Develop County owned recreational lands and facilities, and implement recreational plans of the Comprehensive Plan, which will improve the quality of life for local residents and "spin-off" economic benefits to the local community from the regional visitor-serving and recreational economic sectors.

Integrate and connect County facilities with those of the cities, e.g., Rivershore Enhancement and the Tapteal Greenway.

Locations: Along over 100 miles of shoreline extending from the Vernita Bridge on the Columbia River and Benton City on the Yakima River to Hover Park in south Finley and further down river to Plymouth in south Benton County:

- The Tapteal Greenway in the lower Yakima River has the potential to connect Columbia Point to Benton City and Red Mountain via West Richland and Horn Rapids County Park (see discussion of the Tapteal Greenway in Chapter 8)
- Hover Park in South Finley, with intertie access, brings visitors to south Finley orchards and vineyards
- Two Rivers Park in Finley
- Vernita Terrace and through the Hanford Reach (Hanford Reach National Monument) and B Reactor Museum
- The island area partially owned by the Port of Kennewick off the rural community of Plymouth in the southern area of the County

5. Industrial Development

Work with the port and utility districts, WSDOT, and owners of industrially zoned land to provide lands zoned for industrial uses with transportation access and power (gas and electric). Work with municipalities or the state and local health districts to provide water and waste treatment capabilities sufficient to render industrial zoned lands marketable for industrial uses.

Locations: Notable locations of such lands in the unincorporated County are:

- All Rural Industrial lands
- The area in north Richland, recently transferred from the U.S. Department of Energy to the City of Richland, the Port of Benton, and Energy Northwest for industrial use
- Approximately 85 acres of industrial zoned land at the Interstate 82 and Badger Road interchange
- Rural Industrial land at Plymouth in the south County
- Rural Industrial land at Paterson in the south County

6. Agricultural Water Resources

Maintain a primary support role in the implementation of the Yakima Integrated Plan, work with agricultural and other stakeholders to address future water needs, and work with the broad range of water using interests to identify and obtain additional supplies and improve water quality (see discussion on Water Resources, Section 4.5).

Locations: The geographic areas within which this effort should be pursued are as follows:

- Yakima River Basin in conjunction with Yakima and Kittitas counties
- Within Benton County for those water supply and quality objectives that can be accomplished unilaterally

7. Hanford Site Industrial

Energy, national defense, nuclear medicine, and more general industrial are among the opportunities on the Hanford Site:

Locations: Within the Industrial and Research & Development Zones of the Hanford Site, anchored by existing rail, road, energy, and nuclear infrastructure:

- Medical isotope production by the Fast Flux Test Facility in the Hanford Site's 400 Area
- Development of an industrial energy park in the recently transferred industrial land from the U.S. Department of Energy to the City of Richland, the Port of Benton, and Energy Northwest

8. Resource Use at Sustainable Levels

Coordinate with local jurisdictions and state and federal resource agencies to manage and conserve natural and biological resources at sustainable levels to sustain local economic growth. This requires that it be based on a broad array of sustained resources.

Locations: Generally within land features identified as "critical areas" (Chapter 4), but also relating to resource issues which transcend specific areas, such as ground and surface waters, air quality, and species survival:

- Along the mainstems and tributaries of the Yakima and Columbia rivers and their associated riverine wetlands and near-shore uplands
- Within the Hanford Reach and on the Hanford Site that combined represent a biological resources "bank" within Benton County
- Within Benton County's jurisdictional portion of the Yakima River watershed relative to conservation of ground and surface waters

9. Law and Justice

The quality of life and economic growth of an area are fundamentally influenced by the actual conditions and perception of public safety and welfare. These perceptions are held by residents, visitors, and prospective new business and industry. The expansion of public safety facilities is favorable to economic growth.

Locations: The County Justice Center in Kennewick

10. Education

Coordinate with educational institutions to maintain robust educational programs that are relevant to the regional economy. Although education constitutes a smaller share of the regional economy, this sector has seen more growth than other economic sectors in the region. Washington State University's research activities are also integrated with local economy, such as agriculture and wine based research.

Locations: The Washington State University Richland Campus and the following:

- Washington State University Extension's agricultural and natural resource based program unit, community and economic development program unit, and youth and family program unit
- Columbia Basin College's Richland campus expansion
- Other K-12 and vocational schools

5.5 The County's Role in Economic Development and Diversification

The County's role is identified in its vision and policy statements at the beginning of this Chapter; it promotes economic development by providing basic regional services and infrastructure, where such provisions will promote economic development, public health and welfare, and environmental quality.

Though the range of regional service responsibilities of the County is broad, within the context of economic development, the principal responsibilities are:

- long range planning
- productive coordination with other jurisdictions and interests
- the provision and/or operation and maintenance of infrastructure necessary to support the current economic base and provide competitive advantages to attract new economic growth

Depending upon the circumstance, the County may fulfill these responsibilities unilaterally, or in partnership with other entities such as the port districts, private industry and business, the state, or other local and regional political jurisdictions. For any given issue or project, the County's contribution may range from direct capital expenditures to in-kind services or coordination, integration, and/or facilitation.

6 Housing Element

6.1 Introduction

The Housing element is integrated with the other elements of the Comprehensive Plan. A full understanding of the County's housing policy and plans should include a study of these elements.

The GMA planning goals for housing are as follows:

- Encourage the availability of housing to all economic segments of the population
- Promote a variety of residential densities and housing types
- Encourage the preservation of existing housing stock

The Housing element includes an inventory and analysis of existing and projected housing needs within the County. Chapter 2 of the Comprehensive Plan identifies goals and policies for the preservation, improvement, and development of housing. Chapter 3: Land Use provides analysis to identify sufficient land for multiple housing choices to meet the projected needs of all economic segments of the County.

6.2 Existing Conditions

The 2015 American Community Survey data indicate 71,473 housing units currently exist in the entire Benton County, including cities (U.S. Census Bureau 2015). Unincorporated information is also provided below, along with a breakdown for cities. About 68 percent of the housing units are owner-occupied and 32 percent renter-occupied (Table 6-1).

**Table 6-1
Benton County Housing Types and Occupancy**

	Estimate in 2015	Percent
Total Housing units	71,473	100.00
Occupied housing units	67,430	94.00
Vacant housing units	4,043	6.00
Owner-occupied housing units	45,508	67.50
Renter-occupied housing units	21,922	32.50
Unit types		
1-unit, detached	44,599	62.40
1-unit, attached	1,953	2.70
2 units	2,889	4.00
3 or 4 units	2,776	3.90
5 to 9 units	3,479	4.90
10 to 19 units	3,431	4.80

	Estimate in 2015	Percent
20 or more units	4,509	6.30
Mobile home	7,648	10.70
Boat, RV, van, and other	189	0.30

Source: American Community Survey (U.S. Census Bureau 2015)

The average countywide household size in Benton County has slightly increased from 2.68 persons in 2000 to 2.72 in 2016. Table 6-2 below indicates the distribution of housing in the cities and unincorporated areas.

**Table 6-2
Existing Housing Units**

Jurisdiction	2000	2015
Benton County (total)	55,963	71,473
City of Kennewick	22,043	29,356
City of Richland	16,454	22,130
City of Prosser	1,781	2,301
City of West Richland	3,094	4,530
City of Benton City	1,022	1,194
Total Units Incorporated	44,394 (79%)	59,511 (83%)
Total Units Unincorporated	11,569 (21%)	11,962 (17%)

Source: U.S. Census Bureau (2000, 2015)

6.2.1 *Affordability*

The term affordable, when used with regard to housing, is usually relative to a specific economic segment of the population. According to the U.S. Department of Housing and Urban Development, families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation, and medical care. The 2015 Census data indicate approximately 22 percent of the County’s housing units cost over 30 percent of the owner’s monthly income. The 2015 Census data also indicate median income for Benton County is \$60,251 (Table 6-3).

Table 6-3
Percentage of Households Per Income Range Groups

Income Range	Percentage of Households
Below \$25,000	19.7
Between \$25,000 and \$49,999	22.0
Between \$50,000 and \$99,999	32.3
Above \$100,000	26.0

Most of the new housing being built in the County’s Metropolitan Planning Area is for the custom home market. Although the 2015 American Community Survey data indicate the median housing price being \$184,200 for Benton County, this number is much higher for the Tri-Cities area (U.S. Census Bureau 2015). The average home selling price in 2017 is \$242,300 (Tridex 2017). This indicates a higher percentage of the houses are being built for the above median income range in the Tri-City area. In 2017, the average rental price for a two-bedroom apartment is \$971 in Kennewick and \$1,132 in Richland (RentJungle 2017).

6.2.2 Special Needs Housing

Citizens with special needs living in the County include those who require some assistance in their day-to-day living, such as the physically or mentally disabled, senior citizens, and institutional and group home settings. Social service programs and assisted housing in Benton County all serve a portion of those with special needs.

6.3 Current Trends

Based on the OFM 20-year projection, Benton County’s countywide population is estimated to be 280,109 in the year 2037. The unincorporated areas of the County maintain a 19 percent share of the total countywide population. The “high” series estimates indicate that Benton County can expect a population increase of 86,609 by the year 2037. The unincorporated County’s 19 percent allocation of the countywide 2037 population projection is estimated to be 18,135 additional people. At an estimated unincorporated ratio of 2.7 residents per household, this increase in population would require up to 6,716 new homes in the next 20 years.

Single-family housing is the predominant type throughout the County. In 2015, 65 percent of all units were single family, 24 percent were multi-family dwellings, and 11 percent were Manufactured homes or Factory Assembled Structures (Table 6-4). In unincorporated Benton County, large lot single family homes in a rural setting with accessory structures continue to be the preferred housing type. These are mostly developed on 5-acre or larger lots. The 1 acre lots also include larger single-family homes compared to homes in the County’s urban areas. The unincorporated County also has a large number of manufactured homes as shown in Table 6-4.

**Table 6-4
Housing Mix, Cities in Benton County, 2015**

Jurisdiction	Single family	Multi-family	Manufactured Homes	Total Dwellings ¹
Unincorporated	8,117	220	3,558	11,962
Kennewick	17,590	9,488	2,208	29,356
Richland	15,000	6,309	786	22,130
Prosser	1,431	580	290	2,301
West Richland	3,698	305	527	4,530
Benton City	716	182	279	1,194
Total	46,552 (65%)	17,084 (24%)	7,648 (11%)	71,284 (100%)

Notes:

¹Does not include RV, Boats, and Vans

Source: American Community Survey (U.S. Census Bureau 2015)

6.4 Future Considerations

As discussed above, based on the population estimates, the County will need to add 6,716 new homes in the next 20 years. The Land Use element discusses potential areas for future developments and the County's land capacity to meet projected housing needs. The discussion below indicates multiple housing types in various densities to address housing needs and affordability.

6.4.1 Density

A range of residential densities is provided within the unincorporated County to provide broad affordability related to land costs and construction. Within the Rural Community Center areas in Paterson, Whitstran, Plymouth, and Finley, densities of up to 3 DU/acre may occur, including duplexes. Densities of 1 DU/acre are designated in Rural Transition areas due to their proximity to UGAs and adequate road



Residential development in Finley, Washington

capacity. These designations are considered limited areas of more intensive rural development enabled by RCW36.70A.070 (5)(d). The density of 1 DU/5 acres is the dominant rural density in Rural Remote areas. Low density residential uses are allowed in Rural Resource areas at 1 DU/20 acres. Minimum lot sizes in each land use and zoning district are identified in the zoning code Chapter 11 of BCC.

6.4.2 *Housing Types*

Affordable Housing Types. Factory Assembled Structures and mobile homes offer housing alternatives suitable to low-income and moderate-income groups as well as senior citizens. Factory assembled structures are designed, made off site, and assembled on site. This process helps reduce building material and construction costs. Quality Factory Assembled Structures can be placed on a parcel for approximately 70 percent of the cost of a comparably sized site-built structure. As technology improves, factory assembled structures can be designed to closely resemble site-built homes. In addition, when placed in mobile home parks or subdivisions, Factory Assembled Structures can offer reduced land and infrastructure costs.

Factory Assembled Structures are a major source of affordable housing in Benton County. They meet Housing and Urban Development standards, which make it possible for buyers to get loans to purchase with little or no down payment. This is a very attractive option for those with little savings to buy site-built homes.

Accessory Dwelling Units. The zoning code permits the establishment of additional living quarters within single family residences to permit persons who, due to a disability or an infirmity, require the assistance of friends, relatives, or a professional nurse to remain in their home and for persons related to the occupant. These units help meet the needs of the disabled, infirm, or elderly in need of assisted care and are currently allowed by ordinance in all residential zones and the agricultural zoning district of Benton County.

The County plans to review its zoning code for provisions to allow accessory dwelling units in its single-family residential zones in addition to its current code provision of allowing accessory dwelling units for disabled, infirm, or elderly residents.

Farm Labor Housing.—Farm labor housing is available in all zoning districts that allow residential dwelling units, and, further, the County recognizes that RCW 70.114A provides additional opportunities for migrant and seasonal farm labor housing in Benton County.

Planned Developments. PD developers are offered flexibility in project design and site planning, which can allow for a higher quality development and improved affordability. PDs are generally characterized by flexible site requirements, which focus on overall project design rather than lot by lot design, efficiency in the provision of utilities, and common open space.

Multiple Detached Dwellings. Under the current BCC, the Planning Administrator may approve up to four detached dwellings on an individual lot provided the proposed use complies with all applicable Benton Franklin Health District, Department of Health and Social Services, and Ecology requirements, as well as the density requirements of the Comprehensive Plan. The multiple dwellings

provision allows for supervision of elderly or infirmed family members and other flexible living arrangements.

Temporary Dwellings. All residential and agricultural districts permit temporary dwellings. These types of housing are also approved with or without conditions by the Planning Administrator. They may be approved in cases of personal hardship and to suit the needs of the agricultural community on a temporary basis. Because such hardships or needs are personal and generally transitory, it is determined that the approval of temporary dwellings do not constitute a long-term land use commitment that would conflict with the County's Comprehensive Plan.

6.4.3 *Development Review Process*

In addition to land use policies, the County development review process will be periodically evaluated for efficiency and customer service improvement opportunities. Periodic reviews to improve efficiency and service can help reduce housing development costs and may also encourage developers to use the policy and regulatory features of the Comprehensive Plan which is designed to encourage affordable housing.

7 Transportation Element

7.1 Introduction

The Transportation element of the Comprehensive Plan describes the existing transportation network, LOS, planned improvements and financing, and intergovernmental coordination needs, as required under RCW 36.70A.070(6). Collectively, these items help functionally integrate the transportation network with the Land Use Map (see Appendix A: Map Folio, Figure 14 – Transportation – Existing Major Facilities Map).

Under current local farm and non-farm economic growth conditions, the trend to convert raw land for agriculture, residential, commercial, and industrial land uses will continue. These conversions engender new land uses which drive maintenance and expansion of road capacity for commuter, "farm to market," leisure, recreation, business, and other vehicle trips. Transportation related land use demands ultimately manifest themselves as capital projects in the County's Six-Year Road Program (Appendix H-1). Further information on the Washington State Highway System can be found in Appendix H-3 (Washington State Highway Inventory within Benton County) and Appendix H-4 (Washington State Highway Inventory and 2028 Forecast and Level of Service Analysis).

7.2 Existing Transportation System

Transportation systems in Benton County form a multi-modal network that provides for the movement of people and goods locally. The systems connect to regional, state, national, and international systems. Transportation systems which comprise the local network include road, rail, air, waterborne, and non-motorized (bicycle, pedestrian) transit.

Efficient transportation links to regional, state, national, and global markets are essential to the maintenance and growth of the County's economic base. Additionally, the ease with which people can move throughout the County is an important quality of life factor.

7.2.1 *Benton County Road System*

Within and around the Metropolitan Planning Area (Kennewick, Richland, West Richland), the road system within Benton County is well developed with interstates, state highways, collectors, and local access routes. Improvements have been made to several roads to improve access to some of the outlying rural areas, such as Finley and in areas in southern Benton County. Road access for rural and agricultural areas is good and continues to be improved.

Peak hour congestion problems do exist within the urban areas, notably on routes such as State Route 240 and George Washington Way used by Hanford Site commuters, and on Columbia Center Boulevard related to the Columbia Center Commercial Retail complex in Kennewick.

However, congestion problems are absent on County roads serving rural or agricultural areas. Generally, principal road concerns in rural areas are "all weather" access for agricultural product transport and more direct "farm to market" routes for agricultural products. Several road improvements have been made in recent years to improve the rural road system within the County.



Benton County uses the federal functional classification system for categorizing County roads, including rural and urban local access roads, minor and major collectors, and arterials.

Local access roads. Their primary function is to provide direct access to individual land holdings and uses, whether they be residential, industrial, or agricultural. Local roads generally lead to collectors that collect or merge traffic. Local roads do not have a designated LOS.

Minor Collectors. Their primary function is to conduct traffic "intra-county" from local roads to the major collectors and arterials. This function is often divided between movement and access to land uses. Minor collectors do not handle long thru-trips and are not continuous for any great length. Minor collectors do not have a designated LOS.

Major Collectors. Their primary function is to provide service to any county seat not on an arterial, or to towns or rural centers not served by an arterial, or to other traffic generators such as schools, shipping points, parks, or important agricultural areas. They collect large volumes of traffic from access roads and minor collectors and move it to major and minor arterials and between major activity centers and traffic generators. Major collectors serve the volumes of traffic within areas that

are not served by arterials. Major collectors have a designated LOS of “C” in the unincorporated portions of the County outside of UGAs.

Minor Arterials. These include state highways/routes and a few local routes, and their primary function is to serve as major carriers. They are woven through and fully integrated with local collectors and roads that reach beyond the local network to act as regional links and to bridge the distances between interstate corridors, to which they provide major connections for interstate travel.

Depending upon circumstances, access is provided in various configurations including at-grade intersections to local access roads and even private ingress and egress (with state granted encroachment permits). LOS are designated by WSDOT.

Major Arterials. These include the interstate and other highways with the primary function of moving large volumes of high-speed traffic for long distances. Access is generally provided only at spaced, grade-separated interchanges. Freeways are usually multi-lane, divided highways. They are the component of the road system which connects the regions within a state and across the states of the nation.

Figure 14 in Appendix A: Map Folio depicts the major collectors, arterials, and interstate highways in Benton County.

7.2.2 *Regional Rail System*

Freight rail service to the Tri-Cities and Benton County, as well as surrounding counties, is provided by Union Pacific and Burlington Northern & Santa Fe Railroads as shown on Appendix A: Map Folio, Figure 14 – Transportation – Existing Major Facilities Map.

The Tri-Cities area is one of the few areas between the Rockies and the Cascade Range to be linked by more than one carrier. Vast tonnages of export and import products associated with seaports on both the Pacific and Atlantic coasts are moved through the area. Major quantities of agricultural products from the Midwest and the Pacific Northwest are also transported to the Puget Sound and Portland area for transshipment to Pacific Rim countries.

Passenger Rail Service. Rail passenger service is at Amtrak facilities at Pasco in Franklin County. Connections from Pasco are Spokane and Portland.

Tri-City Railroad. A Union Pacific affiliated rail handling carrier serves the area in and around Richland, operating out of former U.S. Department of Energy facilities in north Richland (TCR 2017). Washington State outlined a set of rail service needs in 2013 (WSDOT) that are applicable to Benton County. These include:

- Need #1: Address constraints to ensure capacity meets future demand

- Need #2: Preserve existing rail capacity and infrastructure
- Need #3: Enhance the efficiency and reliability of existing services
- Need #4: Use the rail system to support economic development by providing access to people and industry
- Need #5: Preserve access to global markets by ensuring access to Washington’s ports

The County will continue to support plans, projects, and other activities that help meet these needs for the rail systems serving areas in the County.

7.2.3 *Air Transportation*

Benton County (and the Tri-Cities) is served by three public airports as shown in Table 7-1.

**Table 7-1
Public Airports Serving Benton County and the Tri-Cities**

Name of Airport	Location	Classification (FAA)	Owner
Tri-Cities Airport	City of Pasco	"Air Carrier" (regional)	Port of Pasco
Richland Airport	City of Richland	"Commuter Service"	Port of Benton
Prosser Airport	City of Prosser	"General Aviation"	Port of Benton

The **Tri-Cities Airport** in Pasco serves as the major air carrier airport for both Benton and Franklin counties and the surrounding region in both Oregon and Washington. The airport has recently expanded and upgraded its terminal facilities and the number of carriers serving the region. Continued steady growth is expected, consistent with population growth in the region.

The **Richland Airport** provides most of the general aviation activities in the County, including recreation flying, flight training, charter flights, air taxi service, business flying, glider operations, and skydiving activities. Activities at the **Prosser Airport** include recreational flying, flight training, air charter, and agricultural application operations.

7.2.4 *Water Transportation/The Columbia-Snake System*

The Columbia and Snake rivers provide an inland commercial waterway consisting of navigational locks in eight dams over a length of 465 miles, extending from Astoria, Oregon, at the mouth to Lewiston, Idaho. Within this system, a navigational channel of 14 feet deep (minimum) is maintained for bulk commodity transportation by ocean-going barge. This inland waterway, which links the Pacific Ocean with the state's agricultural "Inland Empire," forms Benton County's eastern and southern boundaries. In addition to the Port of Benton facilities at Richland, barges can be loaded and unloaded at facilities in Kennewick and Finley.

The principal commodity shipped out of Benton County by barge is grain products. Grain shipments in 2014 above McNary Dam totaled 4,189,000 tons and 4,644,565 tons between McNary and the Dalles dams (Godlewski 2016).

Agricultural products are shipped from privately owned docking facilities located at grain storage and industrial sites. Occasionally, special shipments of former nuclear components, such as submarine reactor hulls, destined for disposal at Hanford, are barged to the Port of Benton dock in Richland.

The demand for waterborne transport fluctuates with markets, commodity supply, and in relationship to the economics of transport by rail and overland truck. However, over the long term, because of its inherent efficiencies, waterborne transport will likely remain an integral part of the Inland Empire transportation system and will continue to play a vital and expanding role as global trade expands, balanced with associated river management strategies supporting salmon recovery efforts. Maintaining the existing water transportation system is an important priority for the County.

7.2.5 *Pipeline Transport*

7.2.5.1 Existing Conditions

Benton County has two interstate natural gas pipelines: Pacific Gas and Transmission Company and Northwest Pipeline Company. The Pacific Gas and Transmission Company line crosses the southeast corner of the County as it extends from Walla Walla County into Oregon. The Northwest Pipeline Corporation line runs up the Columbia River Gorge from Vancouver, Washington, to Plymouth. There it branches into two lines, one to the Yakima Valley and Wenatchee, the other serves the Tri-Cities and Spokane. The system distributes natural gas to Washington's seven utility companies. The maximum pipe size is 30 inches.

7.2.5.2 Future Considerations

Gas energy from this distribution system directly serves the Plymouth and south Finley areas Industrial land use designations. Substantial undeveloped industrial designated land exists within these two areas. The presence of large acreages with gas energy and road, rail, and barge transport opportunities provides economic opportunities that should not be blocked by piece-meal developments. Proactive advanced planning should occur in these areas to preserve their future industrial/commerce values.

7.2.6 *Public Transit Service, Park and Ride Lots, Bicycle Transport*

Ben Franklin Transit (BFT). The Tri-Cities urban area, Prosser, and Benton City are served by several fixed routes operated by Ben Franklin Transit (BFT). BFT also provides a rideshare/vanpool program that operates throughout the region. A map of the BFT Service Area known as the Public Transit

Benefit Area (BFTA) is included in Appendix A. BFT route headways are set and adjusted periodically based on ridership demand and market potential, using load factors, productivity, and development growth to inform the planning process. BFT distributes bus service so that the majority of all residents within the service area are within a 1/2 mile walk of bus service. DAR paratransit service operates on an eligibility basis throughout the entire PTBA, at a regular rate when the origin and destination are within 3/4 of a mile of the service boundary, and at a premium rate when the origin or destination is beyond 3/4 of a mile from the service boundary.

Benton County sits on the Board for BFT and participates in their planning process as well. BFT regularly prepared a Transit Development Plan (TDP) which identifies improvements and expansions to the transit service provided in the region. Because of the nature of providing efficient transit service within budgetary limitations, transit service to unincorporated areas of Benton County are somewhat limited. However, coordination of appropriate services such as bus stops, park and rides and other services occurs with each update of the TDP. The current TDP is adopted by reference in the Comprehensive Plan and can be found at this weblink: https://www.bft.org/assets/1/6/draft-2019-2024-transit-development-plan-for-public-comment_06-13-191.pdf

Park and Ride Lots. There are currently nine park and ride lots in Benton County which are owned by WSDOT, BFT, and the City of Kennewick. BFT buses serve six of the sites in the urban area.

7.2.7 *Non-Motorized Transport*

Bicycle paths have increased in the past several years, with a bike path that forms a loop around the urban areas of the Tri-Cities and a path north and west of Prosser. In addition, roads with lower traffic use in the County are often used by cyclists for recreational riding.

Benton County is an active participant in the regional transportation planning process that is coordinated by the Benton Franklin Council of Governments (BFCG). As members, the County participates regularly on both the Technical Advisory Committee and the Policy Board to address numerous transportation issues in the region. The BFCG has prepared the Regional Active Management Plan which discusses bicycle and pedestrian facilities. As members of BFCG this document and its associated strategies, are adopted and incorporated into the Benton County Comprehensive Plan by reference. This document can be found at the following weblink: <http://bfcog.us/wp-content/uploads/2017/03/FINAL-2016-Regional-Active-Transportation-Plan-3-28-16.pdf>. A map from this document of the Benton County Active Transportation System is included in Appendix A Map Portfolio.

7.2.8 *Transportation Demand Management Strategies*

As discussed above, Benton County is an active participant in the BFCG. The Regional Transportation Plan, *Transition 2040*, includes a chapter on Transportation Management and Operations that discusses Transportation Demand Management Strategies. TDM strategies should be pursued before roadway LOS approaches or drops below adopted standards included in the Comprehensive

Plan. As members of BFCG all of these documents, and associated TDM strategies, are adopted and incorporated into the Benton County Comprehensive Plan by reference. These documents can be found at the following weblink: <http://bfcog.us/transition2040/> <http://bfcog.us/transition2040/>.

7.3 Level of Service Analysis

Consistent with GMA, the County has adopted LOS as the standard of operating efficiency for the County-owned and maintained major collectors and arterials within the County transportation service system. Local roads and minor collectors do not have designated LOS. LOS for minor arterials are designated by WSDOT.

7.3.1 Benton County Level of Service

Benton County's designated LOS is "C" in rural areas and LOS "D" within Urban Growth Areas. When a roadway meets a LOS "C" standard, it means that the streams of traffic flow remain uninterrupted, even at peak hours, by congestion or delays related to traffic volume and road configuration.

County land uses are primarily rural and agricultural, and such uses typically generate new traffic demands gradually. An evaluation of LOS for all County major collectors and arterials was conducted by evaluating existing and future volume (through 2027) estimates.

On rural roads with relatively light traffic volumes where flow is uncomplicated by frequent entry points and signalized intersections, a simple comparison of existing traffic counts and projected traffic counts based upon assumed growth percentages by area in the County was applied to evaluate LOS. The LOS for each of the roads evaluated was determined for both existing and future volumes to be at a C level – efficient flow of traffic without delays. No new major increases in traffic generators from new localized sources were identified as part of this evaluation. Appendix H-2: Transportation Level of Service shows the current volumes of traffic over major collectors and the 10-year projected traffic volumes for each collector. The LOS for each of these roads has been determined to be acceptable, at a C level at least or higher.

7.3.1.1 Level of Service on State-owned Facilities

The LOS for regional highways, including state roadways, is set through a coordinated process through the Benton-Franklin Council of Government (BFCG), the County's regional transportation planning organization, along with state, regional, and local input. The LOS for highways of statewide significance is set by the State in consultation with local jurisdictions, with the State having final authority to establish LOS and associated state and federal expenditures on the system.

An analysis was performed to determine Level of Service on state owned facilities: The Washington State Highway Inventory Matrix shown in Appendix H-3, provides an inventory of state-owned facilities. Appendix H-4 provides details on the analysis of LOS for current conditions as well as for year 2028. All state highway segments will function with acceptable Levels of Service with all

segments anticipated to perform at LOS all, but two segments forecast to be LOS "A" or "B". Those two segments on SR 397 between Kennewick and Finley are forecast to be LOS "D" but are within the Urban Growth Area.

As mentioned in the Land Use and Housing Elements, much of the population growth within the unincorporated Benton County is anticipated to occur outside the city limits but within the Urban Growth Areas. The Level of Service analysis was conducted using the most recent traffic data available from WSDOT for the state highway system along with the BFCG regional traffic model. The regional model forecasts several different land uses throughout the region for the year 2040 to estimate future travel demand on functionally classified roadways. Benton County participates in the development of the model, including the preparation of population and employment forecasts for Transportation Analysis Zones supported by the modeling process. The land use assumptions of the model are included in the Appendix of the Regional Transportation Plan, are included here by reference, and found at this weblink: <http://bfcog.us/wp-content/uploads/2018/01/Appendix-Jan-8.pdf>. Maps representing the TAZ as well as the population and employment growth are included in Appendix H.4. For areas not covered by the regional model, a discussion was held with WSDOT and it was agreed that traffic forecasts for these areas would be fairly represented using 1% per year growth in current volumes.

7.3.2 *Future Considerations*

Improve the Utility of the Transportation Network. The utility and adaptability of an area's transportation network is one of the primary characteristics upon which the "quality of life" is based. By in large, the road transportation network within the County and the Tri-Cities is an excellent and efficient one, consisting of interstate highways, state routes, and local arterials, collectors, and local access routes; it has well-defined and institutionalized mechanisms for eliminating its deficiencies and maintaining its high level of performance.

However, the existing transportation network is almost singularly dedicated to the personal automobile. This is not a fault, but rather a limitation to the larger community's realization of other land uses, commercial enterprises, human activity, and socioeconomic diversity.

A truly multi-modal transportation system invites increased personal mobility (via pedestrian, bicycle, equestrian, and transit modes); it energizes existing and fosters the creation of new activity centers; it melds business, casual, tourism, and recreational activities into a richer and more resilient community fabric.

Policy needs - there should be bicycle, pedestrian, and equestrian trails which connect the major urban and rural activity centers of the County.

Action - the County should initiate a cooperative effort with adjacent jurisdictions, relevant state agencies, business, private interest groups, and citizens to pull together the various bikeway and trail plans from each jurisdiction, into an integrated trail plan.

This integrated trail plan should use open space corridors, public lands, special district rights-of-way, existing public roads, and new acquisitions, to connect urban and rural residential, business, governmental, visitor, and recreational activity centers and amenities via a network of non-motorized travel corridors. The integrated trail plan should integrate with existing transit and automobile system components.

There should be an adopted implementation program and construction schedules for integrated trail plan components.

Agreement should be sought from participating jurisdictions to annually fund, either jointly or unilaterally, depending upon the nature of the project component, the construction of the integrated trail plan. Where feasible, the funding should be targeted so that it integrates functionally with other parks and recreational facilities or trail construction projects in the County or in other jurisdictions.

7.4 Planned Improvements and Financing

7.4.1 County Six-year Road Program

The County Road Program (Appendix H) is the County's principal directive for "near term" capital expenditures to carry out the adopted Transportation element as it relates to the construction of new facilities and preservation of existing corridors. The Road Program is updated annually by the County Road Department with each update approved by the Board of Commissioners. The purpose of the Road Program is to correlate funding sources to needed improvements and identify projects for dedicated revenues. It enables long range decision-making, helps assure the continuity of Commissioner goals and objectives, and helps to identify the impacts in future years of decisions made currently. It also identifies existing and future revenues, revenue sources, maintenance and operating costs, expenditure categories, and improvements for the transportation system.

The Road Program and this Transportation element is coordinated with the transportation planning of other jurisdictions through the BFCG. The County Road Department and the BFCG cooperatively conduct traffic counts on the road network to record traffic volumes over time. The data from these recordings are factored into the annual update of the Six-year Road Program, which identifies capital projects to be carried out in the near term.

The "condition" of roadways is also monitored to assess their surface and bed condition and to indicate where the condition of a road is not sufficient to carry existing and projected volumes, as

well as the volumes that would occur at the designated LOS. These data are also factored into the Six-year Road Program.

Funding Sources – Projects included within the Road Program must have identified sources of funding. Under GMA, projects necessary to maintain designated LOS are a priority. A variety of local, state, and federal funding supports the Road Program, with a primary revenue source being the County Road Fund.



Bridge and powerlines in Benton County

7.4.2 Paths and Trails

In recent years, the County has placed increased emphasis on providing paths and trails as non-motorized travel routes for both commuting and recreation. There is growing citizen interest in bicycling, walking, running, and equestrian trails that connect activity centers.

Funding Sources – RCW 47.30 requires cities and counties to allocate one-half of one percent of the amount of funds received from the motor vehicle fund for trails and paths. In order to spend these funds on the construction of a trail or path, the trail or path must be included in a comprehensive trail plan adopted by the governing body. Additional planning and construction funds are available through various state and federal grants.

7.4.3 Concurrency - Pay As We Go

Under GMA, service capacity for a new project is supposed to be available "concurrent" with the approval of a new project, or when the project is occupied. This requirement for concurrency is intended to prevent existing residents from having to pay for new capital projects to serve new development. Concurrency is designed to prevent large deficits in capacity by adding capacity as growth occurs, instead of letting it build up.

Benton County reviews traffic volume information collected annually and incorporates this information into updates to the Six-year Road Program. This provides an ongoing assessment of the

traffic volume compared to capacity conditions on individual sections of road. In this way, planning and funding of capital projects necessary to meet projected demands can occur in advance, or "concurrently" with the demands. The Road Program is designed to make a variety of improvements to the road network during the planning period to address incremental growth and other needs, as described previously.

Additionally, the principal mechanism for the review and mitigation of new development impacts on designated LOS for local streets, roads, and state highways, is the County's Environmental Policy (SEPA Ordinance). Under BCC Chapter 6.35, those projects that are not "categorically exempt" from SEPA review will address traffic generation in the SEPA Checklist, wherein project related trip generation is identified. Under the ordinance, projects that are categorically exempt are generally de minimis relative to traffic generation.

7.5 Regional Transportation Plans

The BFCG is the lead agency for both the Tri-Cities Metropolitan Planning Organization and the Benton-Franklin Regional Transportation Planning Organization. As lead agency for the Regional Transportation Planning Organization, the BFCG reviews each local jurisdiction's Land Use and Transportation elements of their comprehensive plans to certify each plan is in conformity with the transportation provisions of the GMA and consistent with the regional transportation plan.

BFCG melds the Transportation elements of local government's comprehensive plans into an integrated and internally consistent Regional Transportation Plan for certification consistent with the State Transportation Plan and system requirements. BFCG provides a predictive Transportation Model to the County and other local jurisdictions that produces forecasted traffic demand/capacity analyses from which future transportation improvement planning and projects are identified for planning and funding. The Regional Transportation Plan, *Transition2040 2017-2040*, was adopted in May 2017 by the BFCG. *Transition2040* is a long-range, multi-modal planning document that identifies transportation needs of the Benton-Franklin County region through 2040 (BFCG 2017b). It provides a regional framework and guide for the investment of anticipated federal, state, and local funds based on identified needs, goals, and objectives.

The five primary goals of the plan are:

1. To provide for and improve the safety and security of transportation users and the transportation system through design, operations, maintenance improvements, and public information
2. To maintain, preserve, and prolong the life and utility of prior investments in transportation systems and services
3. To improve the predictable movement of and access to goods and people throughout the region and improve quality of life

4. To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy
5. To make transportation decisions that protect the environment, promote sustainable development, and coordinate regional/community stakeholders

Benton County considers these goals and the associated objectives along with other information in planning for transportation system improvements to the County road system and in lending support to regional projects and programs.

7.5.1 *Current and Future State Highway System Needs*

Transportation elements of GMA comprehensive plans must include an identification of current and forecast needs and a financial analysis of how an identified need might be addressed concerning the regional transportation system, including state highways.

Appendix H-4 lists current and forecast 2028 peak hour traffic volumes for the state highway system in Benton County. The County is not responsible for traffic effects on highway segments in cities, and the WSDOT sets levels of service on Highways of Statewide Significance. When segments in cities and on the Highways of Statewide Significance are removed from that list a total of 56 segments on ten state highways: SR 14, 22, 24, 82, 182, 221, 224, 225, 240 and 397 remain and for which analysis was reported.

A source for identification of current and forecast need on the state highway system is Transition2040, the 2017-2040 Metropolitan/Regional Transportation Plan adopted on May 2017 by the BFCG. Transition2040 is a long-range, multi-modal planning document which identifies the mobility needs of the region, comprising of both Benton and Franklin counties, through the year 2040. Chapter 5 of the Transition2040, Financial Analysis, includes programmed projects and available funds submitted by WSDOT for the period of 2017 through 2025 in Benton and Franklin counties.

The chapter identifies forecasted WSDOT cost for maintenance and operations and capital construction in Benton and Franklin counties. Maintenance and operations needs are forecast at about \$28,000,000 and capital improvement costs at about \$119,000,000. The Plan states revenues and expenditures balance out and there is no predicted new revenue. The only identified system capital improvements in the two-county area are those included in the Connecting Washington funding package.

Connecting Washington is a 16-year program, funded primarily by an 11.9-cent gas tax increase that was fully phased-in on July 1, 2016. Table 7-2 below shows the Connecting Washington projects listed in Transition2040 and state costs associated with each project.

Table 7-2
Connecting Washington Projects in Benton and Franklin Counties

Connecting Washington Account	State Funds
Connell Rail Interchange	\$10,000,000
I-82 West Richland – Red Mountain Interchange	\$27,000,000
US 395/Ridgeline Intersection	\$17,000,000
Duportail Bridge	\$38,000,000
US 95/Safety Corridor Improvements	\$15,000,000
Lewis Street Overpass	\$26,000,000

Source: 2017 WSDOT Project Delivery Plan; Additional WSDOT documentation

In July 2019, WSDOT released the 2019 Project Delivery Plan, a detailed county-level 10-year list of capital improvement and preservation (maintenance and operations) projects and costs for the years 2020 through 2030. Funding decisions at WSDOT are the responsibility of the Department, as are decisions on releasing information on funding sources. A background document companion to the project list discusses funding assumptions, stating the Delivery Plan aligns with legislative direction provided in the 2019-2021 Transportation Budget and is consistent with overall legislative investment expectations.

Noteworthy improvements listed in Benton County are the Connecting Washington projects which, except for the Red Mountain Interchange are urban in nature. Rural improvement projects include the Red Mountain Interchange, the intersection of SR 224/SR 225 in Benton City, railroad crossing improvements in the vicinity of the SR 397/Piert Road intersection and rumble strips on SR 22.

Significant preservation projects listed in the Project Delivery Plan include painting the SR 24/Columbia River Bridge at Vernita and painting the Interstate-82/Columbia River Bridge at Umatilla. Multiple paving projects on Interstate-82 in rural Benton County are also listed.

7.5.2 *2016 Regional Active Transportation Plan for Benton and Franklin Counties and Tri-Cities Urban Area*

The *2016 Regional Active Transportation Plan for Benton and Franklin Counties and Tri-Cities Urban Area* was approved by BFCG in 2016 and is incorporated by reference in *Transition2040*. This document provides a status of bicycle and pedestrian planning and implementation, includes a review of bicycle and pedestrian policies and practices, and discusses active transportation safety issues. The plan notes that attention to bicycling and walking issues in Benton and Franklin counties has significantly increased in volume and importance in the last decade, with interconnected pedestrian and bike systems becoming a more critical component of the regional transportation network. Strong public support exists for improved bicycling and walking conditions through

increased planning, funding, and implementation of shared use paths, sidewalks, and on-street facilities (BFCG 2016).

In addition to these regional plans the Benton County Comprehensive Plan includes goals, policies, and actions relevant to the development of bicycle and pedestrian facilities within the County in Chapter Two Goals and Policies and Chapter 8 Parks and Recreation. These goals and policies endorse the development of bicycle and pedestrian facilities and provide a public participation program for public involvement in the process. Chapter 8 Parks and Recreation also contains a map of existing and proposed trails.

8 Parks and Recreation Element

8.1 Introduction

This Parks and Recreation element, including parks and recreation goals and policies (see Section 2.9) and the County's Parks Plan (Appendix I) are the long-range policy and planning documents for Benton County parks and recreation facilities and properties and future opportunities. The Parks Plan included in Appendix I is incorporated by reference as a part of the County's Comprehensive Plan and will guide future decisions related to the County's parks system and parks facilities, with input from the Benton County Park Board. The Park Board advises the County Commissioners on matters of policy, programs, and projects for the development and operation of Benton County's park system.

This Plan Element applies to a 20-year planning horizon, with major review for possible revisions occurring every 8 years as part of the overall review of the Comprehensive Plan. Review of the Parks Plan (Appendix I) occurs every 6 years.



Two Rivers Park

8.1.1 *Park Planning, Management, and Maintenance*

Park maintenance is the responsibility of the County Parks Department. Park planning, capital facilities, and operations and maintenance are overseen by the Sustainable Development Manager,

who provides administrative support to the seven-member Benton County Park Board that advises the Benton County Board of Commissioners.

After coordination with appropriate County departments, consultation user groups, partnering organizations, and the public, the Park Board submits its planning and capital projects to the County Board of Commissioners for adoption. Park budgets are the responsibility of the Board of Commissioners.

8.1.2 *Washington State Requirements for Recreation Planning*

The Washington State Recreation and Conservation Office is the state agency that manages grant programs for outdoor recreation opportunities. The County's Parks Plan (2014) was prepared in accordance with the requirements specified in the GMA (RCW 36.70A). Additionally, the Parks Plan must be updated every 6 years to remain eligible for funds requested through the Washington State Recreation and Conservation Office.

8.2 Existing Conditions

8.2.1 *Inventory of County Park Facilities*

Benton County currently owns, or operates under lease, ten park facilities on 2,384 acres providing outdoor recreational opportunities and amenities such as lawn activities and picnicking, water and swimming, natural open space and habitat conservation, boat launches, a model airplane facility, a recreational vehicle campground, an equestrian camp, developed shooting facility, and a pioneer cemetery. Benton County subleases all or portions of two parks to non-profit entities (see Appendix A: Map Folio, Figure 15 – Parks and Recreation Map). The parks and recreation facilities are organized into the following:

- **Regional Parks** are intended for more diffuse and passive outdoor uses and serve a large region including rural county residents. These parks are meant to preserve large areas of natural open space and support types of recreation that require large areas or uncommon amenities, such as horse riding or miniature aircraft flying.
- **Natural Parks (Preserves) and Trails** are undeveloped areas mostly in their natural conditions that are managed for educational or recreational purposes. These trails preserve native plant and wildlife habitat and promote passive recreation, with established low-intensity use trails developed on many of these properties and future opportunities to promote trails between existing holdings.
- **Special Use** areas include sites that are either smaller and have focused uses or are managed for specific uses and may be subleased and managed by other organizations.

8.2.1.1 Regional Parks

The County owns or operates two regional parks.

Horn Rapids Park is located 6 miles north of Benton City and along over 5 miles of the north shore of the Yakima River, with about 565 acres of transitional river-to-upland shrub-steppe habitat nestled among other adjoining public lands. The park has an improved campground with full recreational vehicle hookups, showers, restrooms, a horse camp, a model airplane facility, a boat launch, and several miles of multi-use trails. Horn Rapids Park is also used as an outdoor educational center by area schools and scouting organizations. Via trails that continue off-site, visitors can travel up-and-down the Yakima River and hike or ride up onto the Rattlesnake Slope. The park may also become a key location for a future potential recreational trail through the Hanford Site.

Two Rivers Park lies on property leased from the U.S. Army Corps of Engineers about 2 miles east of Kennewick near the community of Finley. The developed portion of the park is centered around two large sheltered lagoons on the west end, while the east end of the park features the 100-acre Rockwell Woods Natural Area consisting of beaver ponds, riparian woodlands, and marshes and bisected by a



Two Rivers Park Playground

nearly mile-long nature trail. Two Rivers is home to the last downstream developed boat launch in the Tri-Cities area and is used heavily throughout the year. First developed in the late 1960s after the McNary Dam Project levees were built, the west end of the park features a playground, extensive picnicking areas, and a disc golf course that was added in 2009.

8.2.1.2 Natural Parks and Trails

The County owns three preserves, with its most recent acquisition of Candy Mountain Preserve in June 2016.

Badger Mountain Centennial Preserve is located on the upper ridges and slopes of Badger Mountain in the south Richland area. Shrub-steppe vegetation, primitive trails, expansive views of the Columbia River Basin, and steep slopes characterize the property. The preserve was purchased in partnership with public, private, and state funds with the goals to preserve views, protect upland habitat, and provide for hiking, biking, and horse riding opportunities. Per Resolution 05-27 that created the preserve in 2005, the acreage is also “banked” by Benton County for possible use as mitigation for shrub-steppe disturbances that may occur elsewhere in the County. Additionally, there is opportunity to potentially connect the Badger Mountain Preserve with the Candy Mountain Preserve.

Candy Mountain Preserve is located north of Badger Mountain in the Goose Gap and upper slopes of the Candy Mountain. Added to the park system in 2016, the preserve includes a 1.7-mile trail to the summit with a parking area at the trailhead.



Candy Mountain Preserve

Wallula Gap Preserve is located in eastern Benton County above Lake Wallula and across from the 'Twin Sisters' feature in Walla Walla County. The park unit consists of three disconnected parcels that are approximately 110 acres that have remained unchanged since the properties were deeded over to the County in 1984 by the U.S. Department of the Interior. The parcels are remote and generally inaccessible, with one parcel consisting primarily of sheer basalt cliffs. Current legal access to the property is by water only, although the railroad corridor limits that access. In order to access the property by land, an easement would have to cross about 5 miles of privately owned property. The properties are managed as part of the National Natural Landmarks program of the National Park Service, and Benton County provides regular reports to the Park Service on the status and condition of the site.

8.2.1.3 Special Use Parks

The County owns or operates five special use parks, including two vista parks and a shooting facility.

Horse Heaven Cemetery was developed south of Benton City in the Horse Heaven Hills as a private pioneer cemetery beginning in 1893. The last burials were in the 1940s, and Benton County took possession of the parcel through a property foreclosure in 1954. Recent improvements include a perimeter driveway and fence, an interpretive sign, and some sitting benches.

Horse Heaven Vista, first developed in 1964, is located southeast of Prosser along State Route 221 on the crest of the Horse Heaven Hills overlooking the Lower Yakima Valley. The site offers a sheltered view point, paved parking area, and restrooms.

Vista Park is located in the Tri-City Heights neighborhood of northwest Kennewick. It is a small neighborhood park with picnic tables and swing sets that was originally developed by the local Vista Junior Women’s Club in 1970. County staff maintains the park including general repair of play equipment, irrigation, and general care of the park. It is the only small park owned by the County in an urban environment.

Rattlesnake Mountain Shooting Facility (RMSF) is located approximately 6 miles north of Benton City adjacent to Horn Road. RMSF is the County’s largest park unit at about 740 acres. A portion of the property is owned by the State of Washington and used through an agreement with the Washington Department of Fish and Wildlife. The remainder of the property was formerly leased from the Bureau of Land Management but was purchased by the County in 2010. Benton County subleases the entire property to its concessionaire—the Tri-Cities Shooting Association (TCSA)—who has overseen maintenance, administration, and operations of the facility since the late 1980s. TCSA is responsible for all capital improvements, though the County occasionally assists financially with certain projects at the advisement of the Park Board. The RMSF is large enough to contain several discrete ranges designed and managed for different shooting disciplines. The facility is open to the public several days per week.

Hover Park is located approximately 10 miles southeast of Kennewick along the Columbia River and downstream of Two Rivers Park on property leased from the U.S. Army Corps of Engineers. Presently undeveloped, this park has good potential for future use. It has a pleasant beach area in a protected lagoon. The Burlington Northern Railroad bisects the property. The area also has historical significance. The first wagon train to the area, the Longmire Wagon Train, crossed the Columbia River on rafts near the park in 1853. The first major ferry crossing from Wallula was in the vicinity, and the park is in proximity of the original Hover town site, established in 1898.

8.2.2 *Other Park and Recreation Opportunities*

In addition to County provided parks facilities, there are other facilities provided by state and local agencies such as Crow Butte and Plymouth arks. Also, some park facilities are provided by the cities, but serve regionally, such as the Columbia Park located in Kennewick and Howard Amon Park in Richland.

Crow Butte Park is owned by the U.S. Army Corps of Engineers and operated by the Port of Benton. The park is located 15 miles west of Paterson on the historic Lewis & Clark Trail. It is also adjacent to the McNary National Wildlife Refuge, a wintering grounds for hundreds of thousands of migratory

waterfowl each year. The 275-acre park provides camping areas, recreational vehicle sites, a marina, boat ramps, swimming, fishing, a bath house, and hiking trails, among other amenities.

Plymouth Park is located 1.2 miles west of the Umatilla Bridge on a near-shore in the Columbia River near the Town of Plymouth. The park is owned and operated by the U.S. Army Corp of Engineers. The campground offers 32 sites with electric hookups. Amenities include flush and pit toilets, showers, drinking water, a dump station, and playground. The day use area has a swim beach, boat ramp, flush toilets, vault toilet, and courtesy dock (Recreation.gov 2017).

Other Public Lands Many of the County's rural residents recreate in natural areas suitable for hunting, fishing, and hiking. In the more remote planning areas of the County, such as Paterson, Plymouth, and Finley, recreational opportunities are often provided by the federally owned waterfront lands that lie along the hydroelectric pools behind each dam.

8.2.3 *Greenway Connections*

Improved public recreational trails are lacking throughout most of the rural County; however, the Tapteal Greenway currently offers connections as discussed below.

Tapteal Greenway is a 35-mile corridor along and including the Yakima River extending from Kiona Bend at Benton City to the mouth of the river at Bateman Island in Richland. Recognizing that the Yakima River provides an entirely different kind of recreational experience than the Columbia, the Greenway corridor features a mixture of ecological landscape types and a relatively high percentage of public lands and public river access locations (Table 8-1).

Table 8-1
Public Rivershore Land Ownership

Agency	Acres	Linear miles
U.S. Army Corps of Engineers	292	13.5
Richland	236	2
West Richland	N/A	1
Washington Department of Fish and Wildlife	10	25
Benton County	784	5.1
Total	1,322	21.85

The Tapteal Greenway Plan seeks to link these ownerships with a system of river and shoreline trails and paths over the 30-mile stretch of river and to use or improve each public property according to an overall plan. The plan aims to connect public spaces in Benton City, West Richland, and Richland via a network of trails and parklands anchored by the Yakima River.

The Tapteal Greenway Plan was developed jointly during the mid-1990s through a planning effort involving local, state, and federal interests; and implementation of the Tapteal Greenway Plan is the primary mission of the Tapteal Greenway Association².

8.3 Current Trends

8.3.1 *Recreational Demand*

Demand for public recreational opportunities and facilities is increasing and will continue to increase as both the urban and rural populations of the County grow and as the growth in overall state population results in "out of area" visitors looking for recreational opportunities (Washington population growth is 100,000 per year).

Based on Washington State Recreation and Conservation Office's 2013 State Comprehensive Outdoor Recreation Plan, walking and hiking continue to be popular activities in Washington. Outdoor team and individual sports (which includes fitness activities like jogging), nature activities, and picnicking and barbequing are also popular in the State.

8.3.2 *Levels of Service and Park Management*

The County's Parks Plan has adopted LOS standards that are meant to be used as guidelines, not absolutes. The LOS identified in Table 8-2 is based on the four park types described above:

Table 8-2
Level of Service Standards

Park Type	Service Area	Level of Service
Regional	15-mile radius and within an hour drive	5 acres per 1,000 population
Natural	20-mile service radius	5 acres per 1,000 population
Trails	N/A	1.37 miles per 1,000 populations
Special Use	N/A	Case by Case

In addition to LOS designations, Benton County organizes its ten parks by "level of management," resulting in a two-tiered system.

- **Tier One** parks have daily operational oversight, either by an assigned County park ranger or by concessionaires or volunteers.
- **Tier Two** parks are smaller, have significantly less use overall, and do not have daily active management.

² Tapteal Greenway Association mission available from www.tapteal.org.

Table 8-3 provides specific information on ownership/lease, size, type, and level of management at each park. See Appendix A: Map Folio, Figure 15 – Parks and Recreation Map.

**Table 8-3
Types and Level of Management at Benton County Parks**

Sites	Owner	Acres	Level of Management
Regional			
Horn Rapids Parks	County	564.5	Tier 1
Two Rivers Park	U.S. Army Corps of Engineers	159.0	Tier 1
Natural			
Badger Mountain Preserve	County	627.1	Tier 1
Candy Mountain Preserve	County	186.0	Tier 1
Wallula Gap Preserve	County	110.0	Tier 2
Special			
Horse Heaven Cemetery	County	2.0	Tier 2
Horse Heaven Vista	County	6.3	Tier 2
Hover Park	U.S. Army Corps of Engineers	175.0	Tier 2
Rattlesnake Mountain Shooting Facility	State and County	740.0	Tier 1
Vista Park	County	0.3	Tier 2

As mentioned, the LOS standards for parks are meant to be used as guidelines, not absolutes. The Parks Plan develops standards to fit with the current population and feedback during the workshop sessions and questionnaire.

According to the Parks Plan, the current park system is not meeting the LOS standards by 374 acres and will need a total of 900 more acres of land to meet those standards 20 years from now (Table 8-4). This acreage analysis does not include special use parks, trail connections, or community desire for preservation of open space lands in certain sensitive and view corridors. Local citizen requests and interest for improvements, whether they be federal- or County-owned lands, generally focus on improved vehicular and boat access. However, "natural area" recreation is only one type of opportunity. There is also an unmet demand for recreational opportunities that rely upon a higher level of facilities and improvements in more developed parks.

**Table 8-4
County Parks Level of Service Requirement by 2035**

Park Type	2014 Level of Service (Population 183,400)	2035 Level of Service (Population 236,007)
Regional	917 acres	1,180 acres
Natural	917 acres +	1,180 acres +
Special Use	Case by Case	Case by Case
Total Parkland to meet Level of Service	1,834 acres	2,360 acres
Trails	253 miles	323 miles

Source: Benton County (2014)

8.4 Future Considerations

8.4.1 *Key Opportunities to Meet Demands*

Capital expenditures to enhance recreational use of County parklands are developed as part of the Capital Facilities element, Chapter 9, and should be prioritized to focus first on locations that have current facilities deficits and/or on park lands where the provision of additional recreational facilities can leverage other recreation related economic and visitor benefits beyond the park itself. Major improvements considered in the Parks Plan are mentioned below.

Horn Rapids Park. Within the unincorporated area, the land and water resources of the park are the central element of the Tapteal Greenway Plan. Development of Horn Rapids Park according to its Master Plan would provide a regional destination point, as well as an activity center for the Greenway. The County 2017-2022 CIP identifies three projects for Horn Rapids Park: 1) addition of a new shop; 2) paving of the driveway to the office/maintenance area; and 3) development of a new master plan for the park.

Two Rivers Park. Improvements are needed for the boat launch, dock, nature trail (boardwalk addition), restroom facilities, and signage. The County CIP considers two major capital projects for Two Rivers Park: 1) remodel of the boat launch, including replacement of all floating docks; and 2) complete replacement of the main restroom at the central part of the park.

Badger Mountain Centennial Preserve Improvements. Anticipated improvements include trail connections to adjacent properties both to the east (Badger Butte/Little Badger Mountain) and to the west (Candy and Red mountains). The 2017-2022 CIP includes improvement to the Summit Road that connects Dallas Road to the summit area along the west ridgeline. This road follows a utility easement and is used numerous times daily by vendors who need access to the summit, as well as

for park business. Improvements would include choosing a formal route, grading in some areas, removal of large cobbles, and placement of suitable coarse gravel.



Badger Mountain Preserve

Improvements to Other Parks and Facilities. In the special use parks, trail and access improvements and maintenance are important. These improvements are done as funding becomes available and are based the County's Parks Plan and as prioritized by the Park Board. Some facilities are operated by County partners who are responsible for maintenance and improvements (e.g., RMSF is operated by the TCSA).

Other improvements as indicated in the CIP are listed below:

- Horse Heaven Vista will have a large entrance sign and placement of two standard alert signs (one each direction) along the highway.
- Hover Park will add a dedicated, purpose-built parking area at the end of Hover Road, lined with barriers, and able to easily accommodate multiple horse trailers. The gravel lot will measure approximately 200 feet by 50 feet and will include appropriate vehicle access controls.

9 Capital Facilities Element

9.1 Introduction and Purpose

The Capital Facilities element identifies necessary and planned capital improvements, improvement schedules, and funding resources that functionally integrate capital facilities into the Comprehensive Plan. For the purposes of this element, capital facilities are defined as the infrastructure the County is responsible for constructing, operating, and maintaining, and which enable the County to provide public services to County residents. This element provides the framework for the County's CIP (Appendix J) and adopts a 6-year CIP list of proposed projects and financing plan.

This element is one of six mandatory planning elements that GMA requires in County's Comprehensive Plan (RCW 36.70A.070 (3)) and must identify specific facilities, include a realistic financing plan, and adjust the plan if funding is inadequate. WAC 365-196-415 provides requirements and recommendations for this element.

9.1.1 *Relationship between Land Use and Capital Facilities*

There is a direct relationship between the Capital Facilities and Land Use elements of the Comprehensive Plan. The Land Use element determines where and at what density population and employment growth will be located. The Capital Facilities element identifies the thresholds of growth, when new and expanded public facilities will be needed, and indicates the County's priority system for constructing the identified public facilities. Although some public facilities are provided by other government agencies or private entities, the County must demonstrate these services are available.

Identified improvements to public facilities that are owned or operated by Benton County shall also be included in the County's annual budget. Any identified public facility improvements that are not owned or operated by the County should be included in the annual budgets and CIPs of the entities which provide those public facilities. State, local government, and district plans that are affected by proposed public facility improvements will be considered prior to inclusion of the improvements in the CIP. This includes considering a city's comprehensive plan when evaluating proposed improvements that affect that city's UGA.

9.1.2 *Capital Facilities Element Update Process*

Any updates to the Capital Facilities element of the Comprehensive Plan will be considered concurrently with other proposed amendments that are included in the annual Comprehensive Plan amendment review. Benton County's CIP, adopted by reference, is a dynamic document that will be updated annually to reflect new cost information, funding information, project list changes, and existing facility updates. The annual updates to the CIP will be done prior to the annual budget process so that CIP projects can be included in the annual budget.

9.2 Capital Project Selection and Level of Service Standards

9.2.1 *Level of Service*

The County and public facility providers will use established LOS for identifying capital improvements. For the County, two sets of LOS standards have been established: 1) C standard for County roads, as discussed in Section 7.3.1, and 2) Park standards as described in Section 8.3.2. These LOS standards, along with other factors considered for other County facilities are considered in identifying planned capital improvements. Other factors considered in planning these improvements include identifying projects that:

- Address existing deficiencies
- Preserve existing capacity
- Provide for new development
- Enhance quality of life
- Meet other County needs not related to growth

The County will evaluate whether the County road and park system standards and other identified capital needs are being met when updates to the Comprehensive Plan are performed according to the deadlines in RCW 36.70A.130(1), when UGAs are reviewed according to RCW 36.70A.130(3), and when major changes are made to this element. If these standards are not being met and public facilities are inadequate, the County will consider one or more of the following strategies:

- Reduce public facility demand
- Reduce LOS standards
- Increase revenue
- Reduce the cost of the needed public facilities
- Reallocate or redirect population and employment growth to make better use of existing facilities
- Phase growth or adjust the timing of development, if the lack of public facilities is a short-term issue

The County will also evaluate if proposed development activities would reduce the LOS of public facilities below the adopted standards. If a proposal is expected to impact a transportation facility and cause it to fall below the LOS standard, or if additional parks and recreation facilities are needed to meet the applicable standards, then preliminary development approval would also need to include additional improvements or strategies made concurrent with the development that maintain these standards. All other types of public facilities do not have the specific concurrency requirement that transportation facilities have, but they do require the provision of adequate public facilities as a condition of project approval.

Public facility improvements for maintenance or other needs and not targeted to maintain LOS may include:

- Facility repairs
- Remodels
- Renovation
- Replacement of obsolete or worn out structures
- Improvements that do not reduce financing for other improvements needed to achieve or maintain LOS standards
- Improvements that do not contradict, limit, or substantially change the goals and policies of any element of this Comprehensive Plan

Public facility improvements may also provide capacity in excess of what would be required to achieve or maintain LOS standards (i.e., the minimum capacity of a capital project is larger than the capacity required to provide the LOS). Excess capacity is beneficial if it results in economies of scale making it less expensive than a comparable amount of capacity acquired at a later date. However, these projects may be given a lower priority than projects needed to maintain the LOS standard.

9.2.2 *Analysis of Future Development*

The County will estimate the type and amount of public facilities needed to accommodate future growth by evaluating previously issued development permits and determining future growth patterns. Future development will be required to pay its fair share of the capital improvements needed to address the impact of such development and the portion of the cost of the replacement of obsolete or worn out facilities. The different methods of payment allowed for these capital improvements include:

- Voluntary contributions for the benefit of any public facility
- SEPA mitigation payments
- Dedications of land
- Provision of public facilities

Future development will not be required to pay fees for needed public facilities to reduce or eliminate existing deficiencies. The growth forecasts, to be used for planning purposes and the specific growth targets for each UGA, are developed using the Benton County population projections established by the OFM, as summarized in Section 3.7.

9.2.3 *Siting Public Facilities*

There are types of public facilities that cannot be located in rural areas of the County, but must remain in cities or UGAs. These include new municipal urban public facilities for residential development such as sewage collection and treatment, urban street infrastructure, and storm water

collection facilities. The County does not currently provide, nor does it plan to provide in the foreseeable future, sewer, water, or utility services. Accordingly, its capital facilities do not include processing or production plants and the distribution/collection systems typically associated with such services. The only exception to this general condition occurs when a private water or disposal system fails, whereupon if placed in "receivership" under state law the County must assume responsibility as an interim condition.

The County may coordinate planning and development of public facilities in UGAs with municipalities and public facility providers by entering into interlocal/joint planning agreements, contracts, memorandums of understanding, or joint ordinances. Capital facilities and utilities may be constructed and operated by outside public service providers on rural properties if they are within the boundaries of a MPR, or a Rural Community Center pursuant to County Comprehensive Plan policies and development regulations. Electric and natural gas transmission and distribution facilities may be sited throughout Benton County both inside and outside of municipal boundaries, UGAs, MPRs, and Rural Community Centers. The County will coordinate with the BFCG and/or municipalities within the County when siting regional and community facilities. This coordination may include developing an inventory of essential facilities, determining a fair share allocation of essential facilities, conducting public involvement strategies, and assuring protections for the environment, public health, and public safety.

9.2.4 Improvements to Public Facilities Identified in Other Plans

Various plans-prepared by other public agencies have been reviewed by the County as part of this periodic Comprehensive Plan review and update that identify potential. A summary of capital facilities forecasted for the next six years, along with the six-year financing plan, for these non-County operated facilities is provided in Table 9-1. This non-County operated facilities forecast and financing plan, combined with the County CIP for County-owned facilities comprise the County's forecast of future needed public facilities and financing plan for the next 6 years, to support implementation of the Comprehensive Plan. The County will review and revise this forecast and financing plan, as applicable, during plan implementation.

Regarding firefighting capabilities, in addition to the capital improvements identified in Table 9-1, the County has conducted an analysis of the adequacy of the firefighting capabilities for those districts that serve on the borders of the UGA and within rural areas of the County. This includes reviewing and incorporating into this plan by reference the Benton County 2018 Community Wildfire Protection Plan, and also interviews conducted with fire district personnel. A discussion of the findings from this analysis is provided in narrative following Table 9-1.

**Table 9-1
Six-Year Capital Improvements Plan for Non-County Operated Facilities**

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
<i>School Districts</i>	Kennewick School District	Aging facilities need updates. Capacity to meet school enrollment is adequate for several years.	Planned new or remodeled schools	Bond	<ul style="list-style-type: none"> • Kennewick High School, 2019-2021, \$105,000,000 • Amistad Elementary (Phase 2), 2019-2020, \$22,000,000 • Kamiakin High School Addition, 2020-2021, \$5,000,000 • Southridge High School Addition 2020-2021, \$5,000,000 • New Elementary #18, 2021-2024, \$26,000,000 • Ridge View Elementary, 2023-2024, \$24,000,000
				Potential bond, planned for future	<ul style="list-style-type: none"> • Hawthorne Elementary, 2025-2026, \$28,000,000 • Washington Elementary, 2025-2026, \$28,000,000 • New Elementary #19, 2025-2026, \$29,000,000 • Horse Heaven Hills Middle School • 2025-2027, \$40,000,000
	Richland School District	Aging facilities need updates. Capacity to meet school enrollment is adequate for several years.	<p>Planned new or remodeled schools and make other facility improvements.</p> <p>The school district is starting a facilities long term plan in the</p>	Bond approved February 2017 for \$99 million bond. Also applying for about \$42 million in state assistance	<ul style="list-style-type: none"> • Replacement of Badger Mountain Elementary 2020-2021, \$21 million • Replacement of Tapteal Elementary, 2019-2020, \$19.9 million

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
			<p>next year to see how they are doing in growth areas and depending on findings, there is potential for seeking additional bond funding before 2025.</p>	<p>dollars to augment local contributions</p>	<ul style="list-style-type: none"> • New elementary school #11 on Belmont Boulevard in West Richland, opened 2019, \$17.5 million • Construction of a new elementary school in south Richland, 2021-2022, estimated \$22 million • Renovation of the Richland High School auditorium, will be completed in 2021, \$9 million • Home side improvements and installation of field turf at Fran Rish Stadium, 2022-2023, \$10 million • Improved athletic fields at Hanford High School, 2021-2022, \$6 million • Construction of a new Teaching, Learning & Administrative Center, Sept. 2020 opening, \$11.6 million • Renovation of the 1982 wing of the old Jefferson Elementary into the Early Learning Center • Classroom additions, almost done with Phase 2, and working on getting a

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
					grant to do another phase in summer 2020 <ul style="list-style-type: none"> Working on other purchases of land throughout district
	Prosser School District	Aging facilities need updates. Capacity to meet school enrollment is adequate for several years.	Planned remodel of schools, new high school and district offices	Bond	<ul style="list-style-type: none"> New Prosser High School, \$66,804,783; June 2021 Remodel of 3 elementary schools, \$39,339,497, fall 2022 Remodel old Prosser High School into District Offices, \$905,000, summer 2023
	Ki-Be School District	Aging facilities need updates. Capacity to meet school enrollment is adequate for several years.	Planned remodel of schools in future and parking lot repaving	Received a state grant and will run a bond in 2025 for remodeling the elementary and middle school in 2026.	<ul style="list-style-type: none"> Repaving the high school parking lot with the state grant received sometime from now through 2020. No other planned projects until after 2026.
	Finley School District	Aging facilities need updates.	Have done remodeling the last few years.	Bond of \$10 million in 2017	<ul style="list-style-type: none"> Renovate the Career & Technical Education (CTE) Buildings and Greenhouses, \$2,140,746 Upgrade athletic facilities, including ADA compliant grandstands, weight room equipment, and locker room modernization, \$2,556,000 Install security cameras and new key system at all

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
					<p>three school buildings to improve student and staff safety, \$405,000</p> <ul style="list-style-type: none"> • Complete additional projects including new carpeting at the elementary school, new roofing at the middle school, a new water distribution plant at the middle and high school, new lighting in all schools, \$4,015,000 • Tax & Contingencies \$883,254
	Paterson School District	Existing facilities adequate	None	Not applicable	Not applicable
	Grandview School District	Existing facilities within Benton County adequate	None	Not applicable	Not applicable
<i>Water and Sewer</i>	Cities and Towns in Benton County	Existing system plans with facilities inventories and capacities adopted by reference	6-year water system and sewer plans	Rates and development charges, grants and loans. Existing revenues and planned rate increases will support system improvements, with growth paying for growth	See system plans, incorporated by reference, for these details

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
<i>Power</i>	Benton County PUD	Existing system plans with facility inventories adopted by reference	Transportation improvements	Rates and development charges. Existing financial plans support system improvements, with growth paying for growth	See system plans, incorporated by reference, for these details
<i>Transportation and Stormwater</i>	Benton County, and Cities and Towns	Existing inventories adopted by reference	6-year transportation (including stormwater) improvement plans adopted by reference	County road fund, city revenue sources, grant and loans	See 6-year plans, incorporated by reference, for details
<i>Fire Districts (see also associated narrative that follows for additional information on adequacy of firefighting capabilities)</i>	District 1	Fire station needs remodeled in Badger Canyon, and outdated equipment needs replaced	Fire station remodel in Badger Canyon, new fire truck ambulance purchase, replacement of specialized apparatus, replacement of wildland and structure engines and evaluating current administrative facility	Planned bond on ballot in November 2019 for \$3 million Received FEMA grant for additional personnel	<ul style="list-style-type: none"> • Fire station remodel in Badger Canyon, new fire truck (\$700,000), • Ambulance purchase (\$240,000) • Replacement of specialized apparatus (\$200,000) • Replacement of wildland and structure engines (\$800,000 - \$1 million) <p>Most to be done or started in 2020, if bond passes, with replacement of engines over the next 6 years. Hiring 4 - 5 additional personnel in 2020</p>
	District 2	Main fire station is over 22 years old and needs	Currently adding additional apparatus bay and lean to	Current budget and WA State Local	Apparatus bay and lean to onto existing maintenance

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
		remodeled but do not have the funding due to low tax revenue.	onto existing maintenance facility out of existing budget. Purchase of two new ambulances. In need of hiring one or more additional Firefighter/Paramedics but	program on a 3-year term. Repayment funds will come from ambulance revenue. No funding yet identified for additional staff.	facility out of existing budget (\$45,000), Purchase of two new ambulances (\$320,000) Both currently in process
	West Benton Fire Rescue	Trucks and equipment aging, and need replaced	Replacement of 3 structure engines, 3 wildland apparatus, 2 tactical tenders, 1 new dozer and 2 command vehicles (more than \$3 million) 1 career staff added in 2020, 6 resident firefighter positions added by end of 2020, 2 career staff adds in 2022 or 2023.	Private and government financing Funds from ballot measure and in 2021 will apply for grant to get these positions two years sooner	Over \$3 million over the next six years
	District 4	Capacity improvements needed	Would like to build a new fire station (#430) on Keene Road in West Richland and purchase at least two new fire engines Will need to add personnel due to growth in the area over time	Bond	New station (costs under development) and fire engines by end of 2020 (\$500,000 for each fire engine)
	District 5	No information available	No information available	No information available	No information available

Capital Facility Type	Providers (Location)	Existing Condition	Planned Improvements (Capacity)	Funding Source(s)	Estimated Cost/Date
	District 6	Currently looking at replacing an ambulance and one Type 1 engine.	<p>Would like to build two new fire stations and a training ground over the next 10 years in the Plymouth area and at far west end off of Sonova Road. Just starting to talk about the building of new fire stations but no timeframe yet.</p> <p>Looking at increasing paid staff from 4 to 7 within next couple years. If station in Plymouth is built, they will have 1 career staff and 6 resident volunteers.</p>	<p>USDA grant or loan program</p> <p>Current budget and savings</p> <p>EMS levy to fund 3 positions</p>	No set timeframe yet

Notes:

ADA – American Disabilities Act

EMS – Emergency Management System

FEMA – Federal Emergency Management Agency

USDA – U.S. Department of Agriculture

Analysis of the Adequacy of Firefighting Capabilities in UGAs and Rural Benton County

Fire District 1

- **Capacity needs or deficiencies for addressing fire risks** - County code for property owners for defensible space and Firewise mitigations would be helpful as the district continues to go into the outreaching interface areas. Continue to deal with fireworks fires annually with lack of enforcement for regulations.
- **Wildland Urban Interface and Residential Growth** - The District has no current hazard fuel reduction program within the annual operating budget due to budget priorities. An increase in available grant funds would be beneficial to target some of the high hazard fuels reductions areas identified in the Benton County Community Wildfire Protection Plan (2018).
- **Fire Breaks:** Changes in the Conservation Reserve Program rules that would allow fire breaks down to the dirt without a negative financial impact to the property owner would be beneficial.
- **Rural Water Supplies:** Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression.
- **Residential and Agricultural Burning:** Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agricultural burns, tumbleweeds, barbeques and woodstoves. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.
- **Communications** - Although the SECOMM system has gone through a major equipment update and fine tuning, the service area due to topography continues to have areas where radio communications between Dispatch and Fire/EMS responders is not always reliable or serviceable in some areas.
- **Other:** As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain more firefighters and EMS personnel.

Fire District 2:

- **Capacity needs or deficiencies for addressing fire risks** - Current and largest risk is not having enough personnel. Small tax base with relatively low-income taxpayers does not produce much in tax revenue. Calls for service have increased dramatically over the years and continue to see a growth in large fires threatening our community.

- **Wildland Urban Interface Defensible Space** - Our Fire District for the last two years has instituted and developed a Firewise program to district residents. This has proven to offer some reduction to our wildfire-related calls; however, it does not get much participation to the high majority of our community despite public campaigns and strong community push. Plan to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for staff time is a need to enhance this program; completing structural assessments every two years has proven difficult.
- **Fire Breaks** - The costs associated with maintaining established fire breaks costs our small fire department thousands of dollars annually and cannot be sustained without some type of financial assistance.
- **Rural Water Supplies** - Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. Very few areas exist for drawing water in the rural areas due to remoteness and lack of developed water systems.
- **Residential and Agricultural Burning** - All open burning within the County is subject to guidelines concerning, size, time, location and permit requirements from Benton County Clean Air Authority (BCCAA). Moreover, the BCCAA and the local cities have banned back yard burning except for blown in tumbleweeds. This is a two-fold problem. The first is that getting rid of some of the fuel loads reduces the fire potential to sustain burning. The other issue is that burning incorrectly causes numerous out of control fires.
- **Communications** - The SECOMM system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.
- **Other** - As with most volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain good firefighters and emergency response personnel.

West Benton Fire Rescue:

- **Capacity needs or deficiencies for addressing fire risks** - Always need more volunteer firefighter staffing. The career positions will not take away anything from the current volunteer force and are only being hired to supplement the response of volunteers. Need to maintain a robust roster of fulltime and volunteer staff to combat large incidents in the jurisdiction.
- **Personnel** - Response model relies heavily on Volunteer Firefighters, which make up 85 percent of response force. Due to a societal decline in volunteerism and the ever-increasing requirements to be a firefighter, it is difficult to increase the depth of the Volunteer ranks. In

addition, it is difficult to expand specialized services such as technical rescue and hazardous materials response when so heavily reliant on volunteer firefighters.

- **Rural Property Development** - Response area continues to see development of new single-family residential structures into the Intermix/Interface areas comprised of heavy grass/brush fuels. Many times, fires in the interface/intermix require an extensive amount of resources to provide structure protection as well as being actively engaged in fire suppression. This can cause a large drain on regionally available apparatus.
- **Communications** - With the recent addition of Franklin County and Walla Walla Fire District 5 to dispatching, radio traffic has been extremely busy. Though local repeaters and tactical frequencies used to command individual incidents are plentiful, both the availability of simulcast frequencies to communicate with the dispatcher and dispatch center capability to listen to and respond to multiple frequencies is lacking.
- **Vegetation Management** - Invasive plant species make managing a 5-acre rural residential parcel difficult. Many rural property owners fail to control invasive species which leads to insufficient or non-existent defensible space. The lack of a State Vegetation Management Program has allowed the cheatgrass and invasive species to grow right up the end edge of Interstate and State Highway road surfaces. Vegetation that has grown up to the edge of a roadway becomes critically dry in the summer months and is easily ignited by discarded smoking material, mechanical problems or traffic accidents and creates traffic hazards due to fire, smoke and responding fire apparatus in the roadway. It is a challenge to protect thousands of acres of lands that abut under-maintained roadways; spend a considerable amount of time dealing with wildland fires started from roadside ignitions.
- **Burn Permits** - Burning is limited within the City Limits of Prosser, and surrounding UGA to tumbleweeds. In the rural areas of the response area, Benton County Clean Air Agency sets burning regulations and sets the daily burn decision regarding outdoor burning. Many times, people are unaware about the daily burn decision or the presence of a burn ban.
- **Fire Inspections** - Prosser is home to a vibrant downtown core comprised of 100-year-old multistory buildings that house restaurants, assembly occupancies, mercantiles, offices and residential units. Fire and Life Safety Inspections came under the authority and responsibility of the City of Prosser in 2015. Proper fire and life safety inspections must be maintained to minimize the occurrences of devastating downtown fire losses.
- **Other** - Relying primarily on Volunteer Firefighters, it can be a struggle to mount an effective initial response force to incidents, and a large/complex natural cover fire or structure always requires the assistance from neighboring agencies to mitigate. To augment daytime

response in during the summer months, seasonal employees help with station tasks and incident responses.

The two fire stations are not staffed around the clock, and calls that occur at night or over the weekend are staffed with personnel responding from home. Continue to identify ways to decrease “turnout time” to incidents, which includes identifying funding to house responders at the headquarters fires station.

Identifying and installing fuel breaks with heavy equipment. Continue to build private landowner relationships and identify areas where fuel breaks will have a positive impact.

Fire District 4:

- **Wildland Urban Interface Defensible Space** - Funding for additional staff time is needed by the fire District to enhance the Firewise program and complete structural assessments every two years and deliver educational materials to potential participants as the population continues to grow and change. There are additional areas that about City of West Richland property (specifically the sewer treatment plant) as well as many private homes that have never had a significant fire resulting in large buildup of fuel. The area also has extremely limited access and does pose a significant hazard if wildfire does gain access to the area. Efforts are needed to coordinate fuel reduction or defensible space around this area. This will be challenging, as there are wetlands in the area as well as being adjacent to the Yakima River and associated fish habitat.
- **Rural Water Supplies** - Continue to seek and develop water supply systems in rural areas for assistance in fire suppression. The District has worked with some of the vineyards to establish water supply points at irrigation ponds, but these are not always a reliable source of water depending upon the time of year and required water use for the vineyards. The District has also worked with the Barker Ranch to identify water supply access points to be developed as the ranch makes improvements to the irrigation and wetland management program. These water supplies allow access to water supplies closer to the threat of wildland fires as identified by landowners, users and the District.
- **Communications** - SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast microwave system. The system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.
- **Residential and Agricultural Burning** - The District continues to see a high number of controlled burning activities that are not allowed under the current Benton County Clean Air Authority rules. The types of allowed burning depend upon the urban growth boundaries as well as agricultural use of lands. Many of the residents who have lived in the area for longer,

still conduct burning of natural vegetation even though they are inside the urban growth boundary, where this type of burning is not allowed. Efforts to educate the public on the rules continues to be a challenge based on the perceived rural nature of large portions of the District.

- **Cooperative Agreements** - The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas.
- **Other** - As with most combination career/volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain reliable personnel to assist with the variety of responses and other administrative activities that must occur to be a progressive and successful organization.

Fire District 5:

- **Residential Growth** – The District has not seen significant population growth. However, there is growth in the suburban areas on the outer district lines, with housing development expanding into the district.
- **Communications** – The District is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire, ems and police, as well as one fire agency from a third county, Walla Walla County. SECOMM has a VHF simulcast and microwave system utilized by fire agencies, and law enforcement agencies operate on an 800MHz radio system. The VHF radio system is outdated and will require a major overhaul within the next 2 to 5 years as parts are no longer available. The merger to one dispatch center was recent. With the addition of Franklin County Fire agencies, Pasco Fire Department and Walla Walla Fire District #5, radio traffic has increased. It seems that the number of dispatch staff needs to be increased to handle the increased radio traffic and calls.
- **Other** – The District is reliant on neighboring fire agencies for structure fires as well as for ALS services. There is a need to have access to Water Tenders and Type 1 Engines.
- **Cooperative Agreements** – The District has mutual aid agreements with neighboring fire agencies. The District will implement or renew needed mutual aid agreements.

Fire District 6:

- **Capacity needs or deficiencies for addressing fire risks** - Need more volunteers and paid staff. Have six seasoned responders that are near retirement age. However, these few

volunteers respond to a majority of the calls for service. These precious few members are the “backbone” of our organization and are vital to our continued operation. New volunteers have recently joined our ranks but will require several years of training to be able to take on medical and fire responsibilities.

The District does not enjoy a large donating population. Fundraisers in our economically depressed area do not produce the donations needed to purchase equipment. The tax base and a small amount of ambulance income are all that is available to operate on.

The remaining budget priorities are placed on personal protective equipment, maintenance, ensuring apparatus are safe, training firefighters and training EMT’s. Several fire stations owned by the District are thirty-five years old and require major repair.

- **Other** - Need weed abatement along the state, federal highways and railways. The overgrowth and close proximity of combustible vegetation causes multiple large fires every year. With our rural location, this can be detrimental to the person in need if we do not have the responders to help. Additional training would also be helpful. Due to rural location it is difficult to get outreach training for firefighter 1, wildland firefighter and Emergency Medical Technician.

9.2.5 *Prioritizing Public Facility Projects*

Prioritization of projects and programs can be difficult, so the County has established the following general guidance in prioritizing public facility projects, from highest to lowest priorities they include:

1. Repair existing public facilities to achieve or maintain LOS
2. Construct new or expanded public facilities to achieve or maintain LOS
3. Repair existing public facilities or construct new public facilities to eliminate hazards
4. Construct new or expanded public facilities to achieve or maintain LOS and other needs as forecasted during the next 6-years
5. Repair existing public facilities or construct new public facilities to reduce the operating cost of providing a public service or facility
6. Construct new facilities to provide excess capacity that will be needed beyond the next 6 years
7. All other facilities the County is obligated to complete that do not meet the criteria above

9.2.6 *Other Considerations*

County strategic goals, key objectives, and financial policies provide the broad parameters for development of the annual CIP. Additional considerations include the following:

- Does a project support the County Commissioners’ strategic goals?
- Does a project qualify as a capital project as defined in the County Budget Policy and have an expected useful life of at least 5 years?

- Does a project satisfactorily address all federal, state, and county legal and financial requirements?
- Does a project support the County's favorable investment ratings and financial integrity?
- Does a project support the County's goal of ensuring all geographic areas of the County have comparable quality in the types of services that are defined in the CIP?
- Does a project prevent the deterioration of the County's existing infrastructure and respond to and anticipate future growth in the County?
- Does a project encourage and sustain quality economic development?
- Is a project responsive to the needs of residents and businesses within the constraints of reasonable taxes and fees?
- Does a project leverage funds provided by other units of government where appropriate?

Master plans also help determine which projects should be included in the CIP, along with associated timeframes. Economic forecasts also inform the capital planning process.

9.3 Financing

9.3.1 *Funding Sources for Public Facility Projects*

Identifying funding sources for public facility projects is critical to the success of the Benton County's CIP. It requires coordination among County Departments and a thorough understanding of the fiscal capacity of the County to finance these facilities. Public facility projects are often very expensive, requiring multi-year commitments of financial resources. It is important to understand that a CIP does not represent a financial commitment or guarantee that the projects will be implemented. County approval does not automatically authorize funding. It does approve the program in concept and provides validity to the planning process. In an attempt to stretch money as far as possible, many different funding sources are considered. The financing of some projects relies on outside grant resources. If grants are not received, the projects may be delayed, removed, or financed with dedicated revenues, general revenues, excess surplus funds, or bond financing.

The County is guided by the following three principles in selecting a funding source for public facility improvements:

Equity. Whenever appropriate, the beneficiaries of a project or service will pay for it. For example, if a project is a general function of government that benefits the entire community, such as a public safety facility, the project will be paid for with general fund revenues or financed with general obligation bonds. If, however, the project benefits specific users, such as a road improvement district, then the revenues will be derived through user fees or charges, targeted taxes, and assessments.

Effectiveness In selecting a source or sources for financing projects, the County will select one or more that effectively funds the total cost of the project. For example, funding a capital project, or the

debt service on a project, with a user fee that does not provide sufficient funds to pay for the project is not an effective means of funding the project.

Efficiency If grants or current revenues are not available to fund a project, the County will select a financing technique that provides for the lowest total cost consistent with acceptable risk factors and principals of equity and effectiveness. These methods currently consist of fixed-rate general obligation or revenue bonds issued by the County, special funding programs funded by state or federal agencies, or special pool financing. When public facility improvements are located both in a City and UGA, the County and City can jointly sponsor the formation of Local Improvement Districts, Road Improvement Districts, and other benefit areas for the construction or reconstruction of infrastructure to a common standard.

9.3.2 *When Funding is Unavailable*

When funding is unavailable to meet existing needs and support plan implementation or as County priorities evolve, the capital facilities plan will be revised at the next annual amendment in one or more of the following ways, as applicable:

- Reduce the LOS for one or more public facilities
- Increase the use of other sources of revenue
- Decrease the cost, and therefore the quality of some types of public facilities while retaining the quantity of the facilities that is inherent in the standard for LOS
- Decrease the demand for and subsequent use of public facilities
- Reassess the land use element

9.3.3 *Maintenance Financing*

The County intends to set aside sufficient revenue to finance ongoing maintenance needs and to provide periodic replacement and renewal of public facilities. This is necessary to keep public facilities in good repair and to maximize their useful life. The County should not provide a public facility or accept the provision of a public facility by others, if the County or other provider is unable to pay for the subsequent annual operating and maintenance costs of the facility.

9.4 Existing Facility Inventory

Benton County maintains a comprehensive capital facilities inventory to meet insurance requirements that is incorporated by reference into the Comprehensive Plan and available upon request. The County existing public facility inventory is updated annually. General capital facilities owned and maintained by the County include:

- County administrative office support including auditor, treasurer, assessor, prosecuting attorney, planning and building, coroner, facilities and recreation, and road
- Construction and maintenance of rural and "farm to market" roads

- Law and justice, including the operation and administration of the courts, jail, and sheriff's functions
- Juvenile justice facilities including detention
- Regional parks and recreational facilities
- Bi-county regional health and human services
- Drainage improvement districts for low lying areas along river mainstems
- Waste management
- Regional fairground facilities

9.5 Capital Improvement Plan

The CIP is a 6-year list of projects updated at least biannually and used by the County to identify, maintain, and pay for current and future infrastructure needs for services provided by the County. The County prepares a comprehensive capital projects list that correlates funding sources to needed improvements and identifies project funding. The CIP is reviewed and updated in conjunction with the County budget process. Each update to the County's CIP is adopted by reference into the Comprehensive Plan.

Because the CIP is a working document regularly amended, it is not included in its entirety as a part of the Comprehensive Plan but is incorporated by reference.

9.6 Siting of Essential Public Facilities (RCW 36.70A.200)

The GMA requires that the comprehensive plans of each county and city include a process for identifying and siting essential public facilities. Essential public facilities include those facilities that are typically difficult to site, such as airports, state education facilities, state or regional transportation facilities, state and local correctional facilities, solid waste handling facilities, and inpatient facilities including substance abuse facilities, mental health facilities, group homes and secure community transition facilities. The OFM maintains a regional list of such facilities that are required to be built within the next 6 years. Because of their nature, these facilities may have large land parcel requirements and unique siting needs with regard to public services and transportation or produce noise and raise complex public health and safety concerns. These requirements and impacts would be imposed upon those living and working in the surrounding area of such facilities. Benton County shall provide land use zones that are compatible and development regulations that are consistent with the statutory requirements applicable to these facilities. The County uses a review process that allows citizen, city, and state agency input when such facilities are proposed. The siting process is summarized in Table 9-2: Essential Public Facilities Siting Matrix.

Airports and heliports operated for the benefit of the public must be appropriately planned to assure that adjacent land uses are compatible. The Benton County Zoning Ordinance shall provide

development regulations that protect life, property, and prevent the establishment of airspace obstructions and other hazards which interfere with safe airport operations.

**Table 9-2
Essential Public Facilities Siting Matrix**

Use: Essential Statewide Facility	Zone	SEPA	Public Utilities		Reviewing Board		Responsible Jurisdiction (local/ federal/ state)	Benton County Permits	Special Siting Criteria
			Water	Sewer	PC/ BOCC	BOA ¹			
Airport ²	RL 5, GMA-AG, LI, HI	Yes	X	X	A/H Overlay	X	RTPO/FAA/WSDOT/ Ecology	BC-Building	Transportation access public services
State Education	UGAR, RL 5, GMA-AG	Yes	X	X		X	Ecology/DOH	BC-Building	Transportation access public services
State & Regional Transportation	All Zones	Yes				X	Ecology/WSDOT/RTPO	BC-Building Structures only	Public services structures only
State Correctional	HI, GMA-AG	Yes	X	X		X	Ecology/DOH	BC-Building	Transportation access public services
Solid Waste Handling	LI, HI, GMA-AG	Yes	X			X	Ecology	BC-Building	Transportation access public services
In-patient Health ³	UGAR, RL 5	DOS ⁴	X	X		X	Ecology/DOH/DSHS	BC-Building	Transportation access public services
Secure Community Transition ⁵	HI	DOS	X	X		X	Ecology/DOH/DSHS	BC-Building	SCTF's land and cell access, not in close proximity to risk potential activities
Others as listed by OFM ⁶	TBD ⁷	DOS	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Notes:

Source: 2006 Benton County Comprehensive Plan, Appendix 4

1. Conditional Use Permit
2. Airport/Heliports are subject to the provisions of 11A.86
3. Substance abuse, mental health, and group homes
4. Depending on size of facility
5. SCTFs as required by RCW 36.70A.200 & RCW 71.09 (civilly committed sex offender housing)
6. Facilities listed by the OFM required or likely to be built within the next 6 years (RCW36.70A.200)
7. To be determined by Benton County Planning Department as projects are identified

A/H: Airport/Heliports
 BC: Benton County
 BOA: Board of Adjustment
 BOCC: Board of County Commissioners
 DOH: Department of Health
 DOS: Determination of Significance
 DSHS: Department of Social and Health Services
 Ecology: Department of Ecology
 FAA: Federal Aviation Administration
 GMA-AG: Growth Management Act Agriculture
 HI: Heavy Industrial

LI: Light Industrial
 OFM: Office of Financial Management
 PC: Planning Commission
 RCW: Revised Code of Washington
 RL: Rural Lands
 RTPO: Regional Transportation Planning Organization
 SCTF: Secure Community Transition Facility
 SEPA: State Environmental Policy Act
 TBD: To be determined
 UGAR: Urban Growth Area Residential
 WSDOT: Department of Transportation

10 Utilities Element

10.1 Introduction and Purpose

Utilities include the supply, treatment, and distribution, as appropriate, of domestic and irrigation water, sewage, storm water, natural gas, electricity, telephone, cable television, microwave transmissions, and streets. Such utilities consist of both the service activity along with the physical facilities necessary for the utilities to be supplied. Utilities are supplied by a combination of general purpose local governments as well as private and community based organizations.

The primary regulatory agency for most utilities in Washington State is the Washington Utilities and Transportation Commission (WUTC). The WUTC ensures that safe and reliable service is provided to customers at reasonable rates. The WUTC regulates the rates and charges, services, facilities, and practices of most of Washington's investor-owned gas, electric and telecommunication utilities. As defined by the WUTC, some utilities are considered a critical service, namely electricity and standard telephone, and must be provided "upon demand." In order to fulfill public service obligations, these utility providers must plan to extend or add to their facilities when needed. On the other hand, natural gas is not considered a necessity, but rather a utility of convenience. All utilities regulated by the WUTC are prohibited from passing the cost of new construction onto the existing rate base. Federal agencies also play a role in regulating some of these utilities. For example, the Federal Communications Commission regulates telecommunications. In addition, the Federal Energy Regulatory Commission, an independent commission with the U.S. Department of Energy, sets rates and charges for the transportation and sale of natural gas, the transportation of oil by pipeline, the transmission and sale of electricity, and the licensing of hydroelectric power projects. Local government, too, has a role in regulation for certain utilities, such as franchise agreements. However, the effort behind meeting GMA requirements is not primarily regulatory; rather, it is to promote coordination and cooperation between jurisdictions and utility providers.

The GMA has given local jurisdictions the obligation and requirement to plan for utilities including identification of utility corridors. The intent of this element is to support utility providers in meeting their public service obligations to provide service on demand to existing and future customers. It is also the intent to minimize negative impacts resulting from the provision of services on the residents, infrastructure, and environment of the County. The County's responsibilities for utilities ranges from regulating their land use, to permitting their activities in public rights-of-way.

Virtually all land uses require one or more of the utilities discussed in this Chapter. Local land use decisions drive the need for new or expanded utility facilities. In other words, utilities follow growth. Expansion of the utility systems is a function of the demand for reliable service that people, their land uses, and activities place on the systems.

Existing and updated maps of utilities in Benton County are maintained by the County GIS to meet the requirements of the Utilities element as outlined in state law. In addition, Capital Facilities Plans of utility providers available in Benton County are hereby adopted by reference to meet the requirements of identifying proposed facilities. See Appendix A: Map Folio, Figure 16 – Public Utility and Rural Electric Association Service Areas.

Information on other special service providers such as fire, port, and school districts, is included in this chapter.

10.2 Electricity

10.2.1 Bonneville Power Administration

The Bonneville Power Administration (BPA) is an agency of the U.S. Department of Energy. It wholesales electric power produced at 29 federal dams located in the Columbia-Snake River Basin, as well as one non-federal nuclear plant. BPA does not own or operate any federal dams; however, it does sell the power produced by these dams as well as power produced by Energy Northwest-operated nuclear power plant located just north of Richland. The U.S. Army Corps of Engineers owns and operates Bonneville Dam, and Grand Coulee Dam is owned and operated by the U.S. Bureau of Reclamation. Between them, these two agencies run all of the dams whose power is sold by BPA.

Electricity is purchased from the BPA and supplied to areas in Benton County via two local public utilities: the Benton County Public Utility District (Benton PUD) and Benton Rural Electric Association (Benton REA).

10.2.2 Benton County Public Utility District

The Benton PUD was established by vote of the residents and began electric distribution operations in October 1946. The Benton PUD service area is entirely within Benton County and includes the cities of Kennewick, Benton City, Prosser, and portions of West Richland. Benton PUD serves Benton County except for the City of Richland, the U.S. Department of Energy's operations on the Hanford Reservation, and those rural areas of the County that are served by Benton REA. It maintains offices in Kennewick and Prosser.

10.2.3 Benton Rural Electric Association

Incorporated in 1937, Benton REA is a consumer owned rural cooperative, which serves portions of Benton, Lewis, and Yakima counties. Benton REA's 1,300 square mile territory extends from the Columbia River at Paterson, north to the Hanford Reservation, and west to White Pass in the Cascade Mountains.

Benton REA serves the rural areas of the Benton County and some urban areas. While Benton REA was originally set up to serve the rural customers of Benton and Yakima counties, the cooperative is becoming more of an urban player as the cities expand into rural areas. Benton REA also serves the community of West Richland and many parts of the UGA around Richland, Benton City, Prosser, and parts of the Hanford Reservation.

10.3 Wind Energy

Deregulation of the electric industry and subsequent energy supply issues have emphasized the need for new and diverse energy sources in the BPA's service area. Wind is a renewable resource that provides an environmentally friendly (or green) source of energy and allows BPA to diversify its energy sources. Several "wind farms" have located in the County on privately owned agricultural land pursuant to leases between landowners and the project developer. Large turbines are strategically placed along the major ridges to capture wind and generate power which is fed back to BPA facilities through substations.



Wind turbine in wheat fields

10.4 Natural Gas

10.4.1 Williams Northwest

Williams Northwest Pipeline operates and maintains its natural gas pipeline that runs through Benton County near Plymouth. Virtually all natural gas is now transported through pipelines.

“Gathering” lines collect and carry the natural gas from wells to transmission lines or plants for processing. A series of compressor stations propel the fuel long distances overland through major transmission pipelines to local distribution and service lines or storage facilities. A network of small-diameter distribution mains and service lines transport the gas to end-users. Related facilities include, but are not limited to cathodic protection stations, test posts, mile markers, meter stations, and valves.

Future pipeline safety concerns are related to the adverse impact and encroachment of development near transmission lines. With more people living and working near transmission lines, the severity of pipeline failures from all causes are likely to increase.

10.4.2 *Cascade Natural Gas*

Cascade Natural Gas Corporation builds, operates, and maintains natural gas facilities serving Benton County. Cascade Natural Gas is an investor owned utility serving customers in 16 counties in Washington State. The Pacific Northwest receives its natural gas from the Southwest United States, and from neighboring Canada. Natural gas is supplied to the entire region via two interstate pipeline systems. The Northwest Pipeline Corporation owns and operates the network that supplies natural gas to Benton County. Natural gas is stored in a facility in Plymouth.

10.5 Telecommunications

The Telecommunications Act of 1996 enacted into law the first comprehensive rewrite of the Communications Act of 1934. The act establishes national guidelines for enabling equitable competition in all telecommunication markets, including the local telephone market, and identifies respective roles of the Federal Communications Commission and the states to accomplish the transition. Several telephone companies supply local, long distance, and cellular service in Benton County.

10.6 Water and Sewer Systems

Benton County does not currently own, operate, or maintain a water or sewage treatment facility with the exception of occasional temporary responsibility for water systems under “receivership” per RCW 70.119A. Sources of water and sewer disposal for housing units are shown in Table 10-1.

Table 10-1
Sources of Water and Sewer Disposal

Source	How Served
Water	Public/Private System
	Private Well/Other
Sewer Disposal	Public System

	Septic Tank/Private
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10.6.1 Existing Conditions

A public supply is generally defined as any system, excluding systems serving only one single-family residence that provides piped water for human consumption. Washington State Department of Health keeps an inventory of water systems in the County that includes a classification of systems according to type of system and number of customers served. The criteria used in establishing the classifications are described in Table 10-2.

**Table 10-2
Washington State Department of Health Water System Criteria**

Class	Water System Criteria
Group A	15+systems/ or serves 25+ people for over 60 days a year
Group B	System with 4+ service connections but <15, serving <25 people a day for over 60 days a year.

Washington State Department of Health defines a “community” water system as a public water system that serves a permanent or seasonal population (e.g., subdivisions, mobile home parks), and a “non-community” water system as a public water system that serves a transitory population (e.g., restaurant, motel). Benton County has Group A water systems, including both non-transient and transient (e.g., campgrounds) and Group B water systems.

The source of water supply is ground water for all these systems with the exception of the Cities of Kennewick and Richland, which in addition to ground water receive water from the Columbia River. Information for each city’s water system, the population served, and the average daily amount of water used, can be found in each entities’ comprehensive plan.

Most rural residents rely on on-site septic tanks and drain fields for their wastewater system needs. While adequately designed and installed on-site septic systems can be appropriate for rural level development, maintenance of such systems varies from excellent to none at all. Poorly maintained septic systems are a source of ground and surface water pollution and have been identified both at the state and local level as significant contributors to high nitrate levels in soil and coliform bacteria in surface water. All on-site systems in the County are permitted and regulated by the Benton-Franklin Health District.

10.6.2 Current Trends

Living in rural areas has become a lifestyle preference in today’s society. The influx of people moving into newly-developed areas of Benton County means more individual or community wells that depend on groundwater and an increased demand on the groundwater supply.

Under state law, all new public water systems must be owned or operated by an SMA. This ensures that the new system has sufficient management and the financial resources to provide safe and reliable service to the system users.

If a SMA is not available to receive ownership/or operation of the system and Washington State Department of Health determines that the new system has met sufficient management and financial resource criteria to provide safe and reliable service, then the new system may be conditionally approved. The conditions may include future inclusion into a SMA, or findings that the system meets the Washington State Department of Health criteria for management, and include an ongoing review of its operational history and status.

Currently the City of Richland and an entity named Water System Management operate SMAs in Benton County. If a system loses its owner/operator due to non-compliance, the system goes into "receivership." During receivership actions, Washington State Department of Health meets with water systems owners and users to discuss restructuring options. If no other SMA or person is willing to be named as a receiver, the court appoints the County as receiver. At present the County is in receivership of one such water system, with the City of Richland SMA operating the system.

State regulations include criteria for sewage treatment systems located in gravelly or coarse sand soils such as minimum land area requirements, or special engineered systems (i.e., mound, sand line trench systems). There are several areas in the County where these soils exist. The Benton-Franklin Health District oversees the placement and permitting of on-site sewer systems. Systems over 3,500 gallons per day are permitted through Ecology.

10.6.3 *Future Considerations*

On-site water and waste systems for multiple users may be a desirable alternative to the single user systems and the extension of municipal systems. The option to cluster development in Rural Community Centers opens the opportunities for the use of such systems.

In the rural communities of Whitstran, Paterson, Plymouth, and Finley, there is a desire among residents for public water systems, which are perceived to be more affordable than individual wells. If such systems were to become a reality, the logical next step could be public waste disposal systems.

A water resource management program to conserve and maintain the County's groundwater supply will be necessary to provide a long term dependable supply sufficient to sustain the future needs for potable water and water for agricultural purposes, as discussed further in Section 4.5.

10.7 Solid Waste

10.7.1 Existing Conditions

The *2013 Benton County Comprehensive Solid Waste Management and Moderate Risk Waste Management Plan* (2013 Plan; Appendix K) provides background and guidance for a long-term approach to solid waste and moderate risk waste management in the region. This 2013 Plan comprises the combined comprehensive solid waste management plan and Local Hazardous Waste/Moderate Risk Waste Plan for the incorporated and unincorporated areas of Benton County.

The purpose of the 2013 Plan is to serve as a roadmap to managing the comprehensive solid waste and moderate risk waste management systems in Benton County. The 2013 Plan was developed as a joint effort of Benton County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland. It is intended to provide citizens and decision makers in Benton County with a guide to implement, monitor, and evaluate future activities in solid waste for a 20-year period. The recommendations for the 2013 Plan not only guide local decision makers, but substantiate the need for local funds and state grants to underwrite solid waste and moderate risk waste projects.

10.8 Special Service Providers

10.8.1 School Districts

The County is divided into seven school districts. All districts are located entirely within the County, with the exception of the Grandview District, which is principally located in Yakima County, but includes approximately 6 square miles of Benton County (stretching 3 miles north and south of Highway 12 at the Yakima County line).

All school districts offer kindergarten through twelfth grade education except the Paterson School District, which contracts sixth through twelfth grades (middle and high school levels) with the Prosser School District.

10.8.2 Higher Learning

Increasingly, education is the key to individual economic success. Frequently, this means a college degree. For counties, a well-educated population is also an ingredient in economic success.

Columbia Basin College, located at Pasco in adjacent Franklin County, is the primary college in the area; they also have a branch campus in Richland. Columbia Basin College is a two-year community college offering a wide range of academic, vocational, and night school programs.

Washington State University (Pullman) has a branch campus located in Richland, offering both graduate and masters education programs. This campus continues to grow in both facilities and

programs offered, and Washington State University degree programs are often integrated with Columbia Basin College programs.

10.8.3 *Library Districts*

The Mid-Columbia Library includes both Benton and Franklin counties and is directed by a board of seven members appointed jointly by the Benton and Franklin County Commissioners. The district's main library is located in Kennewick, while branch libraries are located in towns in both counties. The rural areas are served by a bookmobile that maintains a scheduled route throughout the district. The City of Richland has its own city library.

10.8.4 *Fire Districts*

The five incorporated communities and portions of the remaining unincorporated area of Benton County are served by a mixture of municipal and rural fire departments. Richland and Kennewick municipal fire departments are manned by full-time firemen. Prosser, Benton City, and West Richland operate with full and part-time positions along with volunteer staff. The rural districts are principally manned by volunteer personnel. A mutual aid cooperative-agreement exists between Richland, Kennewick, Pasco, Benton City, Prosser, and the rural districts.

Long-range fire protection needs will also require increases in equipment and manpower to maintain an effective level of protection. With increased urbanization of the County, increased full-time employment due to increased LOS required by residents as opposed to volunteer service can be expected to occur in some of the County's fire protection organizations.

An additional factor is the integration of fire protection needs with long-range water needs. The source, storage capacity, and distribution systems of water systems, as well as fire hydrant placement in urban density developments, must be adequate to provide sufficient volume and pressure for firefighting needs.

10.8.5 *Hospital Districts*

General hospitals are located in Richland, Kennewick, and Prosser providing County residents with inpatient care. The Kennewick and Prosser hospitals are each operated by a public entity in the form of a hospital district directed by elected board members, while the Richland hospital is privately owned and operated. Benton County is also served by a variety of public and private medical clinics providing treatment for most medical concerns.

10.8.6 *Benton-Franklin District Health*

This regional health agency is responsible for a wide variety of health-related programs in Benton and Franklin counties. Some examples of its activities are in the environmental health division: solid

waste, permitting community wells (2 to 4 hookups), approval of on-site sewage disposal systems, and restaurant inspections. The public health division serves the public with immunizations, tuberculosis and sexually transmitted disease clinics, and registration of birth and death certificates.

10.8.7 *Benton Conservation District*

Benton Conservation District is a non-regulatory organization established to provide landowners with technical and financial assistance and dedicated to the wise stewardship of soil, water, air, fish, and wildlife in Benton County. Benton Conservation District is funded by grants and a special assessment authorized by Benton County Commissioners.

10.8.8 *Mosquito Control District*

The Benton County Mosquito Control District is established to eradicate mosquitoes, particularly the mosquito *Culex tarsalis*, which is a carrier of sleeping sickness. The district is administered by a manager, who is directed by a 12-member board appointed by the Commissioners of Benton and Yakima counties, and mayors from the respective city councils of the cities who are within the district (Kennewick, Benton City, Prosser, Richland, West Richland, Mabton, and Grandview). There are three board members representing the unincorporated area of Benton County. The district encompasses 354 square miles within the Yakima and Columbia river drainages, exclusive of the Horse Heaven and Rattlesnake hills, and the Hanford Reservation.

10.8.9 *Benton Clean Air Authority*

The Benton Clean Air Authority carries out the requirements of the Washington State Clean Air Act, RCW 70.94, within the boundaries of Benton County. The agency functions as a single county authority to control the emissions of air contaminants from all sources within the County. The agency is charged with implementing and overseeing agricultural and backyard burn programs; air quality monitoring; asbestos removal notifications and inspections; industrial and commercial air permitting; and enforcement of federal, state, and local air quality regulations.

10.8.10 *Irrigation Districts and Private Irrigation Systems*

Agricultural production that takes place across the midsection of the County, from the Yakima County line to the Finley area, is made possible by the Yakima Project developed by the U.S. Bureau of Reclamation, and by several large water rights on the Columbia River. The Yakima Project was developed primarily for the purpose of providing irrigation water for the fertile Yakima River Valley and consists of over 200 miles of canals and laterals. This project provides the water that enables the

Yakima Valley, which extends into Benton County, to continually be one of the Nation's premier producers of such crops as apples, mint, hops, cherries, and grapes.

The irrigation district locations in Benton County are listed below:

- Roza District
- Sunnyside Valley Irrigation District
- Benton Irrigation District
- Kennewick Irrigation District
- Kiona Irrigation District
- Columbia Irrigation District
- Badger Mountain Irrigation District

10.8.11 Noxious Weed Control District

The Benton County Noxious Weed Control District is directed by a board of five members appointed by the County Commissioners. The intent of the district is to promote weed control by instituting a program that emphasizes education as a means to assist landowners in the identification and control of noxious weeds listed on the County's noxious weed list.

10.8.12 Port Districts

Ports can develop property for industrial use and can lease and sell land, buildings, and facilities to private industry in accordance with state laws. State laws specify that ports may acquire, construct, maintain, operate, develop, and regulate within the district harbor improvements; rail or motor vehicle transfer and terminal facilities; water transfer and terminal facilities; air transfer and terminal facilities; and other commercial transportation, transfer, handling, storage, and terminal facilities and industrial improvements.

Port districts are funded by revenues from the operation of terminals, the sale or lease of properties, and tax levies. A port district may incur debt including issuing general obligation bonds up to 0.25 percent of the assessed value of taxable property in the district without vote of the people. An additional 0.05 percent debt may be incurred if 60 percent of the electorate approves. Port districts also have the power to issue revenue bonds for the acquisition, construction, reconstruction, or extension of various improvements.

There are two port districts in Benton County, the Port of Benton and the Port of Kennewick. They are governed by a three-member elected board of commissioners who appoint the Executive Director.

The Port of Kennewick District was formed in 1915 and expanded to its current area in 1954, including Kennewick, south Richland, West Richland, south Benton City, and the southeast part of the County. The Port of Benton District was formed in 1958 and includes Prosser, central and north Richland, and the majority of Benton City, as well as Hanford and northwest Benton County.

11 References

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Appendix A
Map Folio
(prepared by Benton County GIS)

Appendix B
Environmental Impact Statement
Addendum

Appendix C

Public Participation Plan

Appendix D

Visioning Summary Results

Appendix E

Benton County-wide Planning Policies

Appendix F
Shoreline Master Program Update (2014)

Appendix G
Red Mountain AVA Master Site Plan
(2012)

Appendix H

Transportation

Appendix H-1
Road Program 2016 – 2021
(or as updated)

Appendix H-2

Transportation Level of Service

Appendix H-3
Washington State Highway Inventory
Within Benton County

Appendix H-4
Washington State Highway Inventory
within Benton County and 2028 Forecast
and Level of Service Analysis

Appendix I
Comprehensive Parks Plan, 2014 – 2020

Appendix J
Capital Improvement Plan, 2017 – 2022

Appendix K
Benton County Comprehensive Solid
Waste Management and Moderate Risk
Waste Management Plan, 2013

Appendix L
Agricultural Land Reclassification
Memorandum (2018)

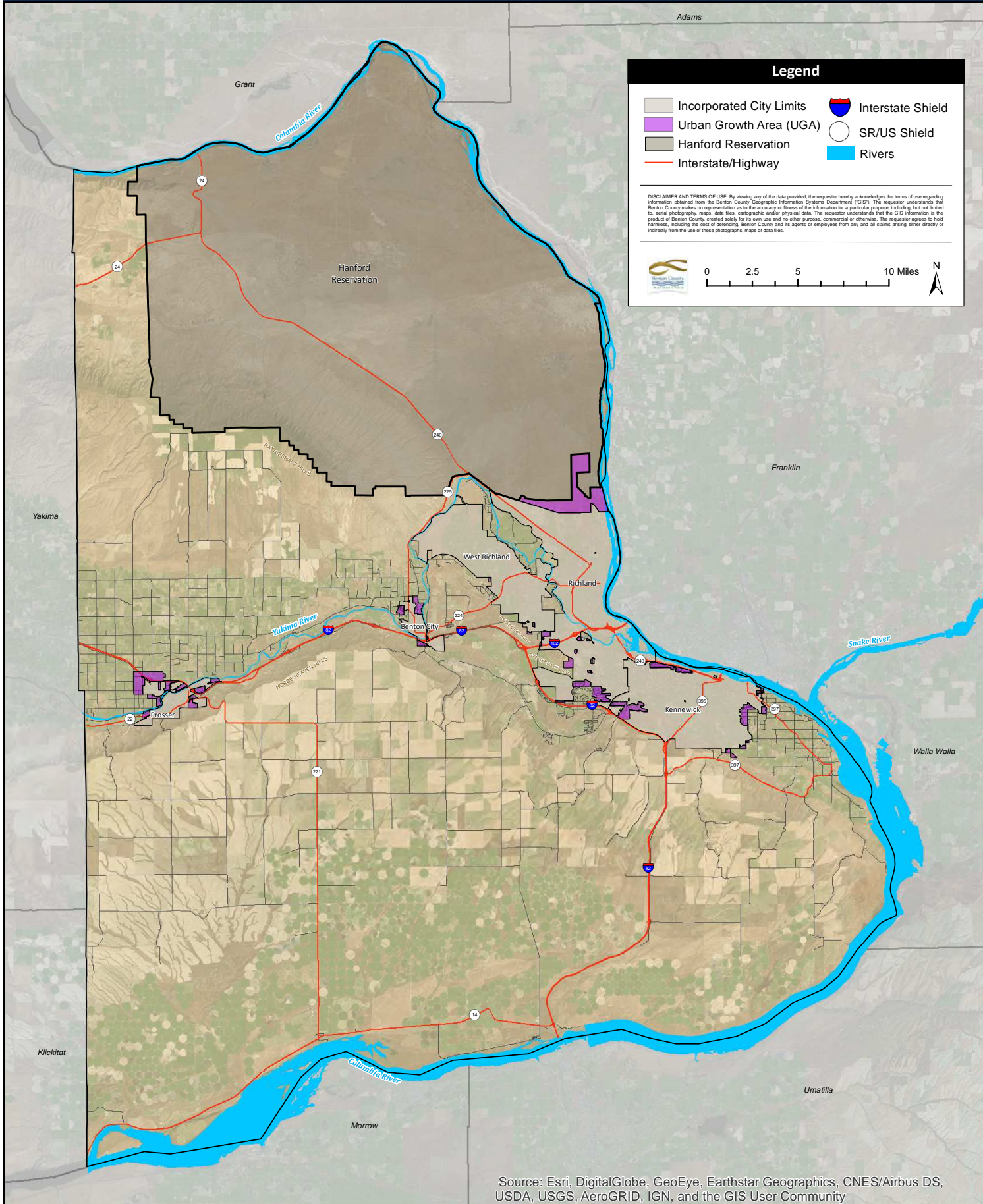
Appendix M
Benton County Community Wildfire
Protection Plan (2018)

Appendix N
Benton County Natural Hazard Mitigation
Plan (2019)

Appendix O

Comment Response Matrix

Figure 1: Vicinity Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018



Legend

- Incorporated City Limits
- Urban Growth Area (UGA)
- Hanford Reservation
- Interstate/Highway
- Interstate Shield
- SR/US Shield
- Rivers

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0 2.5 5 10 Miles

N

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2: Publicly Owned Lands Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

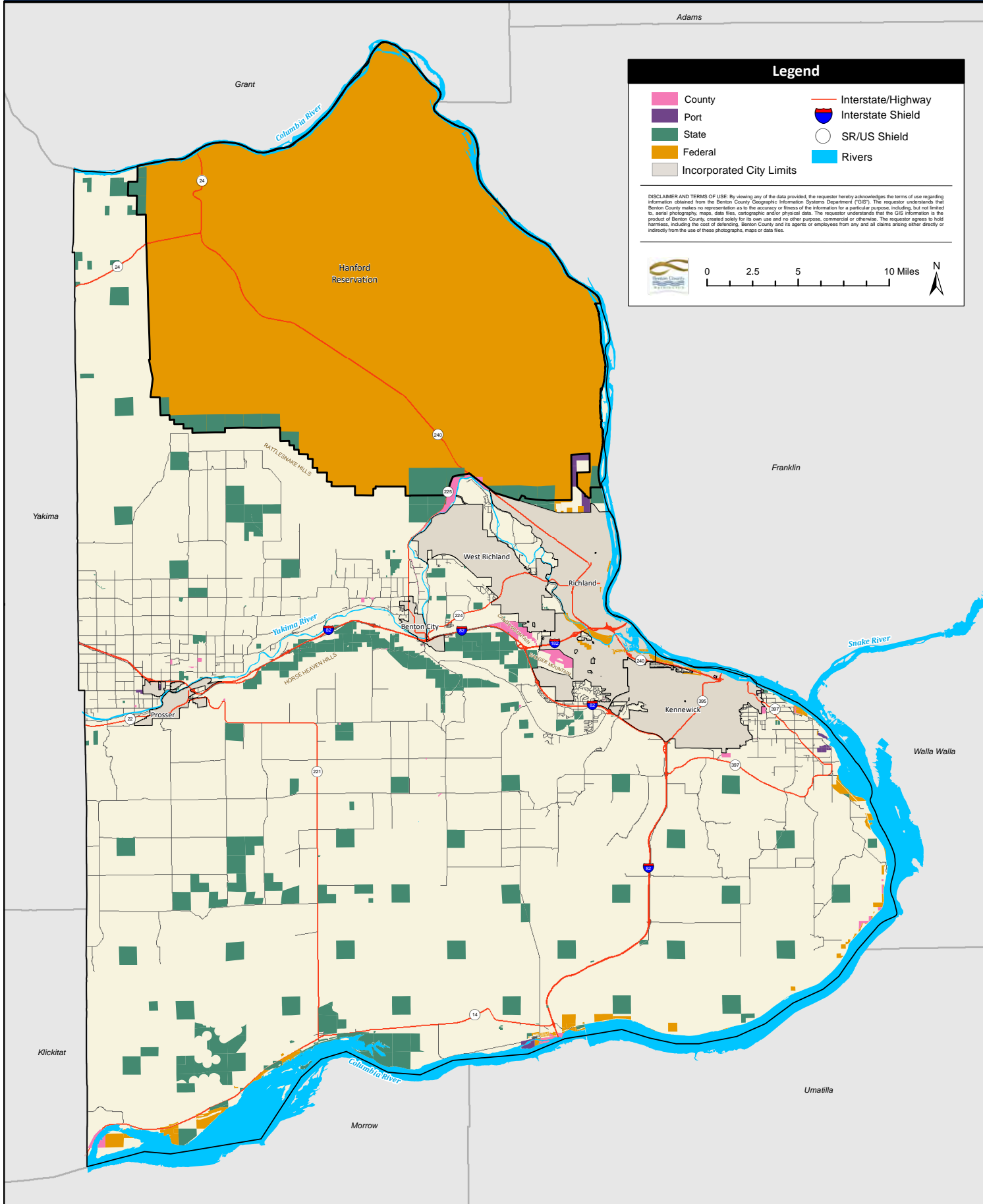


Figure 3: Existing Land Cover Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

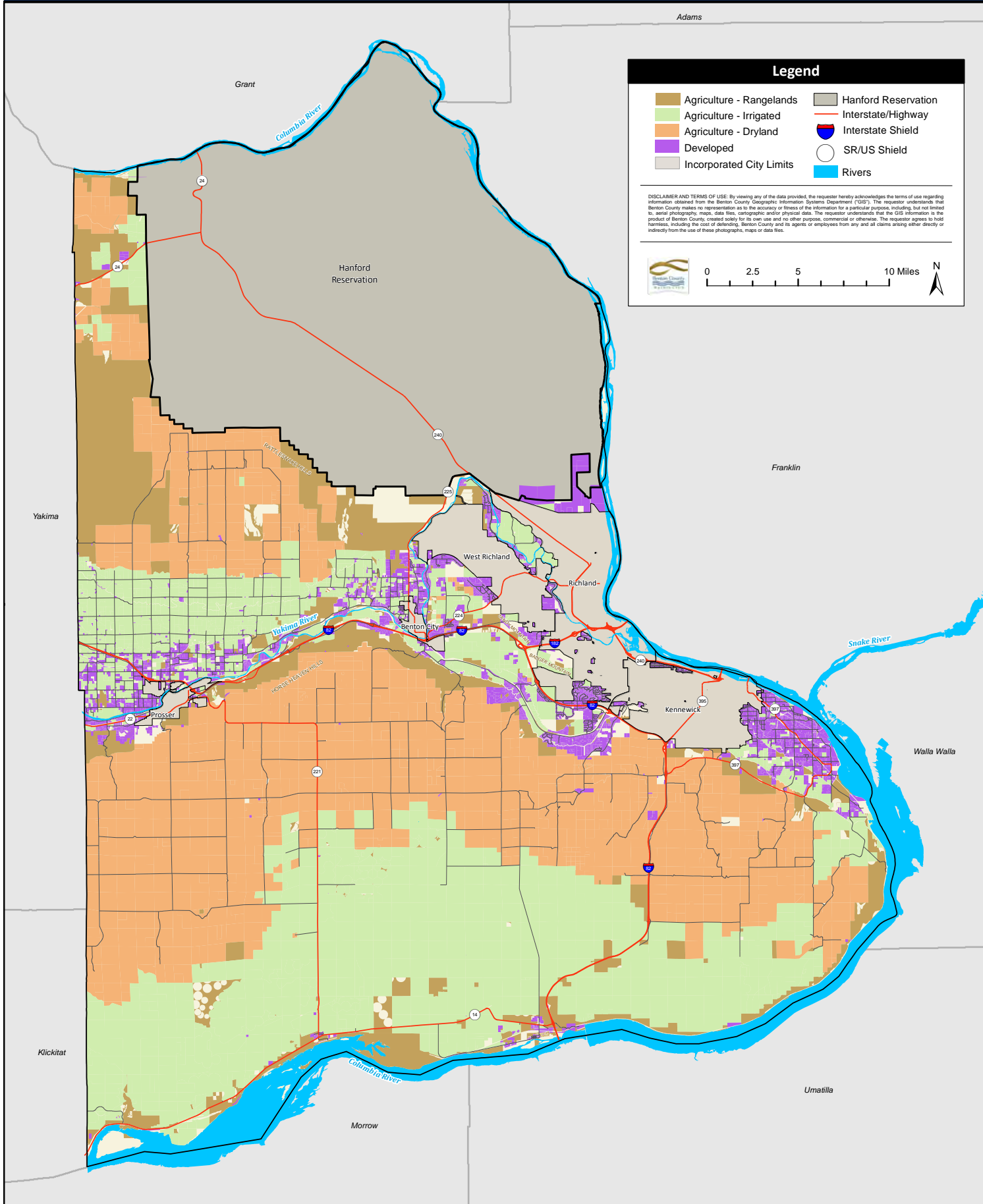
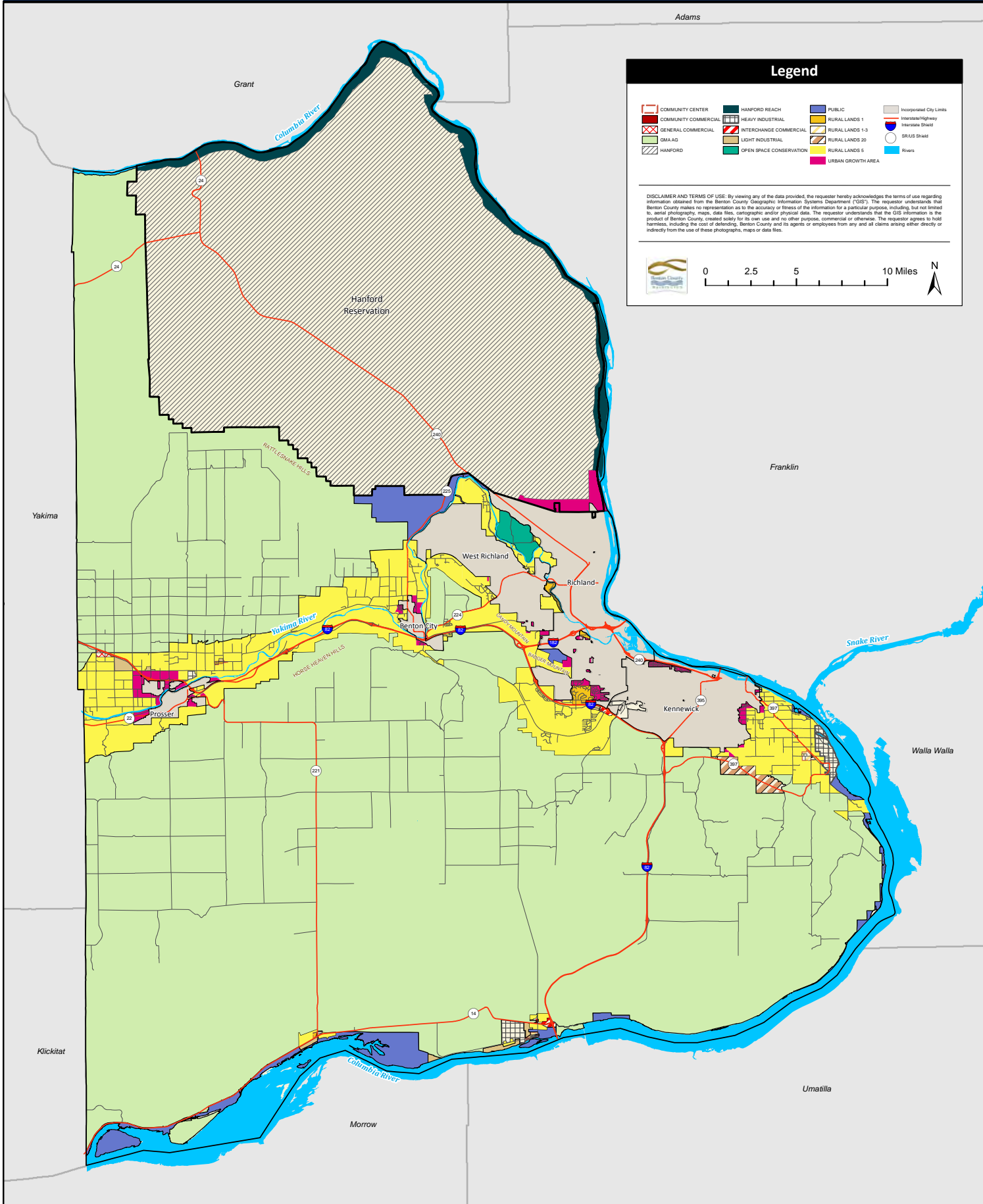


Figure 4: 2006 Periodic Update Land Use Designations Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018



Legend

	COMMUNITY CENTER		HANFORD REACH		PUBLIC		INCORPORATED CITY LIMITS
	COMMUNITY COMMERCIAL		HEAVY INDUSTRIAL		RURAL LANDS 1		INTERSTATE/HIGHWAY
	GENERAL COMMERCIAL		INTERCHANGE COMMERCIAL		RURAL LANDS 1-3		SR/US SHIELD
	GMA AG		LIGHT INDUSTRIAL		RURAL LANDS 20		RIVERS
	HANFORD		OPEN SPACE CONSERVATION		RURAL LANDS 5		
					URBAN GROWTH AREA		

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Figure 5: Future/Proposed Land Use Designations Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / April 12, 2022

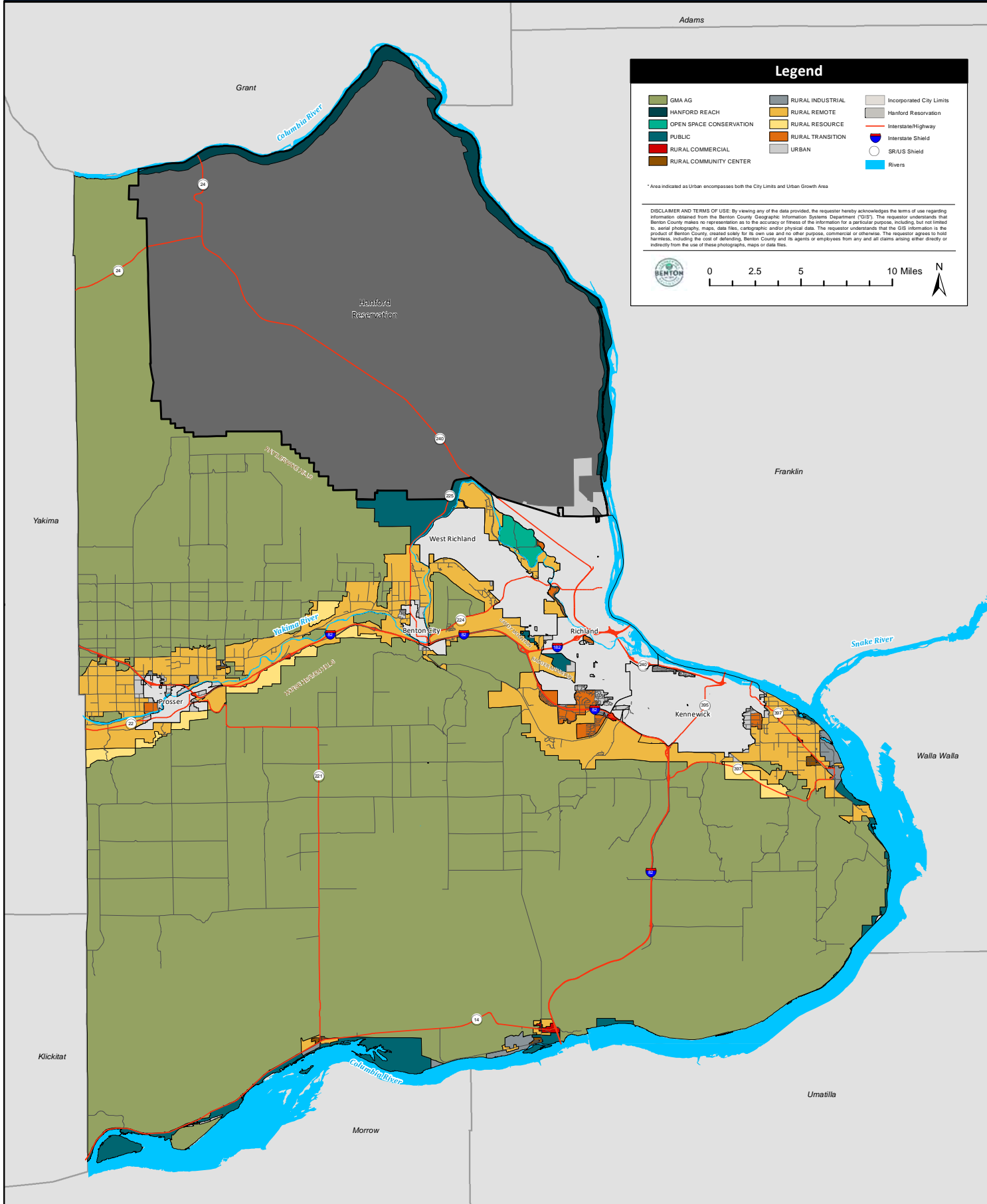


Figure 6: Precipitation Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

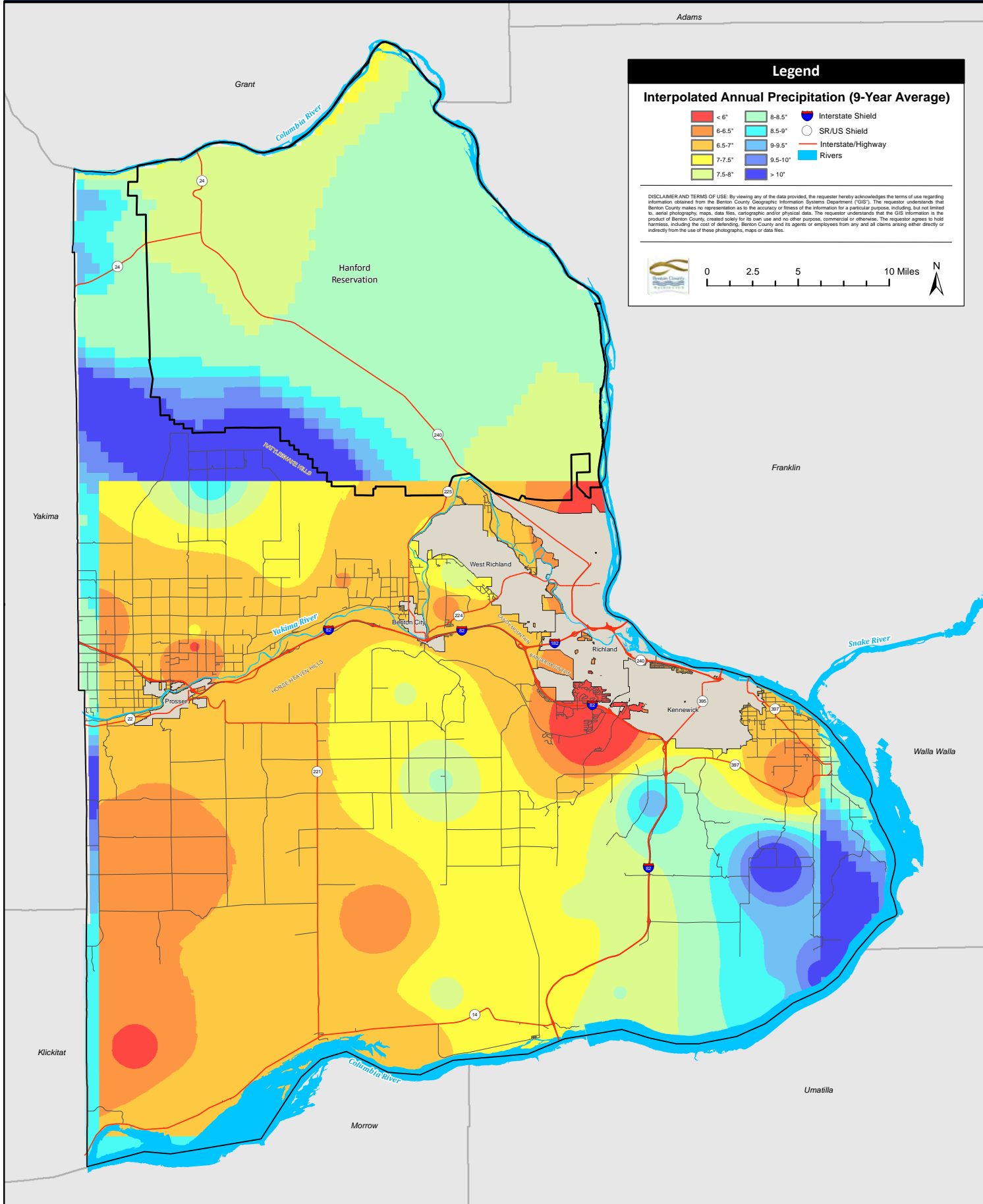


Figure 7: General Soils Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

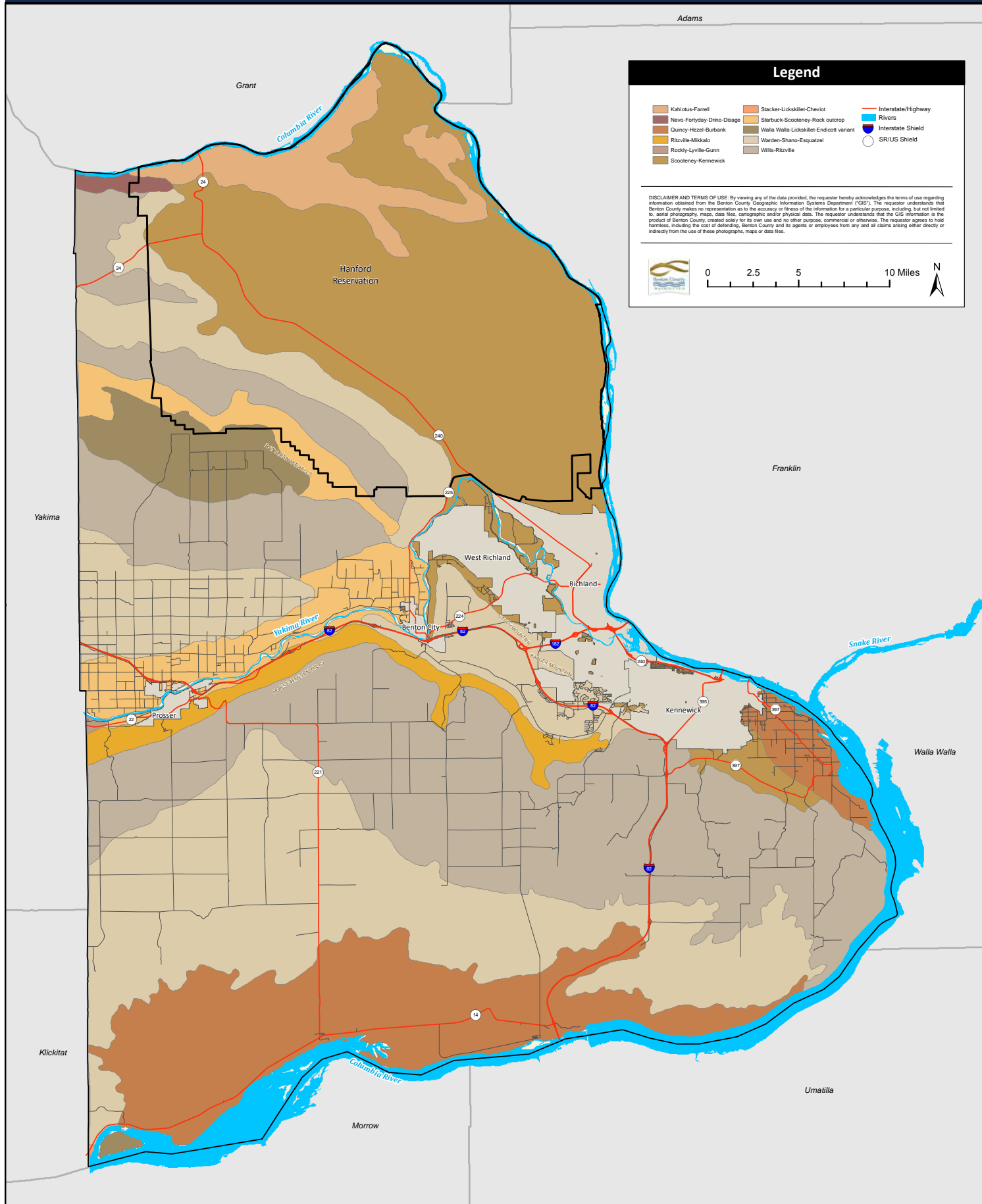
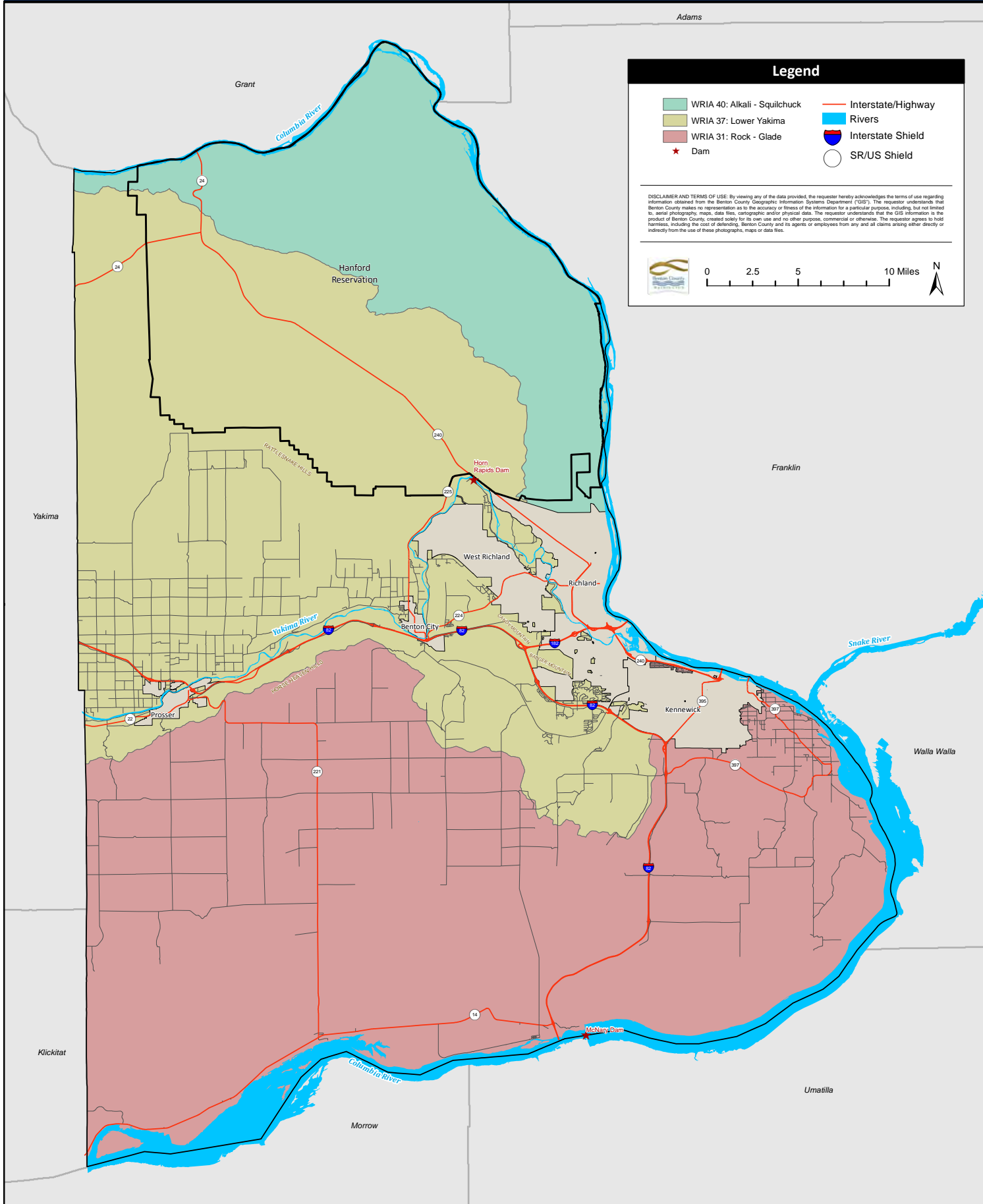


Figure 8: Water Resources Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018



Legend

- WRIA 40: Alkali - Squilchuck
- WRIA 37: Lower Yakima
- WRIA 31: Rock - Glade
- ★ Dam
- Interstate/Highway
- Rivers
- Interstate Shield
- SR/US Shield

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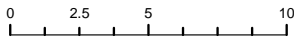
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Figure 9: Wetlands, Rivers, and Streams - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

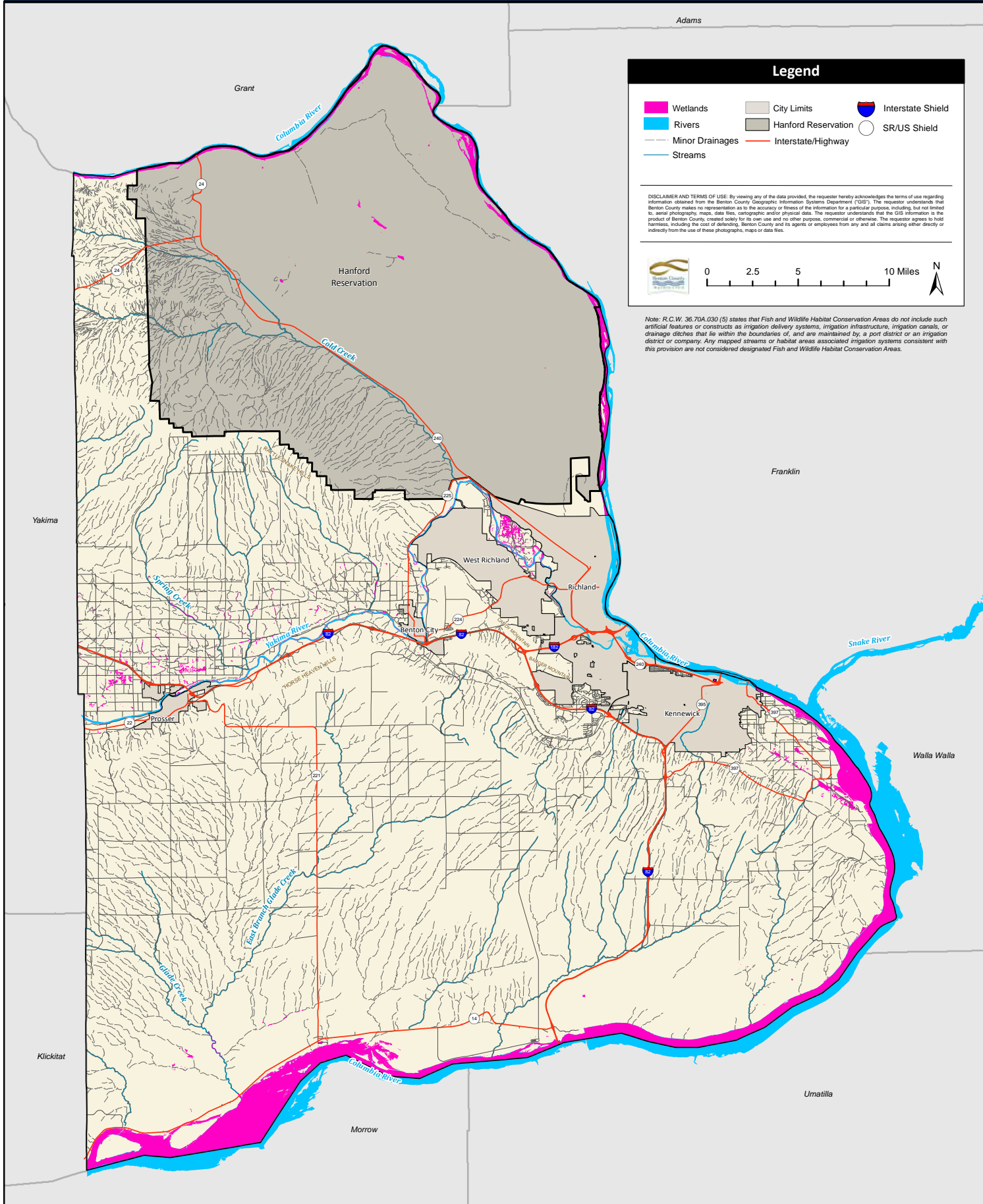
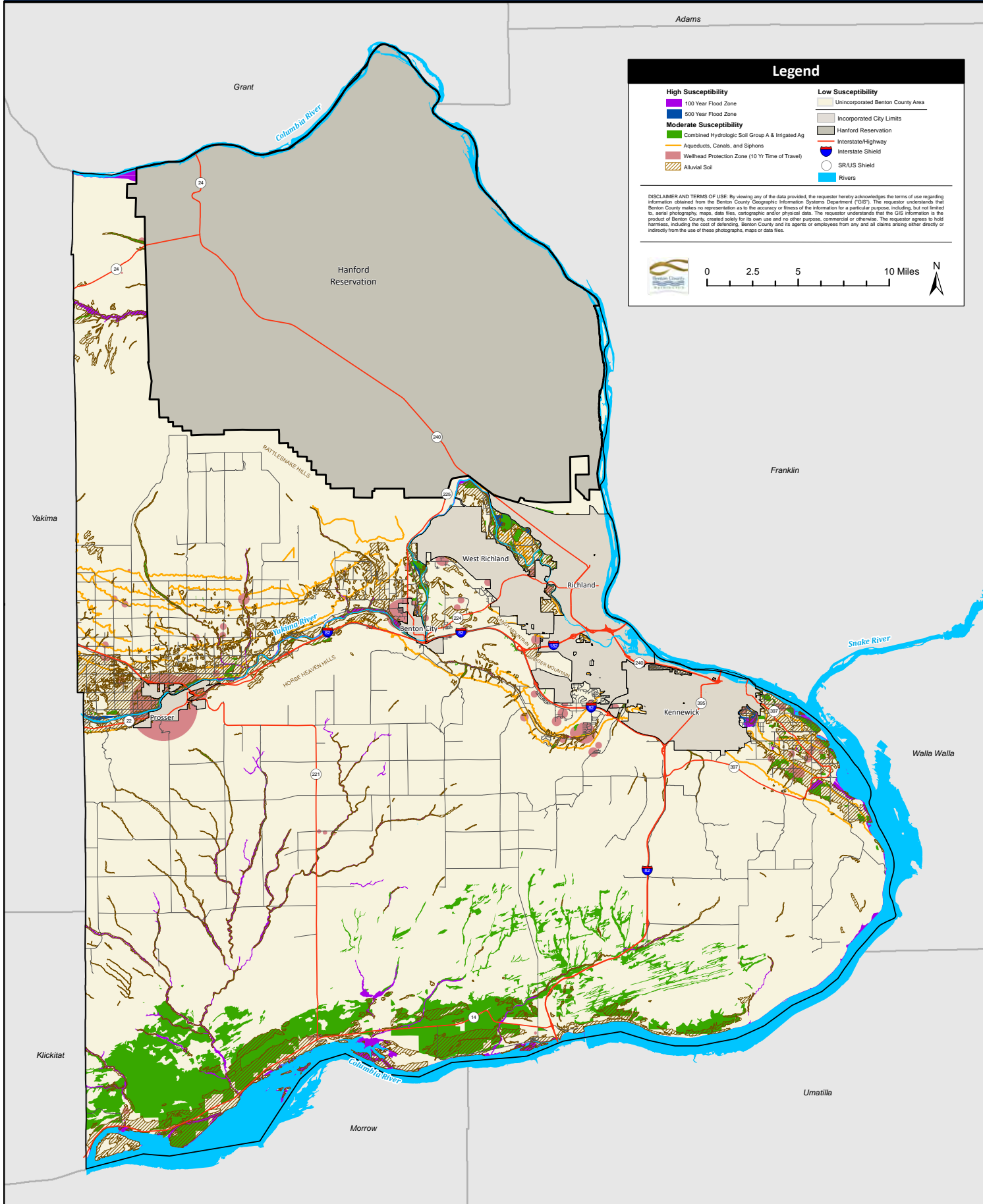


Figure 10: Critical Aquifer Recharge Areas - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018



Legend

High Susceptibility	Low Susceptibility
100 Year Flood Zone	Unincorporated Benton County Area
500 Year Flood Zone	Incorporated City Limits
Moderate Susceptibility	Hanford Reservation
Combined Hydrologic Soil Group A & Irrigated Ag	Interstate/Highway
Aqueducts, Canals, and Siphons	Interstate/Highway Shield
Wetland Protection Zone (10 Yr Time of Travel)	SRUS Shield
Alluvial Soil	Rivers

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Figure 11: Frequently Flooded Areas - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

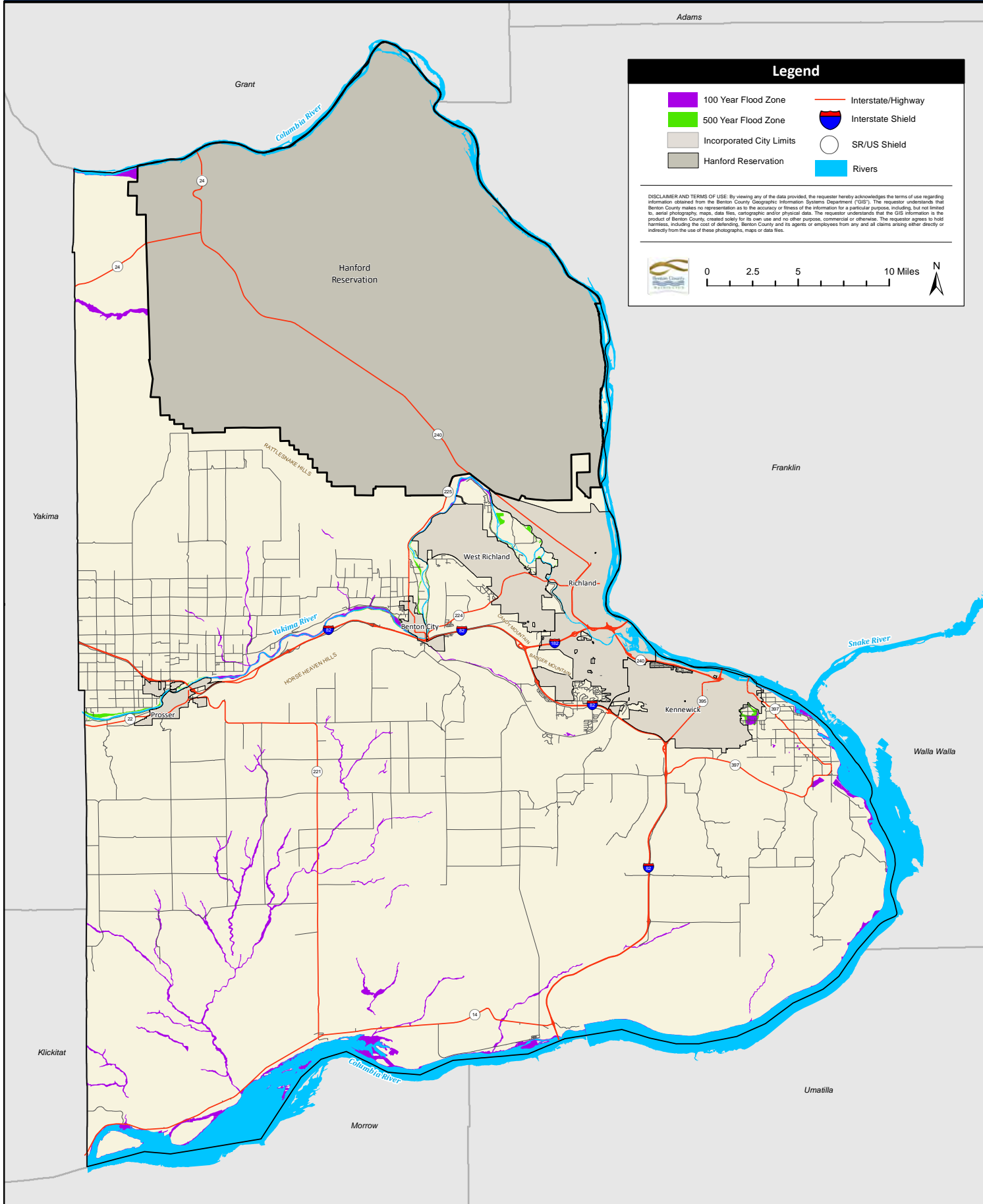


Figure 12: Geologically Hazardous Areas - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

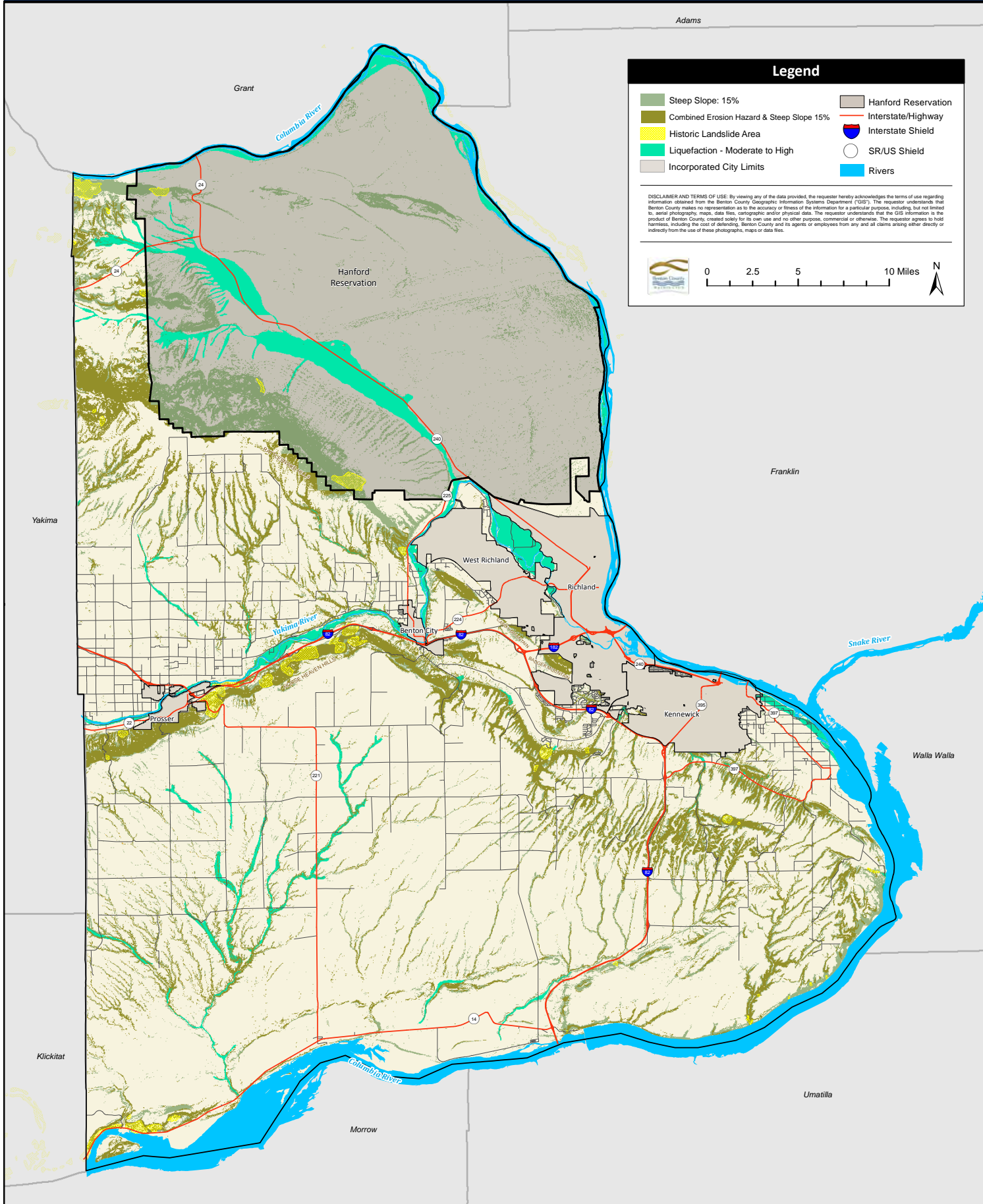


Figure 13: Fish and Wildlife Habitat Conservation Areas - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

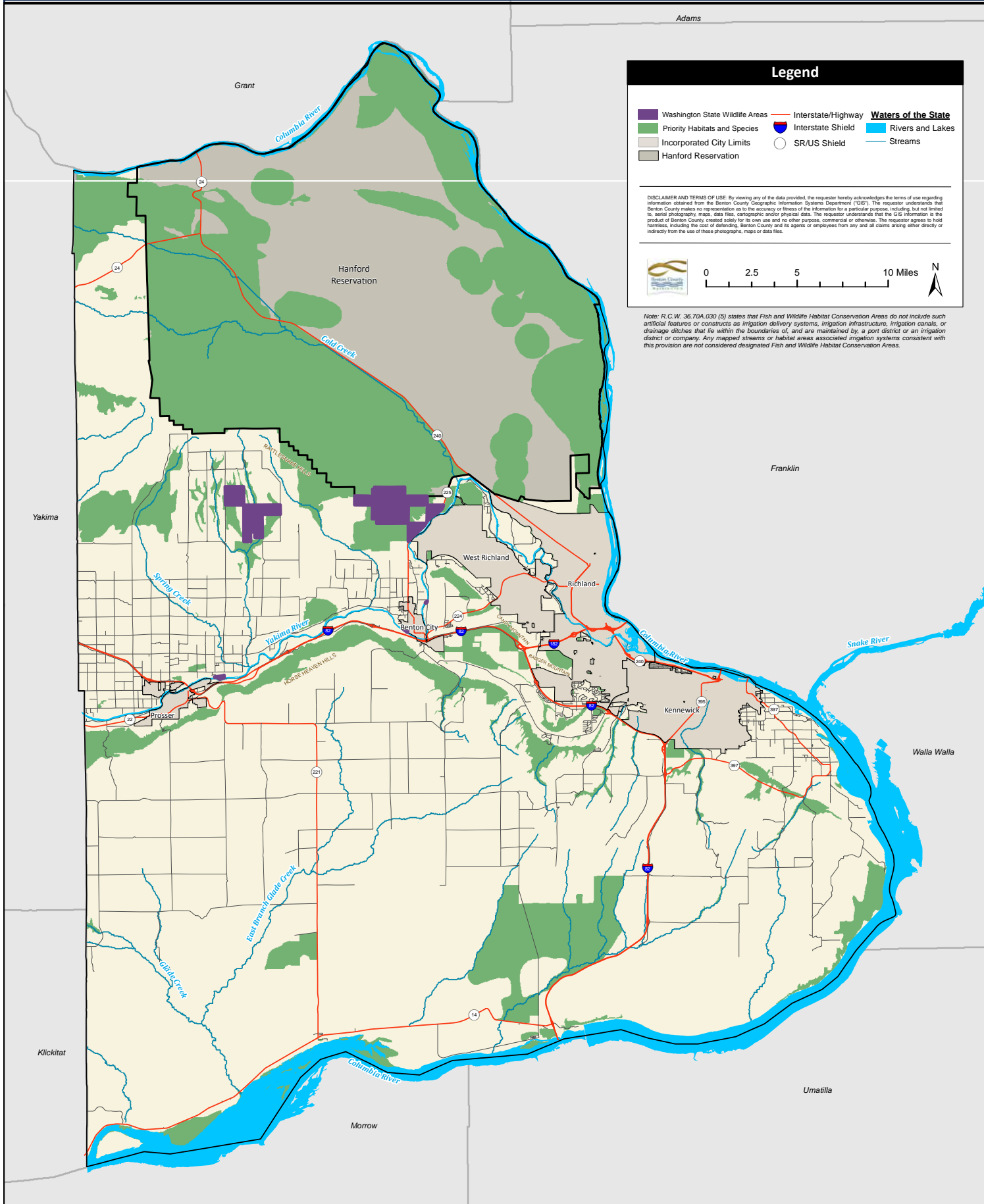


Figure 14: Existing Major Facilities Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

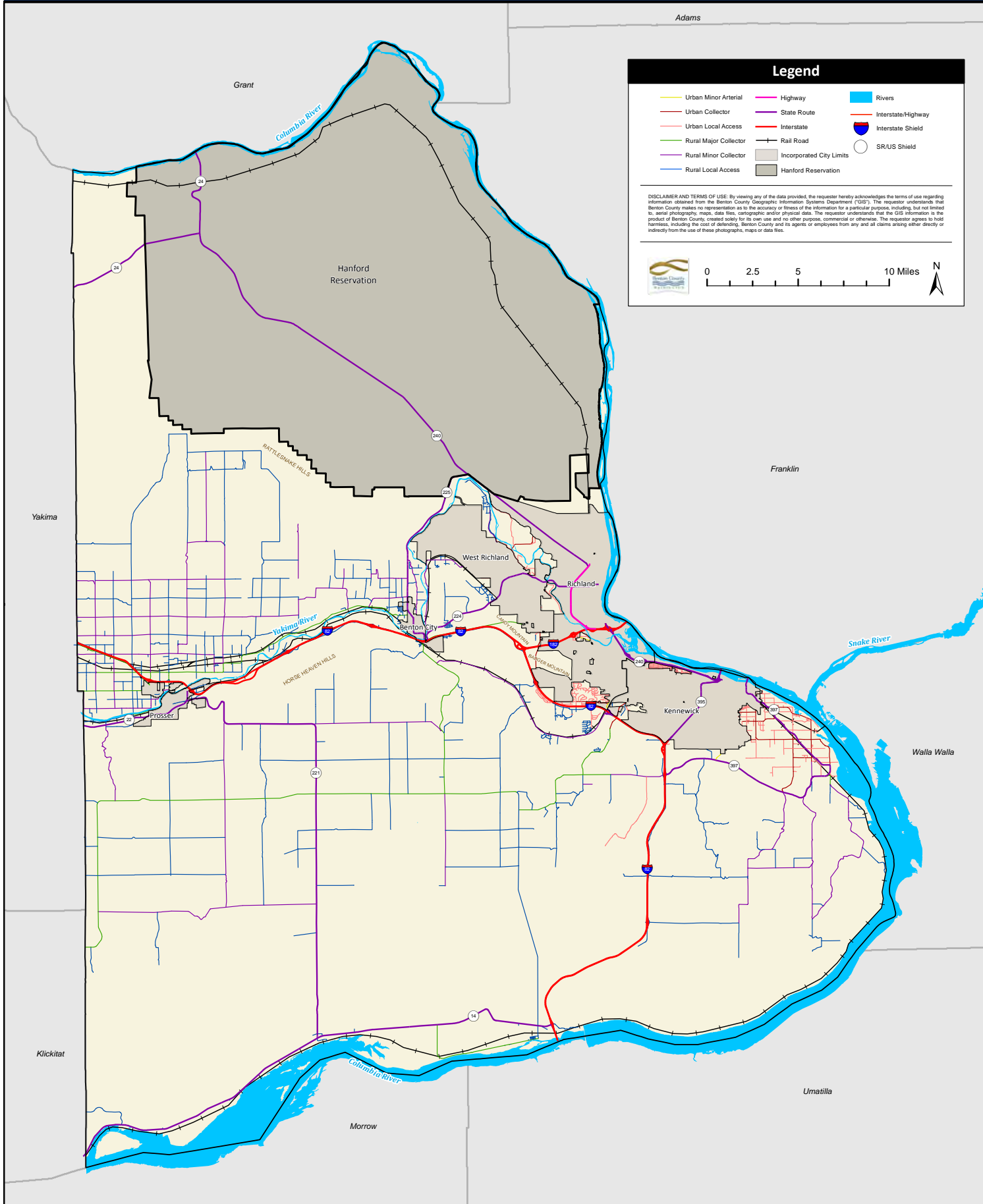


Figure 15: Parks and Recreation Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

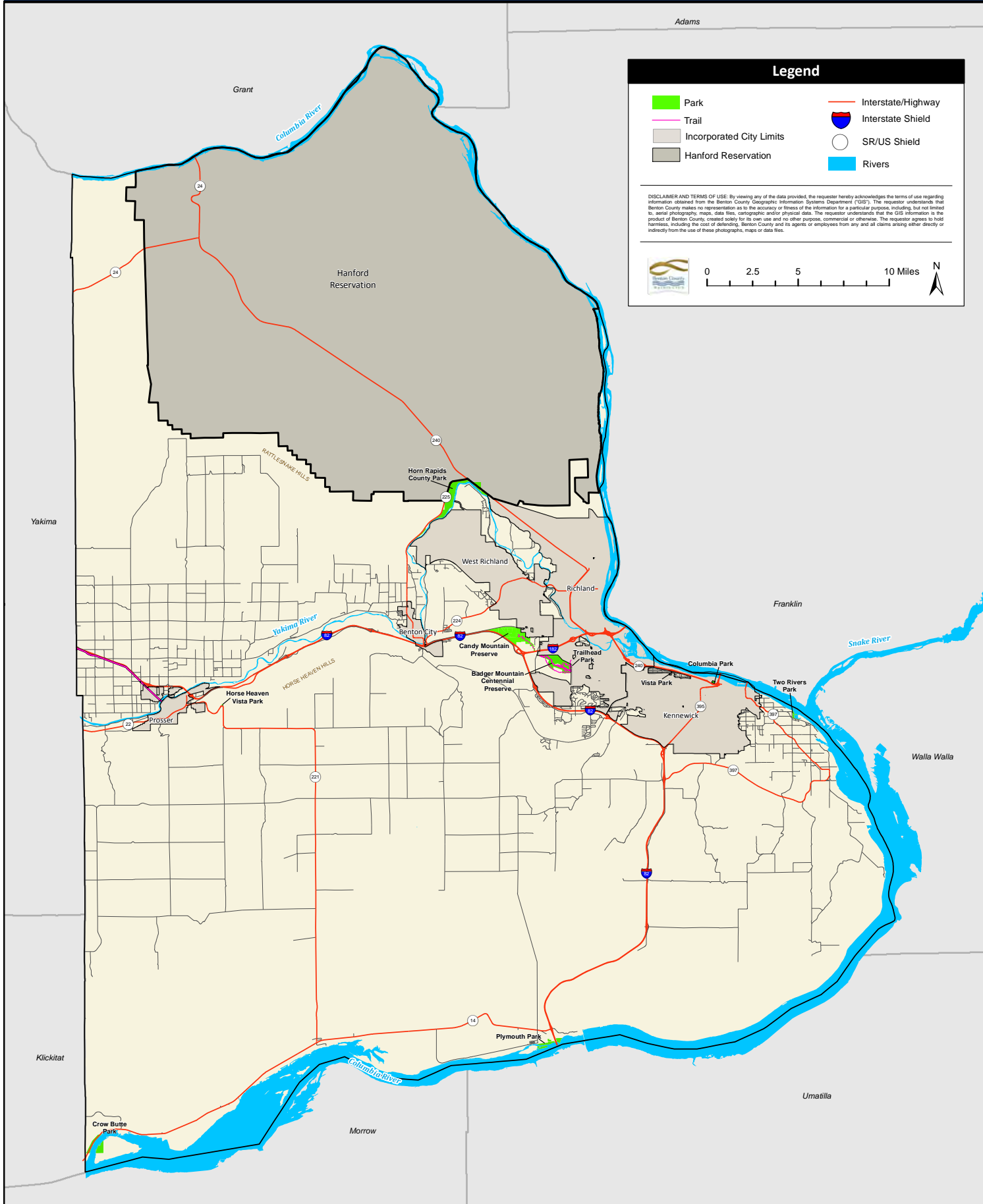
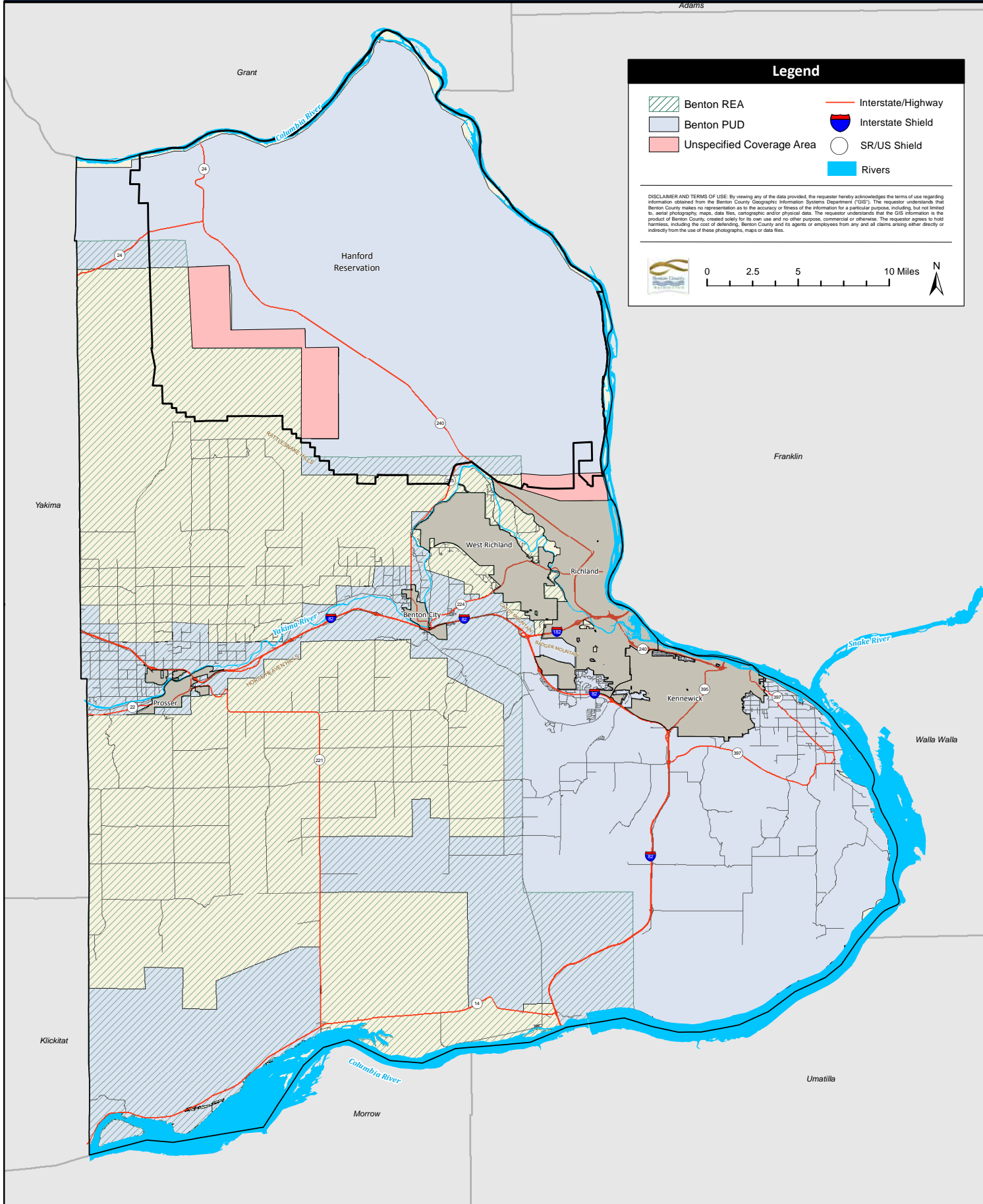


Figure 16: Utilities Map - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018

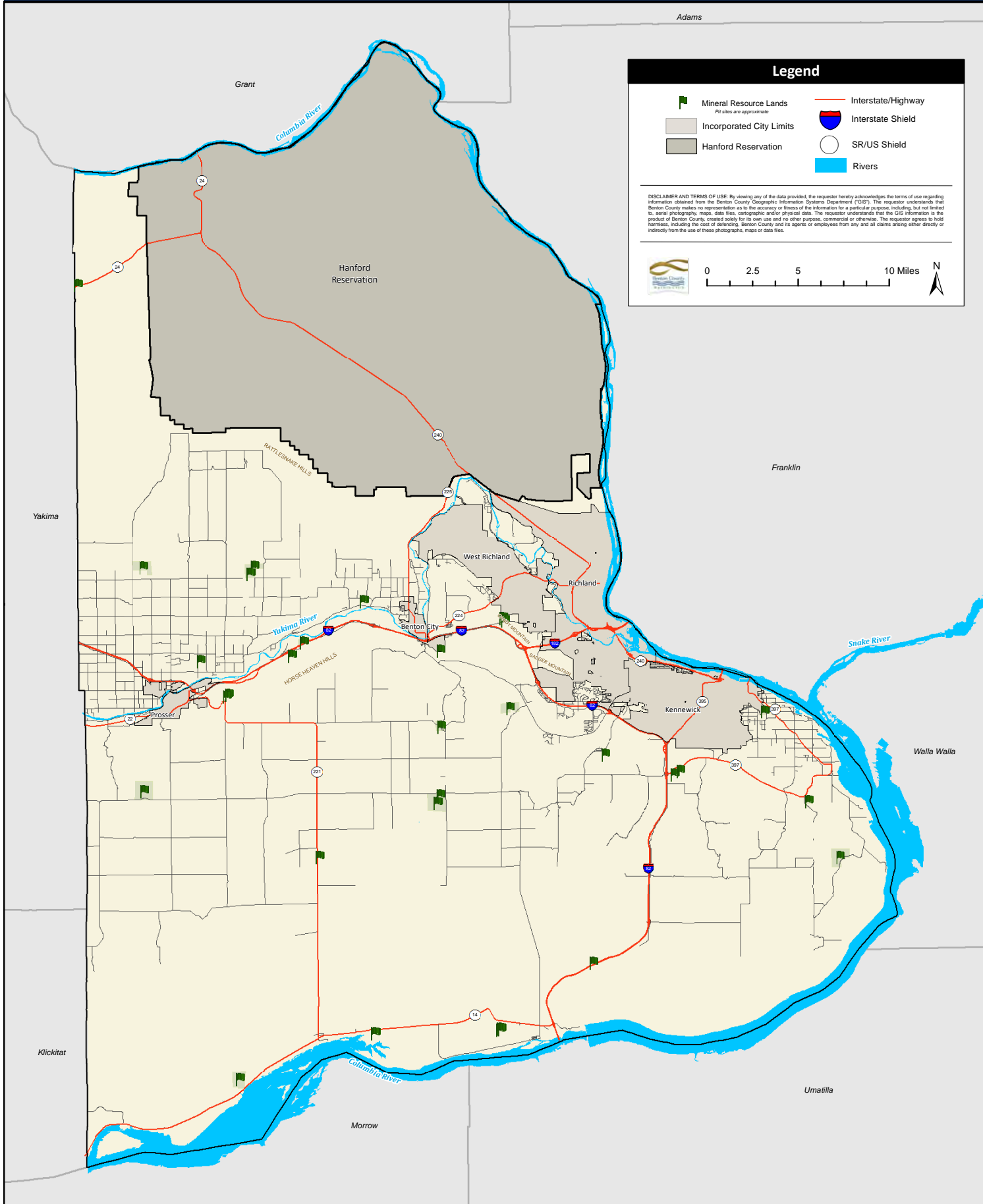


Legend

<ul style="list-style-type: none"> Benton REA Benton PUD Unspecified Coverage Area 	<ul style="list-style-type: none"> Interstate/Highway Interstate Shield SR/US Shield Rivers
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Figure 17: Mineral Resource Lands - Benton County Comprehensive Plan Update Appendix A: Map Folio / February 2018



Legend

- Mineral Resource Lands
All areas are approximate
- Incorporated City Limits
- Hanford Reservation
- Interstate/Highway
- Interstate Shield
- SR/US Shield
- Rivers

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Figure 18: City of Benton City UGA-Benton County Comprehensive Plan Update Appendix A: Map Folio/April 12, 2022

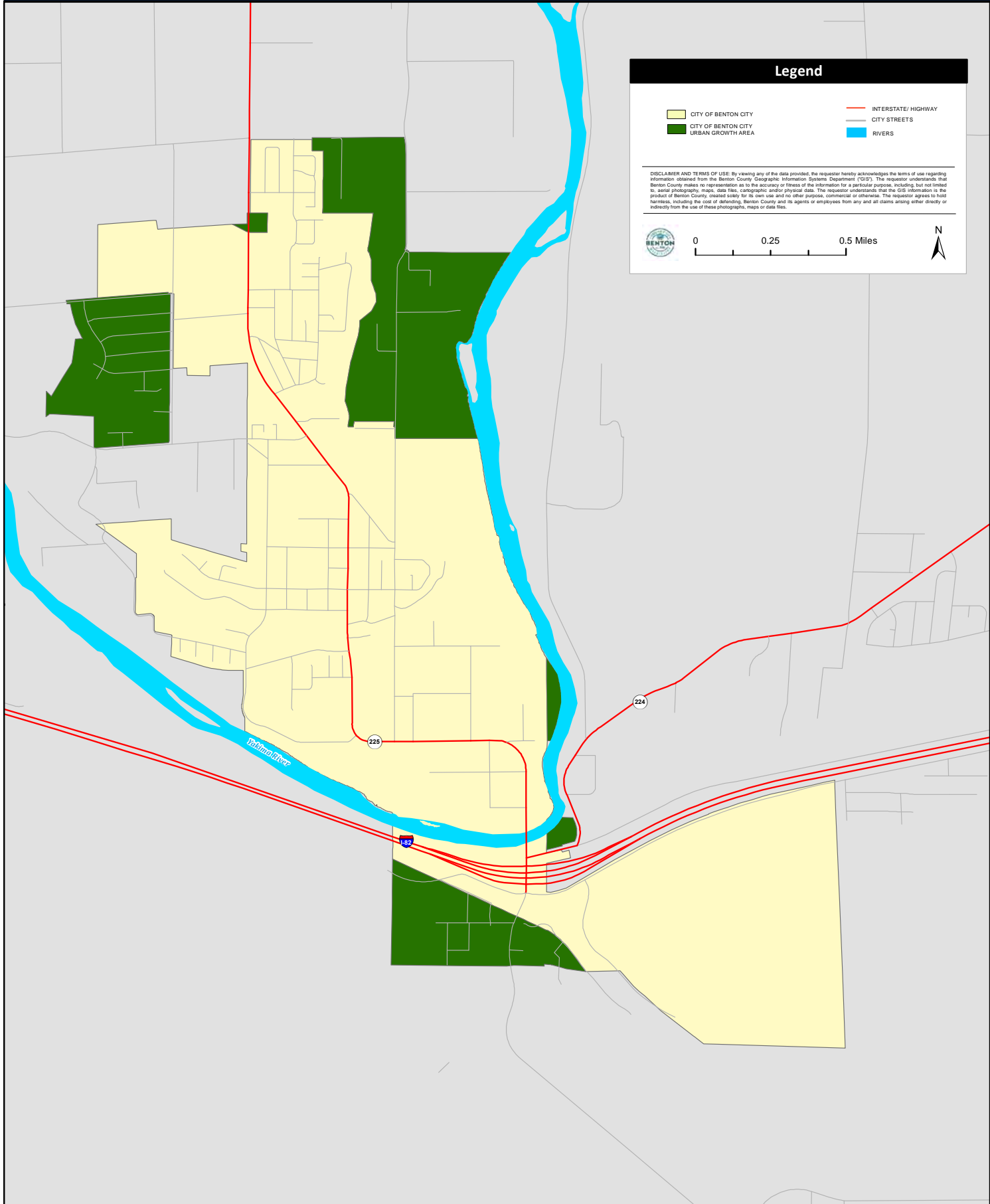


Figure 19: City of Kennewick UGA-Benton County Comprehensive Plan Update Appendix A:Map Folio/April 12, 2022

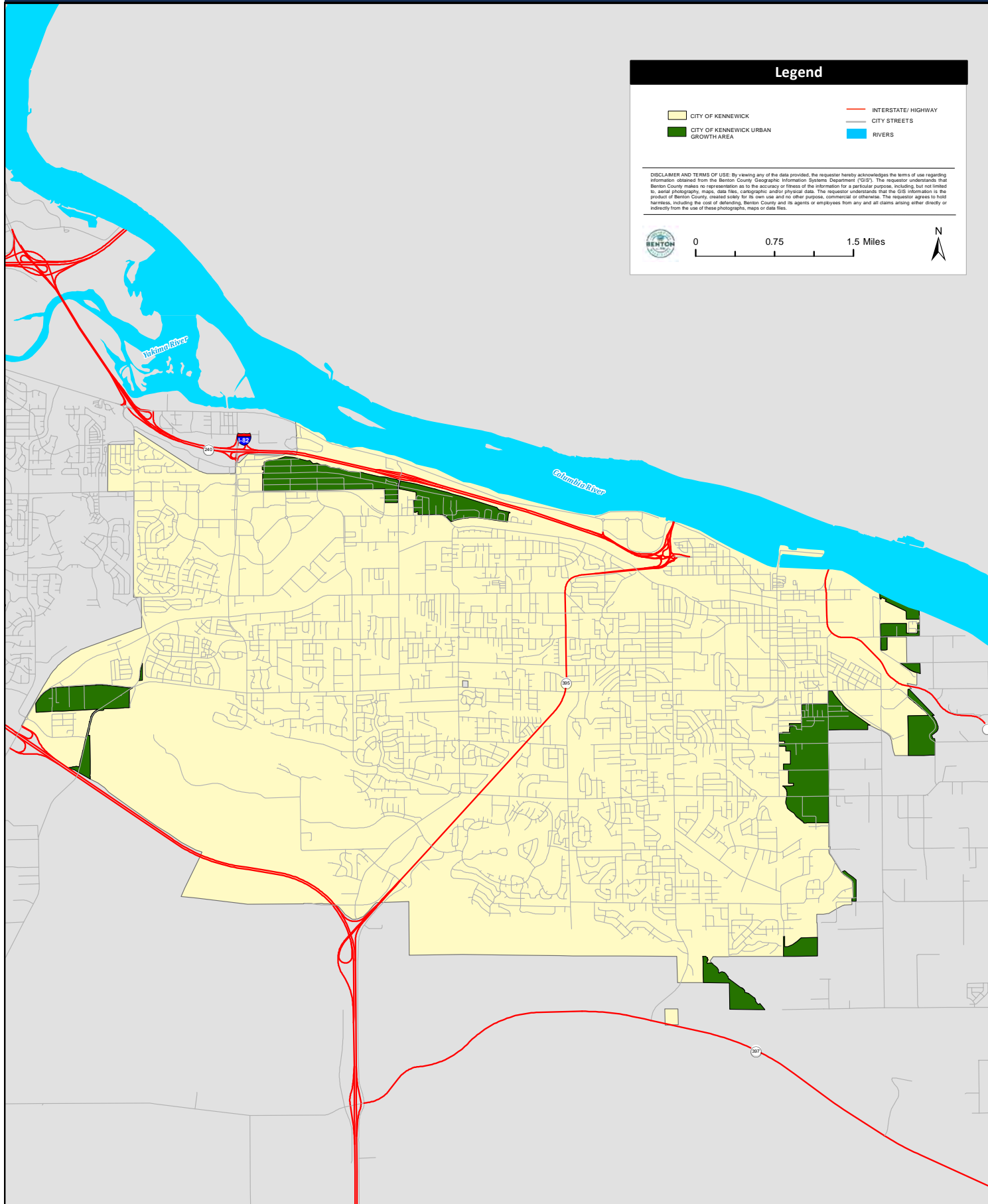


Figure 20: City of Prosser UGA-Benton County Comprehensive Plan Update Appendix A: Map Folio/April 12, 2022

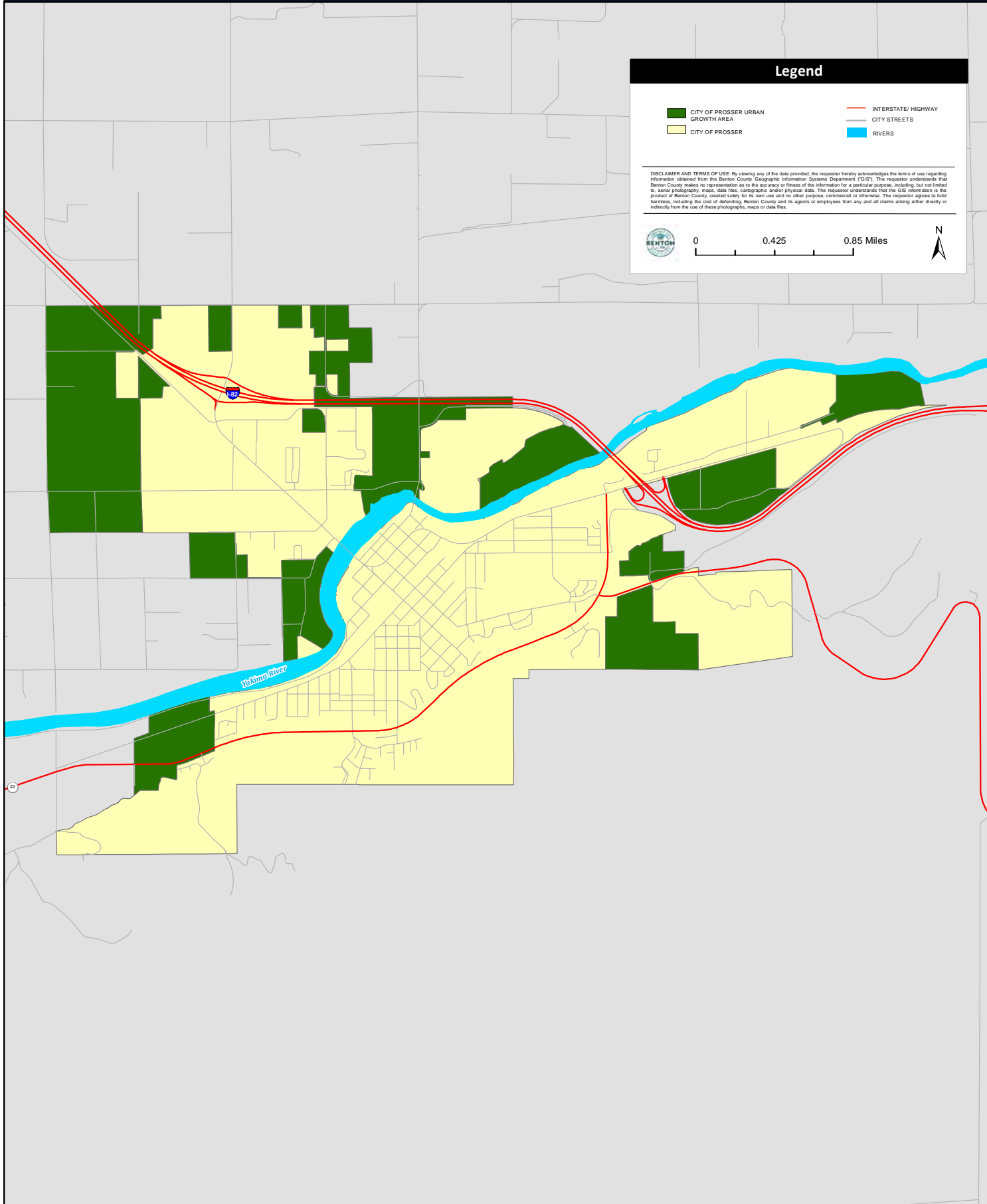


Figure 21: City of Richland UGA-Benton County Comprehensive Plan Update Appendix A: Map Folio/April 12, 2022

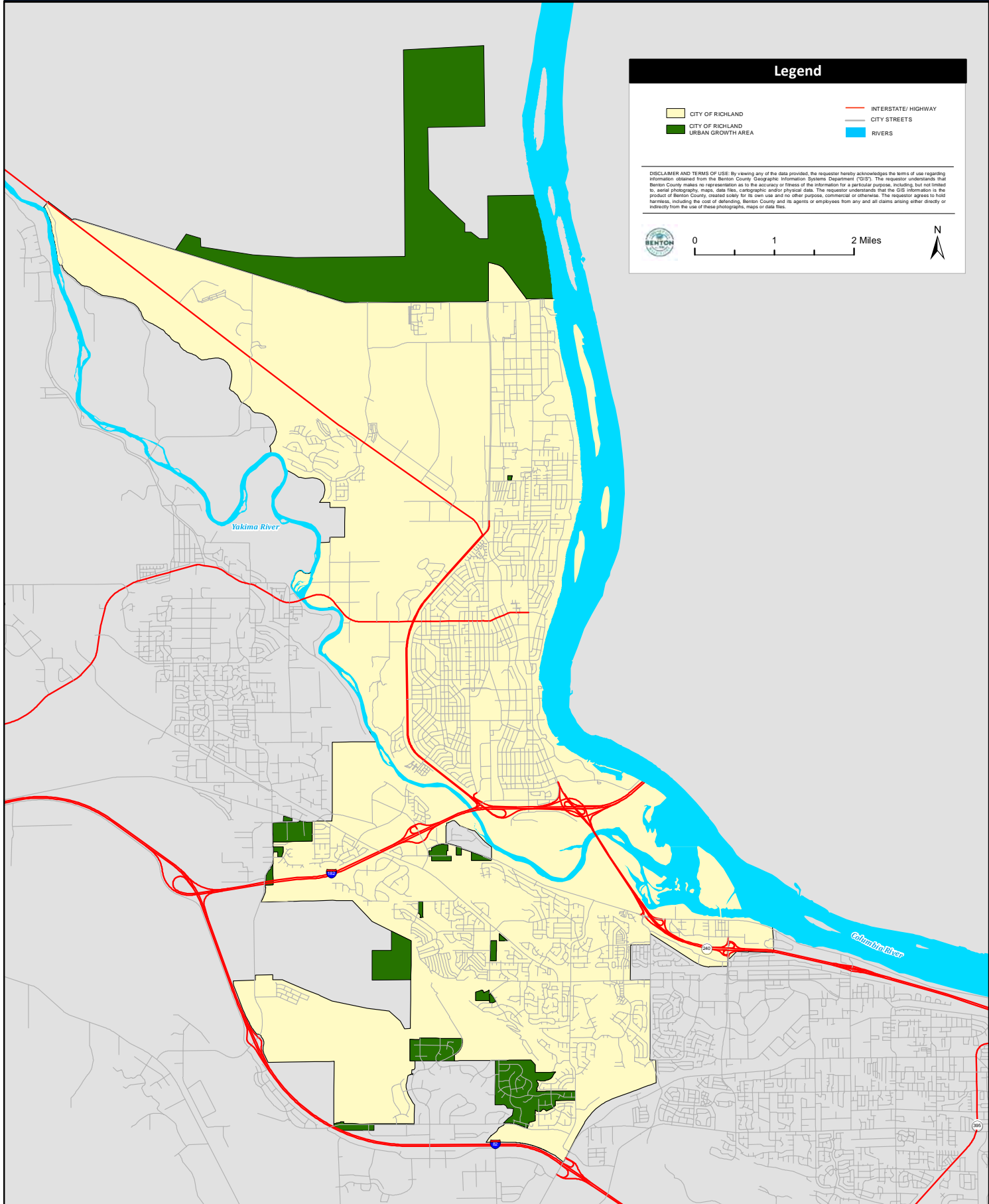
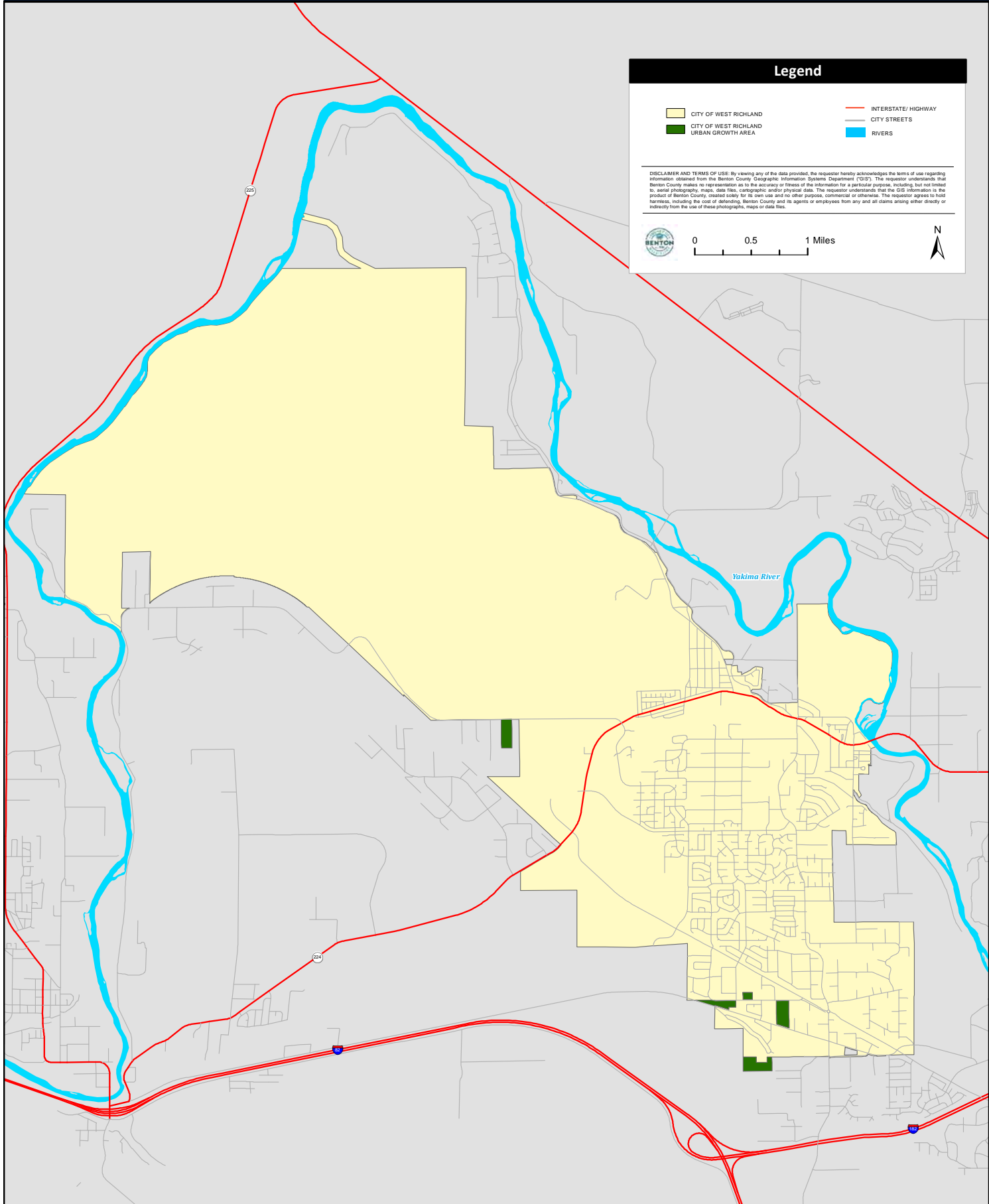


Figure 22: City of West Richland UGA -Benton County Comprehensive Plan Update Appendix A: Map Folio/April 12, 2022



Appendix B
Environmental Impact Statement
Addendum



September 2017
Benton County



Appendix B

Environmental Impact Statement Addendum

Prepared for Benton County

September 2017
Benton County

Appendix B

Environmental Impact Statement Addendum

Prepared for
Benton County
7122 W Okanogan Place, Bldg. A
Kennewick, Washington 99336

Prepared by
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, Washington 98101

Oneza & Associates
3131 Western Avenue, Suite 316
Seattle, Washington 98121

Fact Sheet

Project Title:

Benton County Comprehensive Plan Environmental Impact Statement Addendum

Project Proponent:

Benton County

Location:

The area represented by this Environmental Impact Statement (EIS) Addendum is Benton County (County). The County is located in southeast Washington and encompasses approximately 1,715 square miles.

Proposed Action:

Benton County is updating their Comprehensive Plan consistent with the Growth Management Act (GMA; Revised Code of Washington 36.70A). The Plan is used to guide decisions about development and growth within the County and in the UGAs. It is also designed to help the County meet its long-term vision for growth. The following two alternatives are being considered:

Alternative 1: No Action Alternative

The No Action Alternative, Alternative 1, would maintain the County's existing land use designations without modifications. This means growth would need to occur within existing land use designations and that modifications to land use, either higher density or lower development, modifications to industrial development or changes in agricultural areas, would occur within existing designated lands. UGAs would remain unchanged.

Alternative 2: Proposed Action Alternative

The Proposed Action Alternative, Alternative 2, allows for changes in the Comprehensive Plan to accommodate future land use changes and population growth within the County. Under this alternative, land use designations would be modified, with additional agricultural lands designated as GMA Agricultural Lands, other lands designated to higher density and others to a lower density through a new designation, Rural Resource, that protects steeper slopes and hilltop areas from higher density development in rural areas of the County. Modifications to UGAs are included for both Prosser and the City of Richland.

This alternative also:

- Incorporates the County's Shoreline Master Program Update (2014)

- Includes planning efforts under the Voluntary Stewardship Program (VSP; RCW 36.70A.700) which is promulgated under the GMA. The County is currently developing a VSP Work Plan to voluntarily protect critical areas on agricultural lands.
- Identifies the need to develop a long-term strategy for addressing permit exempt wells in the Yakima Basin needed to support rural development, consistent with the goals of the Yakima Integrated Plan and to provide domestic water supplies for the future.

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Required Permits and/or Approvals:

The following actions would be required for adoption of the Comprehensive Plan Update:

- Final approval of the Comprehensive Plan by the Board of Benton County Commissioners.

Authors and Principal Contributors:

This EIS Addendum was prepared under the direction of Benton County. Research and analysis was provided by:

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Date of Final EIS Issuance:

March 1981

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September 15, 1980

Public Meetings:

- Visioning workshop September 19, 2016 in Kennewick
- Visioning workshop September 28, 2016 in Prosser

Final Action:

County Commission adoption of the Comprehensive Plan Update is planned for December 2017 (subject to change)

Related Plans and Documents:

- Benton County Draft Comprehensive Plan 2017 (September 11, 2017)

A limited number of CD and hard copy EIS documents are available at the Benton County Planning Department at 1002 Dudley Avenue, Prosser, Washington 99350. The EIS is also available online at:

www.2017cpupdate.com

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ABBREVIATIONS

Addendum	Environmental Impact Assessment Addendum
AVA	American Viticultural Area
County	Benton County
CRP	Conservation Reserve Program
DOE	Department of Energy
GMA	Growth Management Act
OHW	ordinary high water mark
Plan	Comprehensive Plan
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SMP	Shoreline Master Program
UGAs	Urban Growth Areas
VSP	Voluntary Stewardship Program

1 Introduction

Benton County (County) is updating its Comprehensive Plan (Plan) consistent with the Growth Management Act (GMA; Revised Code of Washington [RCW] 36.70A). The Plan consists of goals, policies, and analyses of the following elements: economic, land use, natural resources, economics, housing, transportation, parks and recreation, capital facilities, and utilities. The Plan is used to guide decisions about development and growth within the County and in the Urban Growth Areas (UGAs). It is also designed to help the County meet its long-term vision for growth. The Plan was originally developed in 1985 and comprehensively amended in 1998 and 2006, and now again in 2017. More minor amendments have also occurred throughout this period. Refinements to the Plan have been made consistent with the Plan's vision and to further refine the balance of plan elements consistent with GMA goals.

The purpose and intent of the Plan update is to provide for local needs relating to the use of land and infrastructure, including the protection of property and water rights, and in so doing, to meet the state's minimum planning law requirements. Although the Plan has been substantially updated, the basic land use pattern that was established in 1985 and continued in 1998 and 2006 through 2017 has not changed significantly.

This Environmental Impact Assessment Addendum (Addendum) provides an environmental analysis of two alternatives to support the Plan: a "No Action" alternative and a proposed action alternative. Alternative 1, the "No Action" alternative, calls for keeping the County's existing Plan without modifications. Alternative 2, the Proposed Action alternative, allows for changes in the Plan to accommodate future land uses and population growth expected to occur within the County.

The County has prepared this Addendum to amend the *Benton County Final Environmental Impact Statement* (1981) prepared for the existing Plan and amendments (Benton County 1985). This Addendum is intended to satisfy the requirements of the State Environmental Policy Act (SEPA) pursuant to RCW Chapter 43.21C and Washington Administrative Code 197-11-625. This Addendum evaluates Plan alternatives and impacts that propose a similar policy direction, land use patterns, and environmental impacts that are expected to be associated with the proposed action identified in this Addendum. Therefore, the proposed alternative does not substantially change the analysis of significant impacts and alternatives in the existing environmental document.

1.1 SEPA Requirements

SEPA (RCW 43.21C) requires government officials to consider the environmental consequences of actions they are about to take and seek better or less damaging ways to accomplish those proposed actions. Officials must consider whether the proposed action would have a significant, adverse environmental impact on the following elements of the natural and built environment: earth, air,

water, plants and animals, energy and natural resources, environmental health, land and shoreline use, transportation, and public services and utilities.

SEPA empowers local government to protect environmental quality, and it requires state and local officials to make decisions consistent with the policy set forth in the act. When necessary, SEPA can be used to supplement agencies' authority to address gaps in laws affecting environmental quality. Under SEPA, policies, plans, and regulations adopted per GMA are considered "non-project" actions subject to SEPA review.

1.2 SEPA and GMA Integration

The GMA requires compliance with both SEPA and GMA in the comprehensive planning process. Due to similarities, integration of SEPA with GMA eliminates duplication of effort and assures consistency between them. The procedural and substantive requirements of SEPA and GMA have been integrated at several points in the County's planning process:

Public Participation Both SEPA and GMA recognize public participation and agency coordination as fundamental to the planning process. The public participation process for the Plan began in 1985, extending to 1997 where the SEPA analysis is an integral part of the public draft of the Plan; the initial SEPA scoping meeting for the Plan was held in July 1994; as a continuation of scoping, the Rural Citizen's Planning Committees drafted Alternative Land Use Maps directed at achieving identified visions and goals, and compared the gross impacts of each map prior to selecting the Preferred Alternative. Additional public participation activities occurred in the 2006 update, and for more minor amendments occurring through 2015. In 2016, the County conducted two visioning workshops and a survey to offer input on multiple issues concerning the proposed action alternative and visions and goals for the Plan. Chapters of the Plan and maps were provided at the meetings and comment cards used to capture feedback.

Visioning and Scoping Visioning (for the Plan) and scoping (for the EIS) are the fundamental beginning points of each process. The County conducted multiple visioning workshops and a survey to offer input on multiple issues related to the alternatives. Key topics to address in the Plan were gathered during the outreach process. The format of the visioning workshops was set up with chapters of the Plan and maps for participants to review and comment on. Comment cards were used to capture comments and any edits to the chapters of the Plan. The visioning workshops were advertised using flyers posted around the County, an advertisement published on September 8, 2016, a news brief article published on September 13, 2016, in the *Tri-City Herald*, an article in the Prosser Record-Bulletin published on September 14, 2016, a business brief article in the *Tri-cities Area Journal of Business* published on September 16, 2016, and information posted on Benton County's social media pages. All persons (472 individuals) on the Public Participation Plan mailing list were mailed a postcard notification of the versioning workshops and survey. The visioning

workshops were held on September 19 and 28, 2016, in Kennewick and Prosser, respectively. The survey was posted online and received 54 responses.

Existing Conditions Both SEPA and GMA require collection and analysis of information regarding existing conditions. The draft Plan contains a description of existing conditions for the various planning issues/resources.

Goals and Policies Goals and policies play an important role in the development of the GMA comprehensive plan and the SEPA evaluation of plan alternatives. The policies and goals in the 1985 Plan, as minimally amended to reflect GMA requirements for critical areas, UGAs, rural lands, transportation and capital facilities, are drivers for the Plan, along with the general goals of GMA, and the Countywide Goals adopted by the cities and the County.

Impact Analysis GMA requires collection and analysis of data for natural resource lands, critical areas, the mandatory plan elements (i.e., land use, rural, housing, transportation, utilities, capital facilities elements), UGAs, and the siting of essential public facilities. SEPA requires the analysis of the Plan's significant adverse impacts on elements of the natural and built environment. The Plan contains the data inventories and descriptions of resources to which the required SEPA analysis is applied in this chapter.

Mitigation GMA requires plan and ordinance provisions to reduce the impacts of growth on the natural and built environment (e.g., designate and protect by regulation critical areas, protect water quality). Accordingly, the Plan map, text, goals, and policies along with its implementation mechanisms naturally incorporate SEPA required mitigation.

Documents Both SEPA and GMA require preparation of documents for the public participation and decision-making processes, but each has specific guidelines on the information and analysis that must or should be included. This Addendum contains the requirements of SEPA; this Addendum is an integrated portion of the draft Plan document, which has been prepared to satisfy GMA requirements.

1.3 Location

The County is located in southeast Washington and encompasses approximately 1,715 square miles. Five counties surround the County including Klickitat, Yakima, Grant, Franklin, and Walla Walla counties. The Columbia River bounds the north, east, and south sides of the County; the Yakima River intersects the middle of the County from Prosser to its confluence with the Columbia at Richland. Major cities in the County include Benton City, Kennewick, Prosser, Richland, and West Richland.

1.4 EIS Analysis Areas to Enable Plan Action Approvals

A fundamental objective of the state legislature is to make more efficient and timely the process of project review. This is accomplished by integrating comprehensive planning and environmental review so that review and approval of individual development projects becomes, to the extent practical, simply a logical next step in the implementation of the Plan; projects would become in effect "plan actions."

Once the Plan is adopted, future supplements and addendums of the EIS with information rigorous enough to make projects "planned actions" should be pursued if the objective is to aggressively facilitate Plan implementation to accomplish economic or other objectives. This review is focused on specific geographic areas that in the near- and medium-term would experience development pressure as either a matter of Plan policy, or obvious trend. Such areas include:

- The industrial designations in the Finley Rural Planning Area, which are changing to more residential and agriculture land use designations to accommodate development trends
- The Plymouth Rural Planning Area relative to water and sewer service needs and the emerging interest in commercial land uses associated with the Interstate 82 and State Route 14 travel corridors
- The Badger community, including the industrial designation at the Interstate 82 Badger Road interchange in the Richland/West Richland Rural Planning Area
- Red Mountain and the Red Mountain American Viticultural Area (AVA)
- The Hanford Region, including the Vernita Terrace Planning Areas
- Whitstran/Prosser
- Kiona-Benton City
- Expanding urban areas including West Richland, Richland, and Kennewick
- The Southern Plain

2 Alternatives

The County is proposing two alternatives based on projected future growth patterns. The alternatives and how they were developed are described further below.

2.1 How the Alternatives were Developed

Alternative 1, the No Action Alternative, is required under SEPA and calls for keeping the County's existing Plan without modifications. Alternative 2, the Proposed Action Alternative, was developed based on public input during the visioning process. This alternative was also developed through a review of GMA agricultural lands and other land use designations in the County and how they matched current development patterns and population growth projections. Modifications to the land use designations were made to better reflect the existing and potential land use of GMA agricultural lands (lands of commercial long-term significance). Under this alternative, some lands are being removed from GMA agricultural lands designations based upon several years of farming inactivity, disenrollment from the Farm Service Agency Conservation Reserve Program (CRP), and other factors. Changes in density were also made to reflect desire to protect hillsides and hilltops from higher density development and to provide for smaller acreage farms, including vineyards and orchards on north facing slopes, consistent with recent development trends. Additionally, the County received proposals from the cities of Prosser and Richland for UGA modifications, and these requests were incorporated into Alternative 2.

The scoping topics addressed as part of the visioning process are listed below. These include local planning issues identified by the participants the visioning meetings and survey.

2.1.1 *Locally Identified Issues*

UGAs, Rural Character, and Density:

- Control urbanization and urban encroachment into resource lands and designated critical areas
- Concentrate new development in defined growth areas
- Maintain low rural densities
- Preserve farmlands
- Maintain and provide additional open space, parks, and shoreline access
- Agri-tourism infrastructure

Public Services:

- Maintain road capacity
- Maintain water and sewer systems
- Clean up trash and enforce related ordinances

- Increase Wallula Gap Park access
- Increase bicycle and pedestrian access to amenities

Protection of the Natural Environment:

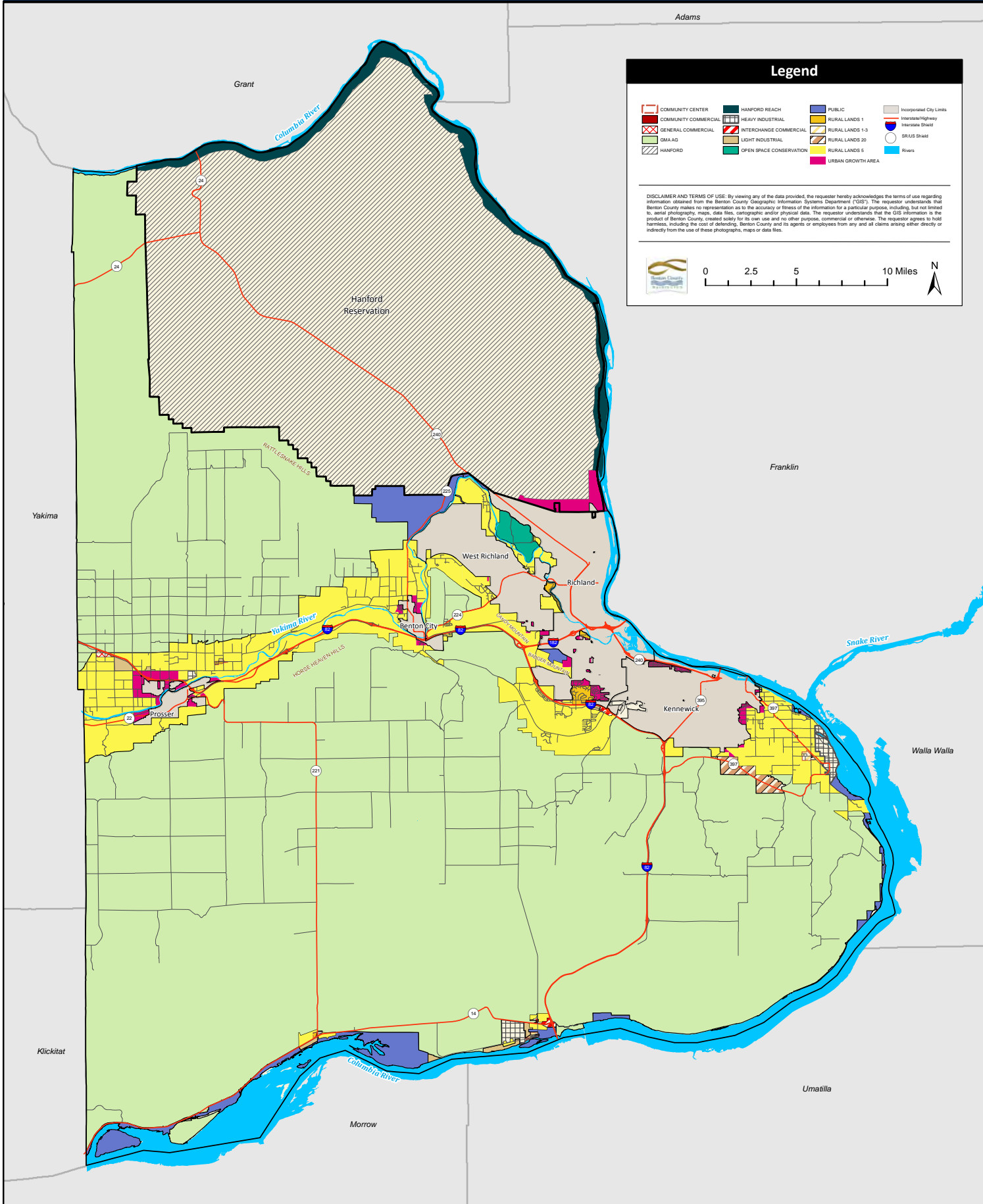
- Protection of the natural environment, specifically fish and wildlife habitat, with an emphasis on riverine and wetland habitats

2.2 Alternatives

2.2.1 Alternative 1: No Action

SEPA requires an EIS study to contain a “No Action” alternative. This alternative would maintain the County’s existing Plan without modifications. This means no land use change would occur to accommodate future growth. The UGAs would remain the same. Limited policy changes may be needed to maintain consistency with the GMA and the Countywide Planning Policies. Figure 2-1 shows the current land use designations in the County. Table 2-1 shows the current distribution of land uses in the County, including city annexation as of 2016.

Figure 2-1: Benton County Current Land Use Designations Map



**Table 2-1
Current Land Use in Benton County**

Land Use Type	Acres	Square Miles	Percent
Cities and Urban Growth Areas	72,245	113	6.58
Hanford	266,351	416	24.27
Hanford Reach	12,443	19	1.13
Unincorporated Area			
GMA Agriculture	647,107	1,011	58.96
Open Space Conservation	2,108	3	0.19
Public	15,163	24	1.38
Rural Lands 1	1,182	2	0.11
Rural Lands 1-3	318	0	0.03
Rural Lands 5	74,039	116	6.75
Rural Lands 20	1,813	3	0.17
Community Center	500	1	0.05
Community Commercial	26	0	0.00
Interchange Commercial	325	1	0.03
General Commercial	202	0	0.02
Light Industrial	1,333	2	0.12
Heavy Industrial	2,344	4	0.21
Total Unincorporated Area	746,460	1,166	68.01
Total County Area	1,097,499	1,715	100

Source: Benton County GIS data

2.2.2 *Alternative 2: Proposed Action Alternative*

Alternative 2, the Proposed Action Alternative, allows for changes in the Plan to accommodate future land uses and population growth within the County. Under this alternative, land use designations would be modified, with additional agricultural lands designated as GMA Agricultural lands, other lands designated to higher density and others to a lower density through a new designation, Rural Resource, that protects steeper slopes and hilltop areas from higher density development in rural areas of the County. For example, Rural Lands 1 and Rural Lands 1-3 are now combined under a Rural Transition land use designation. Rural Lands 5 areas are now designated Rural Remote and Rural Lands 20 as Rural Resource, with some lands previously designated under the No Action Alternative as Rural Lands 5 now designated as Rural Resource with the associated lower density.

Modifications to UGAs are included under this alternative for the cities of Prosser and Richland. The City of Prosser recently de-annexed excess land from the UGA. Based on Prosser’s population projection, a reduction of 483.96 acres of UGA land and an addition of 100.44 acres of land, has been

applied for and is in process. Conversely, the City of Richland added industrial land from 13,641 acres of Hanford land that was transferred from the U. S. Department of Energy (DOE) to the City of Richland, the Port of Benton, and Energy Northwest for industrial use. As a result, 901 acres of Hanford land was added to the Richland UGA.

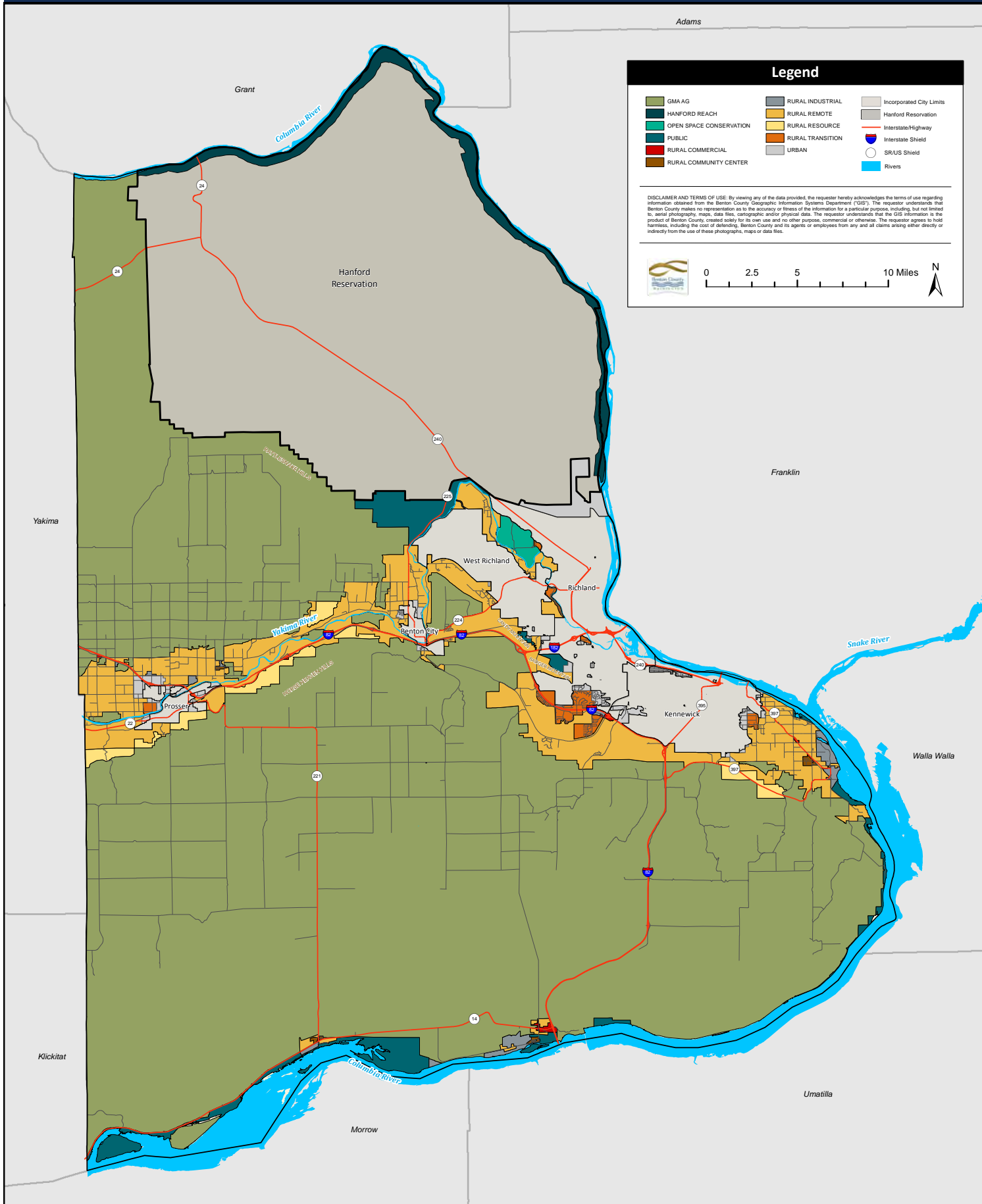
This alternative incorporates the County's Shoreline Master Program (SMP) Update (2014), which is adopted by reference in the Plan. The SMP addresses the Columbia and Yakima rivers, land within 200 feet of the ordinary high water mark (OHWM) of these rivers, their floodways, contiguous 100-year floodplain extending up to 200 feet inland of the floodway, and associated wetlands. The SMP Policy Chapter implements the goals of the state's Shoreline Management Act and is designed to be compatible with the GMA and Plan. This chapter also provides the framework for future decision making and a guide for future development of lands within the County's SMP jurisdiction boundaries.

This alternative also includes planning efforts under the Voluntary Stewardship Program (VSP; RCW 36.70A.700) which is promulgated under the GMA. The County is currently developing a VSP Work Plan to voluntarily protect critical areas on agricultural lands. Implementation of the Work Plan is largely designed to fit within the framework of established programs. The VSP Work Plan is incorporated by reference in the Plan.

Lastly, this alternative identifies the need to develop a long-term strategy for addressing permit exempt wells in the Yakima Basin needed to support rural development, consistent with the goals of the Yakima Integrated Plan and to provide domestic water supplies for the future. This work will include identifying mitigation strategies for providing water for rural development in this part of the County, while avoiding impacts to flows in mainstem reaches and the few Yakima River tributaries that exist in Benton County. The County will complete this work in coordination with the Washington State Department of Ecology, the Yakama Nation, the U.S. Bureau of Reclamation, and stakeholders in the County and Yakima Basin.

Figure 2-2 shows the proposed land use designations for Benton County under the Proposed Action Alternative. Table 2-1 shows the proposed land use designations within Benton County.

Figure 2-2: Benton County Future/Proposed Land Use Designations Map



**Table 2-2
Future/Proposed Land Use in Benton County**

Land Use Type	Acres	Square Miles	Percent
Cities and Urban Growth Areas	72,245	111	6.58
Hanford Site	265,576	415	24.19
Hanford Reach	12,444	19	1.13
Unincorporated Area			
GMA Agricultural	647,223	1,011	58.95
Open Space Conservation	2,169	3	0.20
Public	15,563	24	1.42
Rural Transition	3,140	5	0.29
Rural Remote	68,065	106	6.20
Rural Resource	7,298	11	0.66
Rural Community Center	449	1	0.04
Rural Commercial	426	1	0.04
Rural Industrial	3,312	5	0.30
Total Unincorporated Area	778,218	1,235	
Total County Area	1,115,673	1,782	100

The *Supplement Analysis of the Hanford Comprehensive Land-Use Plan Environmental Impact Statement* was recently published to assess the transition from ongoing site operation and remediation efforts to post-cleanup activities (DOE 2015). As described above, 901 acres of Hanford land was added to the Richland UGA. This and other industrial lands within the cities augment the County's supply of Industrial designated lands.

The Red Mountain Subarea is located within a GMA-designated agricultural district and has also been experiencing significant growth. The area includes the 4,400-acre Red Mountain AVA, a federally-designated grape growing area located on the south slope of the mountain. Future growth and tourism is expected to be managed under the *Red Mountain AVA Master Site Plan* (JTA 2012).

2.3 Similarities and Differences between the Alternative Land Use Maps

Overall, land use in Benton County has several categories: urban, rural, agriculture, industrial, public, and open space lands. Proposed land use designations under each category are discussed in Chapter 3 of the Plan. Generally, the more intense the land use designation and the higher the residential densities allowed, the more adverse the impacts to all systems (e.g., water resources, air quality, capital facilities and infrastructure, public services, indigenous biology, ecology, residential living environments).

Some areas under the Proposed Action Alternative would be added and some removed from the agricultural land designation. Areas proposed to be added include areas that are currently farmed, are irrigated, have a suitable soil type, and are large enough to be commercially viable in the long-term. These areas are generally located on the border of the existing designated agricultural resource land. Areas that would be removed are generally located near population centers and have the potential for more intense use, and are lower productivity agricultural lands that in many cases have been idle for several years, even after disenrollment from CRP.

Land Use Element:

Under the Proposed Action Alternative, future land uses and growth affecting the Land Use Element would be accommodated by changes in land use designations. This alternative would be consistent with site-specific planning efforts in areas experiencing growth such as Hanford and the Red Mountain Subarea.

Natural Resources Element:

The Natural Resources Element would include management of natural resources under site-specific planning efforts. The Proposed Action Alternative would adopt management plans such as the SMP or VSP. Concentrating density to higher density and UGAs would reduce the inappropriate conversion of undeveloped land into developed area.

Economic Element:

The Economic Element synthesizes the various components of Plan that relate to current and emerging land use, growth, and economic issues. Local and regional economic development plans, such as the Economic Development Implementation Plan, would continue to support projected growth of agricultural and non-agricultural economies in the County. Under the Proposed Alternative, the Economic Element would support projected growth of agricultural and non-agricultural economies in the County.

Housing Element:

The Housing Element provides a framework for future planning decisions and outlines goals and objectives the County plans to implement in meeting its housing needs. Housing density would potentially be reduced in some areas that would have a changed designation to Rural Resource while other areas could see higher density, such as less-productive agricultural lands to be designated as Rural Remote.

Transportation Element:

The Transportation Element would continue making preferred improvements in corridors experiencing varying levels of congestion. Efficient transportation links to regional, national, and global markets are essential to the maintenance and growth of the County's economic base. Additionally, the ease with which people can move throughout the County is an important quality of

life factor assessed in the Plan. Peak hour congestion problems would still need to be addressed within urban areas, notably on routes such as State Route 240 and George Washington Way used by Hanford Site commuters, Queensgate Drive, and on Columbia Center Boulevard related to the Columbia Center Commercial Retail complex in Kennewick. Demands on transportation facilities under the Proposed Action Alternative would be more localized by increasing density in urban areas and associated adjacent higher density areas.

Parks and Recreation and Capital Facilities Elements:

The Parks and Recreation and Capital Facilities Elements address facilities that are important to accommodate the County's projected growth. The capital facilities such as parks and recreation would remain largely unchanged. Demands on municipal facilities, fire and emergency services, and police services would be more localized by increasing density in urban areas under the Proposed Action Alternative.

Utilities Element:

The Utilities Element of the Plan addresses utility services within the County. The utility system plans (e.g., water, sewer, stormwater) would continue to serve existing and future developments. Utility service demands would be more localized to urban areas and associated adjacent higher density areas under the Proposed Action Alternative.

3 Affected Environment, Impacts, and Mitigation Measures

3.1 Affected Environment

The physical and human elements of the affected environment are described in the Plan and 1981 EIS. This Addendum is focused on incremental additional impacts and mitigation measures described in the following sections.

3.2 Impacts and Mitigation Measures

The impact analyses for a non-project action such as the Plan are based on the amount of planned growth, areas where growth will occur, land use type and character, and associated adjacent higher density areas. The Plan itself would not result in direct changes to the physical and human environment. However, the Plan provides a policy framework that is intended to guide future development and any impacts to the environment would be indirect. Table 3-1 describes potential impacts to physical and human elements of the environment from the two alternatives described herein.

Mitigation measures are primarily based on regional plans and policies developed to address the impacts of forecast growth. Similarly, improvements to important infrastructure systems needed to accommodate planned growth are identified. Under the Proposed Action Alternative, the Plan references goals and policies intended to address ways to anticipate and mitigate the potential impacts of planned growth on the environment and the County's quality of life. Table 3-1 also includes mitigation measures to address potential impacts from future development.

**Table 3-1
Summary of Impacts and Mitigation Measures by Alternative**

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
<i>Physical Environment</i>			
Earth	Earth-related impacts under the No Action Alternative would be related to development, scaling with the intensity of future land uses within the planning areas. Existing land use designations would allow development to continue to move outward from urban centers, including in some areas potentially better suited for agricultural uses. Future development would be subject to environmental review.	The Proposed Action would reduce land use density in resource lands and concentrate density in cities and UGAs with higher density designations. This would reduce the intensity of development within resource lands and concentrate development in higher-intensity use areas. Agricultural practices would be concentrated to resource lands. Changes in density would also protect hillsides and hilltops from higher density development. SMP and VSP adoption would further protect earth resources.	<ul style="list-style-type: none"> • Compact soils at densities appropriate for planned land uses. • Provide vegetative cover or soil cement on exposed surfaces. • For agricultural practices, implement voluntary conservation measures described in the Voluntary Stewardship Program Work Plan (BERK Consulting 2017)
Air	The No Action Alternative is Future development potentially impacting air quality would be subject to environmental review by the Benton Clean Air Agency.	The Proposed Action would not directly impact air quality. Future development potentially impacting air quality would be subject to environmental review by the Benton Clean Air Agency.	<ul style="list-style-type: none"> • Maintain compliance with Benton Clean Air Agency requirements during construction and operation
Water	Water quality impacts could occur from development activities with the potential to cause erosion or increase impervious surfaces that could discharge contaminated or sediment-laden water to nearby surface waters. Water-related impacts under the No Action Alternative would be related to development, scaling with the intensity of future land uses within the planning areas. Water supply impacts would also be scaled with future growth. Rural development within the Yakima River basin would be limited under this alternative.	Water-related impacts under the Proposed Action would also be scaled with development. Reducing the intensity of development within resource lands and concentrating development in higher-intensity use areas may help to control water quality impacts through existing stormwater infrastructure. Water supply impacts would also be scaled with future growth. Mitigation strategies for addressing permit exempt wells would be provided under this alternative to allow rural development within the Yakima River basin.	<ul style="list-style-type: none"> • Comply with critical areas ordinance per BCC Title 15 • Comply with Shoreline Master Program regulations • Comply with Federal NPDES regulations and County stormwater regulations require stormwater quantity and quality controls. The County has adopted the Ecology Stormwater Management Manual for Eastern Washington (Ecology 2004).

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Water (cont.)			<ul style="list-style-type: none"> • Develop and implement a long-term strategy for addressing permit exempt wells needed to support rural development to meet the goals of the Yakima Integrated Plan and to provide domestic water supplies for the future.
Fauna and Flora	<p>Development puts pressure on terrestrial and aquatic ecosystems that provide important habitat features. Habitat fragmentation caused by development has the potential to alter habitat connectivity, causing some species to migrate into remaining undeveloped areas. The conversion of undeveloped or underutilized land would continue to occur under the No Action Alternative. Development of these parcels could fragment wildlife habitat. Impacts to flora would scale with the intensity of land uses within the planning areas. Rural areas would be most impacted under this alternative by allowing higher-density development to occur.</p>	<p>Encouraging higher-density development in cities or UGAs as part of the Proposed Action Alternative would potentially relieve development pressure on flora in rural areas. Additionally, approximately 61 more acres would be designated as Open Space Conservation under this alternative. This conservation area would protect habitat area from future development. Approximately 7,300 acres of land would be designated as Rural Resource, which would protect flora in some areas such as rural open space, wildlife habitat, public open space for ridges, slopes, and bluffs; the latter particularly associated with the Yakima River corridor. Some lands would be removed from GMA Agricultural Lands designation due to inactivity or disenrollment from CRP.</p>	<ul style="list-style-type: none"> • Comply with critical areas ordinance per BCC Title 15 for fish and wildlife conservation areas, wetlands, and frequently flooded areas • Provide erosion and stormwater control measures during construction, particularly in areas adjacent to surface waters that provide fish and wildlife habitat • Consider landscaping with native plants to provide vegetation of habitat significance in streetscapes, buffers for stormwater swales, rain gardens, and other habitat features. • Reduce impervious surface area by adopting implementing applicable LID requirements per the Stormwater Management Manual for Eastern Washington (Ecology 2004). • Sponsor or encourage public education about the benefits of native vegetation.

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Noise	Noisy activities associated with future development under the No Action Alternative would be subject to the Benton County Noise Ordinance in BCC 6A.15.	The Proposed Action would reduce land use density in resource lands and concentrate density in cities and UGAs with higher density designations, potentially reducing construction noise activities associated with denser development in rural areas. Noise-generating activities associated with future development and land use activities under the Proposed Action Alternative would be subject to the Benton County Noise Ordinance in BCC 6A.15.	<ul style="list-style-type: none"> • For construction activities, comply with Benton County Noise Ordinance in BCC 6A.15.
Light and Glare	The generation of light and glare would scale with future development. Under the No Action Alternative, light and glare impacts from development would be more diffuse, particularly in rural areas where higher-density development would continue to occur.	The Proposed Action Alternative would potentially reduce light and glare impacts in rural areas by concentrating higher-density development in cities and UGAs.	<ul style="list-style-type: none"> • Incorporate directional lighting into streetscapes and other development design, as applicable
Land Use	The No Action Alternative would allow development to occur according to existing land use designations. Future growth would be required to meet existing land use designation criteria previously designed to accommodate past trends in the County. This could impact areas that would be designated as Rural Resource under the Proposed Action Alternative. Site-specific planning efforts in areas experiencing growth such as Hanford and the Red Mountain Subarea would also be implemented according to existing zoning designation criteria and would not be accommodated by the proposed land use designation changes under the Proposed Action Alternative.	The Proposed Action would reduce land use density in resource lands and concentrate density in cities and UGAs with higher density designations. This would reduce the intensity of development within resource lands and concentrate development in higher-intensity use areas. Agricultural practices would be concentrated to resource lands. Rural Transition areas would accommodate future population growth within cities and UGAs near Kennewick, Richland, and Prosser. The City of Prosser would decrease its UGA in response to growth projections, whereas Richland would expand its UGA to include Hanford Site industrial area. Approximately 7,300 acres of land as Rural Resource, preserving the County's rural character.	<ul style="list-style-type: none"> • Utilize existing high-density areas for future population and employment growth within the County • Implement rural area protection or preservation measures to maintain the character of rural areas within the County • Meet population growth targets and housing demand through developing existing planned areas and infill developments • Manage land use in expanding areas such as Red Mountain per the <i>Red Mountain AVA Master Site Plan (JTA 2012)</i>

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Land Use (cont.)			<ul style="list-style-type: none"> • Manage the transition of cleanup activities within the Hanford Site per the <i>Supplement Analysis of the Hanford Comprehensive Land-Use Plan Environmental Impact Statement</i> (DOE 2015)
Natural Resources	<p>Per Section 4 of the Plan, natural resources comprise a variety of resources including climate, soils, agricultural, minerals, water, and critical areas. As described above, impacts too many of these natural resources would be scaled with the intensity of future land uses and population growth. Under the No Action Alternative, development would occur according to existing land use designations. This could impact areas that would be designated as Rural Resource under the Proposed Action Alternative due to the presence of agricultural resources.</p>	<p>As described above, concentrating density in cities and UGAs would potentially reduce impacts to natural resources in rural areas by utilizing existing infrastructure to control stormwater and waste streams. The low intensity use of rural land also provides fish and wildlife habitat, open space, and other environmental benefits. Agricultural resources in rural areas would also be protected from development under this alternative. SMP and VSP adoption would further protect natural resources including shorelines and other critical areas.</p>	<ul style="list-style-type: none"> • Comply with critical areas ordinance per BCC Title 15 • For agricultural practices, implement voluntary conservation measures described in the Voluntary Stewardship Program Work Plan (BERK Consulting 2017) • Protect mineral resources per the provisions of the GMA • Manage mineral resource extraction on the Hanford Site per the <i>Draft Hanford Industrial Mineral Resource Management Plan</i> (2001)
Risk of Explosion or Hazardous Emission	<p>The No Action Alternative is not expected to increase the risk of explosion or hazardous emissions.</p>	<p>The Proposed Action Alternative is not expected to increase the risk of explosion or hazardous emissions.</p>	<ul style="list-style-type: none"> • Manage the risk of explosion or hazardous emissions in accordance with local building and environmental codes
<i>Human Environment</i>			
Population	<p>As described in the Plan, population within the County has continued to grow at a rate of over 20% in recent decades. The No Action Alternative would allow development to occur according to existing land use designations and would accommodate future growth projections within the existing designations. This includes allowing higher density growth to occur within areas designated as Rural 1 through 5.</p>	<p>The Proposed Action Alternative would lower the land use density in resource lands which would further concentrate density in cities and UGAs with higher density designations. Rural Transition areas would accommodate future population growth within cities and UGAs, including areas near Kennewick, Richland, and Prosser, where a significant amount of population growth is expected to occur.</p>	<ul style="list-style-type: none"> • Concentrate development in areas with existing infrastructure and near employment centers • Meet housing demand through developing existing planned areas and infill developments • Consider infill incentives and upzones in cities and UGAs

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Housing	The No Action Alternative would allow development to occur according to existing land use designations. The location and type of housing allowed within these land use designations would not change.	Based on the population estimates, the County will need to add 7,070 new homes in the next 20 years. The Proposed Action Alternative would lower the land use density in resource lands which would further concentrate density in cities and UGAs with higher density designations. The land use designations would be designed to accommodate population growth, and provide housing and employment opportunities in closer proximity to the appropriate zoning and land type. For example, low density residential uses would be allowed in Rural Resources areas	<ul style="list-style-type: none"> • Consider similar mitigation measures as described in “population” above
Transportation/ Circulation	The No Action Alternative would allow development to occur according to existing land use designations. This could result in increased and more diffuse impacts to transportation facilities from future development in rural areas from higher density development. Maintenance of transportation facilities would also be greater and more widespread rather than focused near cities and GMAs.	Increased density in cities and UGAs under the Proposed Action Alternative would increase demand on transportation facilities and circulation, including trails and paths located throughout the County. Major transportation facilities would be impacted by higher density growth including SR-240 and George Washington Way used by Hanford Site commuters, Queensgate Drive, and on Columbia Center Boulevard. Growth in rural areas would need to be accommodated by updates to the County road system. The <u>Six Year Road Program</u> , which is incorporated by reference in the Plan, identifies capital projects to be carried out in the near term based on tracking and reporting.	<ul style="list-style-type: none"> • Work with development applicants to oversee that appropriate coordination with affected agencies and property owners occurs upon future development • Implement transportation improvements in accordance with the BFCG 2016 Regional Active Transportation Plan for Benton and Franklin Counties and Tri-Cities Urban Area • Cooperate with the Washington State RTPO and BFCG for levels of service • Consider multimodal transportation and alternative transportation opportunities to and from growth areas such as the Red Mountain Subarea.

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Public Services	Future population and employment growth would result in increased demand on public services. The No Action Alternative would potentially increase the service area for public services by allowing higher density development to occur in rural areas.	The Proposed Action Alternative would potentially maintain the service area for public services by concentrating density in cities and UGAs with higher density designations; with significant growth in rural areas still projected and associated public services increases also occurring.	<ul style="list-style-type: none"> • Locate public services in close proximity to high-density areas
Energy	Energy demand would continue to increase with future population growth.	Similar to the No Action Alternative, energy demand would continue to increase with future population growth.	<ul style="list-style-type: none"> • Provide incentives for businesses and households to supply alternative energy to the grid • Encourage and educate electric utility customers of energy conservation measures
Utilities	Future population and employment growth would result in increased demand on utilities. The No Action Alternative would potentially increase the service area for utilities by allowing higher density development to occur in rural areas.	Similar to the No Action Alternative, future population and employment growth would result in increased demand on utilities. The Plan includes a policy recognizing that municipal governments and other water utilities are the best long-term providers within UGAs. However, significant growth in rural areas would occur and increase demand for utility services outside of urban areas as well.	<ul style="list-style-type: none"> • Implement similar mitigation measures to “Energy” as described above • Employ consistency between city and county land use planning measures for consistency between land use patterns and utility usage • Encourage new development to occur in currently developed areas where utility corridors are located
Human Health	The No Action Alternative would not have any direct impacts on human health. Indirect impacts to human health could occur through impacts to other elements as the environment such as air or water quality from development.	Similar to the No Action Alternative, it is not expected that the Proposed Action Alternative would have direct impact to human health. The Plan includes several goals for protecting human health, including ensuring that land uses are compatible with surrounding uses that maintain public health, safety, and general welfare.	<ul style="list-style-type: none"> • Employ environmental protection measures according to the elements of the environment as described above

Element	Alternative 1: No Action	Alternative 2: Proposed Action	Mitigation Measures
Aesthetics	Continued population and employment growth would increase the potential for changes to the character and visual quality of the County.	The Proposed Action Alternative would concentrate growth in higher density areas and maintain the rural character of rural areas. Changes in density would also protect rural resources such as hillsides and hilltops from higher density development. This action would help to retain existing neighborhood character which would also reduce visual change.	<ul style="list-style-type: none"> • Encourage rural land uses in rural areas and move higher density development to cities and UGAs • Ensure future development is consistent with the aesthetic character of the neighborhood or land use designation in which it is located. • Future development should comply with SMP and VSP to protect and/or enhance shorelines and other critical areas within the County.
Recreation	Demand for recreational areas would continue to increase with population growth under the No Action Alternative.	No direct impacts to recreation are expected to occur under the Proposed Action Alternative. The Plan includes goals and policies to encourage recreational uses where practicable throughout the County.	<ul style="list-style-type: none"> • Provide for park or recreation opportunities near urban centers through land use designations • Provide shoreline access where feasible consistent with the SMP (Benton County 2014)
Archaeological/ Historical	Future development under the No Action Alternative may result in indirect impacts to archaeological or historical sites.	Adoption of the Plan would not have any direct impacts on archaeological or historical sites. However, indirect impacts may occur from future development. The Plan includes goals and policies for avoiding or mitigating for impacts to archaeological and historical sites from development.	<ul style="list-style-type: none"> • Future development should comply with applicable laws and regulations regarding impacts to cultural resources. Section 106, Executive Order 05-05, and RCW 27.53

Notes:

- BCC: Benton County Code
- BFCG: Benton-Franklin Council of Government
- CRP: Conservation Resource Plan
- GMA: Growth Management Act
- LID: low-impact development
- NPDES: National Pollutant Discharge Elimination System
- RCW: Revised Code of Washington
- RTPO: Regional Transportation Planning Organization
- SMP: Shoreline Master Program
- UGA: Urban Growth Area
- VSP: Voluntary Stewardship Program

4 Comments and Responses

See Appendix M of the Benton County Comprehensive Plan for public comments received during the review process and associated responses.

5 References

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- BFCG (Benton-Franklin Council of Governments), 2016. 2016 Regional Active Transportation Plan for Benton and Franklin Counties and Tri-Cities Urban Area. Prepared for Benton-Franklin Council of Governments. June.
- DOE (U.S. Department of Energy), 2001. *Draft Hanford Industrial Mineral Resource Management Plan*. DOE/RL-2000-61. Richland, Washington.
- DOE, 2015. *Supplement Analysis of the Hanford Comprehensive Land-Use Plan Environmental Impact Statement*. Publication No. DOE/EIS-0222-SA-02. April.
- Ecology (Washington State Department of Ecology), 2004. Stormwater Management Manual for Eastern Washington. Publication Number 04-10-076. September 2004.
- JTA (J.T. Atkins Company, PC), 2012. *Red Mountain AVA Master Site Plan, Benton County, Washington*. Updated September 2012.

Appendix C

Public Participation Plan

Benton County Public Participation Plan 2017 Comprehensive Plan Update

Introduction

One of the mainstays of the Growth Management Act (GMA) is citizen participation. This concept is first articulated in the GMA planning goals, as noted in RCW 36.70A.020. The guidelines that follow in this Public Participation Plan (PPP) are intended to guide and form the basis for public participation related to the GMA and Benton County's planning processes in updating the Comprehensive Plan for 2017. Benton County intends to comply with these guidelines as appropriate to each situation. However, it should be noted that deviations from these guidelines are inevitable and may be warranted, given unique and specific circumstances. RCW 36.70A.140 allows for alterations to the PPP without voiding the overall scope of the project.

Scope of review

Planning Goals and Policies	Utilities Element
Land Use Element	Transportation Element
Housing Element	Critical Areas Element
Capital Facilities Element	Other Elements

Public Participation Guidelines

1. Information services and communication programs.

Benton County will develop, implement, and maintain communication and information services with the intent and purpose of involving and including the most comprehensive and diverse cross-section of the citizens of the community. Benton County will inform and include the public through the following portals:

- Develop and maintain an internet website dedicated to the County's update process.
- Establish, advertise and become actively engaged in responding to written inquiries through email, fax and standard mail.
- Compile a list of parties interested in the PPP obtained from sign-in sheets, written correspondence, and known community groups.

2. Broad distribution of proposals and possible alternatives.

Benton County will distribute documents and information so that they are readily available in a timely fashion for interested parties who would like to view them. Supporting documents such as reports, analyses, recommendations, or environmental reviews should also be easily

accessible. Benton County will take the following steps to ensure that important documents are available in a timely manner by using these guidelines:

- Proposals should be available 10 days prior to a public meeting or hearing scheduled for discussion and/or a decision.
- Electronic versions of documents will be available through the County's website.
- Hard copies are available at the Benton County Planning Department.

3. Public meetings after effective notice.

Benton County will publicize all public meetings and hearings to ensure that the largest number of individuals is made aware of the opportunities to become involved in the Comprehensive Plan update. The following key points will allow this to take place:

- Meet RCW 36.70 and 36.70A requirements.
- Legal notices are published at intervals as required by state law.
- Notices published on the County website.
- Fliers available at the Benton County Planning Department.
- Mailings and emails sent to a compiled list of interested parties.

Meeting Participants

- *Residents*
- *Property Owners*
- *Businesses*
- *Non-profit Groups*
- *Governmental Agencies*

4. Provisions for ensuring open discussions.

Benton County will ensure that public meetings will provide opportunities for an open discussion relating to the relevant issues and these meetings and hearings will allow for appropriate public testimony. Benton County will have the following standards in place to promote the availability of open discussions:

- Schedule meetings and hearings at a date, time and place that should be convenient.
- Provide brief overviews outlining the documents and purpose of each meeting.
- Attendees are encouraged to identifying themselves with sign-in sheets.
- Summaries of each meeting shall be posted as soon as possible.
- Special arrangements to be made available for ADA compliance.

5. Opportunity for submitting written comments.

Benton County will encourage and promote the submission of written comments and/or testimony throughout the Comprehensive Plan Update process. In many instances, detailed, technical, or personal comments can be best expressed and understood in a written format. The following steps should be taken by Benton County staff to encourage written comments:

Tips for submitting written comments

- *Submit prior to deadlines*
- *Helps clarify verbal comments*
- *At public meetings, email or standard mail*
- *Include contact information*

- Provide the contact information of the individuals where written materials should be sent.
- Have clear and concise deadline requirements for submitting written comments.
- Persons testifying should be encouraged to provide concise written statements.
- Promote the use of surveys, alternative interactive displays, or the use of electronic communication technologies.

6. Considerations of and responses to public comments.

Benton County will consider all relevant public comments and public testimony in the decision making process of the Comprehensive Plan update. There are various methods for involving and informing the public, publicizing proposals, and soliciting public comments or opinions. Additional steps will be taken so that comments and recommendations from the public are reviewed by the decision-makers for relevancy. Those would include the following:

- Time should be reserved subsequent to the close of a hearing or comment deadline period prior to the decision so that relevant materials can be adequately reviewed.
- Reconvene a hearing for the purpose of addressing comments that may be used by decision-makers if found necessary.
- Substantive comments pertaining to studies, analyses or reports should be included in the published document itself, such as an EIS statement.
- The record of all comments and testimony shall be compiled and maintained by the staff of the Benton County Planning Department.
- Relevant comments or testimony should be addressed through the findings-of-fact portion of the written decision or recommendation.

Work Plan/Scheduling

Deadline

Phase I Public Participation Plan

March 2015

- Develop and adopt the PPP for the 2017 Comprehensive Plan update.
- Conduct a preliminary GMA Compliance review.

Phase II Visioning and Public Outreach

June 2015

- Develop a website for the 2017 update.
- Compile an interested party's database.

Phase III Finalize Scope of Work

August 2015

- Complete a finalized scope of work.
- Provide an all-encompassing outline of what is to come.

Phase IV Draft Comprehensive Plan Elements

April 2016

- Complete each of the elements of the Comprehensive Plan.
- Produce a complete first draft of the Comprehensive Plan update.

Phase V Revisions and Update

June 2016

- Circulate the first draft of the document.
- Hold public meetings to allow for public comment.
- Provide concise feedback to those who commented.

Phase VI Planning Commission and County Commissioner's review and approval.

December 2016

- Schedule a public hearing with the Planning Commission.
- Submittal and discussion before the Planning Commission.
- Forward recommendation and documents to County Commissioner's for their consideration.
- A public hearing before the County Commissioners.

Phase VII Submit the Comprehensive Plan to the State.

February 2017

- Provide copies to the necessary State agencies for required comments.
- Review their comments and address any necessary concerns.
- Begin 60-day appeal period after publication of Notice of Adoption.

Appendix D

Visioning Summary Results

VISIONING SURVEY RESULTS FOR THE BENTON COUNTY COMPREHENSIVE PLAN UPDATE

An online survey was conducted from August 30, 2016 to October 11, 2016. There were 54 participants in the survey. The survey included 7 questions and sought to capture public input on issues and priorities for Benton County.

2% of the responses were from Finley, 28% of the responses were from Kennewick, 54% of the responses were from Richland, 5% of the responses were from West Richland, 5% of the responses were from Benton City, 6% of the responses were from Prosser, and there were no responses from Paterson or Plymouth.

Key issues/priorities identified from survey include:

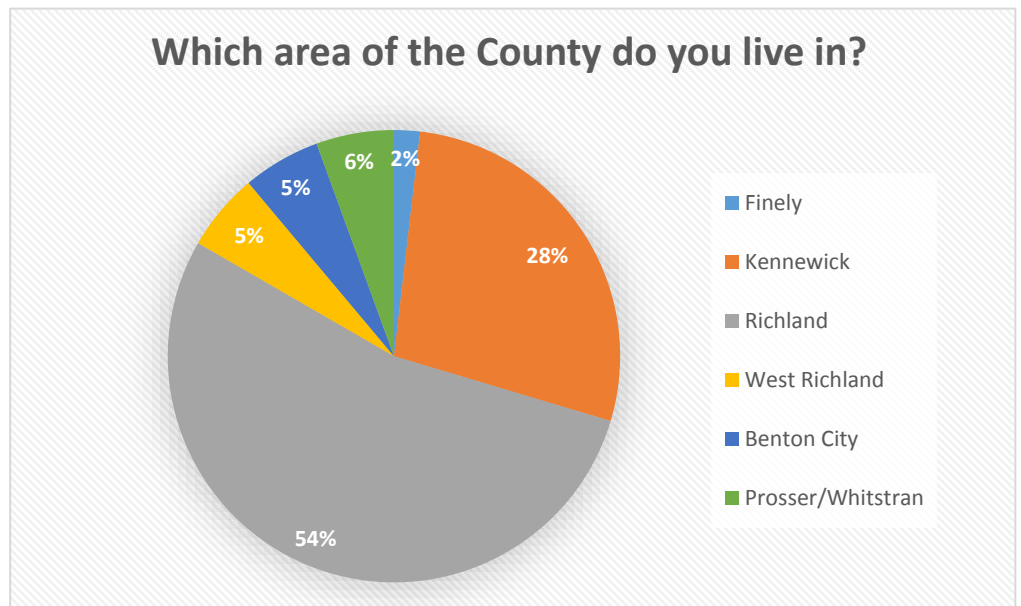
- Preserving the rural character
- Conserving open space
- Preserve hillsides (no development)
- Better access to rivers
- Increase number and quality of parks
- Road improvements
- Limit sprawl
- Safety
- Bike lanes/pedestrian friendly County roads
- More hiking and (non-motorized) biking trails
- Affordable housing

COMPLETE SURVEY RESULTS

Question 1:

Which area do you live in or nearest to?

Finley - 2%
Kennewick - 28%
Richland - 54%
West Richland - 5%
Benton City - 5%
Prosser - 6%
Paterson - 0
Plymouth - 0



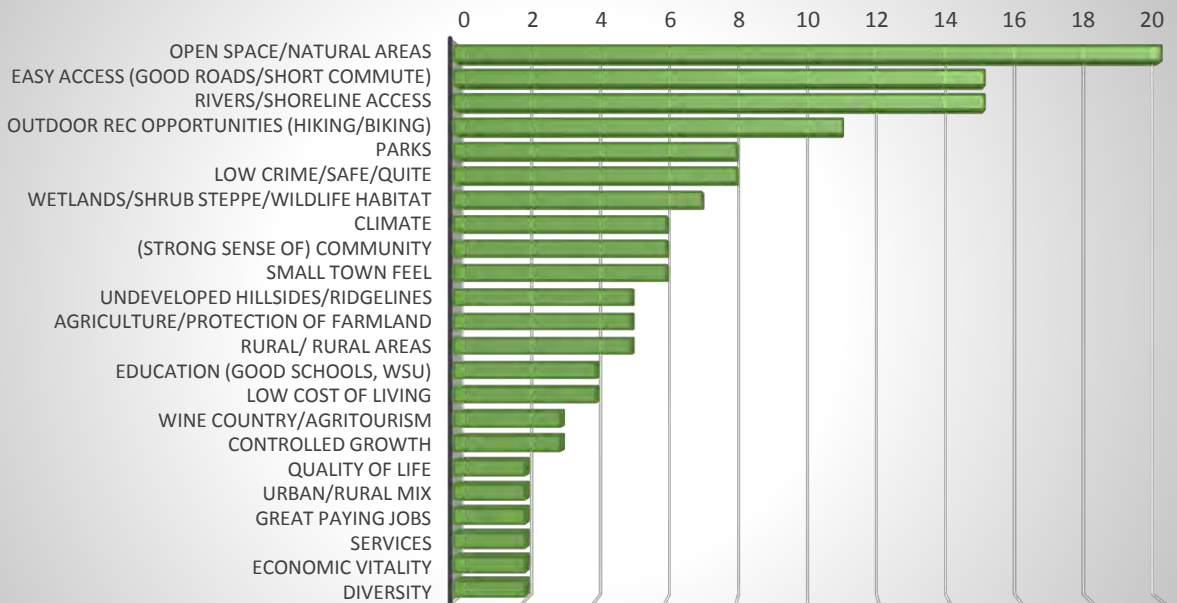
Question 2:

What three words or short phrases describe what you value most about Benton County?

Summary of responses (in order of ranking):

Open space/natural areas
Easy access (good roads/short commute)
Rivers/Shoreline access
Outdoor recreational opportunities (hiking/biking)
Parks
Low crime/safe/quite
Wetlands/Shrub Steppe/Wildlife habitat
Climate
(Strong) Community
Small town feel
Undeveloped hillsides/ridgelines
Agriculture/Farming/Protection of farm land
Rural/ rural areas
Education (good schools, WSU)
Low cost of living
Wine country/agritourism
Controlled growth
Quality of life
Urban/rural mix
Great paying jobs
Services
Economic vitality
Diversity
Opportunity for growth
Trees
People
Attention to art
Convenient to airport
Small business
Collaboration with cities
Open government

Value Most about Benton County

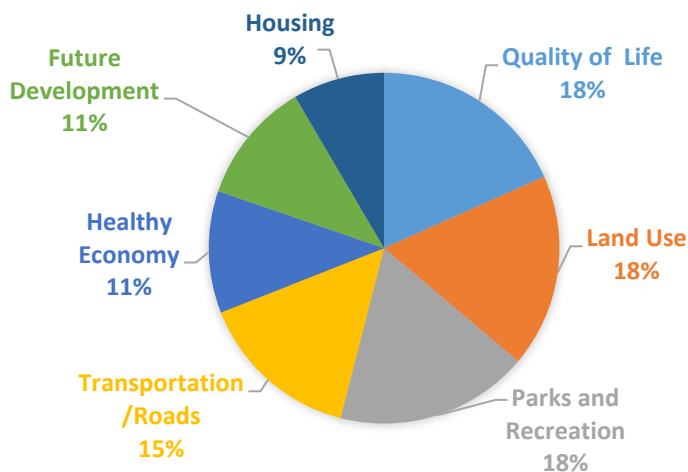


Question 3:

What key concepts/ideas/goals are most important **to be included in the County's** 20-year vision (statement) plan?

Quality of Life	18%
Land Use	18%
Parks and Recreation	18%
Transportation/Roads	15%
Healthy Economy	11%
Future Development	11%
Housing	9%

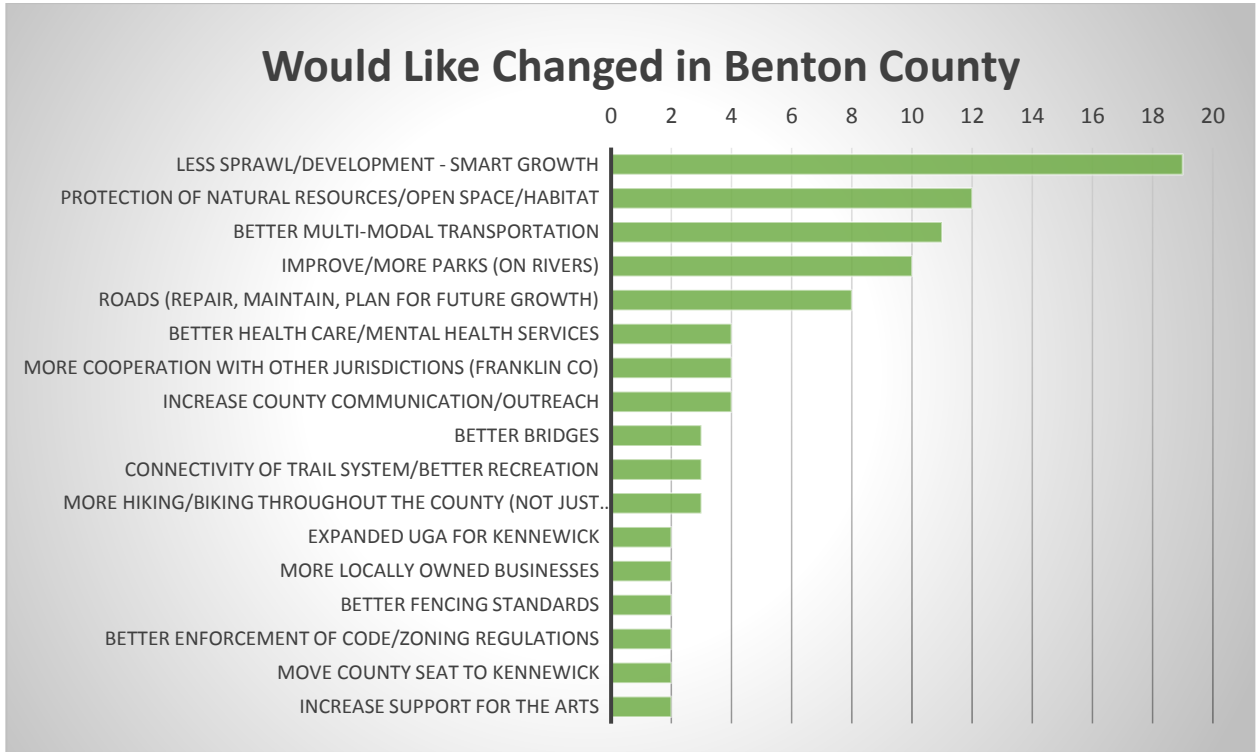
MOST IMPORTANT CONCEPTS TO INCLUDE IN 20-YEAR VISION STATEMENT?



Question 4:

Briefly describe 1-3 things you would like to see changed in Benton County.
 Summary of responses (in order of ranking):

Less sprawl/development - smart growth (mixed use housing)
Protection of natural resources/open space/habitat
Better multi-modal transportation (bike lanes, more sidewalks, better public transportation)
Improve/more parks (on rivers)
Roads (repair, maintain, plan for future growth)
Better health care/mental health services
More cooperation with other jurisdictions (Franklin Co)
Increase County communication/outreach of actions/activities
Better bridges
Connectivity of trail system (Ridges to Rivers)/Better recreation
More hiking/biking throughout the County (not just Tri-cities)
Expanded UGA for Kennewick
More locally owned businesses
Better fencing standards
Better enforcement of code/zoning regulations
Move County Seat to Kennewick
Increase support for the arts
RL-5 zoning is detrimental
Increase ED funding
Less traffic congestion
Better quality houses
Enforce noxious weed control
More trees
Cost of land
Preserve irrigated wetlands
Ban marijuana
Better fire protection for natural areas
More support for animal control/laws against cruelty
More wineries/specialty retailers
More sheriff deputies
Ban fireworks

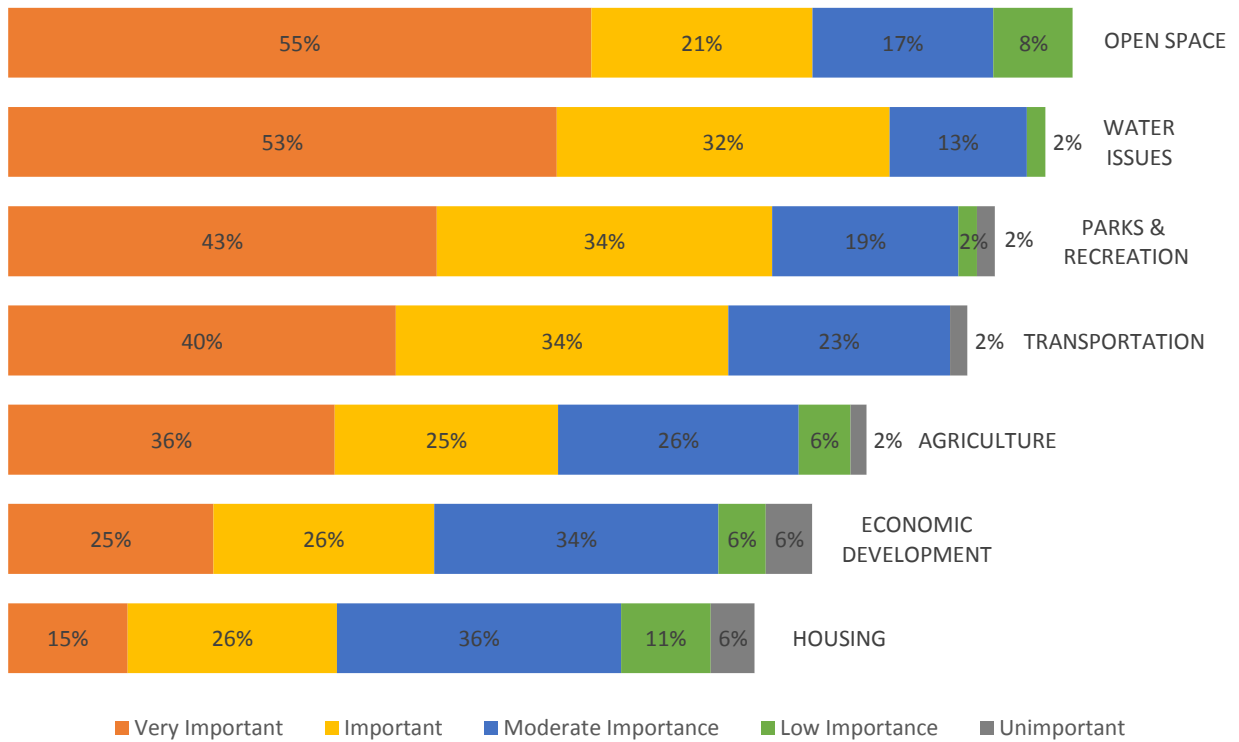


Question 5:

Please indicate the priority level of the following Comprehensive Plan topics the County should focus on during the Comprehensive Plan Update.

	Very Important	Important	Moderate Importance	Low Importance	Unimportant
Open Space/ Rural Character	55%	21%	17%	8%	-
Water Issues	53%	32%	13%	2%	-
Parks and Recreation	43%	34%	19%	2%	2%
Transportation/ Roads	40%	34%	23%	-	2%
Agriculture	36%	25%	26%	6%	2%
Economic Development	25%	26%	34%	6%	6%
Housing	15%	26%	36%	11%	6%

Priority Topics for Comprehensive Plan Update



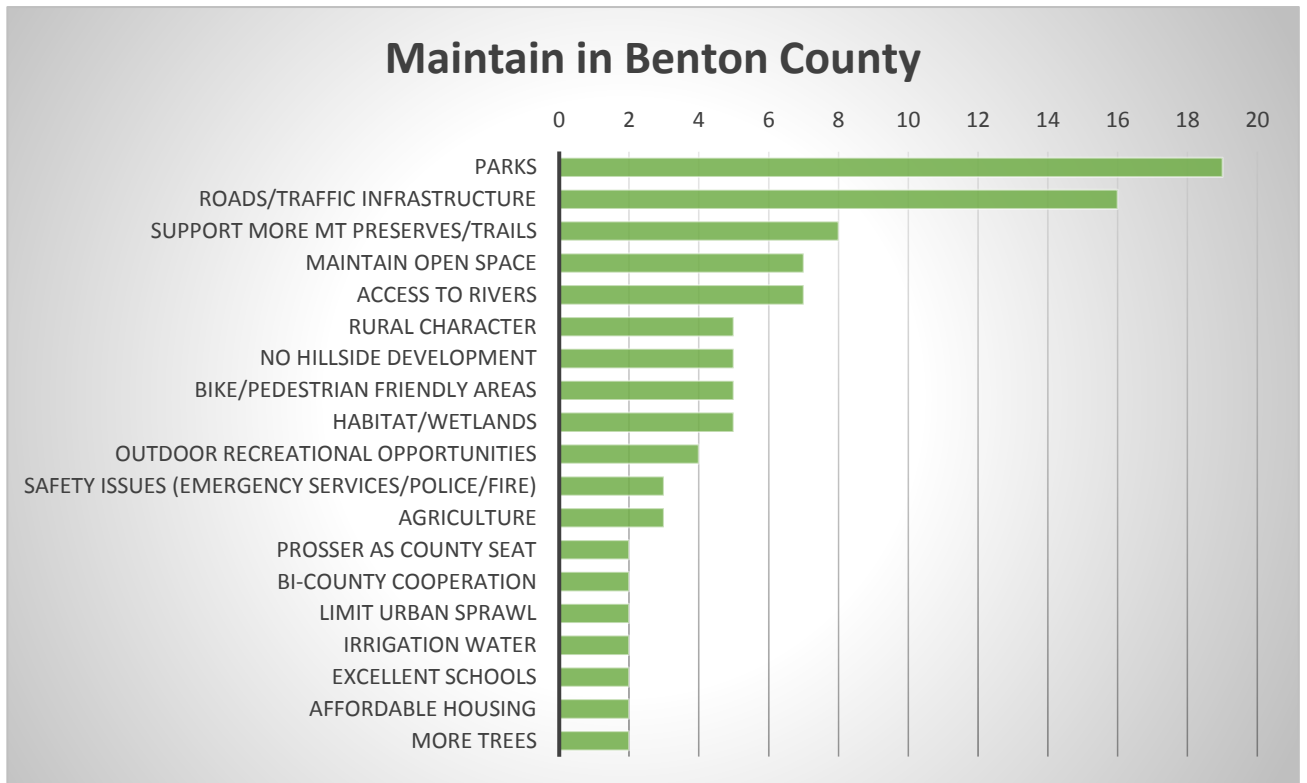
Question 6:

Briefly describe 1-3 things you would like to see maintained in Benton County.

Summary of responses (in order of ranking):

Parks
Roads/traffic infrastructure
Support more Mt preserves/trails
Maintain open space
Access to rivers
Rural character
No hillside development (more restriction)
Bike/Pedestrian friendly areas
Habitat/wetlands
Outdoor recreational opportunities
Safety issues (emergency services/police/fire)
Agriculture
Prosser as county seat
Bi-county cooperation
Limit urban sprawl
Irrigation water
Excellent schools

Affordable housing
More trees
1 acre zoning near UGAs
Economic growth & jobs
Rattlesnake Mt tours
Natural areas and shorelines
Agritourism infrastructure
Real estate tax rates
Land use freedom
Limit light pollution
Small business
Trash removal from empty lots
Weed control
More Commercial Interstate zoning
Cost of living
Telecommunications infrastructure
Attractive directional signage
Tourism
Recycling for Fairgrounds
Desert landscaping



Question 7:

Do you have any other comments related to growth or long-term visioning for Benton County?

Less damaging mosquito control.
Once wetlands are designated they are hard to reverse. The wetlands 5 allowed for a quasi-judicial acknowledgement of the county specific problems in some potentially sensitive areas that were created either by state highways or irrigation districts or both.
Continue to hold some land as open space for affordable, beautiful public exploration and improve education of locals about the environment and conservation in the face of development.
Let's finally see the end of debtors' prison with the State Supreme Court ruling. Policies favorable to business, particularly small businesses and startups. Ordinances and zoning amenable to non-traditional dwellings including tiny homes.
A larger location for the fairgrounds
Encourage growth, but ensure that the infrastructure is there to support it.
Please don't over develop for the sake of income/tax revenue...we live here because we like nature being close and protected.
Most important expansion of UGA south of Kennewick to allow for light industrial that would bring economic dollars and jobs to Benton County.
Let the cities take care of "arts" housing, shopping etc.
I am involved in projects throughout the State. Benton County is the best managed County in the state of Washington.
Support the development of a county Conservation Futures Fund (wildly successful in Spokane Co)
A commitment to public participation and the recording of public meetings throughout this update process. Thoughtful consideration & responses to public comments. My vision is a government BY the people.
It's becoming easier and easier to be jaded, suspicious of others or "the system" and more and more disconnected as people and as a community. Give attention to these over-arching concepts. Put the wisdom of A Patterned Language deep into our structure, mindset and actions.
Just moved a year ago, and love it here. Looking forward to its future.
There should be more bathrooms at parks and school areas. Also more garbage cans in the parks as well as recycling bins in every park.
Biking Trail to Benton City and through wine county (bikes on back roads are dangerous); Reduce sprawl; build an Richland town center multiple levels, with restaurants on third or fourth level to take advantage of river views. Build on top of business there (then make parking below when most is demolished). Provide a 3-5 year transition for those businesses; Additional parking spots and takeouts on Yakima for rafters/boaters
Beatification, public art, and public squares. Sometimes, the buildings are just plain an eyesore. Please prioritize the attractiveness of a building when building a new public facility. Compare the lovely Public Health Building to the hideous justice center for an example. Or the great looking cable bridge to that soviet thing Richland plans to build in Duportail. We can do it and we should. Finally, the cities should consider merging to create a stronger sense of "place". Thank you.
More trails on other mountains/hills for outdoor recreation.
Expand the tourism base through development of wineries, river shore projects, attractive way finding signage and parks & rec opportunities.

Do whatever necessary to avoid allowing and enabling the Queensgate/Southridge types of rampant and seemingly endless development.
It's unconscionable that the County has included nothing about schools in its plan, given enrollment growth of 1,000 to 1,500 students per year.
Keep development to a minimum. Increase our cultural heritage, slow development to maintain our eastern character.
Make sure Benton County gets its fair share of Washington State support for homeless folks and other social services. At present, the per capita assistance levels are skewed in favor of Western Washington.
More trees, more trees, and for the love of everything, put some trees NEAR the playgrounds, nothing is worse than being surrounded by shade trees but the slides burn you cause they are always in the sun.
It's not the most important issue, but I'd like to see development take place with a sensitivity to preserving dark skies at night in those areas where they still exist, especially at the Hanford site, post-clean-up.
We need to have a unified regional planning entity for the entire Tri-Cities and outlying areas. It is ridiculous that we haven't found a way to do that. And, we need SMART forward-thinking City Planning, like what Portland put together in the 1970's!
Bike paths across the county so we can reduce our reliance on cars. Incentivize local businesses - we don't need three Walmarts within 10 miles and a bunch of empty storefronts. Access to preemptive mental health screenings so we don't need to wait 6 months for a checkup. More trees. Benton county needs to think local.
Perhaps Benton County could take the lead on creating a regional taxing and he earning agency like Portland Metro for parks, arts, and transportation. The Grand Bargain idea of all Mid-Columbians voting on two or three big projects makes the most sense. I want a proper theater (not Link) AND year round aquatic facility. I don't care where they are located as much as I care about getting them built! Metro serves 3 counties and 24 municipalities. Economies of scale are more logical and functional.
Encouragement for Benton County to be a leader in small-scale greener power production, i.e., microhydro, residential and business installations of solar and wind power, etc.

Appendix E

Benton County-wide Planning Policies

ORDINANCE NO. 581

AN ORDINANCE relating to county planning; adopting updated Benton County Countywide Planning Policies.

BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF BENTON COUNTY, WASHINGTON:

Section 1. The following new section is hereby made part of Title 16 of the Benton County Code but will not be codified.


COUNTYWIDE PLANNING POLICIES. The attached Countywide Planning Policies are hereby adopted pursuant to RCW 36.70A.210 as the countywide planning policies for Benton County and the cities therein.

Section 2. Severability. If any provision of this ordinance is declared unconstitutional, or the applicability thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the ordinance and the applicability thereof to other persons and circumstances shall not be affected thereby.

Section 3. Effective Date. This ordinance shall take effect and be in full force upon its passage and adoption.

ADOPTED AND PASSED this 7 day of Feb 2017.


Chairman of the Board.


Chairman Pro-Tem.


Member.

Approved as to Form:

Constituting the Board of
County Commissioners of
Benton County, Washington

Deputy Prosecuting Attorney

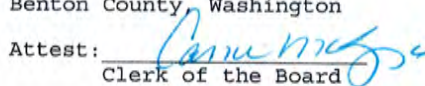
Attest: 
Clerk of the Board

Exhibit A

INTRODUCTION AND OVERVIEW:

The Washington State Growth Management Act (GMA) requires that cities and counties adopt comprehensive plans. The GMA further requires that counties adopt Countywide Planning Policies (CWPPs), in cooperation with the cities located in whole or in part within the county. CWPP establish a countywide framework for developing and adopting county and city comprehensive plans. The role of the CWPP is to coordinate comprehensive plans of jurisdictions in the same county for regional issues or issues affecting common borders (RCW 36.70A.100). Under state law, RCW 36.70A.210(1) describes the relationship between comprehensive plans and CWPPs. It says that:

a 'countywide planning policy' is a written policy statement or statements used solely for establishing a countywide framework from which county and city comprehensive plans are developed and adopted pursuant to this chapter. This framework shall ensure that city and county comprehensive plans are consistent as required in RCW 36.70A.100. Nothing in this section shall be construed to alter the land use powers of the cities.

In order to achieve the objectives above, and to ensure that regional planning efforts and governmental actions are consistent with current legal requirements and information, substantial revisions to the Benton County CWPPs have been proposed. The development of these revisions was a collaborative process between the County and the cities.

HISTORY:

In 1991, one year after the Washington State Legislature enacted the Growth Management Act (GMA), the GMA was amended to require that Countywide Planning Policies (CWPPs) be adopted within those counties subject to the GMA. The first Benton County Countywide Planning Policies were adopted on September 28, 1992.

AMENDMENTS AND ADOPTION:

In the years since the last CWPPs were adopted in Benton County, the GMA has evolved through amendments and judicial interpretations provided by the GMA and the courts. The revised CWPPs attempt to provide procedures for County and city/town coordination to address these issues.

The GMA does not specifically address amendments to the CWPPs; however, it has become apparent that the Benton County CWPPs should be updated in order to better address countywide planning concerns and coordination between jurisdictions in the County. A public hearing was held by the Benton County Planning Commission on April 12, 2016.

Benton County is the lead agency for this proposal and has determined that it does not have a significant adverse impact on the environment and a Determination of Non Significance was issued on February 10, 2016

In order to comply with GMA requirements and the adoption/amendment procedures identified below, all jurisdictions in Benton County must agree to the adoption of the revised CWPPs. This process will involve the planning departments, planning commissions, and elected representatives of each jurisdiction. In order to facilitate this process, Benton County, in consultation with the cities, has developed the following adoption/ratification process for the draft CWPPs:

1. Benton County Planning Commission recommendation on proposed CWPPs.
2. The Benton County Board of Commissioners (BOCC) adopts a resolution agreeing in principle to the proposed CWPPs, but acknowledging that changes may need to be made based on input from each jurisdiction. The BOCC's resolution will contain a statement requiring that each jurisdiction ratify the CWPPs adopted by Benton County and will lay out a schedule for future approval steps.
3. CWPPs approved by Benton County BOCC reviewed by each jurisdiction's Planning Commission.
4. The elected body of each jurisdiction passes a resolution which states that the jurisdiction either: (a) supports the CWPPs in their entirety, (b) rejects the CWPPs in their entirety, or (c) supports the CWPPs with specific changes.
5. If specific changes are identified by a jurisdiction in step four, the Benton County Planning Department and Planning Commission may amend the CWPPs and attempt to reconcile and conflicting changes.
6. The Benton County BOCC adopts, by ordinance, the final CWPPs.

SECTION 1. Countywide planning policy is a written policy statement or statements used solely for establishing a countywide framework from which County and City comprehensive plans are developed and adopted. This framework will ensure that City and County comprehensive plans are consistent with statewide planning policies and as required by the Growth Management Act.

SECTION 2. POLICIES TO IMPLEMENT RCW 36.70A.110;

Policy #1: The Comprehensive Plans of Benton County and each of the cities therein shall be prepared and adopted with the objective to facilitate economic prosperity by accommodating growth consistent with the following:

1. Urban Growth. Encourage development in urban areas where adequate public facilities exist or can be provided in a cost efficient manner.
2. Reduce the inappropriate conversion of undeveloped land into low density development lacking adequate services, injurious to ground and surface water quality, destructive to the area's agricultural lands base and less than cost effective relative to public service costs.

3. Transportation. Encourage efficient multi-modal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.

4. Property rights. Private property rights shall not be taken for public use without just compensation having been made. The property rights of land owners shall be protected from arbitrary and discriminatory actions.

5. Permits. Maintain a permit review process that provides for integrated and consolidated review.

6. Natural resource industries. Maintain and encourage natural resource-based industries, including agricultural, fisheries and mineral industries.

7. Open space and recreation. Encourage the retention of open space and the development of recreational opportunities, conserve fish and wildlife habitat, and increase access to natural resource lands and water.

8. Environment. Protect the environment and enhance the region's high quality of life, including air and water quality and the availability of water.

9. Citizen participation and coordination. Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts.

10. Public facilities and services. Ensure that those public facilities and services necessary to support development shall be adequate to serve development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards. With the exception of water, sewer, and local access streets, which shall be available at the time of occupancy, the term "adequate" shall be defined as either available at the time of occupancy, or shown on the current Capital Improvement Plan (CIP), as a funded project within six years.

11. Historic preservation. Identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance.

SECTION 3. POLICIES FOR PROMOTION OF CONTIGUOUS AND ORDERLY DEVELOPMENT AND THE PROVISION OF URBAN SERVICES TO SUCH DEVELOPMENT;

Policy #2: The County shall allocate future projected populations through the use of the latest population projections published by the Washington State Office of Financial Management (OFM). Allocation of future populations shall be based on the following distribution: City of Kennewick 40% of total county population; City of Richland 28% of total county population; Benton County 19% of total county population; City of West Richland 8% of total county population; City of Prosser 3% of total county population and City of Benton City 2% of total county population. The County, in consultation with the Cities, will review the OFM population projection ranges (Low, Medium and High) and allocation percentages whenever OFM publishes new GMA population projections.

Policy #3: The locating of Urban Growth Areas within the County shall be accomplished through the use of accepted planning practices which provide sufficient land and service capacity, up to the determined need, to meet projected populations at urban densities and service standards within the Cities, and urban densities for those portions of the County located within the urban growth areas.

Policy #4: That Urban Growth Areas of each City shall be based upon official and accepted population projections for minimum of 20 years. The gross undeveloped and underdeveloped acreage within the city limits and the Urban Growth Area shall be sufficient to meet all the land requirements, for the following: community and essential public facilities, population projection, commercial and industrial activities, employment projections, infill and to prevent inflation of land cost due to a limited land supply.

- a. The jurisdictions within the county shall use a uniform formula for identifying the land area necessary per capita for each community. Each jurisdiction's population projection shall be multiplied by its gross per capita land area requirement, which in the aggregate will define total land needs within the Urban Growth Area (UGA).

The uniform formula is as follows:

$A + B + C + D + E + F + G + H + I + J + K = \text{acreage/per capita (or acreage per dwelling unit if per capita is divided by average household size) where:}$

- A = residential land per capita; (or DU)
- B = parks and recreational area per capita;
- C = area required for public facilities (fire stations, jails, etc.,) per capita;
- D = area required for schools per capita;
- E = commercial area per capita, or per employee;
- F = industrial/manufacturing area per capita;
- G = open space (golf courses, etc.) per capita;
- H = public service lands required for transportation network, easements and R.O.W.s per DU;
- I* = use 70% build-out for all residential lands;
- J = add 25% to the total of A Through I for land supply/demand balance;
- K = land credit for undevelopable lands i.e. Critical Areas including steep slopes, wetlands, habitat, etc. within the UGA.

* The same factor should be used for all jurisdictions.

Policy #5 : That within the urban growth area, urban uses shall be concentrated in and adjacent to existing urban services or where they are shown on a Capital Improvement Plan to be available within 6 years.

Policy #6: That cities limit the extension of service district boundaries and water and sewer infrastructure to areas within each jurisdiction's urban growth area contained in their adopted Comprehensive Plan. Utility plans should attempt to reflect possible needs for 50 years.

Policy #7: Within each Comprehensive Plan, the Land Use Plan for urban growth areas shall designate urban densities and indicate the general locations of greenbelt and critical areas.

Policy #8: Wherever possible, given consideration of all other variables, such as existing unused service infrastructure, the placement of an urban growth line into an area of existing commercial agriculture shall be avoided.

Policy #9: The appropriate directions for the expansion of urban growth areas are those which are unincorporated lands with existing service infrastructure and lands adjacent to corporate limits.

Policy #10: All policies within each jurisdiction's Comprehensive Plans shall be modified to be consistent with adopted Countywide Policies.

SECTION 4. POLICIES FOR SITING PUBLIC FACILITIES OF A COUNTYWIDE OR STATEWIDE NATURE;

Policy #11: The County and Cities, along with public participation shall develop a cooperative regional process to site essential public facilities of regional and statewide importance. The objective of the process shall be to ensure that such facilities are located so as to protect environmental quality, optimize access and usefulness to all jurisdictions, and equitably distribute economic benefits/burdens throughout the region or county.

At the Countywide and multi-county level, the following action should be accomplished:

- a. Develop a uniform siting procedure which enables selection of optimum project sites and appropriate size and scale relative to intended benefit area.

Policy #12: Support the existing solid waste program that promotes and maintains a high level of public health and safety, protects the natural and human environment of Benton County and encourages public involvement by securing representation of the public in the planning process.

Policy #13: Encourage and expand coordination and communication among all jurisdictions and solid waste agencies/firms in Benton and Franklin Counties in order to develop consistent and cost-effective programs that avoid duplication of effort and gaps in program activities.

- a. Utilize the existing Benton-Franklin Solid Waste Advisory Committee.

SECTION 5. POLICIES FOR COUNTYWIDE TRANSPORTATION FACILITIES AND STRATEGIES;

Policy #14: Maintain active County-City participation in the Regional Transportation Planning Organization in order to facilitate City, County, and State coordination in planning regional transportation facilities and infrastructure improvements to serve essential public facilities including Port District facilities and properties.

SECTION 6. POLICIES THAT CONSIDER THE NEED FOR AFFORDABLE HOUSING, SUCH AS HOUSING FOR ALL ECONOMIC SEGMENTS OF THE POPULATION AND PARAMETERS FOR ITS DISTRIBUTION;

Policy #15: The County and Cities within shall work together to provide housing for all economic segments of the population. All jurisdictions shall seek to create the conditions necessary for the construction of affordable housing, at the appropriate densities within the cities and County. The following actions should be accomplished:

- a. Jointly quantify and project total Countywide housing needs by income level and housing type (i.e. rental, ownership, senior, farm worker housing, group housing.)
- b. Establish a mechanism whereby the housing efforts/programs of each jurisdiction address the projected Countywide need.
- c. Address the affordable housing needs of very low, low, and moderate income households, and special needs individuals through the Comprehensive Housing Affordability Strategy (CHAS).
- d. Develop design standards for implementation within the Comprehensive Plan with special attention to be given to the residential needs of low to moderate income families.

SECTION 7. POLICIES FOR JOINT COUNTY AND CITY PLANNING WITHIN URBAN GROWTH AREAS;

Policy #16: Urban growth areas may include territory located outside of a city if such territory may be characterized by urban growth or is adjacent to territory already characterized by urban growth. Within urban growth areas, only urban development may occur. For the purposes of locating urban growth areas, and permitting new development within them, "Urban" is defined as:

- a. Having dedicated and improved (surfaced) streets, with dimension, design and construction standards for new development determined by "joint city/county standards" and;
- b. For new development, road, street and intersection right-of-way widths located and sized to accommodate projected local and regional average daily traffic (ADT) as determined by each jurisdictions Land Use Plan Transportation Element and, where relevant, projections of the Benton Franklin Council of Governments.

Policy #17: To encourage logical expansions of corporate boundaries into urban growth areas, and to enable the most cost efficient expenditure of public funds for the provision of urban services into newly annexed areas. The County and each City shall jointly develop and implement development, land division and building standards, and coordinated permit procedures for the review and permitting of new subdivisions within Urban Growth Areas.

- a. Joint development standards shall be adopted by all jurisdictions. Standards may vary between the County and various incorporated jurisdictions.

SECTION 8. POLICIES FOR COUNTYWIDE ECONOMIC DEVELOPMENT AND EMPLOYMENT;

Policy #18: Consistent with the protection of public health, safety, welfare, and the use of natural resources on a long-term sustainable basis, the ability of service capacity to accommodate demands, and the expressed desires of each community, Comprehensive Plans shall jointly and individually support the County and region's economic prosperity in order to promote employment and economic opportunity for all citizens.

Policy #19: The County and Cities have historically partnered with each other as well as with other organizations to achieve economic development throughout the region. It is the intention of the County and Cities to continue to actively pursue mutually beneficial partnerships that promote growth in all sectors of business and industry, including but not limited to: areas of agriculture, agri-business, industrial, commercial, public schools, recreation and tourism. Key strategies will include promoting family wage jobs, increasing income and reducing poverty, increase business formation, expansion and retention, and creating jobs and financial investment to improve the economics of our communities.

- a. An economic development element should be integrated into the comprehensive plan of each jurisdiction. The economic development element should establish goals and policies for each jurisdiction; actively promote employment opportunities for family-wage jobs; support the retention and expansion of businesses and industry in Benton County; support development of public schools; encourage the development of tourist-related businesses, including those that capitalize on area agricultural and other resources.
- b. Comprehensive Plans should foster and promote a natural environment that will contribute to economic growth and prosperity, and a business environment that offers diverse economic opportunities for businesses of all types and sizes in the region.
- c. The County and Cities should encourage public and private agency cooperation and participation in the comprehensive planning process. These agencies should cooperatively evaluate trends and opportunities to identify strategies meeting long-term economic needs for the County region.
- d. The County and Cities agree that Benton County may establish economic development strategies and implementation criteria for siting major industrial and resource based development within rural areas of the County in accordance with RCW 36.70A.365.
- e. The provision of utilities and other supporting urban governmental services to commercial and industrial areas should be coordinated and assigned a high priority by utility purveyors and service providers.
- f. A Countywide land use inventory should be established to monitor commercial and industrial land supply.

- g. Support the development of public schools in areas where present or can be extended, is financially supportable at urban densities, where the extension of public infrastructure will protect health and safety, as per WAC 365-196-425(3)(b).

SECTION 9. AN ANALYSIS OF THE FISCAL IMPACT.

Policy #20: Capital Improvement Plans and Land Use Plans, shall conduct fiscal analyses which identify and refine the most cost effective use of regional and local public services. This should be accomplished through actions including the following:

- a. City's six year CIPs for streets, water, and sewer should show infrastructure sized to accommodate build-out of service areas within the 20 year urban growth area, at a minimum.
- b. Construction design and placement standards for roads, intersections and streets (with provisions for storm water conveyance), sewer, water and lighting infrastructure, should be determined based upon an analysis which identifies the lowest public expenditure over extended periods of time. Utilities should be incorporated into such analyses.
- c. Build out scenarios should be factored into school, fire and police service demand projections.

Policy #21: Support the development of public schools in areas where utilities are present or can be extended, is financially supportable at urban densities, where the extension of public infrastructure will protect health and safety, and the school locations are consistent with the analysis recommended by WAC 365-196-425(3)(b).

SECTION 10. AMENDING POLICIES.

Policy #22: The Growth Management Act requires counties planning under the Act to adopt a countywide planning policy in cooperation with the cities located in the county. The countywide planning policy is to be a written policy statement or statements used solely for establishing a countywide framework from which county and city comprehensive plans are developed and adopted pursuant to this [GMA] chapter." The purpose for the Benton County Wide Planning Policies is to meet this requirement of the Act. This document is a tool that will provide the necessary guidance to achieve consistency during the updating of comprehensive plans for the county and the cities/towns.

The County Commissioners will review the policies and cause a final proposal to be transmitted to the cities for ratification and ultimately back to the Board of Commissioners for final action. The County Wide Planning Policies will be considered adopted when ratified by the cities and approved by the Board of Commissioners. Cities agree to take action within 45 days of the transmittal of the proposal and to submit resolutions of ratification to the county to document the action taken by the city.

The Board of Commissioners agrees to adopt the ratified policies without modification upon receipt of notice that at least three cities have acted affirmatively. The Commissioners will convene to consider possible modifications to these policies if ratification is not accomplished.

Future amendments to the County Wide Planning Policies may be considered when proposed by the County or a City.

SECTION 11. LOCATE URBAN GROWTH AREAS

Population Projections

1. Review and comment on preliminary OFM population projections due in Dec. 91.
2. Legislative bodies of each jurisdiction to review OFM population projections.
3. Update the existing land use inventory to reflect current conditions (use county GIS to provide county-wide land use inventory).
4. GMC derives formula for allocation of OFM population projections -sends formula to individual jurisdictions via the BCPPC.

-BCPPC sends to indiv.jurisdictions legislative bodies for review
-BOCC takes action on pop.allocation

Land Use Element Map

1. Identify accepted uniform planning criteria used for locating Urban Growth Areas:

-natural physical barriers and roads
-existing service capacity (supply/deficit)
-projected service capacity (new supply)
-planning objectives (GMA req.) and;
2. Uniform criteria for insuring adequate land supply within Urban Growth Areas:

-enable growth without creating excess demand for services, congestion etc.,
-discourage sprawl without grossly inflating land costs;
3. Identify uniform, established candidates for the supply of developable land within the Urban Growth areas:

-vacant, underutilized, partially utilized
4. Identify uniform, established candidates for lands to be excluded from development, such as lands:

-needed for R.O.W.
-hazardous, critical, open space etc.,
-too costly to provide services
-to be zoned agricultural with Transfers of Density Rights (TDRs)
5. Map existing public, private and semi-public service district boundaries and;

6. Inventory all existing capital facilities for public, private and semi-public service providers, and transportation network, identify existing capacity:

Water	sewer
fire	police
schools	ports
parks	libraries
hospital	communications

7. Confer with BFRC to establish current level transportation data re: inventory

-each jurisdiction to build on BFRC transportation data; define local street conditions, capacities, programmed and needed improvements.

8. Inventory housing stock - identify existing supply/demand ratio by housing.

9. Using Population Projections per jurisdiction, accomplish the following:

-project housing mix/type and occupancy rates;
-identify projected gross demands for services identified in item #5, above;
- equate existing services infrastructure capabilities and C.I. P.s with gross demands;
-identify new C.I.s, (supplies of water, sewer, school, rec. fac. etc.,) necessary to meet gross demands;
-survey options to meet gross service with cost effectiveness on essential services (i.e., water and sewer, road maintenance as a priority) and; type, identify present need (use Census);
-with the cost effectiveness of meeting other services demands as a consideration.

10. Contact each utility purveyor. Solicit participation on LUE advisory committees on relevant issues.

11. Inventory facilities/capacities of existing utility services, identify current plans for new facilities and capacities including but not limited to electric, telecommunications, natural gas. Rely on BFRC data.

12. lands such as: utility and transportation corridors, landfills, sewage treatment facilities, recreation, schools etc.,

-integrate existing information from comp. plans, needs assessments, pop. projections, into one joint list of needed public lands;
-county must work with state and cities to identify areas of shared need and shall prepare a prioritized list with estimated acquisition dates;
-capital acquisition budget for each jurisdiction with jointly agreed upon priorities and schedule. *

13. Identify Open Space Corridors within and between Urban Growth Areas, including:

-lands used or designated as recreational, wildlife habitat, trails, and "critical areas" as defined in sec .3

-optional: develop a mechanism to purchase fee simple or lesser interests in these open spaces using funds authorized by RCW 84.34.230 *

-develop an acquisitions list for those lands with critical resources imposing extreme constraints on development *

14. Draft a procedure, including siting criteria, for locating/approving essential public facilities.

-review list of essential facilities provided by OFM with the objective to identify those suitable for location in urban vs rural areas.

15. Consistent with the revised Policies in the Comp. Plan Texts, integrate population projections, land use and capital facilities inventory data, lands necessary for new capital facilities, and total land requirements to support population projections densities, open space and critical/natural areas (set asides) into new 20 year Urban Growth Areas.

16. Review of Urban Growth Areas by each jurisdiction's legislative body.

17. BOCC adopts Urban Growth Areas, then;

SECTION 12. PREPARE DRAFT LAND USE MAP

Map Designations

1. Prepare Draft Land Use Map with general distribution, location and extent of land uses, and:

-Urban Growth Areas and Rural Lands;

-Open Space;

-Public Facilities and lands;

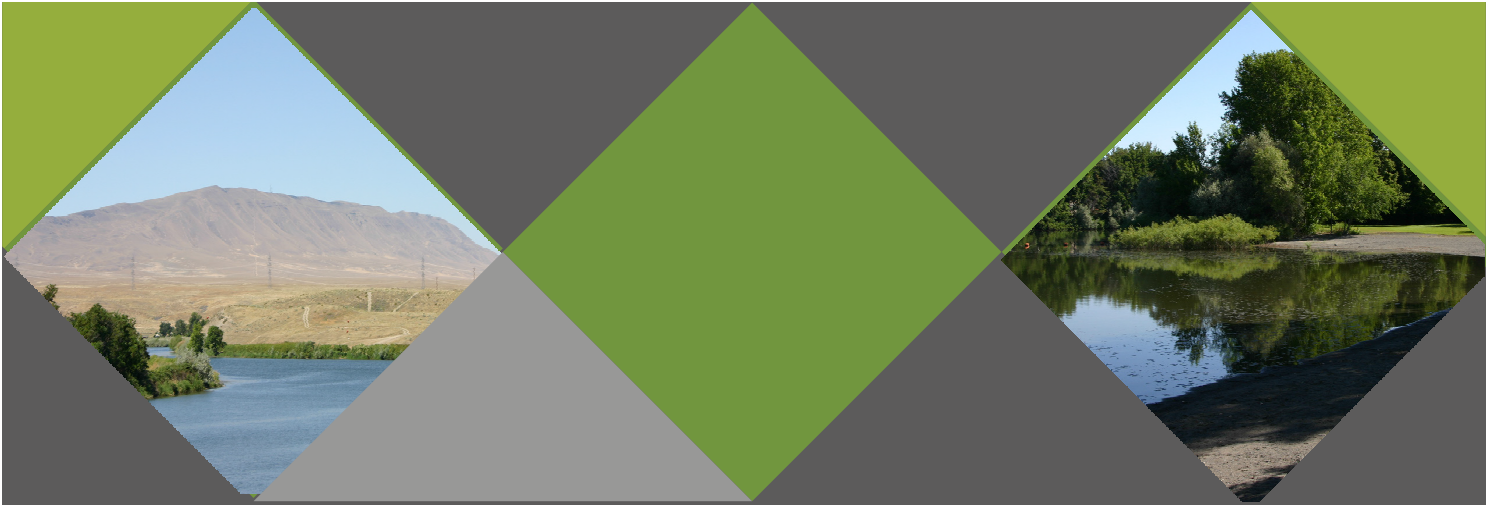
-population densities;

-building intensities;

-est. future pop. densities (multiply av. bldg. densities X pers/household:

* not necessary for locating urban growth boundaries

Appendix F
Shoreline Master Program Update (2014)

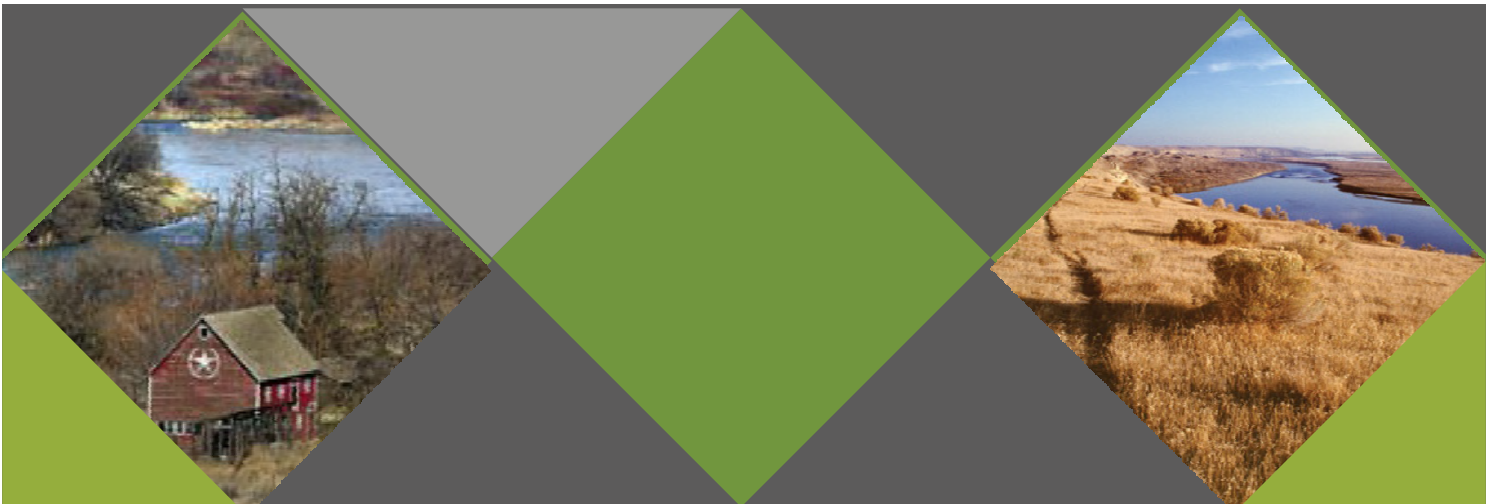


Benton County

SHORELINE MASTER PROGRAM UPDATE

Locally Approved June 3, 2014
Ecology approved February 16, 2015

Benton County
Grant No. G1200022





BENTON COUNTY SHORELINE MASTER PROGRAM 2014

BOARD OF COUNTY COMMISSIONERS

Jerome Delvin Shon Small James Beaver, Chairman

BENTON COUNTY PLANNING COMMISSION

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James Willard Richard Giberson Yi Qu Darwin Crosby

BENTON COUNTY PLANNING STAFF

Mike Shuttleworth, Planning Manager
Susan Walker, Senior Planner
Valerie Smith, Associate Planner

The Benton County Planning Staff would like to extend their thanks and appreciation to the residents of Benton County for their contributions throughout development of this Shoreline Master Program. Special thanks to members of the Shoreline Advisory Committee for their thoughtful input and countless hours of dedication: Michael Crowder, Matthew Cummings, Shane Early, Deb Heintz, John Haakenson, Marjorie Kaspar, Tom Mackay, John Marvin, Mark Nielson, Vic Parrish, Scott Revell, Darrel Sunday, Mark Teske, and Richard Visser.

*Shoreline Master Program Update Resolution #2014-440 locally approved June 3, 2014.

*Approved by the Department of Ecology with an effective date of February 16, 2015.

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BENTON COUNTY SHORELINE MASTER PROGRAM

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SHORELINE MASTER PROGRAM POLICY CHAPTER



A. Introduction

1. Purpose and Relationship to State Planning and Shoreline Laws

Washington State's citizens voted to approve the Shoreline Management Act (SMA) of 1971 in November 1972. In accordance with the SMA, Benton County developed and adopted its first Shoreline Master Program (SMP) in 1974. A SMP is a set of goals, policies and regulations required by the SMA that:

- Encourages reasonable and appropriate development of shorelines with an emphasis on water-oriented use, such as docks, marinas, and recreational facilities, or industries and commercial uses that require a shoreline location and support economic development; and,
- Protects the natural character of the shorelines, the land, vegetation, wildlife, and shoreline environment; and,
- Promotes public access and provides opportunities to enjoy views and recreational activities in shoreline areas.

The SMP addresses the Yakima and Columbia Rivers, land within 200 feet of the ordinary high water mark (OHWM) of these rivers, their floodways, contiguous 100-year floodplain extending up to 200 feet inland of the floodway, and associated wetlands.

In 2003 the Washington State Department of Ecology (Ecology) updated the SMP Guidelines (referenced as SMP Guidelines). The SMA and implementing SMP Guidelines require all towns, cities, and counties across the state to comprehensively update their SMPs. The SMP update allows preparation of a locally-tailored program that represents the visions and interests of our citizens and meets the needs of our rural communities. The SMP is required to be updated and adopted by June 2014.

After the local development and adoption process is complete, the completed SMP is reviewed by Ecology to ensure compliance with the SMP Guidelines. The SMP does not become effective until it has been adopted by the County and approved by Ecology.

This SMP Policy Chapter addresses one aspect of requirements: a statement of goals and policies. Detailed regulations are located in the Benton County Code Title 15. Together, the Shoreline Master Program Policy Chapter and the Shoreline Master Program Regulations constitute the entire SMP.

BENTON COUNTY SHORELINE MASTER PROGRAM

The SMP Policy Chapter is considered a sub area plan of the Benton County Comprehensive Land Use Plan (Comprehensive Plan) prepared in accordance with the Growth Management Act (GMA). The GMA was amended in 1995 to add the goals and policies of the SMA as one of the goals of the GMA. The purpose of the SMA is stated in RCW 90.58.020 as follows:

“The legislature finds that the shorelines of the state are among the most valuable and fragile of its natural resources and that there is great concern throughout the state relating to their utilization, protection, restoration, and preservation. In addition it finds that ever increasing pressures of additional uses are being placed on the shorelines necessitating increased coordination in the management and development of the shorelines of the state. The legislature further finds that much of the shorelines of the state and the uplands adjacent thereto are in private ownership; that unrestricted construction on the privately owned or publicly owned shorelines of the state is not in the best public interest; and therefore, coordinated planning is necessary in order to protect the public interest associated with the shorelines of the state while, at the same time, recognizing and protecting private property rights consistent with the public interest. There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, state, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines.



It is the policy of the state to provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses. This policy is designed to insure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto.

In the implementation of this policy the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally. To this end uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the state's shoreline. Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single-family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state. Alterations of the natural condition of the shorelines and shorelands of the state shall be recognized by the department. Shorelines and shorelands of the state shall be appropriately classified and these classifications shall be revised when circumstances warrant regardless of whether the change in circumstances occurs through man-made causes or natural causes. Any areas resulting from alterations of the natural condition of the shorelines and shorelands of the state no longer

meeting the definition of "shorelines of the state" shall not be subject to the provisions of chapter 90.58 RCW.

Permitted uses in the shorelines of the state shall be designed and conducted in a manner to minimize, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public's use of the water."

This SMP Policy Chapter implements the goals of the SMA and is designed to be compatible with the GMA Comprehensive Plan. This SMP Policy Chapter is a sub area plan of the Benton County Comprehensive Plan, and is adopted by reference within the Plan. This Chapter provides the framework for future decision making and a guide for future development of lands within the County's SMP jurisdiction boundaries.

As used in this SMP Policy Chapter, goals are the broad value statements and reflect the community's broad vision for its shorelines. Goals are organized into different SMP "elements." Policies are more detailed statements of the County's vision and complete and give detail to the goals. Policies serve as a bridge between the goals and regulations.

Regulations are the specific, enforceable standards which will be implemented for shoreline development, uses and activities. They are organized by shoreline environment designations and specific land use and activity regulations. Unlike shoreline goals and policies, shoreline regulations do not become part of the County's Comprehensive Plan. Rather, shoreline regulations become part of the Benton County Code (See Title 15).

2. Profile of Benton County's Shoreline Jurisdiction

Benton County's shoreline jurisdiction encompasses 330 miles of the Columbia and Yakima Rivers. The total acreage of upland shorelands regulated by the Benton County SMP is 14.93 square miles, which, in accordance with state law, includes lands within 200 feet of the ordinary high water mark (OHWM) of the Columbia and Yakima Rivers, as well as floodways, floodplain areas within 200 feet of a mapped floodway, and associated wetlands.

Fifty-eight (58) percent of the County's shorelands occurs along the Columbia River, and the remaining 42 percent of the County's shorelands occur along the Yakima River. Both the Columbia and the Yakima Rivers within Benton County are classified as Shorelines of Statewide Significance, meaning that under State Law, specific shoreline management preferences and priorities must be applied. Federal lands make up approximately 35 percent of the area in the County's shoreline jurisdiction.

B. General Statement of Goals

It shall be the ultimate goal of the Benton County SMP to provide plans, policies and regulations consistent with the SMA (RCW 90.58) and with the SMP Guidelines (WAC 173-26, State Master Program Approval/Amendment Procedures and Master Program Guidelines), which will reflect the desires of the citizens of Benton County regarding the balanced use of the county shorelines.

It is recognized that the Columbia and Yakima River shorelines in Benton County are Shorelines of Statewide Significance and must be given consideration as a major resource from which all people derive benefit. For these areas, the goals of the SMP, consistent with RCW 90.58.020, shall:

- Recognize and protect the statewide interest over local interest. This means that the County will consider its local Comprehensive Plan and development regulations as well as consult State agency policies, programs and recommendations in developing use regulations.
- Preserve the natural character of the shoreline.
- Result in long-term over short-term benefit.
- Protect the resources and ecology of the shoreline.

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- Increase public access to publicly owned areas of the shorelines. In Benton County, public access should be planned and coordinated to ensure locations are appropriately sited and designed to prevent damage to the natural environment, and respect the privacy of adjacent private property owners.
- Increase recreational opportunities for the public in the shoreline. Recreational opportunities should likewise be appropriately sited and designed to be compatible with the natural environment and adjacent privately owned lands.
- Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary. (Consistent with RCW 90.58.020)

It shall further be the goal of the SMP to:

- Recognize and protect private property rights and provide for the use and enjoyment of private property consistent with the intent of the SMA.
- Avoid undue burdens on private property and streamline standards and procedures where feasible.
- Preserve the public's and property owner's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state to the greatest extent feasible.
- Promote preferred uses which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the state's shoreline consistent with the SMA and SMP Guidelines.
- Recognize the Columbia River as a transportation corridor.
- Recognize alterations of the natural condition of the shorelines and shorelands of the state.

The following statements of goals and policies are directed to address elements as outlined in the SMA and SMP Guidelines. The major SMP Policy Chapter sub-elements are: shoreline uses and modification, economic development, public access, recreation, circulation, conservation, historic/cultural, flood hazard management, restoration, and shoreline process and administration.

C. Shoreline Uses and Modifications Sub-element

SMP-Goal 1. To foster and promote the best use of Benton County shorelines. To encourage shoreline development and modifications which are wisely placed, consistent with the physical limitations of the areas, serve the needs and desires of the local citizens, and protect the functions and values of the shorelines.

1. Shoreline Environment Designation Policies

SMP-P1. To provide a high quality shoreline environment where:

- A. Recreational opportunities are available and compatibly located and designed.
- B. The public enjoys access to and views of shoreline areas.
- C. Natural systems are preserved, restored or enhanced.
- D. Ecological functions of the shoreline are maintained and improved over time.
- E. Water-oriented uses are promoted consistent with the shoreline character and environmental functions.
- F. The rural and agricultural character of Benton County shorelines is encouraged.



- SMP-P2. Provide a comprehensive shoreline environment designation system to categorize Benton County shorelines into environments based upon the primary characteristics of shoreline areas to guide the use and management of these areas.
- SMP-P3. Designate shorelines with the following shoreline environment system:
 - A. Aquatic: Protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark
 - B. Natural: Protect those public shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use.
 - C. Conservancy: Protect ecological functions of open space, floodplain and other sensitive public or protected lands and ensure appropriate management and development of existing and future public parks and recreation areas.
 - D. Hanford: Recognize and foster the unique economic, environmental, and recreational values of the Hanford area as it transitions over time from federal energy purposes to other land uses and management consistent with the Hanford Reach National Monument designation.
 - E. Rural: Promote agricultural use and activities, including associated irrigation and support facilities, and accommodate low-density rural home sites, function as a separation between urban areas, and maintain an open space character and provide opportunities for recreational uses compatible with agricultural activities.
 - F. Residential: Accommodate residential development and accessory structures that are consistent with existing rural character and provide appropriate public access and recreational uses.
 - G. Rural Industrial: Provide for intensive water-oriented commercial, transportation, power production, and industrial uses, while protecting existing ecological functions.
 - H. Urban Transition Area: Ensure optimum utilization of shorelines occurring within designated Urban Growth Areas by managing development and uses so that it enhances and maintains shorelines for a variety of future urban uses and protect and restore ecological functions of open space, flood plain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses.

2. Agriculture Policies



- SMP-P4. Preserve and maintain productive farmlands in shoreline jurisdiction.
- SMP-P5. Promote and protect agri-tourism.
- SMP-P6. Encourage erosion control measures in accordance with the United States Department of Agriculture Natural Resources Conservation Service agency guidelines.
- SMP-P7. Limit livestock access to shoreline areas.
- SMP-P8. Control irrigation runoff to minimize discharge of chemicals, fertilizer, sediment, and organic materials in aquatic areas in accordance with federal and state water quality standards.
- SMP-P9. Allow diversion of water for agricultural purposes consistent with water rights laws and rules.

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- SMP-P10. Encourage maintenance of vegetative zones between tilled areas and aquatic areas to reduce stormwater runoff, reduce sedimentation, and promote fish and wildlife habitat.

3. Aquaculture Policies

- SMP-P11. Encourage aquaculture that supports the recovery of endangered or threatened fish species.
- SMP-P12. Restrict aquaculture in areas where it would result in a net loss of ecological functions or significantly conflict with navigation or other water-dependent uses.

4. Boating and Private Moorage Facilities Policies

- SMP-P13. Give boating facilities and private moorage structures priority for shoreline location.

- SMP-P14. Design and construct boating facilities and private moorage structures to result in no net loss of ecological functions.

- SMP-P15. Give preference to boating facilities and private moorage structures that minimize the amount of shoreline modification, in-water structure, and overwater cover. In support of this, community structures are encouraged.



- SMP-P16. Ensure new boating facilities are located only at sites where suitable environmental conditions, shoreline configuration, access, and compatible adjacent uses are present. Such facilities should be coordinated with applicable local, state and federal plans and, where feasible, collocated with other compatible water-dependent uses to efficiently provide recreational resources, avoid unnecessary duplication, and minimize adverse impacts to shoreline ecological functions and processes.
- SMP-P17. Ensure boating facilities are located, designed, constructed and maintained to avoid adverse proximity impacts such as noise, light and glare; aesthetic impacts to adjacent land uses; impacts to navigation; and impacts to public access to the shoreline.

5. Breakwaters, Jetties, Groins and Weirs Policies

- SMP-P18. Allow breakwaters, jetties, and groins to be located waterward of the OHWM only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.
- SMP-P19. Consider alternative structures with less impact where physical conditions make such alternatives feasible.

6. Dredging and Dredge Material Disposal Policies

- SMP-P20. Site and design new development to avoid or, if that is not possible, to minimize the need for new and maintenance dredging.
- SMP-P21. Ensure dredging and dredge material disposal is done in a manner that avoids or minimizes significant ecological impacts. Impacts that cannot be avoided should be mitigated in a manner that assures no net loss of shoreline ecological functions.
- SMP-P22. Discourage the disposal of dredge material on shorelands or wetlands within a channel migration zone.

7. Fill Policies

- SMP-P23. Allow fill when it is demonstrated to be the minimum extent necessary to accommodate an allowed shoreline use or development and with assurance of no net loss of shoreline ecological functions and processes.

SMP-P24. Encourage fill when it is associated with restoration projects.

8. In-Stream Structures Policies

SMP-P25. Ensure the location, design, construction and maintenance of in-stream structures give due consideration to the full range of public interests, watershed functions and processes, and environmental concerns, with special emphasis on protecting and restoring priority habitats and species.

SMP-P26. Encourage non-structural and non-regulatory approaches as an alternative to in-stream structures. Non-regulatory and non-structural approaches may include public facility and resource planning, land or easement acquisition, education, voluntary protection and enhancement projects, or incentive programs.

9. Mining Policies

SMP-P27. Ensure mining activities are sited, designed, conducted, and completed to result in no net loss of shoreline ecological functions and processes.

SMP-P28. Base the determination no net loss of ecological function on an evaluation of the reclamation plan required for the site.

SMP-P29. Give preference to mining proposals that result in the creation, restoration or enhancement of habitat for priority species.

10. Residential Development Policies



SMP-P30. Design subdivisions in shoreline jurisdiction to be compatible with environmental conditions and to protect shoreline aesthetics.

SMP-P31. Encourage pedestrian access along the shoreline through the subdivision.

SMP-P32. Require residential development make adequate provision for wastewater, water, and stormwater facilities and apply best management practices to protect shoreline water quality and meet the needs of the development.

SMP-P33. Restrict residential development in areas subject to flooding.

SMP-P34. Encourage low impact development and vegetation conservation measures to promote environmental quality.

SMP-P35. Prohibit over-water residential development and floating homes.

11. Shoreline Stabilization Policies

SMP-P36. Locate and design new development to avoid the need for future shoreline stabilization to the extent feasible.

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SMP-P37. Use structural shoreline stabilization measures only when nonstructural methods are infeasible. Nonstructural methods include building setbacks, structure relocation, groundwater management, and other measures.

SMP-P38. Ensure soft structural shoreline stabilization measures are used prior to hard stabilization measures unless demonstrated to be insufficient.

SMP-P39. Allow new or expanded structural shoreline stabilization only where demonstrated to be necessary to support or protect an allowed primary structure or a legally existing shoreline use that is in danger of loss or substantial damage, or for reconfiguration of the shoreline for mitigation or enhancement purposes.

SMP-P40. Ensure all proposals for structural shoreline stabilization, both individually and cumulatively, do not result in a net loss of ecological functions.



12. Utilities Policies

SMP-P41. Locate new utilities outside shoreline jurisdiction unless alternative locations are unfeasible, the utility requires a shoreline location, or the utility is necessary to support an approved shoreline use.

SMP-P42. Ensure new utilities utilize existing transportation and utility rights-of-way easements, or existing cleared areas to the greatest extent feasible.

SMP-P43. Design and locate utility structures to minimize disruption of public access to the shoreline, obstruction of visual access to the water, and loss of shoreline ecological function.

13. Existing Development Policies



SMP-P44. Allow legal pre-existing uses and structures to continue in accordance with this SMP.

SMP-P45. Allow alterations of legal pre-existing structures, uses, and lots in consideration of:

- A. historic development patterns, or
- B. occupancy by preferred uses pursuant to the SMA, or
- C. provision of ecological restoration, or
- D. public safety or other public purposes.

- SMP-P46. Encourage transitions from non-water-oriented uses to water-oriented uses and from non-conforming uses to conforming uses.
- SMP-P47. Review changes to nonconforming uses, structures, or lots in relation to the SMP no-net-loss of ecological function objective.
- SMP-P48. Balance rural historic character and protection/rehabilitation of significant cultural and historic properties with conformity to SMP rules when considering changes to nonconforming uses, structures, and lots.

D. Economic Development Sub-element

- SMP-Goal 2. To promote and protect tourism and agricultural activities along the shoreline.
- SMP-Goal 3. To realize locally the inherent economic opportunities and benefits associated with transition of the Hanford lands, infrastructure and resources from a military to a peacetime mission.
- SMP-Goal 4. To encourage economic development along shorelines in a manner compatible with environmental conditions and desired land use character of the shorelines.
- SMP-Goal 5. To facilitate shoreline economic growth and prosperity while taking into account the existing rural quality of life.

1. Commercial Development Policies

- SMP-P49. Give preference to water-dependent commercial uses over non-water-dependent commercial uses in the shoreline environment. Prefer water-related and water-enjoyment uses over non-water-oriented commercial uses.
- SMP-P50. Ensure shoreline commercial development provides public access to the shoreline where opportunities exist, provided that such access would not pose a health or safety hazard.
- SMP-P51. Limit over-water, and non-water-oriented commercial uses in the shoreline environment.
- SMP-P52. Allow limited commercial development in rural areas characterized by agriculture and/or industrial development to support the needs of employees.

2. Industry Policies

- SMP-P53. Design industrial development in the shoreline environment to minimize impacts to shoreline resources and interference with shoreline use by adjacent property owners.
- SMP-P54. Limit non-water-oriented industrial development in the shoreline environment and only in areas physically separated from the shoreline, where navigability is restricted, or as part of a project that provides public access or ecological restoration benefits.
- SMP-P55. Encourage cooperative use of existing port facilities, including docks and piers to reduce additional disruption to the shoreline.
- SMP-P56. Allow future industrial and port facilities that are dependent upon a shoreline location in areas where the shoreline is already characterized by industrial development or planned for such uses.



E. Public Access Sub-element

- SMP-Goal 6. To provide, protect, and enhance a public access system that is both physical and visual, which increases the amount and diversity of public access to Columbia and Yakima River shorelines, consistent with the natural shoreline character, private property rights, and

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public safety. To prioritize public access on public properties, promote coordinated public access through incentives to private developments, and ensure appropriate resources are available for maintenance and enforcement.

- SMP-Goal 7. Consistent with the adopted Benton County Comprehensive Plan and Comprehensive Parks Plan and together with other agencies, promote a connected public access system along the Yakima River west of Benton City to Columbia Point and Bateman Island.
- SMP-P57. Ensure that the creation of public access will not endanger natural features or contribute to a loss of ecological functions.
- SMP-P58. Provide additional physical and visual public access to shorelines, with a focus on public properties, by developing and implementing parks, recreation, and trails plans.
- SMP-P59. In order to promote environmental protection and avoid private trespass, acquire or improve public access opportunities in high demand or good water locations. Priority locations include, but are not limited to: Snively, Chandler reach, Finley, Paterson, and others.
- SMP-P60. Focus public access in less environmentally sensitive areas and offer adequate recreation facilities and parking.
- SMP-P61. Apply public access standards to new development creating a demand for public access. Allow flexible options to provide public access in new development.
- SMP-P62. Consider incentives for well-designed common access and for improved ecological function.

G. Recreation Sub-element

- SMP-Goal 8. To meet the recreational needs of Benton County residents and visitors while protecting shoreline ecological resources.
- SMP-P63. Develop recreational activity areas in a manner which complements the intent of the shoreline environment and natural habitats and results in no-net-loss of shoreline ecological function.
- SMP-P64. Encourage recreational development and use of the shorelines that is related to enjoyment of, access to, and use of the water. Give shoreline recreational development priority within shoreline jurisdiction.
- SMP-P65. Ensure provision of recreational space and uses is coordinated and consistent with the County's shoreline public access plan.
- SMP-P66. Continue to work with non-profit, state, and federal agencies to support local and regional opportunities for public recreation, shoreline access and use.
- SMP-P67. Recognize that state-owned shorelines are particularly adapted to providing wilderness beaches, ecological study areas, and other recreational uses for the public.
- SMP-P68. Require development applicants to monitor or limit the use of fertilizers, herbicides, and pesticides to maintain recreational facilities. Management that utilizes organic treatments, integrated pest management, or non-synthetic chemicals is preferred where feasible and practical.



H. Circulation Sub-element

- SMP-Goal 9. To encourage a circulation system which will efficiently and safely move people, goods and services with good planning to minimize disruption or adverse effect on the shoreline areas.

SMP-Goal 10. To allow for safe emergency access to shorelines.

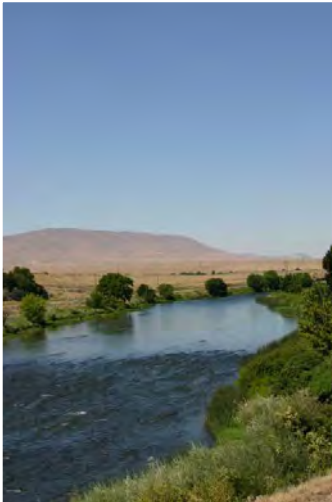
SMP-P69. Design transportation facilities within shoreline jurisdiction to the minimum size necessary to reduce their impact on the ecological function of the shoreline.

SMP-P70. Maintain transportation facilities in a manner that minimizes impacts on the ecological function of the shoreline.

SMP-P71. Encourage non-motorized trails that provide recreational access to the shoreline.

SMP-P72. Allow parking in shoreline jurisdiction for authorized uses where upland locations are not feasible. Allow parking in shoreline jurisdiction for water-oriented uses when needed to support access to water-oriented elements of the development.

I. Conservation Sub-element



SMP-Goal 11. To encourage sound management of renewable shoreline resources and protection of non-renewable shoreline resources. Non-renewable resources are those that are in danger of depletion faster than nature can create them. Renewable resources can be replaced over time. It is recognized that shorelines themselves are finite areas within which to balance shoreline uses, conservation, and public access.

SMP-Goal 12. To achieve sustainability of resource functions and values and no-net-loss of ecological functions by allowing shoreline development and modifications when impacts are minimized through mitigation sequencing and by encouraging and incentivizing restoration of ecological functions where they have been impaired.

SMP-Goal 13. Promote and protect the scenic aesthetic quality of shoreline areas and vistas to the greatest extent feasible.

1. Environmental Protection Policies

SMP-P73. Protect all shorelines of the state in a manner consistent with all relevant constitutional and other legal limitations on the regulation of private property so that there is no net loss of ecological functions from both individual permitted or exempt development.

SMP-P74. Protect and, where necessary, apply planning and land use measures to improve the quality and productivity of the County's environmental resources (air, ground and surface waters, and indigenous biology).

SMP-P75. Sustain a diverse, productive, and high quality natural environment for the use, health and enjoyment of County residents.

2. Critical Areas Policies

SMP-P76. Identify and protect critical fish and wildlife habitat from destruction or encroachment of incompatible uses.

SMP-P77. Preserve natural wetlands (marshes, sloughs, shorelines, etc.) that are important wildlife and game habitat or recreational areas.

SMP-P78. Protect life and property by avoiding inappropriate developments in areas susceptible to natural disasters and hazards, such as floodways and steep slopes.

3. Shoreline Vegetation Conservation Policies

SMP-P79. Where new developments, uses and/or redevelopments are proposed, ensure shoreline vegetation, both upland and waterward of the OHWM, is conserved to maintain shoreline ecological functions and processes.

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SMP-P80. Encourage management and control of noxious and invasive weeds. Control of such species should be done in a manner that retains onsite native vegetation, provides for erosion control, and protects water quality.

4. Water Quality, Stormwater, and Nonpoint Pollution Policies

SMP-P81. Maintain and improve the water quality of the Yakima and Columbia Rivers, and preserve surface and groundwater for the beneficial use of the rural area's citizens and wildlife.

SMP-P82. Require that new developments or expansions or retrofits of existing developments assess the effects of additional stormwater runoff volumes and velocities, and mitigate potential adverse effects on shorelines through design and implementation of appropriate stormwater management measures.

J. Historic / Cultural Sub-element

SMP-Goal 14. To encourage the protection of areas and sites having historic, cultural, educational or scientific value.

SMP-P83. Ensure development applicants provide protection and restoration of sites, buildings, structures, districts and objects along Benton County shorelines having historic, archaeological, cultural, educational or scientific value consistent with state and federal laws.

SMP-P84. Require development applications along shorelines to consult with professional archaeologists, historians, biologists, Washington State Department of Archaeology and Historic Preservation (DAHP) and affected tribes to screen proposals, identify areas containing potentially valuable data, and to establish procedures for maintaining the area in an undisturbed condition, or salvaging the data.

SMP-P85. Require developers to immediately stop work and notify Benton County, DAHP, and affected tribes, if any archaeological or historic resources are uncovered during excavation to allow for preservation and/or retrieval of data.

K. Flood Hazard Management Sub-element

SMP-Goal 15. To protect life and property and avoid the need for new shoreline stabilization or flood control infrastructure.

SMP-Goal 16. To apply consistent flood hazard regulations to reduce the potential for damage to persons or property.

SMP-P86. Recognize and protect the hydrologic functions of floodplains by limiting the use of structural flood hazard reduction measures.

SMP-P87. Ensure developments subject to damage or that could result in loss of life do not locate in areas of known flood hazards unless it can be demonstrated by the project proponent that the development is sited, designed and engineered for long-term structural integrity, and that life and property on and off-site are not subject to increased hazards as a result of the development.

SMP-P88. Limit new development or uses in shoreline jurisdiction, including subdivision of land that would likely require structural flood hazard reduction measures.

L. Restoration Sub-element

SMP-Goal 17. To upgrade shoreline ecological functions and aesthetics to a level commensurate with their importance to the community and to achievement of regional goals for species and habitat recovery such as through the projects, programs and plans established within the SMP Shoreline Restoration Plan.

SMP-Goal 18. To provide voluntary incentives for restoration by property owners, facilitate the permitting for restoration projects, and coordinate with agencies, tribes, and non-profit

groups to achieve effective restoration of shoreline ecological functions and maximize public funding.

- SMP-P89. Promote restoration and enhancement actions that improve shoreline ecological functions and processes and target the needs of sensitive plant, fish and wildlife species as identified by Washington Department of Fish and Wildlife, Washington Department of Natural Resources, affected tribes, National Marine Fisheries Service, and/or U.S. Fish and Wildlife Service.
- SMP-P90. Ensure restoration and enhancement of shorelines is designed using principles of landscape and conservation ecology and restores or enhances chemical, physical, and biological watershed processes that create and sustain shoreline habitat structures and functions.
- SMP-P91. Seek funding to implement restoration and enhancement projects, particularly those that are identified in the Restoration Plan of this SMP or in other pertinent plans. Funding may be sought by the county or other entities.
- SMP-P92. Develop application processing guidelines that will streamline the review of restoration-only projects.
- SMP-P93. Allow for the use of tax incentive programs, mitigation banking, grants, land swaps, or other programs, as they are developed, to encourage restoration and enhancement of shoreline ecological functions and to protect habitat for fish, wildlife and plants.

M. Shoreline Process and Administration Sub-element

- SMP-Goal 19. To provide a process to update the SMP consistent with the update schedule of the SMA.
- SMP-P94. When assigning environment designations and determining permitted uses within the different designations and use categories, consider the ability of the landscape to accommodate planned uses.
- SMP-P95. Encourage citizen participation in the implementation of this SMP.
- SMP-P96. Protect property rights of landowners from arbitrary and discriminatory actions.
- SMP-P97. Develop administrative procedures which will help the applicant, the County, and other interested parties reach a quick and accurate assessment of a proposed development.
- SMP-P98. Reconcile conflicting public policy goals by considering the overall needs of the community including public access, infrastructure requirements, utility corridor alignments and facilities, and natural resource protection.
- SMP-P99. Implement shoreline improvements as scheduled through the Capital Facilities Element of the County’s Comprehensive Plan and Capital Improvement Plan processes.



SHORELINE MASTER PROGRAM REGULATIONS

Reader's Guide

The Shoreline Management Act and Benton County's SMP

Washington State's citizens voted to approve the Shoreline Management Act (SMA) of 1971 in November 1972. The SMA seeks to provide environmental protection for shorelines, preserve and enhance shoreline public access, and encourage appropriate development that supports water-oriented uses. Benton County developed and adopted its first Shoreline Master Program (SMP) in 1974. That SMP was developed almost 40 years ago and since then much has changed along Benton County shorelines. In addition, knowledge of best development and conservation practices has evolved. There have also been changes in State laws and rules. Therefore, in accordance with the SMA, Benton County has prepared this SMP to guide and manage its shorelines.

The Benton County SMP contains goals, policies, regulations, and a use map that guide the development of shorelines in accordance with the SMA (Revised Code of Washington [RCW] 90.58), Washington State Department of Ecology (Ecology) SMP Guidelines (Washington Administrative Code [WAC] 173-26), and Shoreline Management Permit and Enforcement Procedures (WAC 173-27).

Consistent with RCW 36.70A.480, the goals and policies of Benton County's SMP, approved under chapter 90.58 RCW, are considered a sub area plan of the County's *Comprehensive Land Use Plan* (Comprehensive Plan) and are found in the SMP Policy Chapter. The SMP Policy Chapter is a sub area plan of the Benton County Comprehensive Plan, and is adopted by reference within the Plan. It provides the framework for future decision making and a guide for future development of lands within the County's SMP jurisdiction boundaries.

All regulatory elements of this SMP, including, but not limited to, definitions and use regulations, are a part of the County's development regulations and are contained in Title 15, Shoreline Master Program.

Shoreline Jurisdiction

In accordance with state laws and rules, the jurisdiction of Benton County's SMP encompasses the Columbia and Yakima Rivers, land within 200 feet of the ordinary high water mark (OHWM) of these waterways, their floodways, contiguous 100-year floodplain extending up to 200 feet inland of the floodway, and associated wetlands.

Applicability and Exemptions

The SMP applies to all proposed uses and development occurring within shoreline jurisdiction. This SMP does not apply to certain activities that do not alter structures or properties, such as interior building changes or routine gardening. It also does not apply to legally established uses already on the land such as existing agriculture, existing residences, and other existing uses, structures, and activities. See Section 15.01 for a complete description of SMP applicability.

There are also activities that are exempt from the Shoreline Substantial Development Permit system. These activities are subject to the standards of the SMP, but are not required to submit fees and other materials associated with Shoreline Substantial Development Permits. Common exemptions include, but are not limited to:

- Normal maintenance or repair of existing structures or developments
- Bulkheads common to single-family residences
- Emergency construction necessary to protect property from damage
- Construction and practices normal or necessary for farming, irrigation, and ranching activities including agricultural service roads and utilities, construction of a barn or similar agricultural structure, and the construction and maintenance of irrigation structures
- Construction of a single-family residence

- Construction of a dock, including a community dock, designed for pleasure craft only, for the private noncommercial use

Exemptions are fully described and listed in WAC 173-27-040 and RCW 90.58.030 (3)(e), 90.58.140(9), 90.58.147, 90.58.355, and 90.58.515, as amended. See Section 15.09.040 for additional information on exemptions.

How to Read and Apply this SMP

When reading the SMP, it is useful to consider the definitions of the following terms that are based on definitions in the SMP Guidelines (WAC 173-26-020):

- Shall or must: means a mandate; the action must be done.
- Should: means that the particular action is required unless there is a demonstrated, compelling reason, based on policy of the Shoreline Management Act and shoreline master program, against taking the action.
- May: means the action is acceptable, provided it conforms to the provisions of this SMP and the Act.

In general, this SMP uses the word “should” in goals, objectives, and policies, and “shall” in the regulations. Additional definitions are located in Section 15.02.

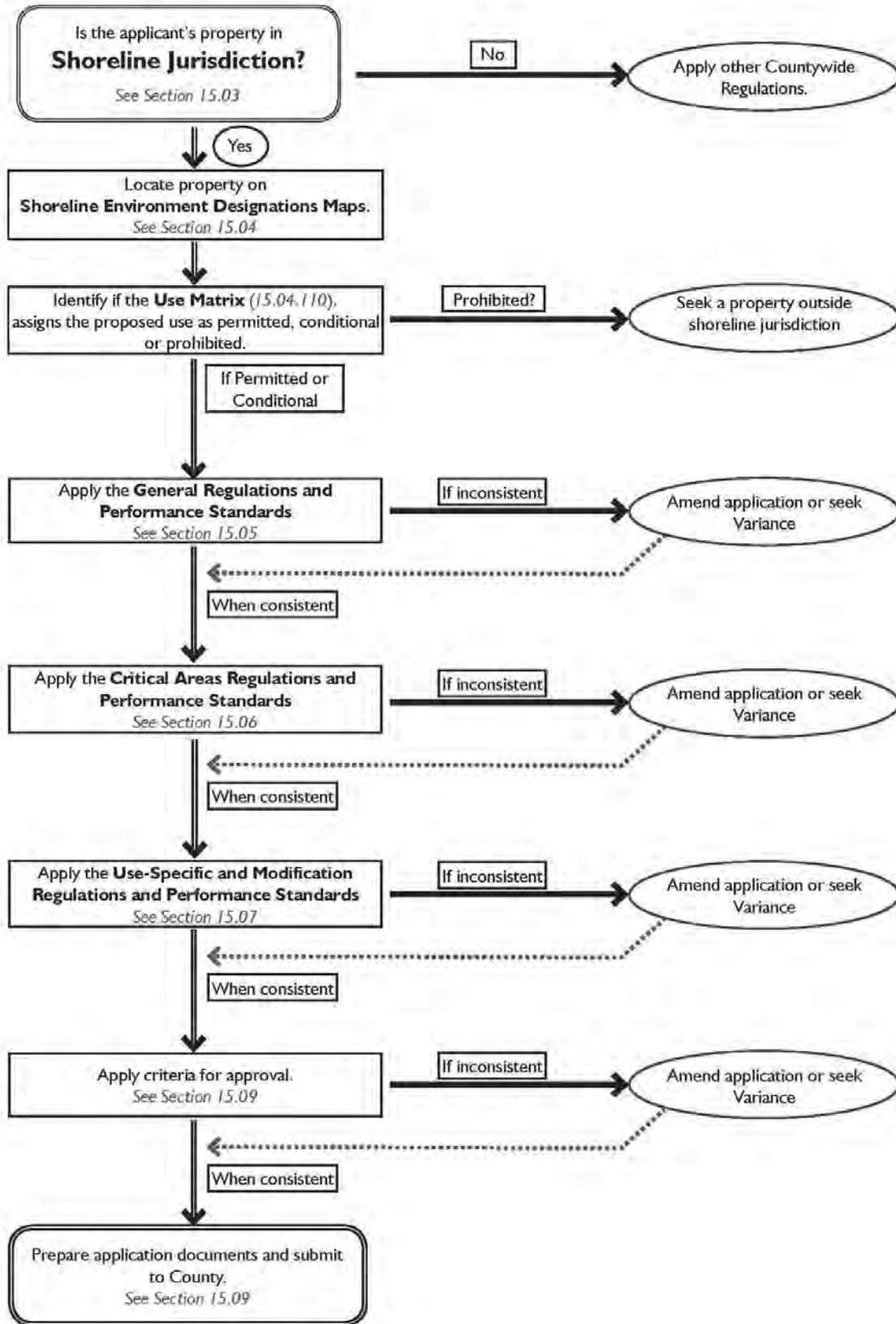
The SMP has a high level of detail for the following reasons: 1) to allow for more shoreline applications to be approved administratively for an efficient and cost-effective process, 2) to cross-reference applicable state and federal laws to help consolidate requirements and be a resource for property owners and local government staff, and 3) to provide some certainty of interpretation and application that benefits property owners and local government staff over time.

For informational purposes, the flow chart below illustrates how an applicant could navigate the regulations to determine if and how they apply to a particular project and property. In addition to approval from the Benton County Department (Permitting), any shoreline development or construction project may also require a permit from the U.S. Army Corps of Engineers and/or the Washington Department of Fish and Wildlife, and the Washington Department of Natural Resources, as well as other agencies (please see “Coordination” section below).

Coordination of Permits and Requirements with Other Agencies

Although not required by this SMP, applicants may find it helpful to coordinate early in the project design process with one or more of the following agencies depending on the type and location of the project:

- Washington Department of Fish and Wildlife (any project that may affect upland or aquatic habitats)
- Washington Department of Natural Resources (projects waterward of the OHWM)
- Yakama Nation (any project that may affect upland or aquatic habitats)
- U.S. Army Corps of Engineers (projects waterward of the OHWM on the Columbia River or that involve any fill on the Yakima River)
- Washington Department of Ecology (any project, but particularly those that require a permit from the Corps or may have impacts on wetlands or other waters)
- Benton Conservation District (any project where the applicant is interested in restoration opportunities)



Many projects may also be under the jurisdiction of one or more of the above-listed agencies (particularly for projects located waterward of the OHWM), in which case early consultation is not only advised, but required. The Governor's Office for Regulatory Innovation and Assistance permitting services website is a useful tool for identifying potential jurisdictional agencies and permits.

For residents of the County interested in improving the ecological functions of their shoreline, the County's Shoreline Restoration Plan identifies a number of agencies and organizations that can provide advice or assistance with design and implementation.

Section 15.01 Authority and Purpose

01.010 Authority

This SMP is enacted and administered according to the following state law and rules:

- (e) The Shoreline Management Act (SMA) of 1971, Chapter 90.58 RCW;
- (f) State master program approval/amendment procedures and master program guidelines, WAC 173-26; and
- (g) Shoreline management permit and enforcement procedures, Chapter 173-27 WAC.

01.020 Purpose

The purposes of this SMP are:

- (a) To promote the public health, safety, and general welfare of the County by providing comprehensive policies and effective, reasonable regulations for development, use and protection of jurisdictional shorelines; and
- (b) To further assume and carry out the local government responsibilities established by RCW 90.58.050 including planning and administering the regulatory program; and
- (c) To assure no net loss of ecological functions associated with the shoreline; and
- (d) To carry out the policies and use preferences in RCW 90.58.020, described in Section 15.03.

01.030 Applicability

- (a) Except as described in Subsection (b) and (c), all proposed uses and development occurring within shoreline jurisdiction must conform to the intent and requirements of the laws and rules cited in Section 15.01.010 and this SMP.
- (b) The following are examples of activities that are not considered development and are therefore not subject to this SMP:
 - (1) Interior building improvements that do not change the use or occupancy;
 - (2) Exterior structure maintenance activities, including painting and roofing, as long as it does not expand the existing footprint of the structure; and,
 - (3) Routine landscape maintenance of established, ornamental landscaping, such as lawn mowing, pruning and weeding.
- (c) Consistent with Section 15.02 (Definitions), WAC 173-26-020 (Definitions), and WAC 173-26-241(3)(a), as amended, this SMP shall not require modifications of or limit agricultural activities on agricultural lands.
- (d) Activities that are exempt from the permit system in Section 15.09.040 shall comply with this SMP whether or not a permit or other form of authorization is required.
- (e) The shoreline permit procedures, policies and regulations established in this SMP shall apply countywide to all nonfederal uses, activities, and development.

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- (f) This SMP applies to lands subject to nonfederal ownership, lease or easement, even though such lands may fall within the external boundaries of a federal ownership.

01.040 Findings

This SMP was developed based on community participation, local shoreline conditions, and the Shoreline Management Act provisions per Resolution 2014-440 dated June 3, 2014. Key findings are highlighted below:

- (a) The Benton County SMP Public Participation Plan, adopted by the County Commissioners in June 2012, was followed, and encouraged public involvement and interaction, and provided public forums, open houses and meetings in several venues in the County.
- (b) A Shoreline Advisory Committee made up of fourteen volunteers with diverse backgrounds, including, shoreline property owners, residents, agri-business, economic and environmental interests, state and federal agencies and the Yakama Nation, and sanctioned by the Board of County Commissioners, reviewed, interacted and provided input for the SMP and all required documents.
- (c) The Benton County Shoreline Analysis Report, Inventory and Channel Migration Maps, Cumulative Impacts Analysis, and voluntary Restoration Plan were utilized for the development of the Benton County SMP update which was prepared in conformance with RCW 90.58 (Shoreline Management Act) and WAC 173-26.
- (d) The SMP is appropriately tailored to accommodate Benton County's unique environmental conditions and community needs.
- (e) The policies, programs and regulations of the SMP address cumulative impacts of the reasonably foreseeable future development and use of the County's shoreline and further demonstrate through its Cumulative Impacts Analysis that the SMP as prepared will not result in degradation of shoreline ecological functions over the next 20-year planning horizon.
- (f) The SMP will help protect water quality for the County's rivers and streams, increase protection of lives and property from flood, protect fish and wildlife habitat, allow preferred uses along the shoreline meeting the needs of the Benton County community, and promote recreational opportunities for County residents consistent with RCW 90.58/WAC 173-26.
- (g) The SMP is in the best interest of the public and is consistent with the Benton County Comprehensive Plan and furthers the intent of the Shoreline Management Act (RCW 90.58/WAC 173-26).

01.050 Relationship to Other Codes, Ordinances and Plans

- (a) All applicable federal, state, and local laws shall apply to properties in the shoreline jurisdiction.
- (b) Consistent with RCW 36.70A.480, the goals and policies of this SMP approved under chapter 90.58 RCW shall be considered a sub area plan of Benton County's Comprehensive Plan. All regulatory elements of this SMP, including, but not limited to, definitions and use regulations, shall be considered a part of Benton County's development regulations.
- (c) All local development regulations including, but not limited to, zoning and subdivision rules shall apply in addition to this SMP. This SMP includes critical areas regulations applicable only in shoreline jurisdiction, and shall control within shoreline jurisdiction over other County critical area regulations adopted pursuant to the Growth Management Act.
- (d) In the event provisions of this SMP conflict with provisions of federal, state, county or city regulations, the provision that is most protective of shoreline resources shall prevail, when consistent with policies set out in the SMA.

01.060 Liberal Construction

As provided for in RCW 90.58.900, the SMA is exempted from the rule of strict construction; the SMA and this SMP shall therefore be liberally construed to give full effect to the purposes, goals, objectives, and policies for which they were enacted.

01.070 Effective Date

The SMP is hereby adopted on the 3rd of June, 2014. This SMP and all amendments thereto shall become effective 14 days from the date of the Washington Department of Ecology's written notice of final approval.

Section 15.02 Definitions

Whenever the words and terms set forth in this Section appear in this title, they shall be given the meaning attributed to them by this Section. Definitions established by RCW 90.58.030 and WAC 173 have been incorporated herein and should these definitions in the RCW or WAC be amended, the most current RCW or WAC definition shall apply. Except where specifically defined in this Section, the RCW, the WAC, or the Benton County Code, all words used in this SMP shall carry their customary meanings.

"Abutting" means bordering upon, to touch upon, or in physical contact with. Sites are considered abutting even though the area of contact may be only a point.

"Accessory" means any use or development incidental to and subordinate to a primary use of a shoreline use or development. See also Appurtenance, Residential.

"Adjacent" means to be nearby and not necessarily abutting.

"Agricultural activities" means agricultural uses and practices including, but not limited to: Producing, breeding, or increasing agricultural products; rotating and changing agricultural crops; allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded; allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions; allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement; conducting agricultural operations; maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, provided that the replacement facility is no closer to the shoreline than the original facility; and maintaining agricultural lands under production or cultivation. See Section 15.05.010 regarding interpretation of agricultural activities.

"Agricultural equipment" and "agricultural facilities" includes, but is not limited to:

- A. The following used in agricultural operations: Equipment; machinery; constructed shelters, buildings, and ponds; fences; upland finfish rearing facilities; water diversion, withdrawal, conveyance, and use equipment and facilities including but not limited to pumps, pipes, tapes, canals, ditches, and drains;
- B. corridors and facilities for transporting personnel, livestock, and equipment to, from, and within agricultural lands;
- C. farm residences and associated equipment, lands, and facilities; and
- D. roadside stands and on-farm markets for marketing fruit or vegetables.

"Agricultural land" means those specific land areas on which agriculture activities are conducted as of the date of adoption of a local master program as evidenced by aerial photography or other documentation. After the effective date of the master program, land converted to agricultural use is subject to compliance with the requirements of the master program.

"Agricultural lands of long-term commercial significance" means those lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products.

"Agricultural products" includes but is not limited to horticultural, viticultural, floricultural, vegetable, fruit, berry, grain, hops, hay, straw, turf, sod, seed, and apiary products; feed or forage for livestock; Christmas trees; hybrid cottonwood and similar hardwood trees grown as crops and harvested within twenty years of

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planting; and livestock including both the animals themselves and animal products including but not limited to meat, upland finfish, poultry and poultry products, and dairy products.

"Agricultural Related Industry" means specifically:

- A. Packaging Plants - may include but are not limited to the following activities: washing, sorting, crating, and other functional operations such as drying, field crushing, or other preparation in which the chemical and physical composition of the agriculture product remains essentially unaltered. Does not include processing activities, or slaughter houses, animal reduction yards, and tallow works.
- B. Processing Plants - may include but are not limited to those activities which involve the fermentation or other substantial chemical and physical alteration of the agricultural product. Does not include slaughter houses or rendering plants.
- C. Storage Facilities - may include those activities which involve the warehousing of processed and/or packaged agricultural products.

"Agricultural tourism" or "Agri-tourism" refers to the act of visiting a working farm or any agricultural, horticultural or agribusiness operation for the purpose of enjoyment, education or active involvement in the activities of the farm or operation.

"Amendment" means a revision, update, addition, deletion, and/or reenactment to an existing shoreline master program. "Applicant" means a person, party, firm, corporation, or other legal entity that proposes a development, construction or use on a site.

"Approval" means an official action by a local government legislative body agreeing to submit a proposed SMP or amendments to the Department of Ecology for review and official action pursuant to this chapter; or an official action by the Department of Ecology to make a local government SMP effective, thereby incorporating the approved SMP or amendment into the state master program.

"Appurtenance, residential" is necessarily connected to the use and enjoyment of a single family residence and is located landward of the ordinary high water mark and the perimeter of a wetland. Normal appurtenance includes a garage; deck; driveway; utilities; fences; installation of a septic tank and drainfield and grading which does not exceed two hundred fifty cubic yards and which does not involve placement of fill in any wetland or waterward of the ordinary high water mark.

"Aquaculture" means the culture and/or farming of fish, shellfish, or other aquatic plants and animals. Aquaculture is dependent on the use of the water area and, when consistent with control of pollution and prevention of damage to the environment, is a preferred use of the water area. Commercial aquaculture is conducted to produce products for market with the objective of earning a profit. Non-commercial aquaculture is conducted for the benefit of native fish recovery, education and interpretation, or other public benefit or use.

"Aquifer" means a body of rock or soil that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

"Aquifer confined" means groundwater overlain by a confining bed, such as an impermeable layer of clay or rock.

"Aquifer Recharge/Interchange Area" means those natural and man-made land features that hold or convey surface waters having connectivity to groundwater.

"Aquifer unconfined" means groundwater lying between the soil profile and the shallowest impermeable layer (i.e., clay, basalt).

"Archaeologist, professional" means a person who meets qualification standards promulgated by DAHP and the National Park Service and published in 36 CFR Part 61, and which define minimum education and experience required to perform identification, evaluation, registration and treatment activities for archaeological sites. In

some cases, additional areas or levels of expertise may be needed, depending on the complexity of the task and the nature of the properties involved.

"Area of Special Flood Hazard", which designation on the Flood Insurance Rate Maps always includes the letter A or V, means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.

"Base Flood" or "100-year Flood" means the designation on the Federal Emergency Management Act (FEMA) Flood Insurance Maps that denote areas subject to floods having a one (1) percent chance of being equaled or exceeded in any given year. The base flood is determined for existing conditions, unless a basin plan including project flows under future developed conditions has been completed and adopted by Benton County; in these cases, future flow projections shall be used. In areas where the Flood Insurance Study includes detailed base flood calculations, those calculations may be used until projections of future flows are completed and approved by Benton County.

"Best Management Practices" or "BMPs" means physical, structural and/or managerial practices, that, when used singly or in a combination protect the functions and values of critical resources. BMPs are current and evolving conservation practices, systems of practices, management and operational measures, design and construction techniques, or normal and accepted industry standards that are applied to land uses and land use activity in a manner which:

- A. controls soil loss and reduces water surface and ground-water quality degradation caused by nutrients, animal wastes, toxins, and sediment; and,
- B. mitigates adverse impacts to the natural chemical, physical and biological environment of the County; and,
- C. facilitates the utilization of the County's natural resources on a long term, sustainable yield basis.

"Board of Adjustment" means the County board which hears applications for variances, conditional use permits and other quasi-judicial matters assigned to it by the legislative body. Appeals may be taken to the Board by any person aggrieved, or by any officer, department, board or bureau of the county affected by appealable decisions of the director.

"Boating Facilities" means developments and uses that support access to shoreline waters for purposes of boating, including marinas, community docks serving more than four single-family residences or multi-family units, public piers, and community or public boat launch facilities.

"Breakwater" means a fixed or floating off-shore structure that protects the shore from wave action or currents.

"Buffer" means a designated area used to separate incompatible uses or protect resources or development. Buffers are generally undeveloped areas. There are different types of buffers for different purposes:

- A. buffers which protect sensitive natural resources (critical areas) from the adverse impacts of development are generally undeveloped open space which are ecologically part of the protected resource;
- B. buffers which protect the integrity of development from certain natural hazards such as slope instability, floods or fire prone areas, and which ensure that buildings and development avoid the hazardous condition;
- C. buffers to separate incompatible uses, such as residential from industrial, airports, or certain activities common to commercial agriculture, are generally open or sparsely populated.

"Building Setback" means a line which establishes a definite point beyond which the foundation of a building shall not extend; this line is measured from the upland edge of the shoreline buffer.

"Bulkhead" means a vertical or nearly vertical erosion protection structure placed parallel to the shore consisting of concrete, timber, steel, rock, or other permanent material not readily subject to erosion.

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"Candidate" means any species officially designated as "Candidate" by the appropriate agency of the federal government or by the Washington State Department of Fish and Wildlife.

"Channel migration zone (CMZ)" means the area along a river within which the channel(s) can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings.

"Clearing" means the cutting or removal of vegetation or other organic plant material by physical, mechanical, chemical, or any other means.

"Commercial" means those activities engaged in commerce and trade and involving the exchange of money, including but not limited to, retail, services, wholesale, or business trade activities. Examples include, but are not limited to, hotels, motels, or other commercial accommodations, grocery stores, restaurants, concessions, shops, commercial recreation facilities such as marinas, boat repair, boat, canoe, or kayak rentals, and offices.

"Comprehensive master program update" means a master program that fully achieves the procedural and substantive requirements of the Department of Ecology's SMP Guidelines effective January 17, 2004, as now or hereafter amended.

"Comprehensive Plan" means the Benton County Comprehensive Land Use Plan and any amendments, addenda, or supplemental plans that are duly adopted under Chapter 36.70 RCW (as amended), for Benton County or any portion thereof.

"Conditional use" means a use, development, or substantial development which is classified as a conditional use or is not classified within the applicable master program.

"Creeks" mean those areas of Benton County where surface waters form or have formed a defined channel or bed and for which the State Department Fish and Wildlife has Hydraulic Permit Authority. The channel or bed need not contain water year-round. This definition is not meant to include irrigation ditches, channels, storm or surface water runoff devices or other entirely artificial watercourses unless they are, or have been, used by salmonids or used to convey streams naturally occurring prior to construction in such water course.

"Critical Aquifer Recharge/Interchange Areas" means those aquifer recharge/interchange areas that have an effect on, or are associated with, aquifers used for potable water in community water systems.

"Critical Areas" means those specific resources which are subject to protection by regulation under Section 15.07 (e.g., wetlands, geologically hazardous areas, fish and wildlife conservation areas, frequently flooded areas, critical aquifer recharge/interchange areas).

"Critical Areas Overlay Maps" were developed from and are augmented by resource and technical studies, aerial photographs, and other resource maps, such as the:

- A. Federal Emergency Management Agency's (FEMA), 100-year flood maps,
- B. County and other agency Geologic Hazards Map(s),
- C. U.S.D.A. Natural Resources Conservation Service (NRCS) Soils Capabilities Map(s),
- D. Slope Stability Map(s),
- E. U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory Map(s),
- F. Washington State Department of Fish and Wildlife (WDFW), Priority Habitats and Species Maps (PHS),
- G. County Shoreline Management Map(s), and
- H. other maps as are appropriate.

“Cumulative impact” means the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

"Department" means the Benton County Planning Department.

"Development" means a use consisting of the construction or exterior alteration of structures; dredging; drilling; dumping; filling; removal of any sand, gravel, or minerals; bulkheading; driving of piling; placing of obstructions; or any project of a permanent or temporary nature which interferes with the normal public use of the surface of the waters overlying lands subject to the act at any stage of water level. See also “Substantial Development.”

Development does not include the following activities:

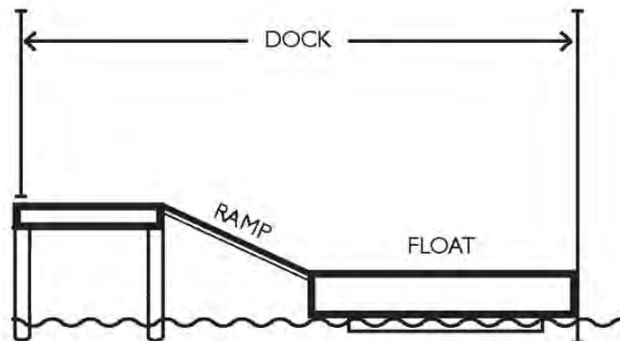
- A. Interior building improvements that do not change the use or occupancy;
- B. Exterior structure maintenance activities, including painting and roofing as long as it does not expand the existing footprint of the structure;
- C. Routine landscape maintenance of established, ornamental landscaping, such as lawn mowing, pruning and weeding; and
- D. Maintenance of the following existing facilities that does not expand the affected area: septic tanks (routine cleaning); wells; and individual utility service connections.

"Development regulations" means the controls placed on development or land uses by a county or city, including, but not limited to, zoning ordinances, critical areas ordinances, all portions of a SMP other than goals and policies approved or adopted under chapter 90.58 RCW, planned unit development ordinances, subdivision ordinances, and binding site plan ordinances together with any amendments thereto.

"Development Site" means the legal boundaries of the parcel or parcels of land for which an applicant has applied for authority from Benton County to carry out a development proposal.

"Diversity (ecological)" refers to the variety of species of plants and animals that compose a biotic community or ecosystem, often expressed as total number of different species.

“Dock” means a structure built over or floating upon the water and used as a landing place for boats and other marine transport, fishing, swimming, and other recreational uses. A dock typically consists of the combination of one or more of the following elements: pier, ramp, and/or float.



"Dredging" means removal of earth from the bed of a stream, lake, or pond for the purpose of flood control; navigation; utility installation (excluding on-site utility features serving a primary use, which are “accessory utilities” and shall be considered a part of the primary use); the construction or modification of essential public facilities and regional transportation facilities; restoration (of which the primary restoration element is

sediment/soil removal rather than being incidental to the primary restoration purpose); and/or obtaining minerals, construction aggregate, or landfill materials. This definition does not include excavation for mining within a pond created by a mining operation approved under this title or under a local zoning ordinance, or a mining operation in existence before Zoning, Shorelines, or Critical Areas permits were required for such operations. Dredging, as regulated in this SMP under Section 15.07.60, is not intended to cover other excavations waterward of the ordinary high water mark that are incidental to construction of an otherwise authorized use or

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modification (e.g., bulkhead replacements, large woody debris installations, boat launch ramp installation, pile placement).

"Ecological functions" or "shoreline functions" means the work performed or role played by the physical, chemical, and biological processes that contribute to the maintenance of the aquatic and terrestrial environments that constitute the shoreline's natural ecosystem. Shoreline ecological functions include, but are not limited to hydrologic (transport of water and sediment across the natural range of flow variability; attenuating flow energy; developing pools, riffles, gravel bars, nutrient flux, recruitment and transport of large woody debris and other organic material), shoreline vegetation (maintaining temperature; removing excessive nutrients and toxic compound, sediment removal and stabilization; attenuation of high stream flow energy; and provision of woody debris and other organic matter), hyporheic functions (removing excessive nutrients and toxic compounds, water storage, support of vegetation, and sediment storage and maintenance of base flows), and habitat for native aquatic and shoreline-dependent birds, invertebrates, mammals; amphibians; and anadromous and resident native fish (e.g., space or conditions for reproduction; resting, hiding and migration; and food production and delivery).

"Ecologically intact" means shoreline areas that retain the majority of their natural shoreline functions, as evidenced by the shoreline configuration and the presence of native vegetation. Generally, but not necessarily, ecologically intact shorelines are free of structural shoreline modifications, structures, and intensive human uses. In forested areas, they generally include native vegetation with diverse plant communities, multiple canopy layers, and the presence of large woody debris available for recruitment to adjacent waterbodies. Recognizing that there is a continuum of ecological conditions ranging from near natural conditions to totally degraded and contaminated sites, this term is intended to delineate those shoreline areas that provide valuable functions for the larger aquatic and terrestrial environments which could be lost or significantly reduced by human development. Whether or not a shoreline is ecologically intact is determined on a case-by-case basis.

"Ecosystem-wide processes" means the suite of naturally occurring physical and geologic processes of erosion, transport, and deposition; and specific chemical processes that shape landforms within a specific shoreline ecosystem and determine both the types of habitat and the associated ecological functions.

"Erosion" means the process in which soil particles are mobilized and transported by natural agents such as wind, rain, splash, frost action or stream flow.

"Exempt" developments are those set forth in WAC 173-27-040 and RCW 90.58.030(3)(e), 90.58.140(9), 90.58.147, 90.58.355, and 90.58.515, as hereafter amended, which are not required to obtain a Shoreline Substantial Development Permit, but which must otherwise comply with applicable provisions of the SMA and this Master Program.

"Fair market value" of a development is the open market bid price for conducting the work, using the equipment and facilities, and purchase of the goods, services and materials necessary to accomplish the development. This would normally equate to the cost of hiring a contractor to undertake the development from start to finish, including the cost of labor, materials, equipment and facility usage, transportation and contractor overhead and profit. The fair market value of the development shall include the fair market value of any donated, contributed or found labor, equipment or materials.

"Feasible" means that an action, such as a development project, mitigation, or preservation requirement, meets all of the following conditions:

- A. The action can be accomplished with technologies and methods that have been used in the past in similar circumstances, or studies or tests have demonstrated in similar circumstances that such approaches are currently available and likely to achieve the intended results;
- B. The action provides a reasonable likelihood of achieving its intended purpose; and

C. The action does not physically preclude achieving the project's primary intended legal use.

In cases where these Guidelines require certain actions unless they are infeasible, the burden of proving infeasibility is on the applicant. In determining an action's infeasibility, the County may weigh the action's relative public costs and public benefits, considered in the short- and long-term time frames.

"Fill" means the addition of soil, sand, rock, gravel, sediment, earth retaining structure, or other material to an area waterward of the OHWM, in wetlands, or on shorelands in a manner that raises the elevation or creates dry land.

"Fish and Wildlife" mean any member of the animal kingdom, including without limitation, any vertebrate, mollusk, crustacean, arthropod, or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body parts thereof.

"Fish and Wildlife Conservation Areas" refer to the following:

- A. Those areas shown on the Fish and Wildlife Conservation Areas Map in the Benton County Comprehensive Plan;
- B. Areas identified on the Washington State Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Map within which a Priority Species is known to have a Primary Association;
- C. Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat. These do not include ponds deliberately designed and created from dry sites such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds (of less than three years duration) and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority;
- D. Lakes, ponds, creeks and rivers planted with native fish populations, including fish planted under the auspices of federal, state, local or tribal programs or which supports priority fish species as identified by the Washington State Department of Fish and Wildlife;
- E. Washington State Wildlife Areas as identified on Washington Department of Fish and Wildlife maps; and
- F. Washington State Natural Area Preserves and Natural Resource Conservation Areas as identified on Washington Department of Natural Resources maps.

"Float" means an anchored (not directly to the shore) floating platform that is free to rise and fall with water levels and is used for water-dependent recreational activities such as boat mooring, swimming or diving. Floats may stand alone with no over-water connection to shore or may be located at the end of a pier or ramp.

"Flood" or "Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- A. The overflow of inland or tidal waters and/or
- B. The unusual and rapid accumulation of runoff of surface waters from any source.

"Flood insurance rate map (FIRM)" means the official map on which the Federal Emergency Management Agency has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

"Flood Insurance Study" means the official report provided by the Federal Emergency Management Agency that includes flood profiles, the Flood Boundary and Floodway Map (FBFM), and the water surface elevation of the base flood.

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"Floodplain" is synonymous with the one hundred-year floodplain and means that land area susceptible to inundation with a one percent chance of being equaled or exceeded in any given year. The limit of this area shall be based upon flood ordinance regulation maps or a reasonable method which meets the objectives of the SMA.

"Floodway" means the area, as identified in this Master Program, that either:

- A. Has been established in Federal Emergency Management Agency Flood Insurance Rate Maps or floodway maps; or
- B. Consists of those portions of a river valley lying streamward from the outer limits of a watercourse upon which flood waters are carried during periods of flooding that occur with reasonable regularity, although not necessarily annually, said floodway being identified, under normal condition, by changes in surface soil conditions or changes in types or quality of vegetative ground cover condition, topography, or other indicators of flooding that occurs with reasonable regularity, although not necessarily annually.

Regardless of the method used to identify the floodway, the floodway shall not include those lands that can reasonably be expected to be protected from flood waters by flood control devices maintained by or maintained under license from the federal government, the state, or a political subdivision of the state.

"Frequently Flooded Areas" means those areas of Benton County subject to inundation by a base flood (100-Year Flood) and other flood hazard areas such as creeks, wasteways, wetlands, canyons, and closed depressions which are shown on the County's Geologic Hazards Maps. See also "Area of Special Flood Hazard."

"Geologically Hazardous Areas" are areas which pose potential threats to life or property because of unstable soil, geologic or hydrologic conditions, or steep slopes. Geologically Hazardous Areas shall include, but are not limited to, all landslide and seismic hazard areas.

"Geotechnical report" or "geotechnical analysis" means a scientific study or evaluation conducted by a qualified expert that includes a description of the ground and surface hydrology and geology, the affected land form and its susceptibility to mass wasting, erosion, and other geologic hazards or processes, conclusions and recommendations regarding the effect of the proposed development on geologic conditions, the adequacy of the site to be developed, the impacts of the proposed development, alternative approaches to the proposed development, and measures to mitigate potential site-specific and cumulative geological and hydrological impacts of the proposed development, including the potential adverse impacts to adjacent and down-current properties. Geotechnical reports shall conform to accepted technical standards and must be prepared by qualified professional engineers or geologists who have professional expertise about the regional and local shoreline geology and processes.

"Grade" means the vertical location of the ground surface. "Natural grade" is the grade as it exists or may have existed in its original undisturbed condition. "Existing grade" is the current grade in either its undisturbed, natural condition or as disturbed by some previous modification. "Rough grade" is a stage where grade conforms approximately to an approved plan. "Finish grade" is the final grade of the site which conforms to an approved plan. "Average grade level" is the average of the natural or existing topography of the portion of the lot, parcel, or tract of real property which will be directly under the proposed building or structure. In the case of structures to be built over water, average grade level shall be the elevation of the ordinary high water mark. Calculation of the average grade level shall be made by averaging the ground elevations at the midpoint of all exterior walls of the proposed building or structure.

"Grading" means the movement or redistribution of the soil, sand, rock, gravel, sediment, or other material on a site in a manner that alters the natural contour of the land

"Groin" means a barrier type of structure that extends from the stream bank into a waterbody for the purpose of the protection of a shoreline and adjacent uplands by influencing the movement of water or deposition of

materials. Groins may serve a variety of functions, including bank protection, pool formation, and increased roughness, and may include rock structures, debris jams, or pilings that collect wood debris. See also "Weir."

"Groundwater" means the supply of fresh water under the surface of the ground in an aquifer that forms a natural reservoir of potable water.

"Guidelines" means those standards adopted by the Department of Ecology into the Washington Administrative Code (WAC) to implement the policy of Chapter 90.58 RCW for regulation of use of the shorelines of the state prior to adoption of master programs. Such standards also provide criteria for local governments and the Department of Ecology in developing and amending master programs.

"Hard structural shoreline stabilization" means shoreline erosion control practices using hardened structures that armor and stabilize the shoreline from further erosion. Hard structural shoreline stabilization typically uses concrete, boulders, dimensional lumber or other materials to construct linear, vertical or near-vertical faces. These include bulkheads, rip-rap, and similar structures.

"Height" is measured from average grade level to the highest point of a structure: Provided, that television antennas, chimneys, and similar appurtenances shall not be used in calculating height, except where such appurtenances obstruct the view of the shoreline of a substantial number of residences on areas adjoining such shorelines, or the SMP specifically requires that such appurtenances be included: Provided further, that temporary construction equipment is excluded in this calculation.

"Houseboat" or "floating home" means a dwelling unit constructed on a float that is moored, anchored, or otherwise secured in the water and is not designed for navigation under its own power.

"Hyporheic" means a groundwater area adjacent to and below channels where water is exchanged with channel water and water movement is mainly in the downstream direction

"Impervious Surface" means any material which reduces or prevents absorption of water into previously undeveloped land.

"Industry" means facilities for processing, manufacturing, and storage of finished or semi-finished goods, wholesale trade or storage, together with necessary accessory uses such as parking, loading, and waste storage and treatment.

"In-stream structures" are structure placed by humans within a stream or river waterward of the OHWM that either causes or has the potential to cause water impoundment or the diversion, obstruction, or modification of water flow. In-stream structures may include those for hydroelectric generation, irrigation, water supply, flood control, transportation, utility service transmission, fish habitat enhancement, recreation, or other purpose.

"Landslide" means episodic downslope movement of a mass of soil or rock.

"Landslide Hazard Area" refers to those areas of Benton County subject to a severe risk of landslide which include the following:

- A. Any areas with a combination of:
 - 1. Slopes greater than fifteen (15) percent;
 - 2. Impermeable soils (typically silt and clay) frequently inter-bedded with granular soils (predominately sand and gravel); or,
 - 3. Springs or ground water seepage.
- B. Any area which has shown movement during the Holocene epoch (from ten thousand 10,000 years ago to present) or which is underlain by mass wastage debris of that epoch;

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- C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by water action, including stream channel migration zones, or surcharge by upslope irrigation district canals or waterworks;
- D. Any area located on an alluvial fan, presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments.

"Maintenance, Normal" means those usual acts to prevent a decline, lapse, or cessation from a legally established condition. See "Repair, Normal."

"Manufactured Home" means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. The term "manufactured home" does not include a recreational vehicle.

"Manufactured Home Park" or "Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"May" means the action is acceptable, provided it conforms to the provisions of this chapter.

"Mining" means the removal of naturally occurring minerals and materials from the earth for commercial value. Mining includes processing and batching. Mining does not include large excavations for structures, foundations, parking areas, etc.

"Mitigation (sequencing)" means the use of any or all of the following actions that are listed in descending order of preference:

- A. avoiding the impact altogether by not taking a certain action or parts of an action;
- B. minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- C. rectifying the impact by repairing, rehabilitating or restoring the affected sensitive area;
- D. reducing or eliminating the impact over time by preservation or maintenance operations during the life of the development proposal;
- E. compensating for the impact by replacing, enhancing or providing substitute sensitive areas and environments;
- F. monitoring the impact and taking appropriate corrective measures.

"Monitoring" means the ongoing evaluation of the impacts of a development proposal on the biological, hydrologic and geologic conditions of Critical Areas. Monitoring includes the gathering of baseline data and the assessment of the performance of required mitigation measures through the collection and analysis of data for the purposes of understanding and documenting changes in natural ecosystems and features.

"Moorage facility" means a marina, pier, dock, mooring buoy, or any other similar fixed moorage site.

"Must" means a mandate; the action is required.

"Native vegetation" refers to plant species which are indigenous to the Central Basin region and which reasonably could have been expected to naturally occur on the site. Native vegetation does not include noxious weeds.

"Natural or existing topography" means the topography of the lot, parcel, or tract of real property immediately prior to any site preparation or grading, including excavation or filling.

"New Construction" means structures for which the "start of construction" commenced on or after the effective date of this Title.

“Nonconforming,” when used in reference to a use or structure, means a land use or structure that was lawful when established, but which does not now conform to the use regulations of the zone in which it is located. A use or structure shall be considered established if it conformed to applicable development regulations at any time or if it commenced or was constructed under a permit that has not expired.

"Nonwater-oriented uses" means those uses that are not water-dependent, water-related, or water-enjoyment.

“No net loss of ecological functions” means a public policy goal and requirement to maintain the aggregate total of the County’s shoreline ecological functions at its current level. For purposes of reviewing and approving this SMP, “current” is equivalent to the date of the Final Shoreline Analysis Report (April 2013). As a development standard, it means the result of the application of Mitigation Sequencing, in which impacts of a particular shoreline development and/or use, whether permitted or exempt, are identified and addressed, such that there are no adverse impacts on shoreline ecological functions or processes relative to the legal condition just prior to the proposed development and/or use.

"Ordinary High Water Mark" (OHWM) means that mark on lakes and streams which will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in ordinary years, as to mark upon the soil a character distinct from that of the abutting upland.

"Outcrop" refers to a geologic layer exposed at the earth's surface.

"Permit", for the purposes of this SMP, means any substantial development, variance, conditional use permit, or revision authorized under chapter 90.58 RCW.

“Pier” means a fixed platform above the water and supported by piles, usually perpendicular to the shoreline. See also “Dock.”

“Preferred uses” are those uses which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the shoreline. "Preferred" uses include single-family residences, ports, shoreline recreational uses, water-dependent industrial and commercial developments, and other developments that provide public access opportunities.

“Priority habitat” means a habitat type with unique or significant value to one or more species. An area classified and mapped as priority habitat must have one or more of the following attributes: Comparatively high fish or wildlife density; comparatively high fish or wildlife species diversity; fish spawning habitat; important wildlife habitat; important fish or wildlife seasonal range; important fish or wildlife movement corridor; rearing and foraging habitat; refuge; limited availability; high vulnerability to habitat alteration; unique or dependent species; or shellfish bed. A priority habitat may be described by a unique vegetation type or by a dominant plant species that is of primary importance to fish and wildlife. A priority habitat may also be described by a successional stage. Alternatively, a priority habitat may consist of a specific habitat element (such as talus slopes, caves, snags) of key value to fish and wildlife. A priority habitat may contain priority and/or non-priority fish and wildlife.

“Priority species” means species requiring protective measures and/or management guidelines to ensure their persistence at genetically viable population levels. Priority species are those that meet any of the criteria listed below:

- A. State-listed or state proposed species. State-listed species are those native fish and wildlife species legally designated as endangered (WAC 232-12-014), threatened (WAC 232-12-011), or sensitive (WAC 232-12-011). State proposed species are those fish and wildlife species that will be reviewed by the Department of Fish and Wildlife (POL-M-6001) for possible listing as endangered, threatened, or sensitive according to the process and criteria defined in WAC 232-12-297.
- B. Vulnerable aggregations. Vulnerable aggregations include those species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to congregate. Examples include heron colonies, seabird concentrations, and marine mammal congregations.

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- C. Species of recreational, commercial, and/or tribal importance. Native and nonnative fish, shellfish, and wildlife species of recreational or commercial importance and recognized species used for tribal ceremonial and subsistence purposes that are vulnerable to habitat loss or degradation.
- D. Species listed under the federal Endangered Species Act as either proposed, threatened, or endangered.

"Provisions" means policies, regulations, standards, guideline criteria or environment designations.

"Public interest" means the interest shared by the citizens of the state or community at large in the affairs of government, or some interest by which their rights or liabilities are affected including, but not limited to, an effect on public property or on health, safety, or general welfare resulting from a use or development.

"Public access" means the ability of the general public to reach, touch, and enjoy the water's edge, to travel on the waters of the state, and to view the water and the shoreline from adjacent locations.

"Public Trust Doctrine" is a common law principle generally holding that the waters of the state are a public resource owned by and available to all citizens equally for the purposes of navigation, conducting commerce, fishing, recreation and similar uses. While the doctrine protects public use of navigable water bodies below the ordinary high water mark, the doctrine does not allow the public to trespass over privately owned uplands to access the tidelands.

"Qualified Professional" means an accredited or licensed professional with a combination of education and experience in the discipline appropriate for the subject matter under review, or someone who would qualify as an expert in their field.

"Recharge Area" refers to an area in which water is absorbed and added to the groundwater reservoir.

"Recreation" means an experience or activity in which an individual engages for personal enjoyment and satisfaction. Shore-based outdoor recreation includes but is not limited to fishing; various forms of boating, swimming, hiking, bicycling, horseback riding, picnicking, watching or recording activities such as photography, painting, bird watching or viewing of water or shorelines, nature study and related activities.

"Recreational uses" refers to public, private, or commercial uses which offer activities, pastimes, and experiences that allow for the refreshment of mind and body. Examples include, but are not limited to, parks, viewpoints, trails, public access facilities, public parks, and other low-intensity use outdoor recreation areas. Recreational uses that do not require a shoreline location, nor are related to the water, nor provide significant public access, are considered non-water-oriented. For example, a recreation use solely offering indoor activities would be considered non-water-oriented.

"Recreational Vehicle" is a vehicle which is a travel trailer, motor home, truck camper, or camping trailer that is designed and used as temporary living quarters or overnight camping, is either self-propelled or mounted on or drawn by another vehicle, has a body length of no more than forty-five (45) feet; or, any structure inspected, approved and designated as a recreational vehicle by an agency bearing the insignia of the State of Washington or any other state or federal agency having the authority to approve recreational vehicles.

"Regulated Substance" means the toxic or natural substances and dangerous waste which have the potential to cause adverse impacts to ground and surface water quality and are controlled to ensure proper management and handling. Toxic and dangerous substances are listed in but not limited to Washington Administrative Code (WAC) 173-201A-040, and WAC 173-303-080.

"Repair, Normal" means to restore a development or structure to a state comparable to its original, legally established condition, including but not limited to its size, shape, configuration, location and external appearance, within a reasonable period after decay or partial destruction, except where repair causes substantial adverse effects to shoreline resource or environment. Replacement of a structure or development may be authorized as repair where such replacement is the common method of repair for the type of structure or development and the

replacement structure or development is comparable to the original structure or development including but not limited to its size, shape, configuration, location and external appearance and the replacement does not cause substantial adverse effects to shoreline resources or environment. See also "Maintenance, Normal."

"Residential" means buildings, structures or portions thereof that are designed and used as a place for human habitation. Included are single, duplex or multi-family dwellings, manufactured homes, and other structures that serve to house people, as well as the creation of new residential lots through land division. This definition includes accessory uses common to normal residential use, including but not limited to, residential appurtenances, accessory dwelling units, and home occupations.

"Restore," "restoration" or "ecological restoration" means the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures, and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions.

"Riparian Corridor" means the natural vegetation which lines the sides and tops of banks along rivers, creeks and streams. Typical vegetation include willows, cottonwood, maples, alder and other brushy understory which transitions into upland vegetation as distance from the bank increases.

"River" means the Yakima and Columbia Rivers.

"Salmonid" means a member of the fish family salmonidae. In Benton County, these include, but are not limited to, coho, Chinook, sockeye, resident rainbow, brown trout, steelhead, and whitefish.

"Seismic Hazard Areas" mean those areas of Benton County that are potentially subject to severe risk of earthquake damage as a result of seismically induced ground shaking, slope failure, settlement, soil liquefaction or surface faulting.

"Setback". See "Building Setback."

"Shall" means a mandate; the action must be done

"Shorelands" or "shoreland areas" means those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward two hundred feet from such floodways; and all wetlands and river deltas associated with the streams and lakes which are subject to the provisions of this chapter; the same to be designated as to location by the Department of Ecology.

"Shorelines" means all of the water areas of the state, including reservoirs, and their associated shorelands, together with the lands underlying them; except (i) shorelines of statewide significance; (ii) shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and (iii) shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes.

"Shoreline areas" and "shoreline jurisdiction" means all "shorelines of the state" and "shorelands" as defined in RCW 90.58.030.

"Shorelines of statewide significance" means the following shorelines of the state:

- A. Those lakes, whether natural, artificial, or a combination thereof, with a surface acreage of one thousand acres or more measured at the ordinary high water mark;
- B. Those natural rivers or segments east of the crest of the Cascade range downstream of a point where the annual flow is measured at two hundred cubic feet per second or more, or those portions of rivers east of the crest of the Cascade range downstream from the first three hundred square miles of drainage area, whichever is longer; and

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C. Those shorelands associated with A and B, above.

"Shorelines of the state" are the total of all "shorelines" and "shorelines of statewide significance" within the state.

"Shoreline environment designations" are a classification of shorelines established by this SMP in order to provide a uniform basis for applying policies and use regulations within distinctively different shoreline areas.

"Shorelines Hearings Board", a quasi-judicial body within the state Environmental and Land Use Hearings Office, which hears appeals by any aggrieved party on the issuance of a shoreline permit. See RCW 90.58.170 et seq. for the role of the Washington State Shorelines Hearings Board.

"Shoreline modifications" means those actions that modify the physical configuration or qualities of the shoreline area, usually through the construction of a physical element such as a dike, breakwater, pier, weir, dredged basin, fill, bulkhead, or other shoreline structure. They can include other actions, such as clearing, grading, or application of chemicals.

"Shoreline stabilization" means structural or non-structural modifications to the existing shoreline intended to address erosion impacts to property and dwellings, businesses, or structures caused by natural processes, such as current, flood, wind, or wave action. They are generally located parallel to the shoreline at or near the OHWM.

"Should" means that the particular action is required unless there is a demonstrated, compelling reason, based on policy of the Shoreline Management Act and this chapter, against taking the action.

"Significant vegetation removal" means the removal or alteration of trees, shrubs, and/or ground cover by clearing, grading, cutting, burning, chemical means, or other activity that causes significant ecological impacts to functions provided by such vegetation. The removal of invasive or noxious weeds does not constitute significant vegetation removal. Tree pruning, not including tree topping, where it does not affect ecological functions, does not constitute significant vegetation removal.

"Slide" refers to the downward mass movement of soil, rock, or snow resulting from failure of that material under stress.

"Slope" refers to the inclination of the surface of the land from the horizontal.

"SMA" means the Washington State Shoreline Management Act, chapter 90.58 RCW.

"Soft structural shoreline stabilization" means shoreline erosion control and restoration practices that contribute to restoration, protection or enhancement of shoreline ecological functions. Soft structural shoreline stabilization typically includes a mix of gravels, cobbles, boulders, logs and native vegetation placed to provide shore stability in a non-linear, generally sloping arrangement. Linear, vertical faces are an indicator of Hard Structural Shoreline Stabilization (see above definition).

"State master program" is the cumulative total of all shoreline master programs and amendments thereto approved or adopted by rule by Ecology.

"Structure" means a permanent or temporary edifice or building, or any piece of work artificially built or composed of parts joined together in some definite manner, whether installed on, above, or below the surface of the ground or water, except for vessels.

"Substantial development" shall mean any development of which the total cost or fair market value exceeds six thousand, four hundred, and sixteen dollars, or any development which materially interferes with the normal public use of the water or shorelines of the state. The dollar threshold must be adjusted for inflation by the Office of Financial Management every five years, beginning July 1, 2007, based upon changes in the consumer price index during that time period. "Consumer price index" means, for any calendar year, that year's annual average consumer price index, Seattle, Washington area, for urban wage earners and clerical workers, all items, compiled by the Bureau of Labor and Statistics, United States Department of Labor. The Office of Financial Management

must calculate the new dollar threshold and transmit it to the Office of the Code Reviser for publication in the Washington State Register at least one month before the new dollar threshold is to take effect. For purposes of determining whether or not a permit is required, the total cost or fair market value shall be based on the value of development that is occurring on shorelines of the state as defined in RCW 90.58.030(2)(c). The total cost or fair market value of the development shall include the fair market value of any donated, contributed or found labor, equipment or materials. See WAC 173-27-040 for a list of developments that are not considered substantial.

"Substantially degrade" means to cause significant ecological impact.

"Transportation" means roads and railways, related bridges and culverts, fills, embankments, causeways, parking areas, and trails.

"Use" means the activity or purpose for which land or structures or combination of land and structures are designed, arranged, occupied, or maintained together with any associated site improvement. This definition includes the construction, erection, placement, movement or demolition of any structure or site improvement and any physical alteration to land itself including any grading, leveling, paving or excavation. Use also means any existing or proposed configuration of land, structures, and site improvements, and the use thereof.

"Utility" means a primary or accessory service or facility that produces, transmits, stores, processes, or disposes of electrical power, gas, water, sewage, communications, oil, and the like.

"Vadose Zone Analysis" means the characterization of the soil profile above the water table.

"Variance" is a means to grant relief from the specific bulk, dimensional or performance standards set forth in this Master Program and not a means to vary a use of a shoreline.

"Vegetation" means any and all organic plant life growing at, below, or above the soil surface.

"Vessel" includes ships, boats, barges, or any other floating craft which are designed and used for navigation and do not interfere with the normal public use of the water.

"Water-dependent use" means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations.

"Water-enjoyment use" means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use; or a use that provides for recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general characteristic of the use and which through location, design, and operation ensures the public's ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment.

"Water-oriented use" means a use that is water-dependent, water-related, or water-enjoyment, or a combination of such uses.

"Water quality" means the physical characteristics of water within shoreline jurisdiction, including water quantity, hydrological, physical, chemical, aesthetic, recreation-related, and biological characteristics. Where used in this chapter, the term "water quantity" refers only to development and uses regulated under this chapter and affecting water quantity, such as impermeable surfaces and storm water handling practices. Water quantity, for purposes of this chapter, does not mean the withdrawal of ground water or diversion of surface water pursuant to RCW 90.03.250 through 90.03.340.

"Water-related use" means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because:

- A. The use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or

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- B. The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient.

"Weir" means a structure generally built perpendicular to the shoreline for the purpose of diverting water or trapping sediment or other moving objects transported by water.

"Wetland" or "wetlands" means that area inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands may include those artificial wetlands specifically intentionally created from non-wetland areas to mitigate conversion of wetlands.

"Wetland Edge" means the line delineating the outer edge of a wetland established by using the procedures in the currently approved Federal Wetland Delineation Manual.

"Wetland Functions" refer to the natural processes performed by wetlands and include functions which are important in facilitating food chain production, providing habitat for nesting, rearing and resting site for aquatic, terrestrial or avian species, maintaining the availability and quality of water such as purifying water, acting as recharge and discharge areas for groundwater aquifers and moderating surface water and storm water flows as well as performing other functions including but not limited to those set out in U.S. Army Corps of Engineers regulations at 33 C.R.R. Section 320.4(b)(2) (1988).

Section 15.03 Shoreline Jurisdiction and Use Preferences

03.010 Definition

- (a) As defined by the Shoreline Management Act of 1971, shorelines include certain waters of the State plus their associated "shorelands." The waterbodies designated as shorelines of the State are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater and lakes whose area is greater than 20 acres. In Benton County, only the Yakima River and the Columbia River meet shoreline criteria.
- (b) Shorelands, as adopted by Benton County and indicated on the Official Shoreline Maps are available for review in the Planning Department as either hard copy or computer-generated images of the County's Geographic Information System, are defined as:

"those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter..." (RCW 90.58.030)

- (c) The extent of shoreline jurisdiction is indicated on the Official Shoreline Maps available for review in the Planning Department as either hard copy or computer-generated images of the County's Geographic Information System. The purpose of the Official Shoreline Maps is to identify Environment Designations (Section 15.04 below). The maps only approximately identify or depict the lateral extent of shoreline jurisdiction. The actual lateral extent of the shoreline jurisdiction shall be determined on a site-specific basis based on the location of the ordinary high water mark (OHWM), floodway, floodplain, and presence of associated wetlands.
- (d) In circumstances where shoreline jurisdiction does not include an entire parcel, only that portion of the parcel within shoreline jurisdiction and any use, activity or development proposed within shoreline jurisdiction on that portion of the parcel is subject to this Shoreline Master Program.

03.020 General Shoreline Use Preferences

- (a) This SMP adopts the following policy provided in RCW 90.58.020, and fully implements it to the extent of its authority under this SMP:

It is the policy of the State to provide for the management of the shorelines of the State by planning for and fostering all reasonable and appropriate uses. This policy is designed to insure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the State and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto...

In the implementation of this policy, the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the State shall be preserved to the greatest extent feasible consistent with the overall best interest of the State and the people generally. To this end uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the state's shoreline. Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single family residences and their appurtenant structures, ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state....

Permitted uses in the shorelines of the State shall be designed and conducted in a manner to minimize, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public's use of the water.

- (b) When determining allowable uses and resolving use conflicts on shorelines within jurisdiction consistent with the above policy, the following preferences and priorities as listed in WAC 173-26-201(2)(d) shall be applied in the order presented below:
- (1) Reserve appropriate areas for protecting and restoring ecological functions to control pollution and prevent damage to the natural environment and public health.
 - (2) Reserve shoreline areas for water-dependent and associated water related uses ... Local governments may prepare master program provisions to allow mixed-use developments that include and support water-dependent uses and address specific conditions that affect water-dependent uses.
 - (3) Reserve shoreline areas for other water-related and water-enjoyment uses that are compatible with ecological protection and restoration objectives.
 - (4) Locate single-family residential uses where they are appropriate and can be developed without significant impact to ecological functions or displacement of water-dependent uses.
 - (5) Limit non-water-oriented uses to those locations where the above described uses are inappropriate or where non-water-oriented uses demonstrably contribute to the objectives of the Shoreline Management Act.

03.030 Shorelines of Statewide Significance**03.030.01 Designation Criteria**

Certain shoreline waterbodies and their associated shorelands have elevated status under the SMA if they are streams and rivers in Eastern Washington that are "...downstream of a point where the annual flow is measured at two hundred cubic feet per second or more, or those portions of rivers east of the crest of the Cascade range

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downstream from the first three hundred square miles of drainage area, whichever is longer” (RCW 90.58.030(2)(e)(v)(B)). These waterbodies are considered to be “shorelines of statewide significance,” and have unique supplemental provisions outlined in Sections 15.03.030.02 and 15.03.030.03 below. All of Benton County’s shorelines, the Yakima and Columbia Rivers, are Shorelines of Statewide Significance.

03.030.02 Use Preferences

- (a) In accordance with RCW 90.58.020, the following management and administrative policies are hereby adopted for all Shorelines of Statewide Significance in the County and UGAs, as defined in RCW 90.58.030(2)(e). Consistent with the policy contained in RCW 90.58.020, preference shall be given to the uses in the following order that are consistent with the statewide interest in Benton County’s shorelines. These are uses that:
- (1) Recognize and protect the statewide interest over local interest;
 - (2) Preserve the natural character of the shoreline;
 - (3) Result in long term over short term benefit;
 - (4) Protect the resources and ecology of the shoreline;
 - (5) Increase public access to publicly owned areas of the shorelines;
 - (6) Increase recreational opportunities for the public in the shoreline;
 - (7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary. (WAC 173-26-251(2))
- (b) Uses that are not consistent with these preferences should not be permitted on shorelines of statewide significance.

03.030.03 Policies

Consistent with the use preferences for Shorelines of Statewide Significance contained in RCW 90.58.020 and identified in Section 15.03.030.02, the County will base decisions administering this SMP on the following policies in order of decreasing priority:

- (a) Recognize and protect the state-wide interest over local interest.
- (1) Solicit comments and opinions from groups and individuals representing state-wide interests by circulating amendments to the Master Program, and any proposed amendments affecting Shorelines of Statewide Significance, to state agencies, affected Tribes, adjacent local governments’, citizen's advisory committees and local officials, and state-wide interest groups.
 - (2) Recognize and take into account state agencies' policies, programs and recommendations in developing and administering use regulations and in approving shoreline permits.
 - (3) Solicit comments, opinions and advice from individuals with expertise in ecology and other scientific fields pertinent to shoreline management.
- (b) Preserve the natural character of the shoreline.
- (1) Designate and administer shoreline environments and use regulations to protect and restore the ecology and environment of the shoreline as a result of human intrusions on shorelines.
 - (2) Restore, enhance, and/or redevelop those areas where intensive development already exists in order to reduce adverse impact on the environment and to accommodate future growth rather than allowing high-intensity uses to extend into low-intensity use or underdeveloped areas.
 - (3) Protect and restore existing diversity of vegetation and habitat values, wetlands, and riparian corridors associated with shoreline areas.
 - (4) Protect and restore habitats for State-listed “priority species.”
- (c) Support actions that result in long-term benefits over short-term benefits.

- (1) Evaluate the short-term economic gain or convenience of developments relative to the long-term and potentially costly impairments to the natural shoreline.
 - (2) Preserve resources and values of Shorelines of Statewide Significance for future generations and restrict or prohibit development that would irretrievably damage shoreline resources.
 - (3) Ensure the long-term protection of ecological resources of statewide importance, such as anadromous fish habitats and unique environments.
- (d) Protect the resources and ecology of the shoreline.
- (1) All shoreline development should be located, designed, constructed and managed consistent with mitigation sequencing provisions outlined in Section 15.05.020 to minimize adverse impacts to regionally important wildlife resources, including spawning, nesting, rearing and habitat areas, and migratory routes and result in no net loss of shoreline ecosystems and ecosystem-wide processes.
 - (2) Actively promote aesthetic considerations when contemplating new development, redevelopment of existing facilities, or general enhancement of shoreline areas.
- (e) Increase public access to publicly owned areas of the shoreline.
- (1) Give priority to developing paths and trails to shoreline areas and linear access along the shorelines, especially those trail corridors that would be a regional recreational and transportation resource.
 - (2) Locate development landward of the OHWM so that access is enhanced and opportunities for access are not precluded.
 - (3) Increase public access opportunities for those with disabilities consistent with the Americans with Disabilities Act.
 - (4) Provide incentives to landowners that provide shoreline public access, such as development incentives, tax reductions, or other measures.
- (f) Increase recreational opportunities for the public on the shoreline.
- (1) Plan for and encourage development of facilities for public recreational use of the shoreline, including facilities for boating, swimming, fishing, and other water-oriented activities.
 - (2) Reserve areas for lodging and related facilities on uplands with provisions for appropriate public access to the shoreline.

Section 15.04 Shoreline Environment Designations

04.010 Urban Transition Area

04.010.01 Purpose:

The purpose of assigning an area to an Urban Transition Area environment designation is to:

- (a) Ensure optimum utilization of shorelines occurring within designated Urban Growth Areas by managing development and uses so that they enhance and maintain shorelines for a variety of future urban uses, and
- (b) Protect and restore ecological functions of open space, flood plain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses.

The Urban Transition Area designation also reflects Benton County's coordinated planning with its cities.

04.010.02 Designation Criteria:

Assign an Urban Transition Area environment designation to Urban Growth Areas, where high intensity land-uses, including residential, commercial, recreational and industrial development or supporting utilities and transportation exist or are planned for in the future or where there is existing or planned development that is compatible with maintaining or restoring the ecological functions of the area.

04.010.03 Management Policies:

- (a) Recognize the cities' SMP development standards in Urban Transition Area areas. Shoreline regulations should reflect each UGA's unique character. Major Urban Transition Areas are described below:
 - (1) Richland UGA North: Richland intends this shoreline have a natural character. The shoreline in this area has a low level of human disturbance, or has been disturbed in the past but either has been isolated from human activity in the near past or is subject to a restoration program designed to restore natural ecological processes and functions. Scientific, historical, cultural, educational research uses, and low-intensity water-oriented recreational access uses may be allowed provided that no significant ecological impact on the area will result.
 - (2) Benton City UGA: UGA lands vary in existing and planned character, allowing a range of residential, suburban agricultural, commercial, recreational, and transportation uses, designed in a manner to achieve no-net-loss of ecological function.
 - (3) Kennewick UGA: UGA lands are suitable for urban development that is compatible with maintaining or restoring of the ecological functions of the area.
 - (4) Prosser UGA: The Prosser UGA shorelines are intended for residential, industrial, and other low intensity development compatible with maintaining or restoring of the ecological functions of the area.
- (b) In regulating uses in the Urban Transition Area environment, first priority should be given to water-dependent uses. Second priority should be given to water-related and water-enjoyment uses. Nonwater-oriented uses should be allowed in limited situations where they do not conflict with or limit opportunities for water-oriented uses or on sites where there is no direct access to the shoreline.
- (c) When expanding the Urban Transition Area environment, first consider the availability of existing Urban Transition Area land for water-oriented development.
- (d) Uses that preserve the natural character of the area or promote preservation of open space, floodplain or sensitive lands either directly or over the long term are encouraged. Uses that result in restoration of ecological functions should be allowed if the use is otherwise compatible with the purpose of the environment and the setting.
- (e) Policies and regulations shall assure no net loss of shoreline ecological functions as a result of new development.
- (f) Public access should be required on public lands. Private development that creates a demand for shoreline access should provide visual or physical access unless there are constitutional or legal limitations, safety, security, environment, or other similar factors that limit its feasibility.

04.020 Rural Industrial

04.020.01 Purpose:

The purpose of the Rural Industrial environment designation is to provide for intensive water-oriented commercial, transportation, power production, and industrial uses, while protecting existing ecological functions. This designation will provide the opportunity for the development, redevelopment and infill of existing rural industrial and commercial developments or former industrial or commercial sites consistent with the rural character of Benton County.

04.020.02 Designation Criteria:

Assign a Rural Industrial environment designation to shoreline areas in industrial or commercial areas of intensive rural development if they currently support concentrations of commerce, transportation, power production, or navigation; or are suitable and planned for intensive water-oriented uses.

04.020.03 Management Policies:

- (a) In regulating uses in the Rural Industrial environment, first priority should be given to water-dependent uses. Second priority should be given to water-related and water-enjoyment uses. Nonwater-oriented uses should be allowed in limited situations where they do not conflict with or limit opportunities for water-oriented uses or on sites where there is no direct access to the shoreline.
- (b) Policies and regulations shall assure no net loss of shoreline ecological functions as a result of new development. Where applicable, new development shall include environmental cleanup and restoration of the shoreline to comply with any relevant state and federal law.
- (c) Public access should be required on public lands. Private development that creates a demand for shoreline access should provide visual or physical access unless there are constitutional or legal limitations, safety, security, environment, or other similar factors that limit its feasibility.
- (d) Full utilization of existing industrial areas and altered lands should be achieved before further expansion of intensive development is allowed.

04.030 Residential**04.030.01 Purpose:**

The purpose of the Residential environment designation is to accommodate residential development and accessory structures that are consistent with this chapter. An additional purpose is to provide appropriate public access and recreational uses.

04.030.02 Designation Criteria:

Assign a Residential environment designation to shoreline areas that are predominantly single-family residential development or are planned and platted for residential development.

04.030.03 Management Policies:

- (a) Shoreline development standards should ensure no net loss of shoreline ecological functions, taking into account the environmental limitations and sensitivity of the shoreline area, the level of infrastructure and services available, and other comprehensive planning considerations.
- (b) Subdivisions and recreational developments should provide public or community access.
- (c) Access, utilities, and public services should be available and adequate to serve existing needs and those planned for future development.
- (d) Commercial development, including commercial recreation and agri-tourism, should be consistent with underlying rural zoning and limited to water-oriented uses within shoreline jurisdiction.

04.040 Rural**04.040.01 Purpose:**

The purpose of assigning an area to a Rural environment designation is to promote agricultural use and activities, including associated irrigation and support facilities, and accommodate low-density rural home sites, function as a separation between urban areas, and maintain an open space character and provide opportunities for recreational uses compatible with agricultural activities.

04.040.02 Designation Criteria:

Assign a Rural environment designation to those areas characterized by:

- (a) agricultural lands of long-term commercial significance and low-density rural home sites;
- (b) commercial agricultural potential; or
- (c) parallel roads, railroads, canals, levees or other alterations in shoreline jurisdiction that limit shoreline ecological functions.

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04.040.03 *Management Policies:*

- (a) Promote agricultural activities on agricultural lands.
- (b) Allow new agricultural activities and expansions of current agricultural activities on previously un-farmed lands consistent with this SMP.
- (c) Non-agricultural uses should be limited to those compatible with agriculture. Shoreline development within or adjacent to designated agricultural resource lands should incorporate measures to reduce compatibility impacts, such as open space landscaped separations or other measures to address impacts to agricultural operations.
- (d) Development standards should seek to conserve soils and water resources suitable for agricultural purposes.
- (e) Activities and uses should be designed for compatibility with the rural character, including the overall density pattern.

04.050 Hanford

04.050.01 *Purpose:*

The purpose of the Hanford environment is to recognize and foster the unique economic, environmental, and recreational values of the area as it transitions over time from federal energy purposes to other land uses and management consistent with the Hanford Reach National Monument designation.

04.050.02 *Designation Criteria:*

Assign a "Hanford" environment designation to shoreline areas located in the U.S. Department of Energy's Hanford site.

04.050.03 *Management Policies:*

To the extent that this SMP is applicable to federal lands, the following policies should guide uses in shoreline jurisdiction:

- (a) Predominant shoreline uses should include preservation of cultural, ecological and natural resources with limited public access where appropriate.
- (b) High intensity uses in shoreline jurisdiction should be limited to heavy and light industry, energy generation and transmission, research and development, and environmental cleanup.
- (c) High-intensity and low-intensity public access and recreation should be accommodated where consistent with local environmental conditions, and safety and security concerns.
- (d) Uses and activities should be consistent with the Benton County Comprehensive Land Use Plan and Benton County zoning regulations.

04.060 Conservancy

04.060.01 *Purpose:*

The purpose of the Conservancy environment is to:

- (a) protect ecological functions of open space, floodplain and other sensitive public or protected lands and conserve existing natural resources and valuable historic and cultural areas while allowing a variety of compatible uses; and
- (b) Ensure appropriate management and development of existing and future public parks and recreation areas.

04.060.02 *Designation Criteria:*

Assign a Conservancy environment designation if any of the following characteristics apply:

- (a) They are within existing or planned public parks or public lands intended to accommodate public access and recreational developments;
- (b) They are suitable for water-related or water-enjoyment uses;
- (c) They are open space, floodplain or other sensitive areas that should not be more intensively developed;
- (d) They have potential for ecological restoration;
- (e) They retain important ecological functions, even though partially developed; or
- (f) They have the potential for development that is compatible with ecological restoration.

04.060.03 *Management Policies:*

- (a) Uses in the Conservancy environment should be limited to those which sustain the shoreline area's physical and biological resources and uses of a non-permanent nature that do not substantially degrade ecological functions or the rural or natural character of the shoreline area.
- (b) Except in support of agriculture, aquaculture, and recreation uses, commercial and industrial uses should not be allowed.
- (c) Water-oriented uses should be given priority over nonwater-oriented uses. Water-dependent and water-enjoyment recreation facilities and uses that do not deplete the resource over time, such as boating facilities, fishing, hunting, wildlife viewing trails, swimming beaches, and scientific, historical, cultural, and educational research uses, are preferred, provided adverse impacts to the shoreline are mitigated.
- (d) Shoreline development standards should ensure that new development does not result in a net loss of shoreline ecological functions or further degrade other shoreline values.
- (e) Existing uses and development, including roadways and railroads, may be maintained and expanded consistent with provisions of this SMP.
- (f) Public access and public recreation objectives on public lands should be implemented when appropriate and when adverse ecological impacts can be mitigated.
- (g) Construction of new structural shoreline stabilization and flood control works should only be allowed where there is a documented need to protect an existing structure or ecological functions, and only when mitigation is applied.

04.070 Natural

04.070.01 *Purpose:*

The purpose of the Natural environment is to protect those public shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use. These systems require that only very low-intensity uses be allowed in order to maintain the ecological functions and ecosystem-wide processes.

04.070.02 *Designation Criteria:*

A Natural environment designation should be assigned to shoreline areas if any of the following characteristics apply:

- (a) The shoreline is ecologically intact and therefore currently performing an important, irreplaceable function or ecosystem-wide process;
- (b) The shoreline is considered to represent ecosystems and geologic types that are of particular scientific and educational interest; or
- (c) The shoreline is a publicly managed portion of the Umatilla National Wildlife Refuge

04.070.03 *Management Policies:*

- (a) Any use that would substantially degrade the ecological functions or natural character of the shoreline area should not be allowed.
- (b) The following new uses should not be allowed in the Natural environment:

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- (1) Commercial uses.
 - (2) Industrial uses.
 - (3) Nonwater-oriented recreation with no relationship to the shoreline and waterbody.
 - (4) Roads, utility corridors, and parking areas that can be located outside of "Natural" designated shorelines.
- (c) Single-family residential development may be allowed as a conditional use within the Natural environment if the density and intensity of such use is limited as necessary to protect ecological functions and be consistent with the purpose of the environment.
 - (d) Irrigation withdrawals and other agricultural uses of a very low-intensity nature may be consistent with the Natural environment when such use is subject to appropriate limitations or conditions to assure that the use does not expand or alter practices in a manner inconsistent with the purpose of the designation.
 - (e) Scientific, historical, cultural, educational research uses, and low-intensity water-oriented recreational access uses, including non-motorized trails, may be allowed provided that no significant ecological impact on the area will result.
 - (f) New development or significant vegetation removal that would reduce the capability of vegetation to perform normal ecological functions should not be allowed. Do not allow the subdivision of property in a configuration that, to achieve its intended purpose, will require significant vegetation removal or shoreline modification that adversely impacts ecological functions. That is, each new parcel must be able to support its intended development without significant ecological impacts to the shoreline ecological functions.
 - (g) Consistent with the policies of the designation, the County should include planning for restoration of degraded shorelines within this environment.

04.080 Aquatic

04.080.01 *Purpose:*

The purpose of the Aquatic environment is to protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark.

04.080.02 *Designation Criteria:*

Assign an Aquatic environment designation to lands waterward of the ordinary high-water mark.

04.080.03 *Management Policies:*

- (a) Allow new over-water structures only for water-dependent uses, including docks associated with single-family residences; public access; or ecological restoration.
- (b) The size of new over-water structures should be limited to the minimum necessary to support the structure's intended use.
- (c) In order to reduce the impacts of shoreline development and increase effective use of water resources, multiple use of over-water facilities should be encouraged.
- (d) All developments and uses on navigable waters or their beds should be located and designed to minimize interference with surface navigation, to consider impacts to public views, and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.
- (e) Shoreline uses and modifications should be designed and managed to prevent adverse impacts to ecological functions and ecosystem-wide processes, including degradation of water quality and alteration of natural hydrographic conditions. Adverse impacts should not be allowed except where necessary to achieve the objectives of the Shoreline Management Act, and then only when mitigated as necessary to assure no net loss of ecological functions.

04.090 Environment Designation Interpretation

- (a) If disagreement develops as to the exact location of an environment designation boundary line, the Official Shoreline Maps shall prevail consistent with the following rules:
 - (1) Boundaries indicated as approximately following lot, tract, or section lines shall be so construed.
 - (2) In cases where boundary line adjustments or subdivisions occur, the designation applied to the parent parcel prior to the boundary line adjustment or subdivision shall not change as a result. The shoreline designation can be redesignated through an SMP amendment.
 - (3) Boundaries indicated as approximately following roads and railroads shall be respectively construed to follow the nearest right-of-way edge.
 - (4) Boundaries indicated as approximately parallel to or extensions of features indicated in (1), (2), or (3) above shall be so construed.
- (b) In the event of an environment designation mapping error where the SMP update or amendment record, including the public hearing process, is clear in term of the correct environment designation to apply to a property, the Shoreline Administrator shall apply the environment designation approved through the SMP Update or Amendment process and correct the map. Appeals of such interpretations may be filed pursuant to Section 15.09 and the County's appeal procedures referenced in Section 15.09 of this SMP. If the environment designation criteria were misapplied, but the map does not show an unintentional error (e.g. the SMP hearing and adoption record does not indicate another designation was intended), a SMP amendment may be obtained consistent with WAC 173-26-100 and Section 15.09.130.
- (c) All shoreline areas waterward of the OHWM shall be designated Aquatic.
- (d) Upland environment designations shall apply to shorelands.
- (e) Only one environment designation shall apply to a given shoreland area. In the case of parallel designations, designations shall be divided along an identified linear feature and the boundary shall be clearly noted on the map (for example: "boundary is 100 feet upland from the OHWM").

04.100 Official Shoreline Maps and Unmapped or Undesignated Shorelines

- (a) The Official Shoreline Maps at the time of SMP adoption, which illustrate the delineation of shoreline jurisdiction and environment designations in the County and UGAs, are available for review in the Planning Department as either hard copy or computer-generated images of the County's Geographic Information System. The official map shall include the following language: "We hereby certify that this map constitutes the Official Shoreline Map as approved by Ordinance 2014-440 of the Board of County Commissioners and signed by its chairman dated this 3rd day of June, 2014." The Official Shoreline Maps may be updated administratively or through an SMP amendment as indicated in 04.100(b), (c) and (d) below. The Department of Ecology will be provided with electronic files of the Official Shoreline Maps when any updates are made. Minor mapping errors corrected administratively shall not be greater than 1.0 acre in size. If greater than 1.0 acre in size, a SMP amendment shall be completed within three years of finding the mapping error.
- (b) Any areas within shoreline jurisdiction that are not mapped and/or designated due to minor mapping inaccuracies in the lateral extent of shoreline jurisdiction from the shoreline waterbody related to site-specific surveys of OHWM, floodway, and/or floodplain are automatically assigned the category of the contiguous waterward shoreline environment designation. Where the mapping inaccuracy results in inclusion of an unmapped associated wetland, that wetland shall be assigned a Conservancy designation. Correction of these minor mapping inaccuracies may be made and incorporated into the Official Shoreline Maps without an SMP amendment.
- (c) All other areas of shoreline jurisdiction that were neither mapped as jurisdiction nor assigned an environment designation shall be assigned a Conservancy designation until the shoreline can be redesignated through an SMP amendment process conducted consistent with WAC 173-26-100 and SMP Section 15.09.130.

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- (d) The actual location of the OHWM, floodplain, floodway, and wetland boundaries must be determined at the time a development is proposed. Wetland boundary and OHWM determinations are valid for five years from the date the determination is made. Floodplain and floodway boundaries should be assessed using FEMA maps or the most current technical information available.
- (e) In addition, any property shown in shoreline jurisdiction that does not meet the criteria for shoreline jurisdiction (e.g., is more than 200 feet from the OHWM or floodway, is no longer in floodplain as documented by a Letter of Map Revision from FEMA, and does not contain associated wetlands) shall not be subject to the requirements of this SMP. Revisions to the Official Shoreline Maps may be made as outlined in this Section 15.04.100(e) without an SMP amendment.

04.110 Use and Modifications Matrix

- (a) Table 04.110-1 indicates which shoreline activities, uses, developments, and modifications may be allowed or are prohibited in shoreline jurisdiction within each shoreline environment designation. Activities, uses, developments, and modifications are classified as follows:
 - (1) Uses allowed by Shoreline Substantial Development Permit are indicated by an “S” on the use matrix.
 - (2) Uses allowed by Shoreline Conditional Use Permit are indicated by a “C” on the use matrix.
 - (3) Prohibited activities, uses, developments, and modifications are not allowed and are shown as an “X” on the use matrix.
 - (4) Uses or activities not applicable to the shoreline environment designation in question are shown as “N/A” on the matrix.
 - (5) Uses in the Urban Transition Area shall be allowed subject to the most restrictive of the City or County Shoreline Master Program use allowances.

Table 04.110-1 Use and Modification Matrix

Shoreline Use or Modification	Urban Transition Area	Rural Industrial	Rural	Residential	Conservancy	Natural	Hanford	Aquatic
Key: S = Shoreline Substantial Development Permit or Exemption C = Shoreline Conditional Use Permit X = Not allowed N/A = Not Applicable								
Agriculture								
Agricultural Activities, Existing and New	S	S	S	S	S	C	X	N/A
Commercial Dairying, Poultry Raising, Commercial Hog Ranches, Animal Feedlots and Stockyards	X	X	X	X	X	X	X	N/A
Agricultural Stands	S	S	S	S	X	X	X	N/A
Agricultural Related Industries	C	S	S	X	X	X	X	N/A
Agri-tourism	C	S	S	X	X	X	X	N/A
Aquaculture								
Commercial	X	C	C	X	X	X	X	see adjacent upland environment
Non-commercial	S	C	S	X	C	C	S	see adjacent upland environment
Boating and Private Moorage Facilities								
Boat Launches								

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Shoreline Use or Modification	Urban Transition Area	Rural Industrial	Rural	Residential	Conservancy	Natural	Hanford	Aquatic
Key: S = Shoreline Substantial Development Permit or Exemption C = Shoreline Conditional Use Permit X = Not allowed N/A = Not Applicable								
Public	S	X	S	C	C	X	X	see adjacent upland environment
Commercial/Industrial	C	S	C	X	C	X	X	see adjacent upland environment
Other private	X	X	X	X	X	X	X	X
Pier/Dock								
Residential, including community	S	S	S	S	S	S	X	see adjacent upland environment
Commercial, industrial, aquaculture, recreational or public access use	S	S	S	C	C	C	S	see adjacent upland environment
Marinas	C	C	C	X	X	X	X	see adjacent upland environment
Breakwaters, Jetties, and Groins								
To protect or restore ecological functions	S	S	S	S	S	S	S	S
To maintain existing water-dependent uses	C	C	C	C	C	C	C	see adjacent upland environment
All other purposes	C	C	C	C	X	X	X	see adjacent upland environment
Commercial and Service Uses								
Visitor-serving uses	S	S	S	S	X	X	X	C
Recreation concessions	S	S	S	S	S	S	S	S
Other retail, trade or service	C	C	C	C	X	X	X	C
Dredging and Dredge Material Disposal								
Dredging for water-dependent use and public access	S	S	S	S	C	C	C	see adjacent upland environment
Dredging for existing navigation uses	NA	NA	NA	NA	NA	NA	NA	S
Dredging or disposal of dredged material for habitat restoration	S	S	S	S	S	S	S	S
Dredging, other	NA	NA	NA	NA	NA	NA	NA	C
Disposal of dredged material inside CMZ	C	C	C	C	C	C	C	C
Disposal of dredged material outside CMZ	S	S	C	C	X	X	X	see adjacent upland environment
Implementation of dredging maintenance plan	S	S	S	S	S	S	S	S
Fill								
Waterward of the OHWM - restoration	N/A	N/A	N/A	N/A	N/A	N/A	N/A	S
Waterward of the OHWM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C
Upland of the OHWM	S	S	S	S	S	C	S	N/A

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Shoreline Use or Modification	Urban Transition Area	Rural Industrial	Rural	Residential	Conservancy	Natural	Hanford	Aquatic
Key: S = Shoreline Substantial Development Permit or Exemption C = Shoreline Conditional Use Permit X = Not allowed N/A = Not Applicable								
Flood Hazard Reduction Measures								
Modification of Existing Flood Hazard Facilities (including relocation farther landward)	S	S	S	S	C	C	C	N/A
New Facilities	S	S	C	C	C	C	C	N/A
Forest Practices								
Forest Practices	X	X	X	X	X	X	X	N/A
Industry / Manufacturing / Storage								
Water-Oriented	S	S	S	X	X	X	S	C
Non-Water-Oriented								
General	X	C	X	X	X	X	C	X
Separated from Shoreline ¹	S	S	S	X	X	X	S	N/A
Mixed-use project that includes a Water-Dependent Use	S	S	S	X	X	X	S	C
In-Stream Structures								
To protect public facilities	S	S	S	S	C	C	S	see adjacent upland environment
To protect, restore, or monitor ecological functions or processes	S	S	S	S	S	S	S	S
To support agriculture	S	S	S	S	S	C	S	see adjacent upland environment
Other	S	S	S	S	C	C	N/A	see adjacent upland environment
Mining								
Mining that creates, restores or enhances habitat for priority species	S	S	S	S	S	S	S	S
Other mining and on-site processing	C	S	C	X	X	X	C	C
All mining in channel migration zone	C	C	C	X	X	X	C	C
Recreational Development								
Water-Oriented	S	S	S	S	S	S	S	S
Non-Water-Oriented								
General	C	C	C	C	C	X	C	X
Sites separated from shoreline	S	S	S	S	S	S	S	N/A
Residential Development								
Single-Family Dwelling	S	X	S	S	S	C	X	N/A
Accessory Dwelling Unit	S	X	S	S	C	X	X	N/A
Duplex	S	X	S	S	X	X	X	N/A
Houseboats and Over-Water Residential Uses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X

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Shoreline Use or Modification	Urban Transition Area	Rural Industrial	Rural	Residential	Conservancy	Natural	Hanford	Aquatic
Key: S = Shoreline Substantial Development Permit or Exemption C = Shoreline Conditional Use Permit X = Not allowed N/A = Not Applicable								
Shoreline Habitat and Natural Systems Enhancement Projects								
Shoreline Habitat and Natural Systems Enhancement Projects	S	S	S	S	S	S	S	S
Shoreline Stabilization								
New Hard Stabilization	S	S	S	S	C	X	S	see adjacent upland environment
New Soft Stabilization	S	S	S	S	S	C	S	see adjacent upland environment
Repair and Replacement	S	S	S	S	S	S	S	see adjacent upland environment
Transportation and Parking								
Access Roads Serving Permitted Uses	S	S	S	S	S	C	S	N/A
Highways, Freeways, Arterials & Collectors	S	S	S	S	C	C	S	N/A
Bridges	S	S	S	S	C	C	S	C
Railways	S	S	S	S	C	C	S	C
Airstrips	S	S	C	X	X	X	S	N/A
Trails	S	S	S	S	S	C	S	N/A
Parking for Authorized Use	S	S	S	S	S	C	S	N/A
Park and Ride lots and Similar Stand Alone Parking	C	C	C	X	X	X	C	N/A
Utilities								
Utility Services Accessory to Individual Shoreline Projects	S	S	S	S	S	C	S	C
Utility Services to Projects outside Shoreline Jurisdiction	S	S	S	C	C	X	S	C
Power Generating Facilities	S	S	C	X	C	X	C	C
Wind Turbine and Related Support Structures (Zoning Code)	S	S	C	C	C	X	C	C
Utility Transmission Lines	S	S	S	S	S	C	S	C
Utility Services, General	S	S	S	S	S	C	S	C
Wastewater Treatment Facility	S	S	C	X	C	X	C	C

¹ Applies when a proposed development is physically separated from the shoreline by another property or public right of way.

04.120 Development Standards

- (a) There shall be a thirty-five (35) foot maximum building height for all structures, except that utility facilities and bridges are not required to meet this standard. To exceed 35 feet, an applicant must apply for a Shoreline Variance, and comply with the following criteria in addition to standard Shoreline Variance criteria:

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- (1) Demonstrate overriding considerations of the public interest will be served, and
 - (2) Demonstrate that the proposal will not obstruct the view of a substantial number of residences on areas adjoining such shorelines or impair views from public lands or impair scenic vistas.
- (b) Minimum shoreline lot frontage shall be consistent with underlying zoning and be no less in width than the following by shoreline environment:
- (1) Urban Transition Area: 70 feet
 - (2) Rural Industrial: 70 feet
 - (3) Rural: 90 feet
 - (4) Residential: 70 feet
 - (5) Conservancy: 90 feet
 - (6) Natural: 90 feet
 - (7) Hanford: 90 feet
- (c) Shoreline buffers: See Section 15.06.030(a).
- (d) Minimum structure setbacks from side property lines in shoreline jurisdiction shall be consistent with the underlying zoning and no less than 5 feet.

Section 15.05 General Regulations and Performance Standards

05.010 Archaeological and Historic Resources

- (a) The County shall require development applicants to consult with DAHP to access data so that every proposal can be screened, and archaeological sites are not disturbed. Review of data and other consultation may occur directly with DAHP or through a professional archaeologist recognized by the State of Washington. Permits issued in areas documented to contain archaeological resources require a site inspection or evaluation by a professional archaeologist. Auger tests may be required before construction and representatives of the DAHP and affected tribes may be invited to observe any tests and construction work, or the County may send results of the test to affected tribes. If auger or historical data indicate probable presence of cultural resources which may be disturbed by excavation, the County shall inform the shoreline permit applicant and may impose conditions on any shoreline permit to assure that such resources are protected, preserved or collected.
- (b) Developers and property owners shall immediately stop work and notify the County, DAHP, and affected tribes if archaeological resources are uncovered during excavation. Following such notification, the County shall require a developer or property owner follow the provisions of Subsection (c).
- (c) Where a professional archaeologist or historian, recognized by the State of Washington, has identified an area or site as having significant value, or where an area or site is listed in, or determined eligible for listing in, national, state or local historical registers, or where through the development application state data has identified the potential for cultural resources, the County shall, with additional DAHP consultation, require a development application to provide an evaluation of the resource, and appropriate conditions, which may include preservation and/or retrieval of data, proposal modifications to reduce impacts, or other mitigation authorized through the State Environmental Policy Act, or other local, state, or federal laws.
- (d) Applicants shall be required to follow applicable provisions of federal and state laws, including but not limited to: Chapter 27.44 RCW Indian Graves and Records and Chapter 27.53 RCW Archaeological Sites and Resources.

05.020 Environmental Protection

- (a) Ecological Functions. Uses and developments on Benton County shorelines must be designed, located, sized, constructed and maintained to achieve no net loss of shoreline ecological functions necessary to

- sustain shoreline natural resources. New uses and developments must not have an unmitigated adverse impact on other shoreline functions fostered by this SMP.
- (b) Protection of Critical Areas and Buffers. Critical areas, critical areas buffers, and shoreline buffers must be protected in accordance with the provisions of SMP Section 15.06, Critical Areas in Shoreline Jurisdiction.
 - (c) Mitigation Requirement. If a proposed shoreline use or development is entirely addressed by specific, objective standards (such as setback distances, pier dimensions, or materials requirements) contained in this SMP, then the mitigation sequencing analysis described in Section 15.05.020(d) is not required. In the following circumstances, the applicant must provide a mitigation sequencing analysis as described in Section 15.05.020(d):
 - (1) if a proposed shoreline use or development is addressed in any part by discretionary standards (such as standards requiring a particular action “if feasible” or requiring the minimization of development size) contained in this Chapter, then the mitigation sequencing analysis is required for the discretionary standard(s); or
 - (2) when an action requires a Shoreline Conditional Use Permit or Shoreline Variance Permit; or
 - (3) when specifically required by regulations contained in Sections 15.05, 15.06, 15.07 or 15.08 of this SMP.
 - (d) Mitigation Sequence. In order to ensure that development activities contribute to meeting the no net loss provisions by avoiding, minimizing, and mitigating for adverse impacts to ecological functions or ecosystem-wide processes, an applicant required to complete a mitigation analysis pursuant to Section 15.05.020(c) must describe how the proposal will follow the sequence of mitigation as defined below:
 - (1) Avoid the impact altogether by not taking a certain action or parts of an action;
 - (2) Minimize the impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
 - (3) Rectify the impact by repairing, rehabilitating, or restoring the affected environment to the conditions existing at the time of the initiation of the project or activity;
 - (4) Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
 - (5) Compensate for the impact by replacing, enhancing, or providing substitute resources or environments; and
 - (6) Monitor the impact and the compensation projects and take appropriate corrective measures.
 - (e) Adverse Impacts. Example of common actions that may result in adverse ecological impacts include, but are not limited to, the following:
 - (1) Removal of native plant communities in shoreline jurisdiction,
 - (2) Removal of native or non-native trees that overhang the water,
 - (3) Removal of native or non-native vegetation on slopes if that vegetation supports maintenance of slope stability and prevents surface erosion,
 - (4) Removal or alteration of priority habitats or habitat for priority species,
 - (5) Construction of new or expanded in- and over-water structures,
 - (6) Construction of new or expanded shoreline stabilizations,
 - (7) New discharges of water into the Yakima or Columbia Rivers that may introduce pollutants,
 - (8) Construction of new impervious surfaces whose discharges are not infiltrated and thus may alter hydrologic conditions of shoreline waterbodies,
 - (9) Changes in grading or fill that reduce floodplain capacity.
 - (f) Mitigation Plan. All proposed alterations to shoreline jurisdiction that may have adverse effects on ecological functions require mitigation sufficient to provide for and maintain the functions and values of the shoreline area or to prevent risk from a critical areas hazard. The applicant must develop and

implement a mitigation plan prepared by a qualified professional. Mitigation in excess of that necessary to ensure that development will result in no net loss of ecological functions will not be required by Benton County, but may be voluntarily performed by an applicant. In addition to any requirements found in Section 15.07, Critical Areas in Shoreline Jurisdiction, a mitigation plan must include:

- (1) An inventory and assessment of the existing shoreline environment including relevant physical, chemical and biological elements;
 - (2) A discussion of any federal, state, or local management recommendations which have been developed for critical areas or other species or habitats located on the site;
 - (3) A discussion of proposed measures which mitigate the adverse impacts of the project to ensure no net loss of shoreline ecological functions;
 - (4) A discussion of proposed management practices which will protect fish and wildlife habitat both during construction, and after the project site has been fully developed;
 - (5) Scaled drawings of existing and proposed conditions, materials specifications, and a minimum three-year maintenance and monitoring plan, including performance standards;
 - (6) A contingency plan if mitigation fails to meet established success criteria; and
 - (7) Any additional information necessary to determine the adverse impacts of a proposal and mitigation of the impacts.
- (g) Alternative Mitigation. When compensatory measures are appropriate pursuant to the mitigation priority sequence above, preferential consideration shall be given to measures that replace the impacted functions on site and in kind. To provide for flexibility in the administration of the ecological protection provisions of this SMP, alternative mitigation approaches may be approved within shoreline jurisdiction where such approaches provide increased protection of shoreline ecological functions and processes over the standard provisions of this SMP and are scientifically supported, or are consistent with the Shoreline Restoration Plan or watershed-level management plans. Potential alternative mitigation tools include in-lieu-fee, advance mitigation, and mitigation banking. Authorization of alternative compensatory mitigation measures may require appropriate safeguards, terms or conditions as necessary to ensure no net loss of ecological functions, and may require approval by other state or federal agencies.

05.030 Shoreline Vegetation Conservation

- (a) Vegetation conservation standards do not apply retroactively to existing legally established uses and developments. Vegetation associated with existing structures, uses and developments may be maintained within shoreline jurisdiction.
- (b) Vegetation within shoreline buffers, other stream buffers, wetlands and wetland buffers, WDFW-mapped priority habitats and species areas, and other critical areas must be managed consistent with Section 15.06, Critical Areas in Shoreline Jurisdiction. Regulations specifying establishment and management of shoreline buffers (buffers associated with the Yakima and Columbia Rivers) are located in Section 15.06.030, Rivers and Creeks.
- (c) Other vegetation within shoreline jurisdiction, but outside of shoreline buffers, creek buffers, wetlands and wetland buffers, and other WDFW-mapped priority habitats and species areas must be managed according to Section 15.05.020, Environmental Protection, and any other regulations specific to vegetation management contained in this SMP and Benton County Code.
- (d) Vegetation clearing must be limited to the minimum necessary to accommodate approved shoreline development that is consistent with all other provisions of this SMP and Benton County Code. Mitigation sequencing per Section 15.05.020(d), Environmental Protection, must be applied unless specifically excluded by this SMP, so that the design and location of the structure or development, including septic drainfields, minimizes short- and long-term vegetation removal. The County may approve modifications or require minor site plan alterations to achieve maximum tree retention.

- (e) Where vegetation removal conducted consistent with this Section results in adverse impacts to shoreline ecological function, new developments or site alterations are required to develop and implement a supplemental mitigation plan. Examples of actions that may result in adverse impacts include:

- (1) Removal of native trees, shrubs or groundcovers;
- (2) Removal of non-native trees or shrubs that overhang aquatic areas or stabilize slopes; or
- (3) Removal of native or non-native trees or shrubs that disrupts an existing vegetation corridor connecting the property to other critical areas or buffers.

Mitigation plans must be prepared by a qualified professional and must contain information required in Section 15.05.020(e). Performance standards shall require 100 percent survival in Year 1, with 100 percent tree survival and 80 percent shrub and groundcover survival at the end of the monitoring period. Mitigation measures must be maintained over the life of the use or development.

- (f) Shoreline vegetation may be removed to accommodate a temporary staging area when necessary to implement an allowed use or modification, but mitigation sequencing must be utilized and the area must be immediately stabilized and restored with native vegetation once its use as a staging area is complete.
- (g) Native tree removal in shoreline jurisdiction must be mitigated by installation of a similar native tree at a 1:1 impact to mitigation ratio. Non-native tree removal in shoreline buffers must be mitigated by installation of a native or suitable non-native tree at a 1:1 impact to mitigation ratio. All mitigation trees shall be preferentially placed in the shoreline buffer, unless the trees provide connectivity to upland habitats or other critical areas, and shall be held to a 100% survival standard at the end of three years.
- (h) Where a tree poses a safety hazard, it may be removed or converted to a wildlife snag if the hazard cannot be eliminated by pruning, crown thinning, or other technique that maintains some habitat function. If a safety hazard cannot be easily determined by the County, a written report by a certified arborist or other qualified professional is required to evaluate potential safety hazards.
- (i) Selective pruning of trees for views is allowed. Selective pruning of trees for views does not include removal of understory vegetation, and must not compromise the health of the tree.
- (j) Hand removal or spot-spraying of invasive species (such as Russian olive) or noxious weeds included on the Washington State Noxious Weed List as a Class A, B or C weed on shorelands outside of steep or unstable slope areas is encouraged.
- (k) Mechanical removal or large-scale chemical treatment of invasive species.
- (1) Mechanical removal or large-scale chemical treatment of invasive species (such as Russian olive) or noxious weeds included on the Washington State Noxious Weed List as a Class A, B or C weed on shorelands outside of steep or unstable slope areas is encouraged.
 - (2) Coordination with Benton Conservation District is encouraged prior to undertaking invasive or noxious weed removal projects to ensure that the control and disposal technique is appropriate.
 - (3) Where noxious weeds and invasive species removal results in bare soils that may be subject to erosion or recolonization by invasive or noxious species, the area must be stabilized using best management practices and replanted with native plants (in or outside of shoreline or critical area buffers) or suitable non-native plants (outside of shoreline or critical area buffers). The replanted vegetation must be similar in size and structure at maturity to the removed vegetation.
 - (4) Invasive species removal efforts that exceed one-quarter acre should be phased if feasible to minimize potential erosion and sedimentation impacts.
- (l) Aquatic weed control must only be permitted where the presence of aquatic weeds will adversely affect native plant communities, fish and wildlife habitats, or an existing water-dependent recreational use. Aquatic weed control efforts must comply with all applicable laws and standards.

05.040 Water Quality, Stormwater, and Nonpoint Pollution

- (a) Do not degrade ecological functions. Design, construction and operation of shoreline uses and developments shall incorporate measures to protect and maintain surface and groundwater quantity and quality in accordance with all applicable laws, so that there is no net loss of ecological functions.
- (b) Do not degrade views and recreation opportunities. Design, construction and operation of shoreline uses and developments shall incorporate measures to protect and maintain surface and groundwater quantity and quality in accordance with all applicable laws, so that significant impacts to aesthetic qualities or recreational opportunities do not occur. A significant impact to aesthetics or recreation would occur if a stormwater facility and appurtenant structures such as fences or other features have the potential to block or impair a view of shoreline waters from public land or from a substantial number of residences per RCW 90.58.320, or if water quality were visibly degraded such that the color and character were unattractive and discouraged normal uses such as swimming, fishing, boating, or viewing.
- (c) Requirements for new development.
 - (1) New development and re-development shall manage short-term and long-term stormwater runoff to avoid and minimize potential adverse effects on shoreline ecological functions through compliance with the latest edition of the Benton County Hydrology Manual or approved equivalent. If certain thresholds are not met by a development that trigger compliance with the Benton County Hydrology Manual or approved equivalent, best management practices (BMPs) must still be employed to avoid and minimize potential adverse effects.
 - (2) When the Benton County Hydrology Manual applies, deviations from the standards may be approved where it can be demonstrated that off-site facilities would provide better treatment, or where common retention, detention and/or water quality facilities meeting such standards have been approved as part of a comprehensive stormwater management plan.
- (d) Sewage management. To avoid water quality degradation, sewer service is subject to the requirements outlined below.
 - (1) Any existing septic system or other on-site system that fails or malfunctions will be required to connect to an existing municipal sewer service system if feasible, or make system corrections approved by Benton-Franklin Health District.
 - (2) Any new development, business, single-family or multi-family unit in an Urban Growth Area will be required to connect to an existing municipal sewer service system if feasible, or install an on-site septic system approved by Benton-Franklin Health District.
- (e) Materials requirements. All materials that may come in contact with water shall be untreated or approved treated wood, concrete, approved plastic composites or steel, that will not adversely affect water quality or aquatic plants or animals.

05.050 Public Access

- (a) Efforts to implement the public access provisions of this Section shall be consistent with all relevant constitutional and other legal limitations on regulation of private property and the principles of nexus and proportionality.
- (b) Public access does not include the right to enter upon or cross private property, except on dedicated public rights-of-way or easements or where development is specifically designed to accommodate public access.
- (c) The County adopts the following policies and plans as collectively constituting a shoreline public access plan for Benton County shorelines:
 - (1) Benton County Comprehensive Plan Parks and Recreation Element
 - (2) Benton County Comprehensive Parks Plan

- (3) Hanford Site Comprehensive Land Use Plan Map
- (d) The Shoreline Administrator may approve a public access plan not otherwise listed in Subsection (c) if it:
 - (1) Meets the requirements of WAC 173-26-221(4); and
 - (2) Is developed through an open public process as provided in WAC 173-26-201(3)(b)(i).
- (e) Shoreline development shall not interfere with public access and enjoyment of any nearby publicly owned land areas.
- (f) The County shall not vacate any road, street, or alley abutting a body of water except as provided under RCW 36.87.130 County Roads.
- (g) Shoreline public access shall be required for the following shoreline uses and activities, unless excepted by Subsection (h):
 - (1) Shoreline recreation pursuant to Section 15.07.110;
 - (2) New structural public flood hazard reduction measures, such as dikes and levees;
 - (3) Shoreline development proposed or financed by public entities, including local governments, port districts, state agencies, and public utility districts;
 - (4) New marinas when water-enjoyment uses are associated with the marina;
 - (5) Where commercial use is proposed on land in public ownership;
 - (6) Where the nature of the proposed use, activity or development will likely generate a public demand for one or more forms of physical or visual access to the shoreline;
 - (7) When the proposed use, activity or development is not a water-oriented or other preferred shoreline use, activity or development under the SMA, such as a nonwater-oriented commercial or industrial use; or
 - (8) When the proposed use, activity or development will interfere with the public use, activity and enjoyment of shoreline areas or waterbodies subject to the public trust doctrine (see Section 15.02).
- (h) Notwithstanding the applicability of Subsection (g), an applicant shall not be required to provide public access where the County determines that one or more of the following conditions apply:
 - (1) Reasonable, safe and convenient public access to the shoreline is accessible within one-quarter mile (1,320 feet) of the site;
 - (2) The County's shoreline public access plan defined in Subsection (c) does not indicate a need for public access at the property;
 - (3) The site is within or part of an overall development which has previously provided public access through other application processes;
 - (4) The economic cost of providing for public access upon the site is unreasonably disproportionate to the total long-term economic value of the proposed use, activity or development;
 - (5) The proposed use, activity or development only involves the construction of four or fewer single-family or multifamily dwellings;
 - (6) The proposed use, activity or development only involves agricultural activities;
 - (7) The proposal consists of a new or expanded road or utility crossing through shoreline jurisdiction serving development located outside of shoreline jurisdiction;
 - (8) The nature of the use, activity or development or the characteristics of the site make public access requirements inappropriate due to health, safety or environmental hazards based on evidence provided in the proposed application;
 - (9) The proposed use, activity or development has security requirements that are not feasible to address through the application of alternative design features or other measures;
 - (10) Significant and unmitigable harm to the shoreline environment would be likely to result from an increase, expansion or extension of public access upon the site; or

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- (11) Public access is deemed detrimental to threatened and/or endangered species under the Endangered Species Act.
- (i) Public Access Standards. When public access is provided, the following standards shall apply.
- (1) Physical public access is preferred to solely visual access. Where physical public access is not feasible, the applicant shall incorporate visual public access. Visual public access may consist of view corridors, viewpoints, or other means of visual approach to public waters. Physical public access may consist of a dedication of land or easement and a physical improvement in the form of a trail, park, or other area serving as a means of physical approach to public waters.
 - (2) Physical public access shall be designed to connect to existing or future public access features on adjacent or abutting properties, or shall connect to existing public rights-of-way or access easements, consistent with design and safety standards.
 - (3) Public access proposals shall be designed consistent with parks and recreation standards or plans contained in applicable County, State, or Federal codes or approved plans.
- (j) Shared community access may be allowed if there is no existing or planned public access along the shoreline as determined by a review of adopted parks and recreation plans. Where provided, community access is subject to all applicable development standards of this Section. Preference shall be given for consolidated community access over individual lot by lot access in new multi-lot or multi-unit development.
- (k) Where public access is required pursuant to Subsection (g) and not exempt through Subsection (h), an applicant may request that the public access requirement be fulfilled through developing public access on another site – otherwise called off-site public access or by payment of a fee in lieu.
- (1) Off-site public access, either physical or visual, may be permitted by the County where it results in an equal or greater public benefit than on-site public access, or when on-site limitations of security, environment, or feasibility are present. Off-site public access is preferred where it implements adopted County shoreline public access plans defined in Subsection (c). Off-site public access may include, but is not limited to, enhancing a nearby public property (e.g. existing public recreation site; existing public access; road, street or alley abutting a body of water; or similar) in accordance with County standards; providing, improving or enhancing public access on another property under the control of the applicant/proponent; or another equivalent measure.
 - (2) Instead of on-site or off-site public access improvements, the County may require or an applicant may propose a fee-in-lieu. A fee-in-lieu may be assessed where the off-site improvement is best accomplished by the County or another agency at a later date or better implements the County Public Access Plans listed in Section 15.05.050. The cost of providing the off-site public access shall be proportionate to the total long-term cost of the proposed development or use. The fee-in-lieu agreements, conditions of approval, or mitigation measures shall address the responsibility and cost for operation and maintenance.
- (l) The County may condition public access proposals to ensure compatibility with existing public access or transportation facilities, address environmental conditions or environmental impacts, and/or address compatibility with adjacent properties. Public access facilities shall be made compatible with adjacent private properties through the use of techniques to define the separation between public and private space, including but not limited to, fencing, vegetation, and elevation separations.

05.060 Flood Hazard Reduction

- (a) Development in floodplains shall avoid significantly or cumulatively increasing flood hazards. Development shall be consistent with this SMP, including Section 15.06.050, as well as applicable

guidelines of the Federal Emergency Management Agency and an approved flood hazard management plan.

- (b) The channel migration zone (CMZ) is considered to be that area of a stream channel which may erode as a result of normal and naturally occurring processes and has been mapped consistent with WAC 173-26-221(3)(b). The Channel Migration Zone Maps are available for review in the Planning Department as either hard copy or computer-generated images of the County's Geographic Information System. Applicants for shoreline development or modification may submit a site-specific CMZ study if they believe these conditions do not exist on the subject property and the map is in error. The CMZ study must be prepared consistent with WAC 173-26-221(3)(b), and may include, but is not limited to, historic aerial photographs, topographic mapping, flooding records, and field verification. The CMZ study must be prepared by a licensed geologist or engineer with at least five years of applied experience in assessing fluvial geomorphic processes and channel response.
- (c) The following uses and activities may be authorized within the CMZ or floodway, provided they are also consistent with Section 15.06.050:
- (1) Actions that protect or restore the ecosystem-wide processes or ecological functions or development with a primary purpose of protecting or restoring ecological functions and ecosystem-wide processes.
 - (2) New development or redevelopment landward of existing legal structures, such as levees, that prevent active channel movement and flooding.
 - (3) Existing and ongoing agricultural activities provided that no new restrictions to channel movement are proposed.
 - (4) Development of new or expansion or redevelopment of existing bridges, utility lines, public stormwater facilities and outfalls, and other public utility and transportation structures, including trails, where no other feasible (see definition in Section 15.02) alternative exists or the alternative would result in unreasonable and disproportionate costs¹. Where such structures are allowed, mitigation shall address adversely impacted functions and processes in the affected shoreline.
 - (5) New or redeveloped measures to reduce shoreline erosion, provided that it is demonstrated that the erosion rate exceeds that which would normally occur in a natural condition, that the measures do not interfere with fluvial hydrological and geo-morphological processes normally acting in natural conditions, and that the measures include appropriate mitigation of adverse impacts on ecological functions associated with the river or stream.
 - (6) Water-dependent installations which by their very nature must be in the floodway.
 - (7) Modifications or additions to an existing nonagricultural legal use, provided that channel migration is not further limited and that the modified or expanded development includes appropriate protection of ecological functions.
 - (8) Repair and maintenance of existing legally established use and developments, provided that channel migration is not further limited, flood hazards to other uses are not increased, and significant adverse ecological impacts are avoided.
 - (9) Uses and developments allowed in the floodway under BCC 3.26, provided they are otherwise consistent with all provisions of this SMP.

¹ For the purposes of this Section “unreasonable and disproportionate” means that locations outside of the floodway or CMZ would add more than 20% to the total project cost. Other methods to determine unreasonable and disproportionate cost may be used on a case-by-case basis with approval of the Shoreline Administrator. [20% has been used as a threshold by WSDOT and the Federal Department of Justice for ADA standards]

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- (d) Flood hazard reduction measures shall not result in channelization of normal stream flows, interfere with natural hydraulic processes such as channel migration, or undermine existing structures or downstream banks.
- (e) New development in shoreline jurisdiction, including the subdivision of land, shall not be permitted if it is reasonably foreseeable that the development or use would require structural flood hazard reduction measures within the channel migration zone or floodway.
- (f) New public and private structural flood hazard reduction measures:
 - (1) shall not be approved, unless a scientific and engineering analysis demonstrates the following:
 - a. that they are necessary to protect existing development;
 - b. that nonstructural measures, such as buffers and setbacks, land use controls, wetland restoration, dike removal, use or structure removal or relocation, biotechnical measures, and stormwater management programs are not feasible;
 - c. that adverse effects upon adjacent properties will not result relative to increased floodwater depths and velocities during the base flood or other more frequent flood occurrences;
 - d. that the ability of natural drainage ways to adequately drain floodwaters after a flooding event is not impaired;
 - e. that the proposal has been coordinated through the appropriate diking district where applicable, and that potential adverse effects upon other affected diking districts have been documented; and,
 - f. that adverse impacts on ecological functions and priority species and habitats can be successfully mitigated so as to assure no net loss.
 - (2) shall be consistent with an approved comprehensive flood hazard management plan.
 - (3) shall be placed landward of associated wetlands and designated shoreline buffers, except for actions that increase ecological functions, such as wetland restoration, or when no other alternative location to reduce flood hazard to existing development is feasible as determined by the Shoreline Administrator.
- (g) New public structural flood hazard reduction measures, such as levees, shall dedicate and improve public access pathways unless public access improvements would cause unavoidable health or safety hazards to the public, inherent and unavoidable security problems, unacceptable and unmitigable significant adverse ecological impacts, unavoidable conflict with the proposed use, or a cost that is disproportionate and unreasonable to the total long-term cost of the development.
- (h) In those instances where management of vegetation as required by this SMP conflicts with vegetation provisions included in state, federal or other flood hazard agency documents governing County-authorized, legal flood hazard reduction measures, the vegetation requirements of this SMP will not apply. However, the applicant shall submit documentation of these conflicting provisions with any shoreline permit applications, and shall comply with all other provisions of this Section and this SMP that are not strictly prohibited by the approving flood hazard agency.
- (i) The removal of gravel or other riverbed material for flood management purposes shall be consistent with Section 15.07.060, Dredging and Dredge Material Disposal, and be allowed only after a biological and geomorphological study shows that extraction has a long-term benefit to flood hazard reduction, does not result in a net loss of ecological functions, and is part of a comprehensive flood management solution.

Section 15.06 Critical Areas in Shoreline Jurisdiction

06.010 General

- (a) Applicability. This chapter applies to any real property located within the shoreline jurisdiction of unincorporated Benton County.

- (b) Purpose. The purpose of this chapter is to meet the minimum requirements of the Washington State Growth Management Act, Chapter 36.70A RCW, and the Shoreline Management Act, Chapter 90.58 RCW, by designating the Critical Areas located in unincorporated Benton County and providing, through the use of the best science available, for the protection of the functions and values of those resources from incompatible and injurious use, encouraging the development of strategies to conserve and protect such resources, and preventing cumulative adverse environmental impacts to ground and surface water availability, to water quality, and to wetlands and streams, thereby ensuring the public health, safety, and general welfare while attempting to minimize public expenditures and efforts in response to floods, geological activity, and other natural disasters.
- (c) Identification of Critical Areas - Maps.
- (1) The Critical Areas Overlay Maps for critical areas are used as a general guide to the location, type and extent of critical areas. If present, whether mapped or not, critical areas are protected under all the provisions of this title and all related titles.
 - (2) The Critical Areas Overlay Maps are available for review in the Planning Department as either hard copy or computer generated images of the County's Geographic Information System. The maps will be amended over time to accurately reflect improvements in the accuracy of the data base.
 - (3) The Critical Areas Overlay Maps are also intended to alert the development community, appraisers, and current and prospective property owners of the potential encounter with natural site constraints due to critical areas, which may limit or cause alterations of development plans.
 - (4) If the SMP Administrator has reason to believe that the property proposed for development contains a critical resource based on other map or data sources or review of aerial photographs, then the SMP Administrator may require that additional information be provided prior to the County's acceptance of a development application as complete and ready for processing under current Benton County Codes.
 - (5) When any other title of the Benton County Code conflicts with this chapter, the more restrictive provision will apply.
- (d) Initial Review. The SMP Administrator shall perform an initial Critical Areas Review of any application for development or use. The initial review shall accomplish the following:
- (1) identify which critical areas or their buffers are present on the site;
 - (2) determine whether or not the development falls within the potential critical area(s) and potential buffer(s);
 - (3) in the case of a wetland, determine if it is subject to review under this chapter and if a delineation and wetland rating are necessary to establish whether a development may affect the wetland or its buffer;
 - (4) determine if the development is likely to have an adverse impact on the functions and values of the critical area(s). Development consisting of new construction or a related activity connected with an existing single-family residence shall not be considered an adverse impact to, or displacement of, the functions and values of a critical area if ground coverage is not increased by more than twenty (20) percent, native vegetation is not altered, and no portion of any new construction is located closer to a critical area than the existing principal structure;
 - (5) refer the applicant to such mitigating measures sufficient to protect the functions and values of the critical area and shall assist the applicant in the modification of the development to include specific measures, and appropriate monitoring strategy (where necessary), which meet the title's standards for the protection of the resource(s); and
 - (6) determine if a Critical Areas Special Study is required.
- (e) Critical Areas Special Study - Requirements.

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- (1) The SMP Administrator may require an applicant to conduct a "Critical Areas Special Study" if the Administrator determines that the development could have adverse impacts on a critical area. The purpose of a Critical Areas Special Study is to adequately evaluate the proposal and all potential adverse impacts on a critical area. The study may be included as part of the environmental review process under SEPA as administrated by the County, in accordance with the provisions of this title.
 - (2) The study shall be performed by a professional who is licensed or qualified as an expert in the critical areas at issue. The study shall include the following where applicable:
 - a. the resume of the principal author(s) which disclose(s) their technical training and experience and demonstrates their stature as a qualified professional;
 - b. identification and characterization of the critical area;
 - c. an assessment of any potential hazards associated with the proposed development;
 - d. an assessment of the impacts of the development proposal on any critical area; and
 - e. a mitigation plan which specifies maintenance, monitoring and bonding measures (where necessary).
- (f) Buffer Requirements.
- (1) For any development or use subject to the requirements to provide a buffer around critical areas, the SMP Administrator may allow buffer width averaging when the project proponent can demonstrate application of mitigation sequencing and that project elements would provide an equal or greater contribution to permanent critical resource protection than would the application of the standard buffer. The maximum reduction allowed in any location is 25 percent.
 - (2) The SMP Administrator may require a wider than standard buffer when analysis of impacts by qualified individuals indicates that the standard requirement will not protect a critical area's functions and values.
 - (3) Where a legally established road or railway crosses a shoreline or critical area buffer, the SMP Administrator may approve a modification of the minimum required buffer width to the waterward edge of the improved road if a study submitted by the applicant and prepared by a qualified professional demonstrates that the part of the buffer on the upland side of the road sought to be reduced:
 - a. does not provide additional protection of the shoreline waterbody; and
 - b. provides insignificant biological, geological or hydrological buffer functions relating to the waterward portion of the buffer adjacent to the shoreline waterbody.

If the improved roadway corridor is wider than 20 feet, a study is not required.
- (g) Critical Areas Resource Mitigation Fund. There is hereby created a Critical Areas Resource Mitigation Fund which shall be administered by the Benton County Treasurer's Office. All funds derived from payments received in-lieu of on/off-site mitigation shall be deposited in the fund which shall be used for off-site critical area enhancement or critical area lands acquisition. Monies in said fund not needed for immediate expenditure shall be invested for the benefit of the Critical Areas Resource Mitigation Fund pursuant to RCW 36.29.020. For investment purposes, the Benton County Treasurer is hereby designated the fund manager.
- (h) Permit Issuance.
- (1) The SMP Administrator may issue, issue with conditions, or deny the issuance of a permit, or its extension, in order to comply with and carry out the goals, purposes, objectives and requirements of this chapter. The permit shall include the findings listed in Section 15.06.010(h)(2).
 - (2) A permit may be issued if:

- a. after consideration of all feasible Best Management Practices, including alternative designs, scale (size), locations, and management plans, the proposed development meets the standards of this title, protects the functions and values of critical areas, and that required mitigation reduces impacts to insignificant levels on an individual and/or cumulative project basis; or,
- b. adverse impacts to critical area functions and values are both unavoidable and necessary because of public health and safety, or if specific local or regional economic considerations override the public interest in the protection of the critical areas, or because all reasonable economic uses for the property would be denied as a result of circumstances peculiar to the subject property; and all unavoidable adverse impacts are offset by enhancement of other critical areas on or off-site.

06.020 Wetlands

- (a) Applicability. This chapter applies to wetlands and all development activities within or adjacent to such wetlands located within the shoreline jurisdiction of unincorporated Benton County. The following activities are subject to permitting if they occur in a regulated wetland or its buffer:
 - (1) The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, organic matter, or material of any kind.
 - (2) The dumping of, discharging of, or filling with any material.
 - (3) The draining, flooding, or disturbing the water level or water table.
 - (4) Pile driving.
 - (5) The placing of obstructions.
 - (6) The construction, reconstruction, demolition, or expansion of any structure.
 - (7) The destruction or alteration of wetland vegetation through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a regulated wetland.
 - (8) Activities that result in:
 - a. A significant change of water temperature.
 - b. A significant change of physical or chemical characteristics of the sources of water to the wetland
 - c. A significant change in the quantity, timing or duration of the water entering the wetland.
 - d. The introduction of pollutants.
- (b) Developments Permitted. Developments within wetlands or their buffers as set forth in this chapter are permitted when sited, designed, and operated in a manner which protects the functions and values of the wetland when such developments meet the requirements of this title.
- (c) Identification and Delineation. Wetlands shall be identified and delineated by a qualified professional in accordance with WAC 173-22-035 and designated based on the definitions, methods, and standards set forth in the currently approved Federal Wetland Delineation Manual and applicable regional supplement.
- (d) Categories. Criteria for categorizing a wetland are those specified in the Washington State Department of Ecology's Washington State Wetland Rating System for Eastern Washington, or as revised (Publication #14-06-030).
 - (1) Category I Wetlands are: 1) alkali wetlands; 2) wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as wetlands of high conservation value; 3) bogs; 4) mature and old-growth forested wetlands over ¼ acre with slow-growing trees; 5) forests with stands of aspen; and 6) wetlands that perform many functions very well. These wetlands are those that 1) represent a unique or rare wetland type; or 2) are more sensitive to disturbance than most wetlands; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a high level of function.

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- (2) Category II Wetlands are: 1) forested wetlands in the floodplains of rivers; 2) mature and old-growth forested wetlands over ¼ acre with fast-growing trees; 3) vernal pools; and 4) wetlands that perform functions well.
- (3) Category III Wetlands are: 1) vernal pools that are isolated and 2) wetlands with a moderate level of functions. These wetlands generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
- (4) Category IV Wetlands are wetlands that should be able to be replaced, and in some cases improved. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions and also need to be protected.

(e) Buffer Requirements for Designated Wetlands.

- (1) Vegetative buffers shall be measured from the wetland edge. The width of the buffer shall be determined according to the wetland type. The standard buffer widths are provided in Table 06.020-1 below.
- (2) The use of the standard buffer widths requires the implementation of the measures in Table 06.020-2, where applicable, to minimize the impacts of the adjacent land uses.
- (3) If an applicant chooses not to apply the minimization measures in Table 06.020-2, then a 33% increase in the width of all buffers is required. For example, a 75-foot standard buffer would become a 100-foot buffer if the minimization measures are not implemented.
- (4) The standard buffer widths assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate functions of the buffer are provided.

Table 06.020 – 1. Wetland Buffers

Wetland Category	Standard Buffer Width Scores 3-4 habitat points	Additional buffer width if wetland scores 5 habitat points*	Additional buffer width if wetland scores 6-7 habitat points*	Additional buffer width if wetland scores 8-9 habitat points*
Category I: Based on total score	75 ft	Add 15 ft	Add 45 ft	Add 75 ft
Category I: Forested	75 ft	Add 15 ft	Add 45 ft	Add 75 ft
Category I: Bogs	190 ft	NA	NA	NA
Category I: Alkali	150 ft	N/A	NA	NA
Category I: Natural Heritage Wetlands	190 ft	N/A	NA	NA
Category II: Based on total score	75 ft	Add 15 ft	Add 45 ft	Add 75 ft
Category II: Vernal pool	150	NA	NA	NA
Category II: Forested	75 ft	Add 15 ft	Add 45 ft	Add 75 ft

Wetland Category	Standard Buffer Width Scores 3-4 habitat points	Additional buffer width if wetland scores 5 habitat points*	Additional buffer width if wetland scores 6-7 habitat points*	Additional buffer width if wetland scores 8-9 habitat points*
Category III (all)	60 ft	Add 30 ft	Add 60 ft	NA
Category IV (all)	40 ft	NA	NA	NA

* When the Department of Ecology updates its Wetland Rating Forms, these point ranges should be modified using Ecology's conversion table once developed.

Table 06.020-2. Required measures to minimize impacts to wetlands

(Measures are required, where applicable to a specific proposal)

Disturbance	Required Measures to Minimize Impacts
Lights	Direct lights away from wetland
Noise	<ul style="list-style-type: none"> ▪ Locate activity that generates noise away from wetland ▪ If warranted, enhance existing buffer with native vegetation plantings adjacent to noise source ▪ For activities that generate relatively continuous, potentially disruptive noise, such as certain heavy industry or mining, establish an additional 10' heavily vegetated buffer strip immediately adjacent to the outer wetland buffer
Toxic runoff	<ul style="list-style-type: none"> ▪ Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered ▪ Establish covenants limiting use of pesticides within 150 ft of wetland ▪ Apply integrated pest management
Stormwater runoff	<ul style="list-style-type: none"> ▪ Retrofit stormwater detention and treatment for roads and existing adjacent development ▪ Prevent channelized flow from lawns that directly enters the buffer ▪ Use Low Intensity Development techniques (per PSAT publication on LID techniques)
Change in water regime	Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns
Pets and human disturbance	<ul style="list-style-type: none"> ▪ Use privacy fencing OR plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion. ▪ Place wetland and its buffer in a separate tract or protect with a conservation easement
Dust	Use best management practices to control dust
Disruption of corridors or connections	<ul style="list-style-type: none"> ▪ Maintain connections to offsite areas that are undisturbed ▪ Restore corridors or connections to offsite habitats by replanting

- (5) Increased Wetland Buffer Width. Buffer widths shall be increased on a case-by-case basis as determined by the SMP Administrator when a larger buffer is necessary to protect wetland functions and values. This determination shall be supported by appropriate documentation showing that it is reasonably related to protection of the functions and values of the wetland. The documentation must include but not be limited to the following criteria:
 - a. The wetland is used by a plant or animal species listed by the federal government or the state as endangered, threatened, candidate, sensitive, monitored or documented priority species or habitats, or essential or outstanding habitat for those species or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees; or
 - b. The adjacent land is susceptible to severe erosion, and erosion-control measures will not effectively prevent adverse wetland impacts; or
 - c. The adjacent land has minimal vegetative cover or slopes greater than 30 percent.
- (6) Buffer averaging to *improve wetland protection* may be permitted when all of the following conditions are met:
 - a. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a “dual-rated” wetland with a Category I area adjacent to a lower-rated area.

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- b. The buffer is increased adjacent to the higher-functioning area of habitat or more-sensitive portion of the wetland and decreased adjacent to the lower-functioning or less-sensitive portion as demonstrated by a critical areas special study from a qualified wetland professional.
 - c. The total area of the buffer after averaging is equal to the area required without averaging.
 - d. The buffer at its narrowest point is never less than either $\frac{3}{4}$ of the required width or 75 feet for Category I and II, 50 feet for Category III and 25 feet for Category IV, whichever is greater.
- (7) All other proposals to reduce a wetland buffer may only be approved through the Shoreline Variance process.
- (f) Protection of Water Quality. The following provisions shall be followed to ensure the protection of the quality of water.
 - (1) New surface water discharged to wetlands from developments, including retention/detention facilities, pre-settlement ponds, or other surface water management structures may be allowed provided that the discharge does not decrease the water quality of the wetland;
 - (2) Category I and II wetlands may be used for regional retention/detention facilities only when the use will employ the use of pre-settlement ponds and the use will not lower the wetland's level of function and value, or its category;
 - (3) Use of wetland buffers for surface water management activities other than retention/detention facilities, such as energy dissipators and associated pipes, may be allowed only if:
 - a. no practicable alternative exists; and,
 - b. the functions of the buffer or the wetland are not adversely impacted.
- (g) Subdivisions. The subdivision and/or short subdivision of land in wetlands and associated buffers are subject to the following:
 - (1) Land that is located wholly within a wetland or its buffer may not be subdivided.
 - (2) Land that is located partially within a wetland or its buffer may be subdivided provided that an accessible and contiguous portion of each new lot is:
 - a. Located outside of the wetland and its buffer; and
 - b. Meets the minimum lot size requirements of the underlying zoning district.
- (h) Allowed Uses in Wetlands and Buffers
 - (1) Buffers and application of the normal mitigation sequencing process in Section 05.020, Environmental Protection, is not required of isolated Category III and IV wetlands less than 1,000 square feet that are not associated with a riparian area or buffer, are not part of a wetland mosaic, do not contain habitat identified as essential for local populations of priority species, and are not a vernal pool or alkali wetland. They may be filled if impacts are fully mitigated based on provisions in Section 15.06.020(i). If available, impacts should be mitigated through the purchase of credits from an in-lieu fee program or mitigation bank, consistent with the terms and conditions of the program or bank. In order to verify the following conditions, a critical area special study for wetlands meeting the requirements in Section 15.06.010(e) must be submitted.
 - (2) Activities Allowed in Wetlands and Buffers. The activities listed below are allowed in wetlands and buffers without submission of a Critical Areas Special Study, except where such activities result in a loss of the functions and values of a wetland or wetland buffer. These activities include:
 - a. Conservation or preservation of soil, water, vegetation, fish, shellfish, and/or other wildlife that does not entail changing the structure or functions of the existing wetland or buffer.
 - b. The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, chemical

applications, or alteration of the wetland or buffer by changing existing topography, water conditions, or water sources.

- c. Passive recreation. Passive recreation facilities, including:
 - 1. Walkways and trails, provided that those pathways are limited to minor crossings having no adverse impact on water quality. They should be generally parallel to the perimeter of the wetland, located only in the outer twenty-five percent (25%) of the wetland buffer area except for crossings and infrequent view points, and located to avoid removal of significant trees. They should be limited to pervious surfaces no more than five (5) feet in width for pedestrian use only. In wetlands, raised boardwalks utilizing non-treated pilings may be acceptable.
 - 2. Wildlife-viewing structures.
 - d. Drilling for utilities/utility corridors under a wetland or wetland buffer, with entrance/exit portals located completely outside of the wetland buffer, provided that the drilling does not interrupt the groundwater connection to the wetland or percolation of surface water down through the soil column. Specific studies by a hydrologist are necessary to determine whether the groundwater connection to the wetland or percolation of surface water down through the soil column will be disturbed.
 - e. Enhancement of a wetland or wetland buffer through the removal of non-native invasive plant species. Removal of invasive plant species shall be restricted to hand removal unless permits from the appropriate regulatory agencies have been obtained for approved biological or chemical treatments. All removed plant material shall be taken away from the site and appropriately disposed of. Plants that appear on the Washington State Noxious Weed Control Board list of noxious weeds must be handled and disposed of according to a noxious weed control plan appropriate to that species. Re-vegetation with appropriate native species at natural densities is allowed in conjunction with removal of invasive plant species.
 - f. Educational and scientific research activities
 - g. Normal and routine maintenance and repair of any existing public or private facilities within an existing right-of-way, provided that the maintenance or repair does not expand the footprint or use of the facility or right-of-way.
- (3) Stormwater management facilities. Stormwater management facilities are limited to stormwater dispersion outfalls and bioswales. They may be allowed within the outer twenty-five percent (25%) of the wetland buffer of Category III or IV wetlands only, provided that:
- a. No other location is feasible; and
 - b. The location of such facilities will not degrade the functions or values of the wetland; and
 - c. Stormwater management facilities are not allowed in buffers of Category I or II wetlands.
- (i) Compensatory Mitigation.
- (1) Projects that propose compensation for wetland acreage and/or functions are subject to State and Federal regulations. Compensatory mitigation for alterations to wetlands shall provide for no net loss of wetland functions and values, and must be consistent with the mitigation plan requirements of Section 15.05.020(f). The following documents were developed to assist applicants in meeting the above requirements.
 - a. Compensatory mitigation for alterations to wetlands shall be used only for impacts that cannot be avoided or minimized and shall achieve equivalent or greater biologic functions. Compensatory mitigation plans shall be consistent with Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans--Version 1, (Ecology Publication #06-06-011b, Olympia, WA,

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March 2006 or as revised), and Selecting Wetland Mitigation Sites Using a Watershed Approach (Eastern Washington) (Publication #10-06-07, November 2010).

- b. Wetland mitigation ratios shall be consistent with Table 06.020-3.

Table 06.020-3. Wetland Mitigation Ratios

Category and Type of Wetland	Creation or Re-establishment	Rehabilitation	Enhancement
Category I: Bog, Natural Heritage site	Not considered possible	Case by case	Case by case
Category I: Mature Forested	6:1	12:1	24:1
Category I: Based on functions	4:1	8:1	16:1
Category II	3:1	6:1	12:1
Category III	2:1	4:1	8:1
Category IV	1.5:1	3:1	6:1

- c. To more fully protect functions and values, and as an alternative to the mitigation ratios in Table 06.020-3, the SMP Administrator may allow mitigation based on the “credit/debit” method developed by the Department of Ecology in “Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Eastern Washington: Final Report” (Ecology Publication #11-06-015, August 2012, or as revised).
- d. Impacts to wetland buffers shall be mitigated at a 1:1 ratio. Compensatory buffer mitigation shall replace those buffer functions lost from development.

(2) Wetland Mitigation Banks.

- a. Credits from a wetland mitigation bank may be approved for use as compensation for unavoidable impacts to wetlands when:
 1. The bank is certified under RCW Ch. 90.84 or WAC Ch. 173-700,
 2. The SMP Administrator determines that the wetland mitigation bank can provide appropriate compensation for the authorized impacts, and
 3. The proposed use of credits is consistent with the terms and conditions of the bank’s certification.
- b. Replacement ratios for projects using bank credits shall be consistent with replacement ratios specified in the bank’s certification.
- c. Credits from a certified wetland mitigation bank may be used to compensate for impacts located within the service area specified in the bank’s certification. In some cases, bank service areas may include portions of more than one adjacent drainage basin for specific wetland functions.

(3) Advance Mitigation. Mitigation for projects with pre-identified impacts to wetlands may be constructed in advance of the impacts if the mitigation is implemented according to federal rules, State policy on advance mitigation, and State water quality regulations. If the project with impacts would take place in shoreline jurisdiction, it must also be evaluated via the appropriate shoreline permit process.

(4) Monitoring. Mitigation monitoring shall be required for a period necessary to establish that performance standards have been met, but not for a period less than five years. If a scrub-shrub or

forested vegetation community is proposed, monitoring may be required for ten years or more. The project mitigation plan shall include monitoring elements that ensure certainty of success for the project’s natural resource values and functions. If the mitigation goals are not obtained within the initial five-year period, the applicant remains responsible for restoration of the natural resource values and functions until the mitigation goals agreed to in the mitigation plan are achieved.

06.030 Rivers and Creeks

- (a) Buffer and building setback requirements. The minimum buffers for above ground development located in the vicinity of rivers and creeks are as follows:

Table 06.030 – 1. River and Creek Buffers

Environment Designation	Columbia River	Yakima River	Other Creeks
Urban Transition Area	Consistent with interlocal agreement to apply city SMP. If no agreement is in place: <ul style="list-style-type: none"> • Water-dependent: 0 • Water-related: 50 • Other: 50 	Consistent with interlocal agreement to apply city SMP. If no agreement is in place: <ul style="list-style-type: none"> • Water-dependent: 0 • Water-related: 50 • Other: 50 	Consistent with interlocal agreement to apply city SMP. If no agreement is in place: <ul style="list-style-type: none"> • Fish-bearing: 100 • Non-fish-bearing: 50
Rural Industrial	<ul style="list-style-type: none"> • Water-dependent: 0 • Water-related: 50 • Nonwater-oriented: 100 	NA	Fish-bearing: 100 Non-fish-bearing: 50
Residential	50 buffer + 50 building setback	75 buffer + 25 building setback	Fish-bearing: 100 Non-fish-bearing: 50
Rural	<ul style="list-style-type: none"> • Water-dependent: 0 • Water-related: 50 • Other: 100 	<ul style="list-style-type: none"> • Water-dependent: 0 • Water-related: 75 • Other: 100 	Fish-bearing: 100 Non-fish-bearing: 50
Hanford	200	NA	Fish-bearing: 100 Non-fish-bearing: 50
Conservancy	<ul style="list-style-type: none"> • Water-dependent: 0 • Other water-oriented: see Section 15.06.030(e)(4) • Nonwater-oriented: 200 	<ul style="list-style-type: none"> • Water-dependent: 0 • Other water-oriented: see Section 15.06.030(e)(4) • Nonwater-oriented: 150 	Fish-bearing: 100 Non-fish-bearing: 50
Natural	200	NA	Fish-bearing: 100 Non-fish-bearing: 50

*All dimensions measured in feet horizontally upland of the ordinary high water mark.

- (b) The introduction of any vegetation or wildlife which is not indigenous to the Central Basin region into any river or creek or its nearshore riparian area is prohibited unless authorized by a State of Washington or a federal license or permit. This provision does not apply to vegetation alterations to existing landscaped or agricultural areas.
- (c) Alterations to buffers that occur incidental to construction of an approved use or structure upland of the buffer must be restored to the condition prior to the construction activity once construction is concluded.
- (d) Use of river and creek buffers for surface water management activities other than retention/detention facilities, such as energy dissipators and associated pipes, may be allowed only if the applicant demonstrates that no practicable alternative exists.
- (e) The following uses are allowed in river and creek buffers and building setbacks provided that mitigation sequencing (see Section 15.05.020(d)) is demonstrated and any adverse impacts to ecological functions are mitigated.

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- (1) Water-dependent uses. Consistent with the use allowances for each environment designation, water-dependent uses, modifications and activities may be located in shoreline buffers at the water’s edge.
- (2) Accessories to water-dependent uses. Uses, developments and activities accessory to water-dependent uses should be located outside any applicable standard or reduced shoreline buffer unless at least one of the following is met:
 - a. proximity to the water-dependent project elements is critical to the successful implementation of the facility’s purpose and the elements are supportive of the water-dependent use and have no other utility (e.g., a road to a boat launch facility, facilities that support non-commercial aquaculture);
 - b. in parks or on other public lands where high-intensity recreational development is already legally established and whose use is primarily related to access to, enjoyment and use of the water, they do not conflict with or limit opportunities for other water-oriented uses; or
 - c. the applicant’s lot/site has topographical constraints where no other location of the development is feasible (e.g., the water-dependent use or activity is located on a parcel entirely or substantially encumbered by the required buffer).

In these circumstances, uses and modifications accessory to water-dependent uses must be designed and located to minimize intrusion into the buffer. All other accessory uses, developments and activities proposed to be located in a shoreline buffer must obtain a Shoreline Variance unless otherwise allowed by other regulations in this Section or in this SMP.

- (3) In the Residential environment, the shoreline building setback may contain lawn, landscaping, decks, patios and other alterations that are no taller than 36 inches in height. Minor non-permanent structures taller than 36 inches that are normal residential accessories, such as play structures, picnic tables and benches, or trellises, may also be located in the shoreline building setback. All alterations in shoreline jurisdiction, including the shoreline buffer and the building setback, must also comply with requirements of Section 15.05.030 (Shoreline Vegetation Conservation).
- (4) Water-oriented public access and recreation facilities.
 - a. In recognition of the existing condition of current and planned public shoreline parks and recreation facilities located in the Conservancy environment designation, the following standards shall guide new development and redevelopment of water-oriented public access and recreation facilities in lieu of shoreline buffers. Applicants shall submit a management plan that addresses compliance with each of the following applicable standards and principles, and contains additional information listed in Subsection (4)b below. The County may review and condition the project to more fully implement the principles below.

**Table 06.030 – 2. Water-Oriented Public Access and Recreation Facilities:
Design and Management Standards in Lieu of Shoreline Buffers**

Design Element	Design and Management Standards
i. Category of Use	The following use preferences apply in priority order: <ul style="list-style-type: none"> • Water-dependent uses located waterward, at or immediately upland of the OHWM • Water-related and/or water-enjoyment uses located upland of water-dependent uses. Water-related and water-enjoyment uses shall not displace existing or planned water-dependent uses. If water-dependent uses are not feasible, then water-related or water-enjoyment uses are allowed consistent with applicable performance standards. • Nonwater-oriented recreation uses located upland of water-oriented recreation uses. The preference is that nonwater-oriented uses occupy

Design Element	Design and Management Standards
	<p>existing structures upland of water-oriented recreation uses rather than be established in new structures. Where new nonwater-oriented uses are proposed upland of water-oriented uses, but will not occupy existing structures, they shall avoid native and riparian vegetation consistent with Subsection iv below.</p> <ul style="list-style-type: none"> • Accessory, nonwater-oriented uses located upland of water-oriented uses. However, parking for those with disabilities, when no other location is feasible, may be located per “iii” below. • Existing primary nonwater-oriented uses may only expand if they are located upland of water-oriented uses and if the expansion does not displace water-oriented uses. • Water-enjoyment recreational uses may be expanded. • Existing water-oriented uses may not be converted to a nonwater-oriented use except when the existing water-oriented use is separated from the OHWM by another property.
<p>ii. Impervious Surface and Stormwater Management</p>	<ul style="list-style-type: none"> • New and expanded pollution-generating impervious surfaces (e.g., surfaces used predominantly by vehicles, such as parking areas, roads) must provide water quality treatment before discharging stormwater through use of oil-water separators, bioswales, or other approved technique. This provision does not apply to boat launches. • Treated runoff from pollution-generating impervious surfaces and runoff from non-pollution-generating impervious surfaces shall be infiltrated if feasible. • New or expanded pollution-generating impervious surfaces within 50 feet of the OHWM or within already disturbed areas shall be limited to those necessary to provide vehicle access to boat launches, to improve existing informal parking areas, to expand existing parking, or to provide ADA parking as outlined below under iii. Parking. • New or expanded trail systems shall avoid existing riparian areas and comply with vegetation management requirements below. Existing trail systems may only be expanded in response to increased demand, and shall be expanded landward of existing trail where feasible. Parallel trails shall be placed at least 50 feet upland of the OHWM in the Conservancy environment, when feasible. Parallel portions of trails may be constructed closer to the aquatic area if the trail is located on or upland of previously disturbed rights-of-way, access and/or utility easements, and legally altered sites. Viewing platforms and crossings are allowed in buffers, provided they are also located to avoid significant vegetation removal.
<p>iii. Parking</p>	<ul style="list-style-type: none"> • New parking accessory to shoreline parks shall be at least 100 feet upland of the OHWM, except where a minimum number of parking spaces are provided closer than 100 feet to accommodate those with disabilities or where parking is provided on existing impervious surfaces. • Existing parking closer than 100 feet upland of the OHWM may only be expanded in response to increased demand. Expanded parking shall be expanded in the following order of preference, with 1) being the most preferred: 1) landward of existing parking and 2) laterally of the existing parking, if it is serving a previously existing authorized use and is located on existing impervious surface. Parking shall not be located closer than 50 feet upland of the OHWM unless the proposed expansion area is already an impervious surface or is necessary to accommodate those with disabilities.
<p>iv. Vegetation Management</p>	<ul style="list-style-type: none"> • New and expanded uses in shoreline jurisdiction shall be located to avoid and minimize intrusion into riparian areas, as well as avoid tree and shrub removal. • New and expanded uses in shoreline jurisdiction shall comply with Section 15.05.030, Shoreline Vegetation Conservation.

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Design Element	Design and Management Standards
	<ul style="list-style-type: none"> • Landscape designs for new and modified recreation facilities in shoreline jurisdiction shall incorporate the following. <ul style="list-style-type: none"> ▪ Select species that are suitable to the local climate, having minimal demands for water, minimal vulnerability to pests, and minimal demands for fertilizers. Native species shall comprise 50 percent of the landscaped area, not counting lawn area. Redevelopment of lawn areas shall be no closer than 20 feet from the OHWM. Native grasses may be used within the first 20 feet landward of the OHWM. If lawn areas are not currently established within 50 feet of the OHWM, the existing riparian vegetation within 50 feet of the OHWM shall be maintained, unless a mitigation plan demonstrates improved ecological function. ▪ Preserve existing soil and vegetation (especially trees) where possible. Amend disturbed soils with compost. Mulch existing and proposed landscapes regularly with wood chips, coarse bark, leaves or compost. ▪ Group plants by water need, use more efficient irrigation methods like drip and soakers under mulch, and design and maintain irrigation systems to reduce waste. ▪ Place vegetation to maximize the following benefits: <ul style="list-style-type: none"> – development or supplementation of a native vegetated wildlife corridor, – development or supplementation of riparian vegetation adjacent to the water’s edge, – screening parking areas from views from the water or the park, and/or – discouragement of wildlife that may directly or indirectly interfere with park use or human health (e.g., geese), • While a specified buffer is not required for certain water-oriented recreational uses and developments in public access and recreation areas, recreational improvement projects shall place an emphasis on shoreline restoration/enhancement within 50 feet of the OHWM. This emphasis shall not require the removal of existing lawn areas, but should place an emphasis on incorporation of riparian plantings if the public access area is underutilized or public access would not be impaired by the plantings.
v. Chemical Applications	<p>A lawn and landscape management strategy for any allowed uses in shoreline jurisdiction shall be developed that incorporates the following:</p> <ul style="list-style-type: none"> • A site-specific plan for use of integrated pest management technique, if applicable. • A detailed plan identifying anticipated use of fertilizers, herbicides and pesticides, to include method of application that ensures these materials will not enter the water. Phosphorus-containing fertilizer treatments shall not be applied to turf or landscaping within 50 feet of the OHWM. Natural applications and hand removal are preferred over synthetic applications.
vi. Lighting	<ul style="list-style-type: none"> • Outdoor lighting fixtures and accent lighting must be shielded and aimed downward, and shall be installed at the minimum height necessary. The shield must mask the direct horizontal surface of the light source. The light must be aimed to ensure that the illumination is only pointing downward onto the ground surface, with no escaping direct light permitted to contribute to light pollution by shining upward into the sky. • Outdoor lighting fixtures and accent lighting shall not directly illuminate the shoreline waterbody, unless it is a navigational light subject to state or federal regulations.

Design Element	Design and Management Standards
vii. Campgrounds	Proposed new campgrounds and their associated parking areas shall be a minimum of 50 feet from the OHWM, unless buffer averaging or reduction is applied.

b. Application requirements:

1. Drawings of existing park facilities, including a narrative that identifies area (sq. feet) and description of trails, parking, riparian vegetation, campsites, recreational facilities (ball parks, picnic table, grilling areas), upland vegetation and lawn areas.
 2. Drawings of proposed park facilities, including a narrative that identifies area (sq. feet) and description of trails, parking, riparian vegetation, campsites, recreational facilities (ball parks, picnic table, grilling areas), upland vegetation and lawn areas.
 3. Any increases in impervious surfaces (trail size, parking facilities, recreational facilities, etc.) shall include an explanation as part of the application that addresses the requirement for increased public facilities, what size facilities are needed by existing and projected park users, and the nearest locations of similar facilities.
 4. Expansion of public/park facilities shall be accompanied by a mitigation plan that addresses the design elements and the design and management standards above, addresses any critical area impacts, addresses mitigation sequencing, and demonstrates no net loss of shoreline ecological functions.
- (5) Shoreline residential access. A private access pathway constructed of pervious materials may be installed, a maximum of four (4) feet wide, through the shoreline buffer to the OHWM. Impervious materials may be used only as needed to comply with ADA requirements to construct a safe, tiered pathway down a slope. A railing may be installed on one edge of the pathway, a maximum of 36 inches tall and of open construction. Pathways to the shoreline should take the most direct route feasible consistent with any applicable ADA standards.

06.040 Critical Aquifer Recharge Areas

- (a) Permitted Development. Developments are permitted when sited, designed, and operated in a manner which protects the functions and values of critical aquifer recharge/interchange areas and when such developments meet the requirements of this title.
- (b) Site Analysis Required. An additional site analysis is required for the following types of activities if such activities have the potential to impact recharge/interchange areas:
 - (1) divisions of land;
 - (2) commercial, industrial, manufacturing, and multiple residential projects in excess of four (4) units; or
 - (3) projects or land use activities which process, stockpile, store, receive, transport, discharge, or produce any chemical or organic product or by-product which may contaminate ground or surface water, except where those projects have the primary purpose of water conservation.
- (c) General Information Requirements for Unconfined Aquifers. The SMP Administrator may require some or all of the following information relative to any unconfined aquifer in order to conduct the site analysis:
 - (1) depth to groundwater;
 - (2) hydro-geological susceptibility to contamination and contamination loading potential;
 - (3) hydraulic conductivity and gradient on-site and for relevant adjacent land;
 - (4) soil permeability and contamination attenuation;
 - (5) a vadose zone analysis including permeability and attenuation properties;

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- (6) existing aquifer water quality analysis; and
 - (7) a summary of the proposed activity's potential effect on the water quality of any unconfined aquifer.
- (d) General Information Requirements for Regulated Substances. The SMP Administrator may require any of the following where regulated substances are associated with a development which has potential to impact an aquifer:
- (1) a description of operations and an identification of regulated substances associated with the project;
 - (2) a list of names and volumes of toxic or concentrated organic substances which will be used on the property;
 - (3) a list of all substances to be monitored;
 - (4) a detailed description of how substances are to be handled at the site;
 - (5) a description of the containment devices to be used to comply with the requirements of this chapter and other applicable state and federal requirements;
 - (6) a proposed "Regulated Substance Management Plan" or a "Site Management Plan";
 - (7) a description of the procedures for inspection and maintenance to assure the proper functioning of containment devices and systems;
 - (8) a site map showing the location of the facility and property boundaries and the locations within the facility where regulated substances in containers larger than five (5) gallons or forty (40) pounds are stored, unloaded, tested, used, and/or produced. The location of each containment device (system if there is one) shall also be shown.
- (e) Protection of Water Quality.
- (1) The contamination of groundwater by surface water use, discharge, or runoff shall be prevented.
 - (2) New developments, during both construction and operational phases, which generate surface drainage or runoff to ground or surface water shall:
 - a. assure that the use, handling, discharge, or disposal of regulated substances be accomplished in a manner which prevents their entry into ground or surface waters;
 - b. retain and clean, to current state discharge standards, runoff prior to its discharge into ground or surface water; and
 - c. ensure that runoff or stormwater drainage will not result in soil erosion or water quality degradation.
 - (3) Water quality standards for critical aquifer re-charge/interchange areas shall correspond with appropriate State and Federal standards.

06.050 Frequently Flooded Areas

Benton County Code 3.26 BCC (Flood Hazard Prevention, Adopted 1987, revised 2010) and 15.30 BCC (Frequently Flooded Areas, Adopted 1994, revised 1997) are adopted by reference.

06.060 Geologically Hazardous Areas

- (a) Applicability. This chapter applies to development activities within or adjacent to geologically hazardous areas in shoreline jurisdiction, including steep slopes, channel migration zones, or hillsides located in unincorporated Benton County. A steep slope is defined as one with a slope of fifteen (15) percent or more or where Critical Areas Overlay Maps indicate potentially hazardous conditions.
- (b) Permitted Development. Development as set forth in this chapter is permitted when sited, designed, and operated in a manner which protects life, property, and the public welfare and when such development meets the requirements of this title.

- (c) Prohibited Development. New development and creation of new lots that would cause foreseeable risk from geological conditions during the life of the development or would require structural shoreline stabilization over the life of the development (except as allowed under BCC 15.07.140) is prohibited.
- (d) Minimum hazard setback requirements. For the purposes of this chapter, a minimum hazard setback for development within or adjacent to a Geologically Hazardous Area shall be the hazard setback recommended in the Site Analysis and/or by the Building Department.
- (e) Site Analysis – General Requirements. A site analysis is required within geologically hazardous areas and within 200 feet of geologically hazardous areas. In order to complete an analysis, the SMP Administrator may require any of the following:
 - (1) the physical features of the site, including identification of surface and subsurface soil types, vegetation, streams, canyons, alluvial fans, and drainage ways. Topography shall be shown in five (5) foot contours unless prior approval is received for contours greater than five (5) feet;
 - (2) lot and parcel sizes, proposed lot coverage, type of dwelling units, square footage, dimensions, general type of construction and location of all structures, the existing and proposed utility systems including wells, sanitary sewers, electric, gas, and telephone, and other pertinent information requested by the SMP Administrator;
 - (3) the general location and different circumstances that might be expected to precipitate a geological event;
 - (4) the geologic, topographic, and hydrologic factors that might contribute to slope instability and the location of the site susceptible to instability;
 - (5) suitable buildable areas taking into consideration the long term stability and maintenance of access roads and all other permanent infrastructure needs that would be affected by both the underlying geology and soils;
 - (6) recommended hazard setbacks to protect the geologic and topographic features;
 - (7) relying on existing data, areas with known or potential for seismic hazard;
 - (8) the rate and extent of any potential hazards such as erosion, sliding, slumping etc., must be analyzed in light of the potential to impact the public health, safety and welfare;
 - (9) the potential impact of residential landscape irrigation, drain-fields, upslope and off-site irrigation activities, storm water generation from upslope properties and proposed impervious surfaces on-site, and the influence of street conveyance on slope stability;
 - (10) proposed access, parking, and basic internal vehicle/pedestrian circulation system;
 - (11) the proposed system for retention and release (detention) of storm and surface water runoff generated from the site;
 - (12) general landscaping plan indicating the type and placement of materials used around all structures, parking areas and other cleared portions of the site;
 - (13) the relationship between the proposed development and existing and proposed adjacent areas;
 - (14) where development is proposed downslope of lands in, or with the potential for agriculture, analysis of the impact of surface and subsurface movement of waste irrigation water on the proposed development site shall be provided. The analysis shall include descriptions of the relevant soils, geologic, and hydrologic conditions of the project site and the upslope lands;
 - (15) for public buildings and facilities: identification of minimum design standards where seismic activity has the potential to occur.
- (f) Required Plans.
 - (1) A site development and grading plan which meets the requirements of BCC 06.060(e) and accomplishes the following objectives shall be developed and submitted to the SMP Administrator for projects within 200 feet of geologically hazardous areas:
 - a. assure long term structural integrity of all development;

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- b. protect the public health, safety, and welfare by minimizing the potential for public expenditures for post-project geologic, soils, and hydrology hazards remediation;
 - c. avoid documented seismic and landslide hazard areas as locations for building construction, roads or utility systems where mitigation is not feasible;
 - d. eliminate as completely as practicable, any public or private exposure to landslide hazards or to abnormal maintenance or repair costs through the application of post construction slope stabilization and appropriately upgraded road construction specifications where appropriate;
 - e. minimize storm water runoff and soil erosion impacts;
 - f. control dust during all construction phases;
 - g. achieve maximum feasible retention, in their natural condition, of existing topographic features such as drainage swales, streams, slopes, structurally important ridge lines and rock outcroppings; and
 - h. minimize grading where it will adversely impact slope stability.
- (2) All development and grading plans shall be approved by the appropriate County departments in order to ensure compliance with the current application of the County's Side Hill Development Standards.
- (3) All development and grading plans shall adhere to the requirements of the Benton-Franklin Health District.
- (4) In areas of steep slopes and natural drainages, when construction will extend into the rainy season and potentially cause eroded sediments to move offsite, the storm and surface water runoff retention and detention system must be completed before other phases of site development are begun so that it can serve as a sediment trap during the remainder of the construction.

06.070 Fish and Wildlife Conservation Areas

- (a) Applicability. The provisions of this chapter shall apply within unincorporated Benton County to upland Priority Species and Priority Habitats of Priority Species. While wetlands, rivers and creeks, and their buffers may also be considered Fish and Wildlife Conservation Areas, other provisions of this SMP and Section 15.06 provide specific standards for study, protection and application of mitigation sequencing to those types of Fish and Wildlife Conservation Areas.
- (b) Permitted Development. Developments adjacent to upland Priority Species or adjacent to or within Priority Habitats of Priority Species and their buffers are permitted when sited, designed, and operated in a manner which protects the functions and values of upland Priority Species and their Priority Habitats, and when such development meets the requirements of this title.
- (c) Minimum Buffer Requirements. Buffers for upland Priority Species and Priority Habitats shall be determined by the SMP Administrator based upon Washington Department of Fish and Wildlife recommendations after consultation with the applicant, state, and where appropriate, federal agencies and the Yakama Nation.
- (d) Site Analysis Required.
- (1) Where a regulated development or use is proposed on a parcel containing a mapped upland Priority Species or wholly or partially within a mapped upland Priority Habitat, the parcel shall be surveyed to determine if the following are associated with the parcel:
- a. federal and state listed endangered, threatened, sensitive, or candidate species; and
 - b. any listed plant or animal species on the Washington Department of Natural Resources Natural Heritage Program lists.
- (2) A Critical Area Special Study shall be performed if the resources identified in BCC 15.06.070(d)(1) are found to be associated with the parcel. The following shall be identified:

- a. the nature and extent of the species' primary association with the habitat area;
 - b. the relative density and species richness, breeding, habitat, seasonal range dynamics and movement corridors;
 - c. the relative tolerance of species to human activities;
 - d. the influence of the project, individually and cumulatively, on the wildlife and associated habitats;
 - e. mitigative measures for any project element that would potentially threaten baseline populations and reproduction rates over the long term; and
 - f. information about the presence of migratory species and any migratory patterns.
- (e) General Standards for Habitat Management. The maintenance of sufficient habitat to support baseline populations for all species identified in BCC 15.06.070(d)(1) shall be the objective pursued through the application of flexible site planning and timing of construction, Best Management Practices, and habitat management programs.

Section 15.07 Use-Specific and Modification Regulations and Performance Standards

07.010 Agriculture

- (a) For Shoreline purposes, Section 15.02 (Definitions), WAC 173-26-020 (Definitions), and WAC 173-26-241(3)(a)(ii) (Agriculture) shall determine the need for shoreline review for agricultural activities.
- (b) The provisions of this SMP do not limit or require modification of agricultural activities on agricultural lands as of the date of adoption of the SMP. In determining whether lands meet the definition of agricultural activities, the Shoreline Administrator shall consider laws and rules included in Subsection (a) and information regarding typical agricultural practices for the subject agricultural use, current use taxation records, conservation easements, farm plans, and other relevant information. Examples of agricultural practices that could vary by the type of agriculture include but are not limited to: rotations of fields for grazing, cultivation, production, and harvests; animal breeding, feeding, or forage activities; type and frequency of maintenance, repair and replacement of agricultural facilities; and other typical practices.
- (c) SMP provisions shall apply in the following cases:
 - (1) new agricultural activities on land not meeting the definition of agricultural land;
 - (2) expansion of agricultural activities on non-agricultural lands, or conversion of non-agricultural lands to agricultural activities;
 - (3) conversion of agricultural lands to other uses;
 - (4) other development on agricultural land that does not meet the definition of agricultural activities; and
 - (5) agricultural development and uses not specifically excluded by the SMA and WAC 173-26-020 (Definitions), and WAC 173-26-241(3)(a)(ii).
- (d) Feed lots and stockyards are prohibited in shoreline jurisdiction.
- (e) New agricultural activities and facilities subject to the SMP in Section 15.07.010(c) shall comply with water quality provisions of Section 15.05.040 and Shoreline Vegetation Conservation provisions in Section 15.05.030.
- (f) Vegetative buffers consistent with Section 15.06.030 shall be maintained between the ordinary high water mark and cultivated ground for purposes of erosion control and riparian vegetation protection, and shall apply to uses and activities subject to the SMP in Section 15.07.010(c).
- (g) Diversion of water for agricultural purposes shall be consistent with federal and state water rights laws and rules.

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- (h) No equipment or material shall be abandoned or disposed of in shoreline jurisdiction.
- (i) Development in support of agricultural uses shall be consistent with the environment designation intent and management policies, located and designed to assure no net loss of ecological functions, and shall not have a significant adverse impact on other shoreline resources and values.

07.020 Aquaculture

- (a) Aquacultural facilities must be designed and located to avoid:
 - (1) The spreading of disease, especially to native aquatic life;
 - (2) Introducing new non-native species which cause significant ecological impacts;
 - (3) Significantly conflicting with navigation and other water-dependent uses;
 - (4) A net loss of ecological functions; or
 - (5) Significantly impacting the aesthetic qualities of the shoreline.
- (b) Potential locations for aquaculture are relatively restricted due to specific requirements for water quality, temperature, flows, oxygen content, adjacent land uses, wind protection, and commercial navigation. The technology associated with some forms of present-day aquaculture is still in its formative stages and experimental. Therefore, some latitude in the development of this use shall be given, while the potential impacts on existing uses and natural systems are recognized.
- (c) Aquaculture structures and activities that do not require a waterside location must be located landward of the shoreline buffers required by this SMP.

07.030 Boating Facilities and Private Moorage Structures

- (a) Applicability.
 - (1) This Section applies to all over- and in-water structures and uses that facilitate as their primary purpose the launching or mooring of vessels, or serve some other water-dependent purpose.
 - (2) Uses and modifications covered in this Section include private residential docks (including community docks); docks for commercial, industrial, aquaculture, recreational or public access use; marinas; and boat launches.
- (b) General regulations.
 - (1) New docks shall be allowed only for water-dependent uses or public access. As used here, a dock associated with a single-family residence is a water-dependent use provided that it is designed and intended as a facility for access to watercraft and otherwise complies with the provisions of this SMP.
 - (2) No single-use residential docks may be authorized unless the applicant can demonstrate that reasonable community dock options have been investigated and found infeasible.
 - (3) For all new residential development of two or more waterfront dwelling units or subdivisions or other divisions of land occurring after the effective date of this SMP, only community docks may be allowed.
 - (4) No more than one private, noncommercial dock is permitted per platted or subdivided shoreline lot or unplatted shoreline tract owned for residential or recreational purposes.
 - (5) Floating and other over-water homes, including liveaboards, are prohibited.
 - (6) Extended moorage on waters of the state without a lease or permission is prohibited except as allowed by applicable state regulations. When allowed per state regulations and this SMP, mitigation of any adverse impacts to navigation and public access is required.
 - (7) Overwater structure design, construction, and use must:
 - a. Minimize degradation of aquatic habitats.
 - b. Not impede any juvenile or adult salmonid life stage, including migration, rearing, and spawning.
 - c. Not enhance habitats used by potential salmonid predators (especially fishes and birds).

- d. Be engineered or use proven methods to maximize human safety and minimize potential for flood-related detachment of the facility from shore.
- (8) Consistent with requirements for mitigation sequencing, all boating facilities and private moorage structures must be the minimum size necessary and designed to avoid and then minimize potential adverse impacts. All unavoidable adverse impacts must be mitigated, and a mitigation plan submitted.
- (c) General location regulations. New and expanded boating facilities and private moorage structures must be located to:
 - (1) Minimize hazards and obstructions to public navigation rights.
 - (2) Avoid blocking or obstructing lawfully existing or planned public shoreline access.
 - (3) Minimize the need for new or maintenance dredging.
 - (4) Eliminate the need for new shoreline stabilization, if feasible. Where the need for stabilization is unavoidable, only the minimum necessary shoreline stabilization to adequately protect facilities, users, and watercraft may be allowed.
- (d) General materials regulations.
 - (1) Boating facilities and private moorage structures shall be built with materials that do not leach preservatives or other chemicals.
 - (2) No treated wood of any kind shall be used on any boating facilities and private moorage structures.
 - (3) No paint, stain, or preservative shall be applied to boating facilities and private moorage structures.
- (e) General design and operation regulations.
 - (1) Piers and ramps.
 - a. To prevent damage to shallow-water habitat, piers and/or ramps shall extend at least 40 feet perpendicular from the OHWM on the Columbia River and as needed to reach acceptable float conditions on the Yakima River, unless determined to be impractical due to specific site considerations.
 - b. Piers and ramps shall be the minimum size necessary to achieve their intended purpose.
 - c. The bottom of both the pier or landward edge of the ramp shall be elevated at least 2 feet above the plane of OHWM.
 - d. Grating shall cover the entire pier and ramp for residential structures, and as much area as practicable for other structures. Open areas of grating shall be at least 50 percent, as rated by the manufacturer, unless determined to be infeasible due to specific site or project considerations.
 - (2) Floats.
 - a. Floats shall not be located in shallow-water habitat where they could ground or impede the passage or rearing of any salmonid life stage.
 - b. To prevent damage to shallow-water habitat, floats on the Columbia River shall be positioned at least 40 feet horizontally from the OHWM but no more than 100 feet from the OHWM, as measured from the landward-most edge of the float, unless determined to be impractical due to specific site considerations. Floats on the Yakima River must be located to maintain clearance of at least 18 inches between the riverbed and the bottom of the float between April 15 and July 15 in all years.
 - c. Grating shall cover the entire surface area of the float(s) not underlain by float tubs or other material that provides buoyancy. The open area of the grating shall be a minimum of 50 percent,

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- as rated by the manufacturer, or as otherwise required by state or federal agencies during permit review unless determined to be infeasible due to specific site or project considerations.
- d. Functional grating will cover no less than 50 percent of the float, or as otherwise required by state or federal agencies during permit review, unless determined to be infeasible due to specific site or project considerations.
 - e. Floating docks shall be designed or seasonally removed to prevent the dock from resting on the river bed during periods of lower flow.
 - f. Flotation materials shall be permanently encapsulated to prevent breakup into small pieces and dispersal in water.
- (3) No new skirting is allowed on any structure.
 - (4) Protective bumper material will be allowed along the outside edge of the float as long as the material does not extend below the bottom edge of the float frame or impede light penetration.
 - (5) Safety railings, if proposed, must meet International Building Code requirements and must be an open framework that does not unreasonably interfere with shoreline views.
 - (6) Boating facilities and private moorage structures must be marked with reflectors, or otherwise identified to prevent unnecessarily hazardous conditions for water surface users during the day or night.
 - (7) Exterior finish of all structures must be generally non-reflective, to reduce glare.
 - (8) New covered moorage is prohibited, except when necessary for operation of a water-dependent use at commercial, industrial, or transportation-related facilities.
 - (9) Shoreline armoring (i.e. bulkheads, rip-rap, and retaining walls) shall not occur in association with installation of the overwater structure, if feasible.
 - (10) Nothing shall be placed long term on the overwater structure that will reduce natural light penetration through the structure.
 - (11) Pilings.
 - a. New piling for residential docks shall not exceed 8 inches in diameter, except where larger pilings are required for safety or site-specific engineering reasons. New piling for other docks must be the smallest diameter necessary.
 - b. All pilings shall be fitted with devices to prevent perching by piscivorous (fish-eating) birds.
- (f) General construction regulations.
- (1) Construction of overwater structures shall be completed during allowed in-water work windows.
 - (2) Construction impacts shall be confined to the minimum area needed to complete the project.
 - (3) The boundaries of clearing limits associated with site access and construction shall be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites. This action shall be completed before any significant alteration of the project area.
 - (4) All temporary erosion controls shall be in place and appropriately installed downslope of project activities until site restoration is complete.
 - (5) Any large wood, native vegetation, topsoil, and/or native channel material displaced by construction shall be stockpiled for use during site restoration.
 - (6) No existing habitat features (i.e., wood, substrate materials) shall be removed from the shoreland or aquatic environment without approval.
 - (7) If native vegetation is moved, damaged, or destroyed, it shall be replaced with a functionally equivalent native species during site restoration.
 - (8) Project construction shall cease under high flow conditions that could result in inundation of the project area, except for efforts to avoid or minimize resource damage.
 - (9) Temporary moorages are allowed for vessels used in the construction of boating facilities provided:

- a. Upon termination of the project, the aquatic habitat in the affected area is returned to its pre-construction condition within one year.
 - b. Construction vessels may not ground or otherwise disturb substrates.
 - c. Temporary moorage is located to minimize shading of aquatic vegetation.
- (g) Private residential dock (including community dock) regulations.
- (1) No boat lifts or watercraft lifts of any type will be placed on, or in addition to, the overwater structure unless the applicant can demonstrate that the proposed boat lift meets the intent of the criteria to minimize structure, maximize light penetration, and maximize depth.
 - (2) No electricity shall be provided to, or on, the overwater structure.
 - (3) Piers and ramps shall be no more than 4 feet in width.
 - (4) Shoreline concrete anchors must be placed at least 10 feet landward from the OHWM, if feasible. Shoreline concrete anchors must be sized no larger than 4 feet wide by 4 feet long unless demonstrated insufficient. The maximum anchor height shall be only what is necessary to elevate the bottom of either the pier or landward edge of the ramp at least 2 feet above the plane of OHWM. Alternate anchoring methods may be allowed if approved in advance by WDFW for application on the Yakima River.
 - (5) Float components for private docks shall not exceed the dimensions of 8 feet by 20 feet, or an aggregate total of 160 square feet. Float components for community docks shall not exceed the dimensions of 8 feet by 40 feet, or an aggregate total of 320 square feet, for all float components.
 - (6) Piling and float anchors.
 - a. Pilings shall be spaced at least 18 feet apart on the same side of any component of the overwater structure. The pier/ramp and float are separate components.
 - b. Each overwater structure shall utilize no more than 4 piles total for the entire project. A combination of two piles and four helical anchors may be used in place of four piles.
 - c. Submerged float anchors will be constructed from concrete; and shall be horizontally compressed in form, by a factor of 5 or more, for a minimum profile above the stream bed (the horizontal length and width will be at least 5 times the vertical height).
 - (7) No in-water fill material (including uncured concrete or its by-products) will be allowed, with the exception of pilings and float anchors.
- (h) Docks for commercial, industrial, aquaculture, recreational or public access use.
- (1) The amounts of overwater cover, including length and width; the number of in-water structures; and the extent of any necessary shoreline stabilization or modification must be minimized.
 - (2) Accessory development may include, but is not limited to, parking, non-hazardous waste storage and treatment, stormwater management facilities, and utilities where these are necessary to support the water-oriented use. Nonwater-dependent accessory uses must be located outside of shoreline jurisdiction or outside of the shoreline buffer whenever possible.
 - (3) Garbage or litter receptacles must be provided and maintained by the operator at locations convenient to users.
- (i) Marinas.
- (1) No part of a marina may be wider than 8 feet, except that components up to 10 feet wide may be approved administratively if justified in documentation.
 - (2) New marinas must provide physical and/or visual public access for as many water-oriented recreational uses as possible, commensurate with the scale of the proposal.
 - (3) New marinas must provide adequate restroom and sewage disposal facilities.

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- (4) New or enlarged marinas must provide facilities and procedures for receiving, storing, dispensing, and disposing of oil or hazardous products, as well as a spill response plan.
 - (5) Marina operators must post all regulations pertaining to handling, disposal and reporting of waste, sewage, fuel, oil or toxic materials where all users may easily read them. Rules for spill prevention and response must also be posted on site.
- (j) Boat launch ramps.
- (1) New public, commercial, or industrial boat launch ramps may be approved only if they provide public access to waters that are not adequately served by existing access facilities, if use of existing facilities is documented to exceed the designed capacity, or the ramp is necessary to serve the water-oriented commercial or industrial use.
 - (2) New private boat launches not for commercial or industrial use are prohibited.
 - (3) New public or commercial boat launch facilities must provide adequate restroom facilities.
 - (4) Boat launch ramps must be located where there is adequate water mixing and flushing and where water depths are adequate to eliminate or minimize the need for dredging or filling. Boat launch ramps must be located to minimize the obstruction of currents, alteration of sediment transport, and the accumulation of drift logs and debris.
- (k) Replacement of existing boating facilities and private moorage structures. If any of the following are proposed during a five-year period, the project is considered a new facility and must comply with applicable standards for new facilities.
- (1) Replacement of the entire facility.
 - (2) Replacement of 75 percent or more of support piles.
 - (3) Replacement of 75 percent or more of a boat launch, by area.
- (l) Modification or enlargement of existing boating facilities and private moorage structures.
- (1) Applicants must demonstrate that there is a need for modification or enlargement due to increased or changed use or demand, safety concerns, or inadequate depth of water.
 - (2) Enlarged portions of existing boating facilities and private moorage structures must comply with applicable standards for new facilities.
- (m) Repair of existing boating facilities and private moorage structures.
- (1) Repairs to existing legally established boating facilities and private moorage structures are permitted consistent with all other applicable codes and regulations.
 - (2) All repairs must utilize any material standards specified for new facilities.
- (n) Mitigation.
- (1) Consistent with mitigation sequencing, new or expanded boating facilities and private moorage structures shall be designed to avoid and then minimize impacts, prior to pursuing mitigation.
 - (2) Mitigation proposals must provide impact mitigation at a minimum one-to-one ratio, by area, using one or more of the potential mitigation measures listed below. The ratio should be increased if the measure will take more than one year to provide equivalent function or if the measure does not have a high success rate. Applicants should consult with other permit agencies, such as Washington Department of Fish and Wildlife and/or U.S. Army Corps of Engineers, for additional specific mitigation requirements.
 - (3) For all new or expanded boating facilities and private moorage structures, appropriate mitigation may include one or more of the following measures. In-kind measures are preferred over out-of-kind measures when consistent with the objective of compensating for adverse impacts to ecological function. Mitigation may not include measures that are already required by regulations.

- a. Removal of any legal existing over- or in-water structures that are not the subject of the application.
 - b. Replacement of areas of existing solid over-water cover with grated material or use of grating on altered structures.
 - c. Planting of native vegetation along the shoreline immediately landward of the OHWM consisting of a density and composition of trees and shrubs typically found in undisturbed areas adjacent to the subject waterbody.
 - d. Removal or ecological improvement of hardened shoreline. Improvement may consist of softening the face and toe of the hardened shoreline with soil, gravel and/or cobbles, and/or incorporating vegetation or large woody debris.
 - e. Removal of man-made debris waterward of the OHWM.
 - f. Placement of large woody material if consistent with local, state and federal regulations.
 - g. Participation in an approved mitigation program.
- (o) Submittal requirements.
- (1) For all new or expanded boating facilities and private moorage structures, applicants must provide:
 - a. An assessment of potential impacts to existing ecological processes, including but not limited to sediment transport, hydrologic patterns, and vegetation disturbance.
 - b. A mitigation plan for unavoidable adverse impacts to ecological functions or processes, if applicable.
 - (2) For all new or expanded boating or private moorage facilities other than private residential moorage facilities and commercial or industrial structures, applicants must additionally provide an assessment of need and demand. At a minimum, the assessment shall include the following:
 - a. Existing approved facilities, or pending applications, within the service range of the proposed new facility and relevant characteristics of those facilities, such as level of use and condition.
 - b. The expected service population and relevant characteristics of the population, including any characteristics that justify specific design elements of the proposed facility.
 - c. An assessment of existing water-dependent uses in the vicinity and potential impacts to those uses, and a description of proposed mitigation measures, if applicable.

07.040 Breakwaters, Jetties, Groins, and Weirs

- (a) New, expanded or replacement structures shall only be allowed if it can be demonstrated that they will not result in a net loss of shoreline ecological functions and that they support water-dependent uses, public access, shoreline stabilization, or other specific public purpose.
- (b) Breakwaters, jetties, and groins shall be limited to the minimum size necessary.
- (c) Breakwaters, jetties, and groins must be designed to protect critical areas, and shall implement mitigation sequencing to achieve no net loss of ecological functions.
- (d) Proposed designs for new or expanded structures shall be designed by qualified professionals, including both an engineer and a biologist.

07.050 Commercial Development

- (a) Commercial development in shoreline areas shall be designed, located, and constructed to achieve no net loss of ecological functions.
- (b) Preference shall be given to water-dependent commercial uses over non-water-dependent commercial uses. Water-related uses and water-enjoyment uses shall be given priority over nonwater-oriented uses.
- (c) Commercial development that is not water-dependent shall not be allowed over water except where it is located within the same building and is accessory to a water-dependent use.
- (d) Non-water-oriented commercial development shall not be allowed unless:

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- (1) The use is part of a mixed-use project that includes water-dependent uses and provides a significant public benefit with respect to provision of public access or ecological restoration; or
 - (2) Navigability is severely limited at the proposed site, and the commercial use provides a significant public benefit with respect to provision of public access or ecological restoration.
- (e) In areas of the shoreline designated for commercial uses, non-water-oriented commercial uses may be allowed on sites physically separated from the shoreline by another property or public right-of-way.
- (f) New commercial developments shall provide public access to the shorelines, subject to Section 15.05.050, Public Access.

07.060 Dredging and Dredge Material Disposal

- (a) As regulated in this SMP, dredging is the removal of bed material from below the OHWM or wetlands using other than unpowered, hand-held tools for one of the allowed dredging activities listed in Section (d) below. This Section is not intended to cover other removals of bed material waterward of the OHWM or wetlands that are incidental to the construction of an otherwise authorized use or modification (e.g. shoreline crossings, bulkhead replacements). These in-water substrate modifications should be conducted pursuant to applicable general and specific use and modification regulations of this SMP.
- (b) New development must be sited and designed to avoid or, if that is not possible, to minimize the need for new and maintenance dredging.
- (c) Dredging and dredge material disposal must be done in a manner that avoids or minimizes significant ecological impacts. Impacts that cannot be avoided must be mitigated in a manner that assures no net loss of shoreline ecological functions.
- (d) Dredging may only be permitted for the following activities:
- (1) Development of new or expanded wet moorages, harbors, ports or water-dependent industries of economic importance to the region only when there are no feasible alternatives or other alternatives may have a greater ecological impact.
 - (2) Development of essential public facilities when there are no feasible alternatives.
 - (3) Maintenance of irrigation reservoirs, drains, canals, or ditches for agricultural purposes.
 - (4) Restoration or enhancement of shoreline ecological functions and processes benefiting water quality and/or fish and wildlife habitat.
 - (5) Trenching to allow the installation of necessary underground utilities if no alternative, including boring, is feasible; impacts to fish and wildlife habitat are avoided to the maximum extent possible; and the installation does not alter the natural rate, extent, or opportunity of channel migration.
 - (6) Establishing, expanding, relocating or reconfiguring navigation channels where necessary to assure safe and efficient accommodation of existing navigational uses.
 - (7) Maintenance dredging of established navigation channels and basins when restricted to maintaining previously dredged and/or existing authorized location, depth, and width.
- (e) Dredging for the primary purpose of obtaining fill material is prohibited, except when the material is necessary for the restoration of ecological functions. The site where the fill is to be placed must be located waterward of the OHWM. The project must be either associated with a Model Toxics Control Act or Comprehensive Environmental Response, Compensation, and Liability Act habitat restoration project or, if approved through a Shoreline Conditional Use Permit, any other significant habitat enhancement project.
- (f) Dredge material disposal within shoreline jurisdiction is permitted under the following conditions:
- (1) Shoreline ecological functions and processes will be preserved, restored or enhanced, including protection of surface and groundwater; and
 - (2) Erosion, sedimentation, floodwaters or runoff will not increase adverse impacts to shoreline ecological functions and processes or property.

- (g) Dredge material disposal in open waters may be approved only when authorized by applicable state and federal agencies, and when one of the following conditions apply:
 - (1) Land disposal is infeasible, less consistent with this SMP, or prohibited by law.
 - (2) Nearshore disposal as part of a program to restore or enhance shoreline ecological functions and processes is not feasible.
- (h) All applications for dredging or dredge material disposal shall include the following information, in addition to other application requirements:
 - (1) A description of the purpose of the proposed dredging activities.
 - (2) A site plan outlining the perimeter of the area proposed to be dredged and the dredge material disposal area, if applicable.
 - (3) A description of proposed dredging operations, including, but not limited to:
 - a. The method of removal.
 - b. The length of time required.
 - c. The quantity of material to be initially removed.
 - d. The frequency and quantity of projected maintenance dredging.
 - (4) A description of proposed dredge material disposal, including, but not limited to:
 - a. Size and capacity of disposal site.
 - b. Means of transportation to the disposal site.
 - c. Future use of the site and conformance with land use policies and regulations, if applicable.
 - (5) Plans for the protection and restoration of the shoreline environment during and after dredging operations.
 - (6) An assessment of potential impacts to ecological functions or processes from the proposal.
 - (7) A mitigation plan to address identified impacts, if necessary.

07.070 Fill

- (a) All fills shall be located, designed and constructed to protect shoreline ecological functions and ecosystem-wide processes, including channel migration. Any adverse impacts to shoreline ecological functions must be mitigated.
- (b) Fills in wetlands, floodways, channel migration zones or waterward of the OHWM may be allowed only when necessary to support one or more of the following:
 - (1) Water-dependent uses.
 - (2) Public access.
 - (3) Cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan.
 - (4) Disposal of dredged material considered suitable under, and conducted in accordance with, the Dredged Material Management Program of the Department of Natural Resources and/or the Dredged Material Management Office of the U.S. Army Corps of Engineers.
 - (5) Expansion or alteration of transportation facilities of statewide significance currently located on the shoreline where alternatives to fill are infeasible.
 - (6) Ecological restoration or enhancement when consistent with an approved restoration plan.
 - (7) Maintenance or installation of flood hazard reduction measures consistent with a comprehensive flood hazard management plan and this SMP.
 - (8) Protection of cultural resources when fill is the most feasible method to avoid continued degradation, disturbance or erosion of a site. Such fills must be coordinated with any affected Indian tribes.

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- (c) Upland fills not located within wetlands, floodways, or channel migration zones may be allowed provided they are:
 - (1) Part of an allowed shoreline use or modification, or necessary to provide protection to cultural resources.
 - (2) Located outside applicable buffers, unless specifically allowed in buffers.
- (d) All fills, except fills for the purpose of shoreline restoration, must be designed:
 - (1) To be the minimum size necessary to implement the allowed use or modification.
 - (2) To fit the topography so that minimum alterations of natural conditions will be necessary.
 - (3) To not adversely affect hydrologic conditions or increase the risk of slope failure, if applicable.
- (e) Unless site characteristics dictate otherwise, fill material within surface waters or wetlands shall be sand, gravel, rock, or other clean material with a minimum potential to degrade water quality and shall be obtained from a state-authorized source.
- (f) A temporary erosion and sediment control (TESC) plan, including BMPs, consistent with the latest edition of the Benton County Hydrology Manual or approved equivalent, shall be provided for all proposed fill activities. Disturbed areas shall be immediately protected from erosion using mulches, hydroseed, or similar methods, and revegetated, as applicable.

07.080 Industry

- (a) Over-water construction associated with industrial development that is not water-dependent shall not be permitted. Docks, piers, and boating facilities necessary for operation of ports and water-related or water-dependent uses shall be permitted in accordance with the provisions of this SMP.
- (b) Industrial and port development shall be located, designed, constructed, and operated in a manner that minimizes impacts to the shoreline, provides for no-net-loss of shoreline ecological function, and avoids unnecessary interference with shoreline use by adjacent property owners.
- (c) In the review of shoreline developments, the County shall preference first to water-dependent uses, then to water-oriented industrial uses.
- (d) Non-water-related industrial development shall be prohibited in the shoreline environment, except when:
 - (1) The use is part of a mixed-use project that includes water-dependent uses and provides a significant public benefit with respect to public access or ecological restoration; or
 - (2) Water navigability is severely limited, and the industrial use provides a significant public benefit with respect to public access or ecological restoration.
- (e) Nonwater-oriented industrial uses may be allowed in shoreline jurisdiction on sites that are physically separated from the shoreline by: 1) another property, 2) public right-of-way, or 3) a levee system maintained by or under license from the federal government, State of Washington, or a local government.
- (f) Industrial and port facilities proposed in areas of the shoreline already characterized by industrial or port development shall be given priority over such facilities proposed in shoreline areas not currently developed for industrial or port uses.
- (g) In the consideration of shoreline environment designation amendments, and in the review of shoreline permits, the County shall encourage industrial uses and redevelopment to locate where environmental cleanup and restoration can be accomplished.
- (h) New industrial developments shall provide public access to the shorelines, subject to Section 15.05.050, Public Access; exceptions include safety or operational considerations or other significant impediments as described in Section 15.05.050, Public Access.

07.090 In-Stream Structures

- (a) In-stream structures must provide for the protection and preservation of ecosystem-wide processes, ecological functions, and cultural resources, including, but not limited to, fish and fish passage, priority habitats and species, other wildlife and water resources, shoreline critical areas, hydrogeological processes, and natural scenic vistas.
- (b) New in-stream structures shall not interfere with existing water-dependent uses, including recreation.
- (c) In-water structures shall not be a safety hazard or obstruct water navigation.
- (d) In-stream structures shall be designed by a qualified professional.
- (e) Natural in-water features, such as snags, uprooted trees, or stumps, shall be left in place unless it can be demonstrated that they are actually causing bank erosion or higher flood stages or pose a hazard to navigation or human safety.

07.100 Mining

- (a) All mining proposals in shoreline jurisdiction must demonstrate that the mining is dependent on a shoreline location by evaluating geologic factors such as the distribution and availability of mineral resources in the County, as well as evaluation of need for such mineral resources, economic, transportation, and land use factors.
- (b) Mining proposals shall be consistent with the Washington Department of Natural Resources Surface Mine Reclamation standards (WAC 332-18, RCW 78.44).
- (c) New mining and associated activities shall be designed and conducted to comply with the regulations of the environment designation and the provisions applicable to critical areas where relevant. Meeting the no net loss of ecological functions standard shall include avoidance and mitigation of adverse impacts during the course of mining and reclamation.
- (d) Mining waterward of the OHWM of rivers and streams will not be allowed unless:
 - (1) Removal of specified quantities of sand and gravel or other materials at specific locations will not adversely affect the natural processes of gravel transportation for the system as a whole;
 - (2) the mining and any associated permitted activities will not have significant adverse impacts to habitat for priority species nor cause a net loss of ecological functions of the shoreline.
 - (3) Determinations required by the above requirements must be made consistent with RCW 90.58.100(1) and WAC 173-26-201(2)(a). Such evaluation of impacts should be appropriately integrated with relevant environmental review requirements of SEPA (RCW 43.21C) and the SEPA rules (WAC 197-11).
 - (4) In considering renewal, extension, or reauthorization of other mining operations waterward of the OHWM in locations where they have previously been conducted, the County must require compliance with this Subsection to the extent that no such review has previously been conducted. Where there has been prior review, the County must review previous determinations comparable to the requirements of this Section to assure compliance with this Subsection under current site conditions.
- (e) The proposed subsequent use of mined property must be consistent with the environment designation in which the property is located and the reclamation of disturbed shoreline areas must provide appropriate ecological functions consistent with the setting.

07.110 Recreational Development

The following provisions apply to any development, construction, or use of land or water for recreational purposes within Shoreline jurisdiction, whether public or commercial.

- (a) Recreational development shall demonstrate achievement of no-net-loss of ecological functions.

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- (b) Recreational activities must be compatible with existing or proposed uses in the area and must be consistent with County development standards regarding parking, traffic, noise, building location and size, and others.
- (c) The location, design, and operation of recreational facilities shall be consistent with the purpose of the environmental designation.
- (d) Recreational uses and facilities located within shoreline jurisdiction shall include features that relate to access, enjoyment and use of the water and shorelines of the state. Access to recreational areas should emphasize both consolidated park or open space areas and trail access.
- (e) Commercial components of the use that are not explicitly related to the recreational operation must also conform to the Commercial use standards of Section 15.07.050, Commercial Development.

07.120 Residential Development

- (a) Residential development shall be consistent with applicable environment designations and standards and comply with all applicable subdivision, critical area, and zoning regulations.
- (b) Residential development shall include facilities for water supply, wastewater, stormwater, solid waste, access, utilities and other support facilities in conformance with County standards and which do not result in harmful effects on the shoreline or waters.
- (c) Applications for new shoreline residences shall ensure that shoreline stabilization and flood control structures are not necessary to protect proposed residences.
- (d) New residential developments of five or more units shall provide public access to the shorelines, subject to Section 15.05.050, Public Access.
- (e) Parking areas shall be located upland of the uses they serve.
- (f) Residential development shall be sufficiently set back from steep slopes and shorelines vulnerable to erosion so that structural improvements, including bluff walls and other stabilization structures, are not required to protect such structures and uses.
- (g) Residential development shall be designed, configured and developed in a manner that assures that no net loss of ecological functions results from division of land at full build-out of all lots and throughout all phases of development.
- (h) Single-family residences are considered a priority use only when developed in a manner consistent with control of pollution and prevention of damage to the natural environment.
- (i) In the Natural environment, subdivision of property is not allowed if it will require significant vegetation removal or shoreline modification that adversely impacts ecological functions.
- (j) New floating residences and over-water residential structures shall be prohibited in shoreline jurisdiction.

07.130 Shoreline Habitat and Natural Systems Enhancement Projects

- (a) Applicability. Shoreline habitat and natural systems enhancement projects include those activities proposed and conducted specifically for the purpose of establishing, restoring or enhancing habitat for priority species in shorelines. Such projects may include shoreline modification actions such as modification of vegetation, removal of non-native or invasive plants, shoreline stabilization, dredging, and filling, provided that the primary purpose of such actions is clearly restoration of the natural character and ecological functions of the shoreline. This Section does not apply to mitigation.
- (b) Shoreline restoration and enhancement projects must be designed using the best available scientific and technical information, and implemented using best management practices.
- (c) All shoreline restoration and enhancement projects must protect the integrity of adjacent natural resources, including aquatic habitats and water quality.
- (d) Shoreline restoration and enhancement shall not significantly interfere with the normal public use of the navigable waters of the state without appropriate mitigation.
- (e) Long-term maintenance and monitoring shall be included in restoration or enhancement proposals.

- (f) Relief for OHWM shifts. Applicants seeking to perform restoration projects are advised to work with the County to assess whether and how the proposed project is allowed relief under RCW 90.58.580, in the event that the project shifts the OHWM landward.

07.140 Shoreline Stabilization

- (a) New development must be located and designed to avoid the need for future shoreline stabilization, if feasible.
 - (1) Land subdivisions must be designed based on a geotechnical report to assure that future development of the created lots will not require shore stabilization for reasonable development to occur.
 - (2) New development adjacent to steep slopes or bluffs must be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure, as demonstrated in a geotechnical report.
- (b) New development that would require shoreline stabilization that would cause significant impacts to adjacent or down-current properties and shoreline areas is prohibited.
- (c) All proposals for shoreline stabilization structures, both individually and cumulatively, must not result in a net loss of ecological functions, and must be the minimum size necessary. Soft approaches shall be used unless demonstrated not to be sufficient to protect primary structures, dwellings, and businesses.
- (d) New or enlarged structural shoreline stabilization measures shall not be allowed, except as follows
 - (1) To protect an existing primary structure, including residences, when conclusive evidence, documented by a geotechnical analysis, is provided that the structure is in danger from shoreline erosion caused by currents or waves. Normal sloughing, erosion of steep bluffs, or shoreline erosion itself, without a scientific or geotechnical analysis, is not demonstration of need. The geotechnical analysis must evaluate on-site drainage issues and address drainage problems away from the shoreline edge before considering hard or soft structural shoreline stabilization.
 - (2) In support of new nonwater-dependent development, including single-family residences, when all of the conditions below apply:
 - a. The erosion is not being caused by upland conditions, such as loss of vegetation and drainage.
 - b. Nonstructural measures, such as placing the development farther from the shoreline, reducing the size or scope of the proposal, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient.
 - c. The need to protect primary structures from damage due to erosion is demonstrated through a geotechnical report. The damage must be caused by natural processes, such as currents or waves.
 - (3) In support of water-dependent development when all of the conditions below apply:
 - a. The erosion is not being caused by upland conditions, such as loss of vegetation and drainage.
 - b. Nonstructural measures, such as planting vegetation, or installing on-site drainage improvements, are not feasible over time or sufficient.
 - c. The need to protect primary structures from damage due to erosion is demonstrated through a geotechnical report.
 - (4) To protect projects for the restoration of ecological functions or for hazardous substance remediation projects pursuant to Chapter 70.105D RCW when nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient to adequately address erosion causes or impacts.

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- (e) New hard structural shoreline stabilization measures shall not be authorized, except when a report confirms that there is a significant possibility that a primary structure will be damaged within three years as a result of shoreline erosion in the absence of such hard structural shoreline stabilization measures, or where waiting until the need is immediate results in the loss of opportunity to use measures that would avoid impacts on ecological functions. Where the geotechnical report confirms a need to prevent potential damage to a primary structure, but the need is not as immediate as three years, that report may still be used to justify more immediate authorization to protect against erosion using soft measures.
- (f) An existing shoreline stabilization structure, hard or soft, may be replaced with a similar structure if there is a demonstrated need to protect principal uses or structures from erosion caused by currents or waves. While replacement of shoreline stabilization structures may meet the criteria for exemption from a Shoreline Substantial Development Permit, such activity is not exempt from the policies and regulations of this SMP.
 - (1) For purposes of this Section, "replacement" means the construction of new structure to perform a shoreline stabilization function of existing structure that can no longer adequately serve its purpose. Any additions to or increases in the size of existing shoreline stabilization measures shall be considered new structures.
 - (2) Replacement shall be regulated as a new shoreline stabilization measure, except for the requirement to prepare a geotechnical analysis. A geotechnical analysis is not required for replacements of existing hard or soft structural shoreline stabilization with a similar or softer measure if the applicant demonstrates need to protect principal uses or structures from erosion caused by waves or other natural processes operating at or waterward of the OHWM.
 - (3) Replacement hard structural shoreline stabilization measures shall not encroach waterward of the OHWM or waterward of the existing shoreline stabilization measure unless the residence was occupied prior to January 1, 1992, and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the existing shoreline stabilization structure. All other replacement hard structural shoreline stabilization measures shall be located at or landward of the existing shoreline stabilization structure.
 - (4) Hard and soft shoreline stabilization measures may allow some fill waterward of the OHWM to provide enhancement of shoreline ecological functions through creation of nearshore shallow-water habitat and shoreline rearing habitat for salmonids.
- (g) Repair and maintenance of existing shoreline stabilization measures may be allowed, subject to the following standards. While repair and maintenance of shoreline stabilization structures may meet the criteria for exemption from a Shoreline Substantial Development Permit, such activity is not exempt from the policies and regulations of this SMP.
 - (1) Repair and maintenance includes modifications to an existing shoreline stabilization measure that are designed to ensure the continued function of the measure by preventing failure of any part. Limitations on repair and maintenance include:
 - (2) If within a three-year time period, more than 50 percent of the length of an existing structure is removed, including its footing or bottom course of rock, prior to placement of new stabilization materials, such work will not be considered repair and maintenance and shall be considered replacement. Work that only involves the removal of material above the footing or bottom course of rock does not constitute replacement.
 - (3) Any additions to or increases in the size of existing shoreline stabilization measures shall be considered new structures.
 - (4) The placement of a new shoreline stabilization structure landward of a failing shoreline stabilization structure shall be considered a new structure, not maintenance or repair.

- (5) Areas of temporary disturbance within the shoreline buffer shall be expeditiously restored to their pre-project condition or better.
- (h) Structural shoreline stabilization design and construction standards:
 - (1) Structural shoreline stabilization measures shall not extend waterward more than the minimum amount necessary to achieve effective stabilization, except for those elements that enhance shoreline ecological functions and minimize impacts.
 - (2) Stairs or other water access measures may be incorporated into shoreline stabilization measures, but shall not extend waterward of the measure or the OHWM.
 - (3) All structural shoreline stabilization measures must minimize and mitigate any adverse impacts to ecological functions resulting from short-term construction activities. Techniques may include compliance with timing restrictions, use of best management practices, and stabilization of exposed soils following construction.
- (i) In addition to other submittal requirements, the applicant shall submit the following as part of a request to construct a new, enlarged, or replacement shoreline stabilization measure:
 - (1) For a new or enlarged hard or soft structural shoreline stabilization measure, a geotechnical report prepared by a qualified professional with a Washington state engineering license. The report shall include the following:
 - a. An assessment of the necessity for structural shoreline stabilization by estimating time frames and rates of erosion and reporting on the urgency associated with the specific situation.
 - b. An assessment of the cause of erosion, looking at processes occurring both waterward and landward of the OHWM, and documentation of the OHWM field determination.
 - c. An assessment of alternative measures to shoreline stabilization.
 - d. Where structural shoreline stabilization is determined to be necessary, the assessment must evaluate the feasibility of using soft shoreline stabilization measures in lieu of hard structural shoreline stabilization measures.
 - e. Design recommendations for minimum sizing of hard structural or soft structural shoreline stabilization materials, including gravel and cobble beach substrates necessary to dissipate wave energy, eliminate scour, and provide long-term shoreline stability.
 - (2) For replacements of existing hard structural shoreline stabilization measures with a similar measure, the applicant shall submit a written narrative providing a demonstration of need. The narrative must be prepared by a qualified professional. The demonstration of need shall consist of the following:
 - a. An assessment of the necessity for continued structural shoreline stabilization, considering site-specific conditions such as water depth, orientation of the shoreline, wave fetch or flow velocities, and location of the nearest primary structure.
 - b. An assessment of erosion potential resulting from the action of waves or other natural processes operating at or waterward of the OHWM in the absence of the hard structural shoreline stabilization, and documentation of the OHWM field determination.
 - c. An assessment of alternative measures to shoreline stabilization.
 - d. An assessment of the feasibility of using soft shoreline stabilization measures in lieu of hard structural shoreline stabilization measures.
 - e. Design recommendations for minimizing impacts of any necessary hard structural shoreline stabilization.
 - f. The demonstration of need may be waived when an existing hard structural shoreline stabilization measure is proposed to be repaired or replaced using soft structural shoreline

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stabilization measures, resulting in significant restoration of shoreline ecological functions or processes.

- (3) For all structural shoreline stabilization measures, including soft structural shoreline stabilization, detailed construction plans, including, but not limited to, the following:
 - a. Plan and cross-section views of the existing and proposed shoreline configuration, showing accurate existing and proposed topography and OHWMs.
 - b. Detailed construction sequence and specifications for all materials, including gravels, cobbles, boulders, logs, and vegetation.

07.150 Transportation

This Section addresses all forms of transportation including systems for pedestrian, bicycle, and public transportation as well as roads, railroads, and parking.

- (a) Where other options are available and feasible, new roads, road expansions or railroads shall not be built within shoreline jurisdiction. If subdivisions are being proposed, new road placement shall be evaluated at the time of the plat application, or site development planning.
- (b) When railroads, roads or road expansions are unavoidable in the shoreline jurisdiction, proposed transportation facilities shall be planned, located, and designed to achieve the following:
 - (1) Mitigate possible adverse effects on unique or fragile shoreline features;
 - (2) Maintain no net loss of shoreline ecological functions;
 - (3) Avoid adverse impacts on existing or planned water-dependent uses; and
 - (4) Set back from the OHWM to the maximum feasible to allow for a usable shoreline area for vegetation conservation and planned shoreline uses unless infeasible, standards for ADA accessibility and functionality cannot be met, or the cost is disproportionate to the cost of the proposal.
 - (5) Be consistent with critical areas regulations in Section 15.06.
- (c) Public roads within shoreline jurisdiction shall, where possible, provide and maintain visual access to scenic vistas. Visual access may include, but is not limited to, turn-outs, rest areas, and picnic areas.
- (d) Shoreline crossings and culverts shall be designed to mitigate impact to riparian and aquatic habitat and shall allow for fish passage. Crossings shall occur as near to perpendicular with the waterbody as possible, unless an alternate path would minimize disturbance of native vegetation or result in avoidance of other critical areas such as wetlands.
- (e) Crossings that are to be used solely for access to private property shall be designed, located, and constructed to provide access to more than one lot or parcel of property, where feasible, to minimize the number of crossings.
- (f) The provisions of Section 15.06.050, Frequently Flooded Areas shall be addressed in the design of transportation facilities.
- (g) Transportation proposals shall be consistent with circulation system plans for roads, railroads, pedestrian, bicycle, and public transportation. The SMP Administrator shall condition transportation proposals to be consistent with applicable county, city, state, or federal plans and construction standards, as appropriate.
- (h) Public access standards shall be met in Section 15.05.050.
- (i) Parking facilities in shorelines are not a preferred use and shall be allowed only as necessary to support an authorized use and when minimizing environmental and visual impacts. For the purposes of this Section, authorized means a use or activity included in the use matrix in Section 15.04.110 and associated definitions in Section 15.02. New or expanded parking areas shall:
 - (1) Be sited outside of shoreline jurisdiction unless no feasible alternative location exists, for example where a property does not extend outside jurisdiction;

- (2) Be planted or landscaped to provide a visual and noise buffer for adjoining dissimilar uses or scenic areas; and
- (3) Observe critical area and shoreline buffers.
- (j) If an applicant proposes to pave a roadway or parking area, the proposal shall comply with applicable water quality, stormwater, landscaping, and other applicable requirements of this SMP and the Benton County Code.
- (k) A driveway for an individual single family home is considered a residential appurtenance and is considered part of the primary use, and subject to Section 15.07.120. Private driveways or private roads serving more than one home are subject to the standards of Section 15.07.150.
- (l) When a new or expanded roadway or new or expanded parking facility is proposed, the County may condition the proposal to provide a maintenance plan that promotes best management practices to achieve no-net-loss of shoreline ecological function. For example, maintenance standards may include restrictions on the use of herbicides, hazardous substances, sealants or other liquid oily substances, or de-icing practices adjacent to shoreline buffers or critical areas and their buffers.

07.160 Utilities

- (a) Utility projects within shoreline jurisdiction shall be designed to achieve no-net-loss of shoreline ecological function.
- (b) If an underwater location is necessary, the design, installation and operation of utilities shall minimize adverse ecological impacts.
- (c) Where utility corridors must cross shoreline jurisdiction, such crossings shall be designed to take the shortest, most direct route feasible, unless such a route would result in loss of ecological function, disrupt public access to the shoreline, or obstruct visual access to the shoreline.
- (d) Utility projects within shoreline jurisdiction shall be located within existing transportation or utility corridors or existing cleared areas to the greatest extent feasible.
- (e) Utility production and processing facilities, such as power plants and sewage treatment plants, or parts of those facilities that are non-water-oriented shall not be allowed in shoreline areas unless it can be demonstrated that no other feasible option is available.
- (f) Upon completion of utility system installation, and any maintenance project, the disturbed area shall be regraded to compatibility with the natural terrain and replanted to prevent erosion and provide appropriate vegetative cover.
- (g) The presence of existing utilities shall not justify more intense development. Rather the development shall be consistent with the County Comprehensive Plan, zoning code, and this SMP, and shall be supported by adequate utilities.

Section 15.08 Nonconforming Uses, Structures, and Lots

Nonconforming uses or developments are shoreline uses or development which were lawfully constructed or established prior to the effective date of this Master Program, or approved amendments to the Master Program, but which do not conform to present regulations or standards of the Master Program. The intent of this chapter is to provide regulations regarding nonconforming uses, structures, and lots as well as to establish residences as pre-existing legal uses, conforming to the Master Program as allowed by the SMA.

08.010 Non-Conforming Uses and Structures: Continuance and Discontinuance

- (a) Lots, structures, and uses that were legally established prior to adoption of this Master Program or that were in compliance with the Master Program at the time of initial establishment but, due to revision or amendment of the Master Program, have become noncompliant are nonconforming uses that may continue, without regard to ownership changes, so long as in compliance with this chapter. A use of

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property that is unlawful under other local, state, or federal laws shall not be deemed a nonconforming use.

- (b) Any use which existed prior to adoption of this Master Program or applicability of this Master Program to the property and which is not listed as a permitted use shall be considered a nonconforming use.
- (c) If a nonconforming use is replaced by a conforming use for any length of time, use of the property shall not revert to the nonconforming use. The mere presence of a structure shall not constitute the continuance of a nonconforming use. When a nonconforming use is discontinued for a period of one (1) year or more without replacement by a conforming use, legal conforming use status expires and further use of the structure or lot must be in compliance with the provisions of this Master Program.

08.020 Alteration, Expansion, or Restoration of Nonconforming Uses and Structures

Alteration, expansion, or restoration of nonconforming structures and uses are not allowed except as set forth in this Subsection.

- (a) Single Family Dwelling Units. See BCC 15.08.040.
- (b) Other Structures or Uses – Legally Required Alterations or Expansions. Alteration or expansion of a nonconforming use or structure is allowed if necessary to accommodate handicapped accessibility requirements, fire code, or other life safety related requirements mandated by local, state, or federal law.
- (c) Other Structures or Uses – Dimensional Nonconformities. Legally established structures used for a conforming use but which are nonconforming with regard to setbacks, buffers, or yards; area; bulk; height or density may be maintained and repaired and may be enlarged or expanded, provided that said enlargement does not increase the extent of nonconformity by further encroaching upon or extending into areas where construction or use would not be allowed for new development or uses. For example, vertical, lateral or anterior expansions that do not intrude into a required buffer and which are consistent with the maximum height of this SMP and underlying zoning may be allowed.
- (d) Structures Subject to Variances. A structure for which a variance has been issued shall be considered a legal nonconforming structure, and the requirements of this Section shall apply as they apply to pre-existing nonconformities.
- (e) Movement of a Structure. A nonconforming structure which is moved any distance must be brought into conformance with this Title and the SMA.
- (f) Other Non-conforming Structures. Except as set forth above, nonconforming structures may not be altered or expanded. Such other structures may be restored if less than fifty (50) percent of the gross floor area in flood hazard areas and seventy-five (75) percent of the gross floor area in the remainder of shoreline jurisdiction has been unintentionally destroyed or damaged if:
 - (1) All other requirements of the Benton County Code and the Benton-Franklin Health District are satisfied, including but not limited to setback requirements;
 - (2) The nonconforming use resumes within such structure within one (1) year from the destroying or damaging event; and
 - (3) The restoration of the nonconforming structure does not increase the gross floor area that existed immediately prior to the destruction or damaging event. Structures intentionally destroyed or damaged and those with fifty (50) percent or more of the gross floor area in flood hazard areas and seventy-five (75) percent or more of their gross floor area in the remainder of shoreline jurisdiction unintentionally destroyed or damaged may not be restored or reconstructed.

08.030 Nonconforming Lots

- (a) In any district, any permitted use or structure may be erected on any existing lot or parcel. This provision shall apply even though such lot fails to meet the minimum dimensional requirements of this Title, provided that such structure is allowed within the shoreline environment and all uses of the nonconforming lot shall comply with all other provisions this Master Program, underlying zoning

requirements including setbacks, dimensional standards, and lot coverage requirements and the Benton-Franklin Health District .

- (b) Structures and customary accessory buildings on non-conforming lots shall be set back from the OHWM to the greatest extent feasible. Development proposed inside required buffers shall go through mitigation sequencing and shall require a mitigation plan.

08.040 Pre-Existing Legal Residential Uses – Conforming Legal Residential Structures

Notwithstanding Sections 15.08.010 to 15.08.030, the following shall apply only to pre-existing legal residential structures constructed prior to the effective date of this Title.

- (a) Residential structures and appurtenant structures that were legally established and are used for a conforming use, but that do not meet standards for the following shall be considered a conforming structure: Setback, buffers, or yards; area; bulk; height; or density.
- (b) The County shall allow redevelopment, expansion, or change with the class of occupancy, of the residential structure if it is consistent with the SMP, including requirements for no net loss of shoreline ecological functions. For example, vertical, lateral or anterior expansions that do not intrude farther into a required buffer and which are consistent with the maximum height allowed by this SMP and underlying zoning may be allowed.
- (c) Pre-existing legal residential structures that are damaged or destroyed may be replaced to their prior size and location subject to:
 - (1) all other requirements of the Benton County Code and the Benton-Franklin Health District are satisfied; and
 - (2) to restore a damaged dwelling unit, a complete application for a building permit shall be submitted within one (1) year of the act causing damage or destruction to the dwelling unit.
- (d) For purposes of this Section, “appurtenant structures” means garages, sheds, and other legally established structures. “Appurtenant structures” does not include bulkheads and other shoreline modifications or over-water structures.
- (e) Nothing in this Section shall:
 - (1) Restrict the ability of this Title to limit development, expansion, or replacement of over-water structures located in hazardous areas, such as floodplains and geologically hazardous areas; or
 - (2) Affect the application of other federal, state, or county requirements to residential structures.

Section 15.09 Administration, Permits, and Enforcement

09.010 Purpose

- (a) RCW 90.58.140(3) requires local governments to establish a Program, consistent with the rules adopted by the Washington Department of Ecology, for the administration and enforcement of shoreline development. Also, in accordance with RCW 90.58.050, Benton County has the primary responsibility for administering the regulatory program and Ecology acts primarily in a supportive and review capacity.
- (b) Pursuant to the Shoreline Management Act at RCW 90.58.080 and the Growth Management Act at RCW 36.70A.130, local governments must periodically review, and where appropriate, amend their SMP. Consistent with state laws, Benton County has established a process to evaluate and consider amendments to this SMP.
- (c) The application of this SMP is intended to be consistent with constitutional and other legal limitations on the regulation of private property. The SMP Administrator must give adequate consideration to mitigation measures, dimensional variances, and other possible methods to prevent undue or unreasonable hardships upon property owners.

09.020 Administrative Responsibilities

- (a) The County shall designate a SMP Administrator. The SMP Administrator in Benton County is the Planning Manager and shall have overall administrative responsibility of this SMP. The SMP Administrator or his/her designee is hereby vested with the authority to:
 - (1) Administrate this SMP.
 - (2) Grant or deny exemptions from Shoreline Substantial Development Permit requirements of this SMP.
 - (3) To grant, grant with conditions, or deny Shoreline Substantial Development Permits and time extensions to shoreline permits and their revisions.
 - (4) Make field inspections as needed, and prepare or require reports on shoreline permit applications.
 - (5) Make written recommendations to the Hearings Examiner, Planning Commission and Board of County Commissioners as appropriate. The SMP Administrator shall make recommendations to the Hearings Examiner regarding Shoreline Variances and Shoreline Conditional Use Permits. The SMP Administrator shall recommend SMP amendments to the Planning Commission and Board of County Commissioners.
 - (6) Advise interested persons and prospective applicants as to the administrative procedures and related components of this SMP.
 - (7) Determine and collect fees for all necessary permits as provided in County ordinances or resolutions. The determination of which fees are required shall be established by resolution of the Board of County Commissioners.
 - (8) Make administrative decisions and interpretations of the policies and regulations of this SMP and the SMA.
- (b) The responsible SEPA official or his/her designee is authorized to conduct environmental review of all use and development activities subject to this SMP, pursuant to WAC 197-11 and RCW 43.21C. The responsible official is designated in accordance with the Benton County Code.
- (c) The Hearing Examiner is authorized to:
 - (1) Grant or deny Shoreline Variances, and Shoreline Conditional Use Permits under this SMP.
 - (2) Decide on appeals of administrative decisions issued by the Administrator of this SMP.
- (d) The Planning Commission is authorized to:
 - (1) Review the SMP as part of regular SMP updates required by RCW 90.58.080 as a major element of each County's planning and regulatory program, and make recommendations for amendments thereof to the Board of County Commissioners.
- (e) The Board of County Commissioners is vested with authority to:
 - (1) Initiate an amendment to this SMP according to the procedures prescribed in WAC 173-26-100.
 - (2) Adopt all amendments to this SMP, after consideration of the recommendation of the planning commission, where established. Amendments shall become effective 14 days from the date of the Washington Department of Ecology's written notice of final approval.

09.030 Noticing Requirements

- (a) Applicants shall follow the noticing requirements of the County. At a minimum, the County shall provide notice in accordance with WAC 173-27-110, and shall be consistent with noticing requirements in BCC Title 17.
- (b) Per WAC 173-27-120 the County shall comply with special procedures (public notice timelines, appeal periods, etc.) for limited utility extensions and bulkheads.

09.040 Exemption from Permit Requirements

- (a) An exemption from the Shoreline Substantial Development Permit process is not an exemption from compliance with the SMA or this SMP, or from any other regulatory requirements. To be authorized, all uses and development must be consistent with the policies, requirements and procedures of this SMP and the SMA.
- (b) Exemptions shall be construed narrowly. Only those developments that meet the precise terms of one or more of the listed exemptions may be granted exemption from the Shoreline Substantial Development Permit process.
- (c) A development or use that is listed as a conditional use pursuant to this SMP or is an unlisted use, must obtain a Shoreline Conditional Use Permit even though the development or use does not require a Shoreline Substantial Development Permit. When a development or use is proposed that does not comply with the bulk, dimensional and performance standards of this SMP, such development or use can only be authorized by approval of a Shoreline Variance.
- (d) The burden of proof that a development or use is exempt from the permit process is on the applicant.
- (e) If any part of a proposed development is not eligible for exemption, then a Shoreline Substantial Development Permit is required for the entire proposed development project.
- (f) The County may attach conditions to the approval of exempted developments and/or uses as necessary to assure consistency of the project with the SMA and this SMP. Additionally, nothing shall interfere with the County's ability to require compliance with all other applicable laws and plans.
- (g) The County shall exempt the shoreline developments listed in WAC 173-27-040 and RCW 90.58.030 (3)(e), 90.58.140(9), 90.58.147, 90.58.355 and 90.58.515, as amended, or successor laws, from the Shoreline Substantial Development Permit requirement.
- (h) Letters of exemption shall be issued by the County when a development application is determined to meet the listed criteria for an exemption and when a letter of exemption is required by the provisions of WAC 173-27-050, as amended.

09.050 Interpretations

- (a) The SMP Administrator shall provide administrative interpretations in accordance with the SMA, the SMP Guidelines and with BCC 17.10.170.
- (b) The application of this SMP is intended to be consistent with constitutional and other legal limitations on the regulation of private property. The SMP Administrator shall give adequate consideration to mitigation measures, dimensional variances, and other possible methods to prevent undue or unreasonable hardships upon property owners.
- (c) The County shall consult with Ecology to ensure that any formal written interpretations are consistent with the purpose and intent of chapter 90.58 RCW and 173-26 WAC.

09.060 Permit Applications

- (a) Shoreline applications are classified as follows:
 - (1) Substantial Development Permit
 - (2) Conditional Use Permit
 - (3) Variance
 - (4) Shoreline Exemption
- (b) Permits for Substantial Development, Shoreline Conditional use, or Shoreline Variance shall be in a form prescribed and used by the County including a combined permit application form. Such forms will be supplied by the County.
- (c) The contents of permit applications must be consistent with WAC 173-27-180 and Benton County Code.

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- (d) Where this SMP requires more information than the minimum required by WAC 173-27-180, the SMP Administrator may vary or waive requirements beyond WAC 173-27-180 if the information is unnecessary to process the application.
- (e) The SMP Administrator may require additional specific information if required by the nature of the proposal or the presence of sensitive ecological features, to ensure compliance with other local requirements or the provisions of this SMP.
- (f) At the time of application, the applicant must pay the application fee.

09.070 Procedures applicable to all shoreline permits

- (a) All applications for a permit or a permit revision shall be submitted by the County to Ecology upon a final decision by the County. Final decision by the County shall mean the order or ruling, whether it be an approval or denial, which is established after all local administrative appeals related to the permit have concluded or the opportunity to initiate such appeals have lapsed. Filing shall occur consistent with WAC 173-27-130.
- (b) As set forth in WAC 173-27-190, each Substantial Development Permit, Conditional Use Permit, or Variance, issued by the County must contain a provision that construction pursuant to the permit may not begin and is not authorized until twenty-one days from the date of filing as defined in RCW 90.58.140(6) and WAC 173-27-130, or until all review proceedings initiated within twenty-one days from the date of such filing have terminated; except as provided in RCW 90.58.140(5)(a) and (b).
- (c) A permit data sheet shall be submitted to Ecology with each shoreline permit. The permit data sheet form shall be consistent with WAC 173-27-990.
- (d) After the County's approval of a conditional use or variance permit, the County shall submit the permit to the department for Ecology's approval, approval with conditions, or denial. Ecology shall render and transmit to the County and the applicant its final decision approving, approving with conditions, or disapproving the permit within thirty days of the date of submittal by the County pursuant to WAC 173-27-110.
- (e) Ecology shall review the complete file submitted by the County on conditional use and variance permits and any other information submitted or available that is relevant to the application. Ecology shall base its determination to approve, approve with conditions or deny a conditional use permit or variance on consistency with the policy and provisions of the SMA and, except as provided in WAC 173-27-210, the criteria in WAC 173-27-160 and 173-27-170.
- (f) The County shall provide appropriate notification of the Ecology's final decision to those interested persons having requested notification from local government pursuant to WAC 173-27-130.
- (g) All requests for review of any final permit decisions under chapter 90.58 RCW and chapter 173-27 WAC are governed by the procedures established in RCW 90.58.180 and chapter 461-08 WAC, the rules of practice and procedure of the shorelines hearings board.
- (h) Except as specified in 09.110, Revisions to Permits, the applicant must comply with all aspects of an approval granted under this Chapter, including conditions and restrictions.
- (i) Construction and activities authorized by a Shoreline Substantial Development Permit are subject to the time limitations of WAC 173-27-090.

09.080 Procedures applicable to Substantial Development Permits

- (a) A Shoreline Substantial Development Permit shall be required for all development of shorelines, unless the proposal is specifically exempt per Section 09.040 or is not subject to the SMP per Section 01.030, Applicability.
- (b) Shoreline Substantial Development permits shall be processed consistent with this SMP and BCC Chapter 17.10, Permit Review Process.
- (c) A substantial development permit shall be granted only when the development proposed is consistent with:

- (1) The policies and procedures of the SMA;
 - (2) The provisions of WAC 173-27; and
 - (3) This SMP.
- (d) The County may attach conditions to the approval of permits as necessary to assure consistency of the project with the SMA and this SMP.
- (e) Nothing shall interfere with the County's ability to require compliance with all other applicable plans and laws.

09.090 Procedures Applicable to Shoreline Conditional Use Permits

- (a) Uses specifically classified or set forth in this SMP as conditional uses shall be subject to review and condition by the Hearing Examiner and by Ecology. Shoreline Conditional Use Applications shall be processed consistent with this SMP and BCC Chapter 17.10, Permit Review Process.
- (b) Other uses which are not classified or listed or set forth in this SMP may be authorized as conditional uses provided the applicant can demonstrate consistency with the requirements of this Section and the requirements for conditional uses contained in this SMP.
- (c) Uses which are specifically prohibited by this SMP may not be authorized as a conditional use.
- (d) Uses which are classified or set forth in this SMP as conditional uses may be authorized provided that the applicant demonstrates all of the following:
 - (1) That the proposed use is consistent with the policies of RCW 90.58.020 and the SMP;
 - (2) That the proposed use will not interfere with the normal public use of public shorelines;
 - (3) That the proposed use of the site and design of the project is compatible with other authorized uses within the area and with uses planned for the area under the comprehensive plan and SMP;
 - (4) That the proposed use will cause no significant adverse effects to the shoreline environment in which it is to be located; and
 - (5) That the public interest suffers no substantial detrimental effect.
- (e) In the granting of all conditional use permits, consideration shall be given to the cumulative impact of additional requests for like actions in the area. For example, if conditional use permits were granted for other developments in the area where similar circumstances exist, the total of the conditional uses shall also remain consistent with the policies of RCW 90.58.020 and shall not produce substantial adverse effects to the shoreline environment.

09.100 Procedures Applicable to Shoreline Variances

- (a) The purpose of a variance is to grant relief to specific bulk or dimensional requirements set forth in this SMP where there are extraordinary or unique circumstances relating to the property such that the strict implementation of this SMP would impose unnecessary hardships on the applicant or thwart the policies set forth in RCW 90.58.020. Variances from the use regulations of the SMP are prohibited. Shoreline Variance Applications shall be processed consistent with this SMP and BCC Chapter 17.10, Permit Review Process.
- (b) Variance permits should be granted in circumstances where denial of the permit would conflict with the goals of the SMA as listed in RCW 90.58.020. In all instances the applicant must demonstrate that extraordinary circumstances shall be shown and the public interest shall suffer no substantial detrimental effect.
- (c) Variance permits for development and/or uses that will be located landward of the OHWM, as defined in RCW 90.58.030 (2)(b), and/or landward of any wetland as defined in RCW 90.58.030 (2)(h), may be authorized provided the applicant can demonstrate all of the following:
 - (1) That the strict application of the bulk, dimensional or performance standards set forth in the SMP precludes, or significantly interferes with, reasonable use of the property;

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- (2) That the hardship described in criterion (1) of this Subsection is specifically related to the property, and is the result of unique conditions such as irregular lot shape, size, or natural features and the application of the SMP, and not, for example, from deed restrictions or the applicant's own actions;
 - (3) That the design of the project is compatible with other authorized uses within the area and with uses planned for the area under the comprehensive plan and SMP and will not cause adverse impacts to the shoreline environment;
 - (4) That the variance will not constitute a grant of special privilege not enjoyed by the other properties in the area;
 - (5) That the variance requested is the minimum necessary to afford relief; and
 - (6) That the public interest will suffer no substantial detrimental effect.
- (d) Variance permits for development and/or uses that will be located waterward of the OHWM, as defined in RCW 90.58.030 (2)(b), or within any wetland as defined in RCW 90.58.030 (2)(h), may be authorized provided the applicant can demonstrate all of the following:
- (1) That the strict application of the bulk, dimensional or performance standards set forth in the applicable SMP precludes all reasonable use of the property;
 - (2) That the proposal is consistent with the criteria established under Subsection (c); and
 - (3) That the public rights of navigation and use of the shorelines will not be adversely affected.
- (e) In the granting of all variance permits, consideration shall be given to the cumulative impact of additional requests for like actions in the area. For example if variances were granted to other developments and/or uses in the area where similar circumstances exist the total of the variances shall also remain consistent with the policies of RCW 90.58.020 and shall not cause substantial adverse effects to the shoreline environment.

09.110 Revisions to Permits

- (a) When an applicant seeks to revise a shoreline substantial development permit, conditional use permit, or variance, whether such permit or variance was granted under this SMP, or under the prior effective SMP the SMP Administrator shall request from the applicant detailed plans and text describing the proposed changes to the project. If the Administrative Official determines that the proposed changes are within the general scope and intent of the original substantial development permit, conditional use permit or variance, as the case may be, the revision may be approved by the Shoreline Administrator, without the need for the applicant to file a new Substantial Development Permit application, provided the development is consistent with the SMA, WAC 173-27-100 (Revisions to Permits), and the SMP.
- (b) Within the "scope and intent" of the original permit as referenced in Subsection (a) means the following:
- (1) No additional over-water construction will be involved, except that pier, dock, or float construction may be increased by 500 square feet or 10 percent from the provisions of the original permit, whichever is less.
 - (2) Lot coverage and height may be increased a maximum of 10 percent from the provisions of the original permit,
 - (3) Additional or revised landscaping is consistent with the conditions attached to the original permit and with the SMP.
 - (4) The use authorized pursuant to the original permit is not changed.
 - (5) No adverse environmental impact will be caused by the project revision.
 - (6) The revised permit shall not authorize development to exceed height, lot coverage, setback, or any other requirements of the SMP except as authorized under a variance granted as the original permit or a part thereof.

- (c) If the revision, or the sum of the revision and any previously approved revisions, will violate the criteria specified above, the SMP Administrator shall require the applicant to apply for a new shoreline substantial development or conditional use permit or variance, as appropriate, in the manner provided for herein.
- (d) If proposed revisions to the original permit involve a conditional use or variance, the County shall submit the proposed revision to Ecology for review. Ecology shall respond with its final decision on the proposed revision request within 15 days of the date of receipt by Ecology per WAC 173-27-100(6).

09.120 Enforcement Authority

The County shall apply 173-27 WAC Part II, Shoreline Management Act Enforcement, to enforce the provisions of this SMP.

09.130 Amendments to SMP

- (a) This SMP carries out the policies of the Shoreline Management Act for Benton County. It shall be reviewed and amended as appropriate in accordance with the review periods required in the SMA and in order to:
 - (1) Assure that this SMP complies with applicable law and guidelines in effect at the time of the review; and
 - (2) Assure consistency of this SMP with the County's Comprehensive Plan and development regulations adopted under chapter 36.70A RCW, if applicable, and other local requirements.
- (b) This SMP and all amendments thereto shall become effective 14 days from the date of the Washington Department of Ecology's written notice of final approval.
- (c) The SMP may be amended annually or more frequently as needed pursuant to the Growth Management Act, RCW 36.70A.130(2)(a)(iii).
- (d) Future amendments to this SMP may be initiated by any of the following: The Benton County Shoreline Administrator, Planning Commission, or Board of County Commissioners. The following persons may petition the Planning Commission and Benton County Commissioners to support an amendment:
 - (1) Any owner of property in unincorporated Benton County, when such request is for an amendment that would affect only that person's property;
 - (2) Any resident of unincorporated Benton County supported by ten (10) signatures of persons also residing in unincorporated Benton County; and
 - (3) Any local governmental or non-governmental agency operating in Benton County.
- (e) Applications for SMP amendments shall specify the changes requested and any and all reasons therefore. Applications shall be made on forms specified by the County. Such applications shall contain information specified in the County's procedures for Comprehensive Plan and development regulation amendments pursuant to RCW 36.70A, the Growth Management Act, and information necessary to meet minimum public review procedures in Subsection C.
- (f) The County shall accomplish the amendments in accordance with the procedures of the Shoreline Management Act, Growth Management Act, and implementing rules including, but not limited to, RCW 90.58.080, WAC 173-26-100, RCW 36.70A.106 and 130, and Part Six, Chapter 365-196 WAC.
- (g) Proposals for amendment of this SMP shall be heard by the Planning Commission in an open record hearing. After conducting a hearing and evaluating testimony regarding the application, including a recommendation from the Shoreline Administrator, the Planning Commission shall submit its recommendation to the Board of County Commissioners, who shall approve or deny the proposed amendment following their open record hearing.
- (h) Prior to approval, the County shall make a finding that the amendment would accomplish #1 or #2, and must accomplish #3:

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- (1) The proposed amendment would make this Program more consistent with the SMA and/or any applicable Department of Ecology SMP Guidelines; or
 - (2) The proposed amendment would make this Program more equitable in its application to persons or property due to changed conditions in an area; and
 - (3) This Program and any future amendment hereto shall ensure no net loss of shoreline ecological functions and processes on a programmatic basis in accordance with the baseline functions present as of April 2013 (the *Final Shoreline Analysis Report*).
- (i) After approval or disapproval of a SMP amendment by the Department of Ecology as provided in RCW 90.58.090, the County shall publish a notice that the SMP amendment has been approved or disapproved by Ecology pursuant to the notice publication requirements of RCW 36.70A.290.

09.140 Monitoring

- (a) The County will track all shoreline permits and exemption activities to evaluate whether the SMP is achieving no net loss of shoreline ecological functions. Activities to be tracked using the County's permit system include development, conservation, restoration and mitigation, such as:
- (1) New shoreline development
 - (2) Shoreline Variances and the nature of the variance
 - (3) Compliance issues
 - (4) Net changes in impervious surface areas, including associated stormwater management
 - (5) Net changes in fill or armoring
 - (6) Net change in linear feet of flood hazard structures
 - (7) Net changes in vegetation (area, character)
- (b) Using the information collected in Subsection (a) a no net loss report shall be prepared every eight years as part of the County's SMP evaluation or Comprehensive Plan Amendment process. Should the no net loss report show degradation of the baseline condition documented in the County's Shoreline Analysis Report, changes to the SMP and/or Shoreline Restoration Plan shall be proposed at the time of the eight-year update to prevent further degradation and address the loss in ecological functions.



Environment Designation [1]

- Conservancy
- Hanford
- Natural
- Residential
- Rural
- Rural Industrial
- Urban Transition Area
- SMP Waterbody [2,3]
- County Boundary [4]
- City Boundary [2]
- Urban Growth Area [2]

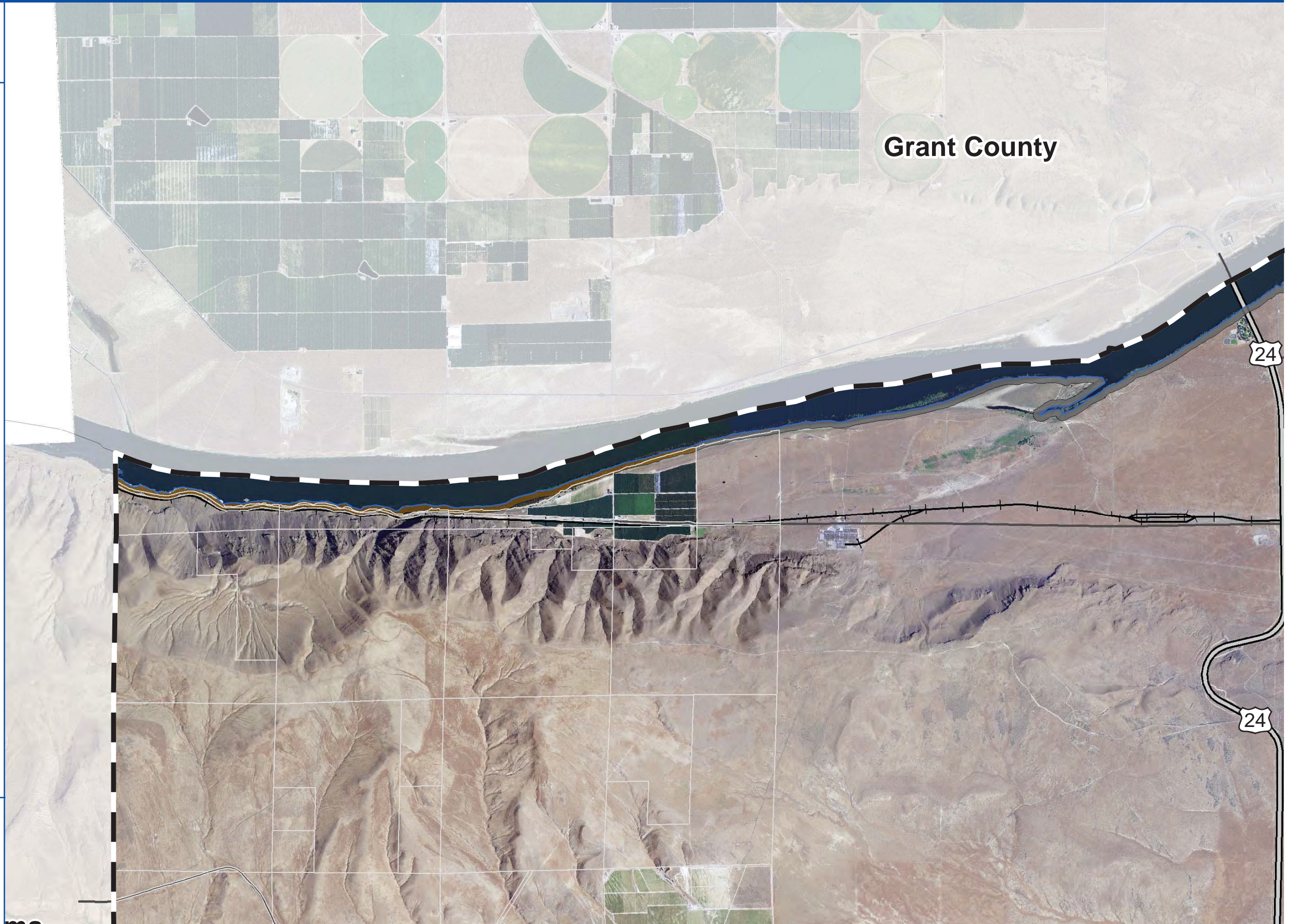
We hereby certify that this map constitutes the Official Shoreline Map as approved by Ordinance 2014-440 of the Board of County Commissioners and signed by its chairman dated this 3rd day of June, 2014.



Data sources:
[1] The Watershed Company; [2] Benton County; [3] US Geological Survey; [4] WA Dept of Ecology.



Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.





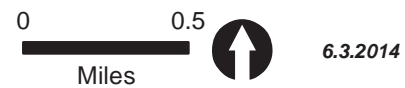
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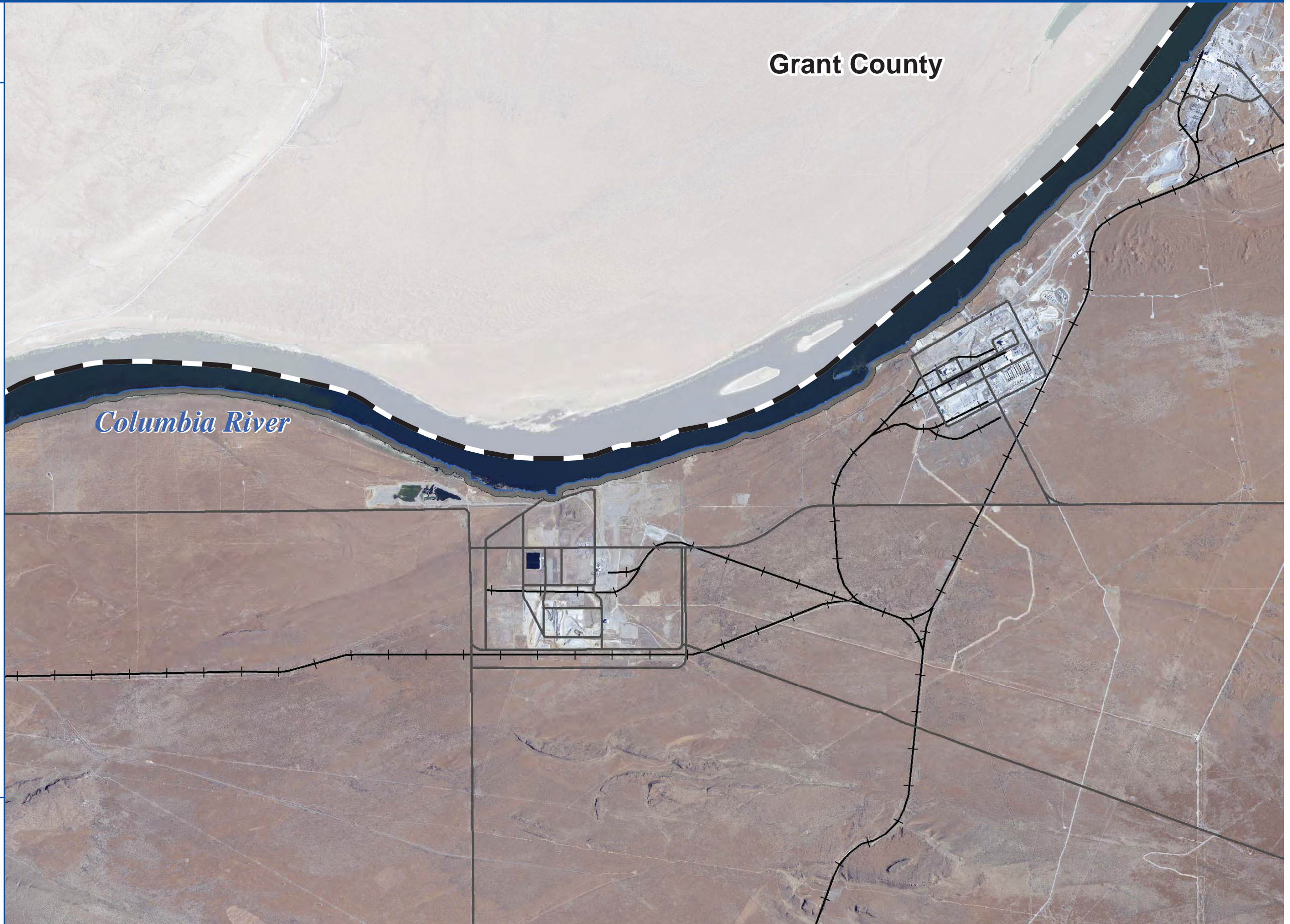
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Environment Designation [1]

- Conservancy
- Hanford
- Natural
- Residential
- Rural
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- Urban Transition Area
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- County Boundary [4]
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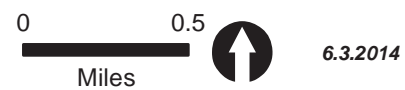
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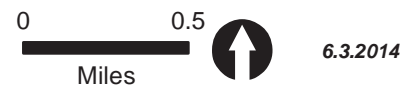
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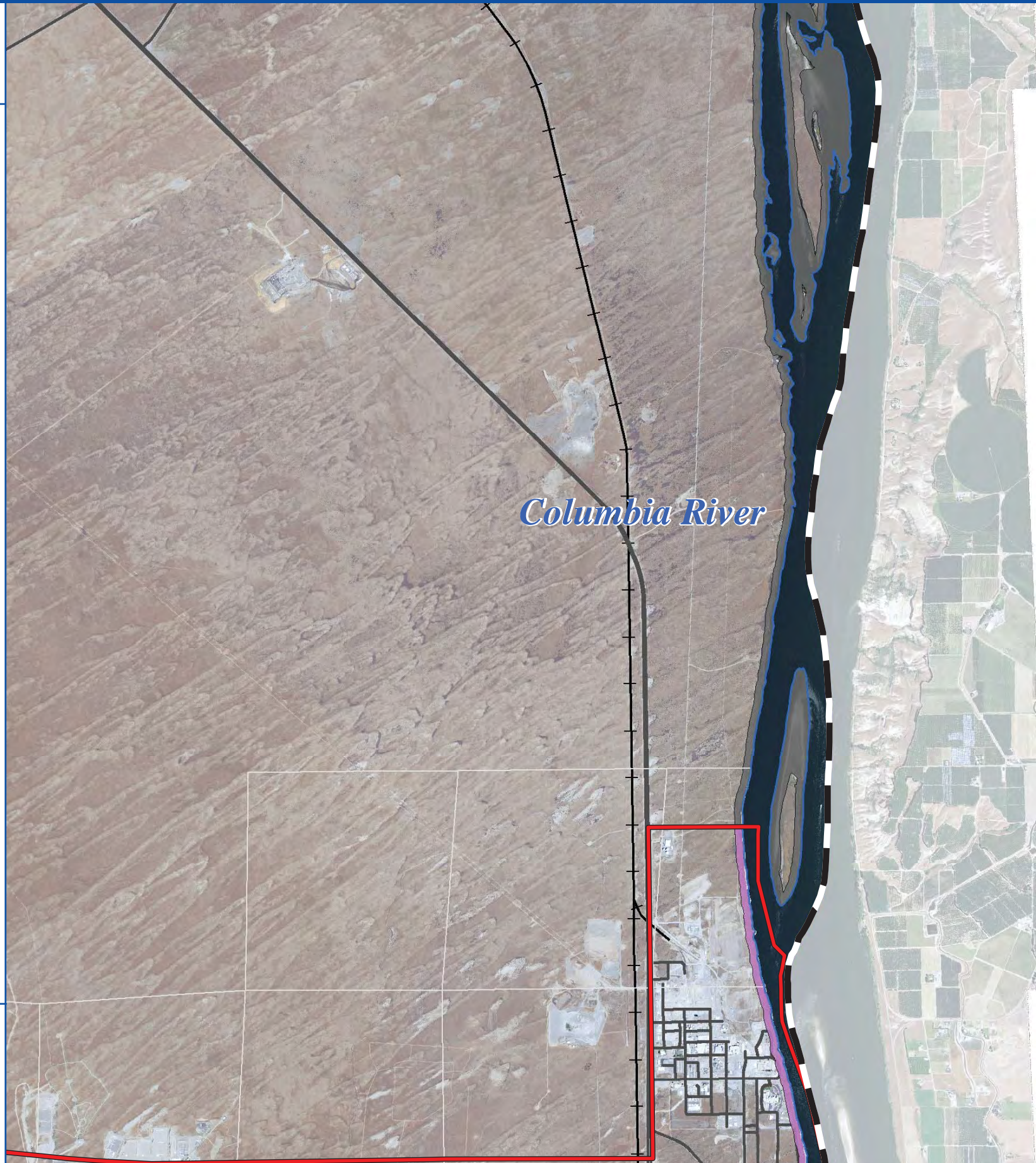
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Franklin County



Franklin County

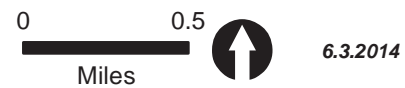
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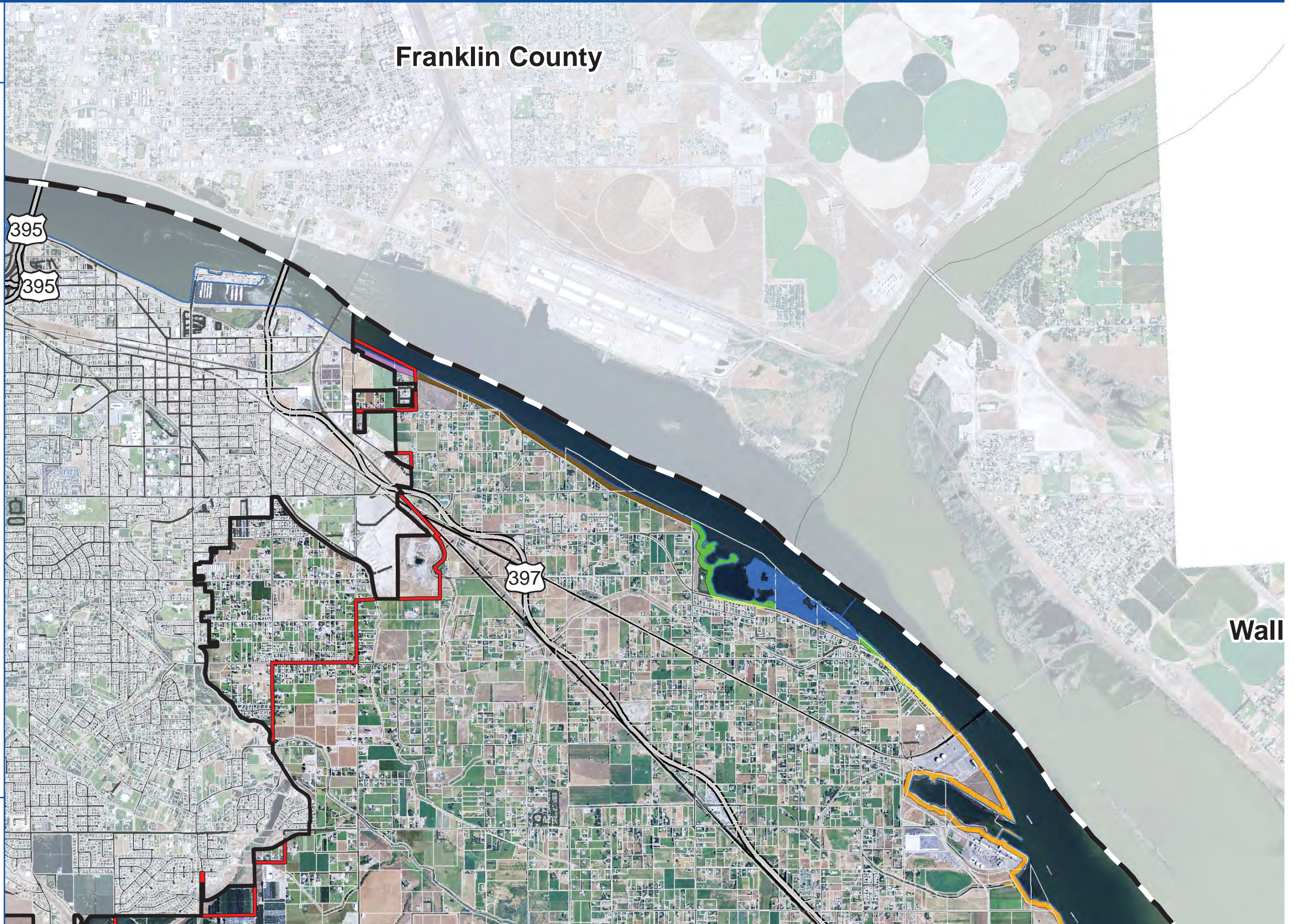
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Wall



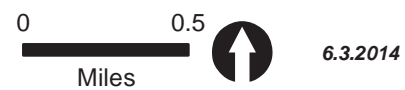
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Walla Walla County



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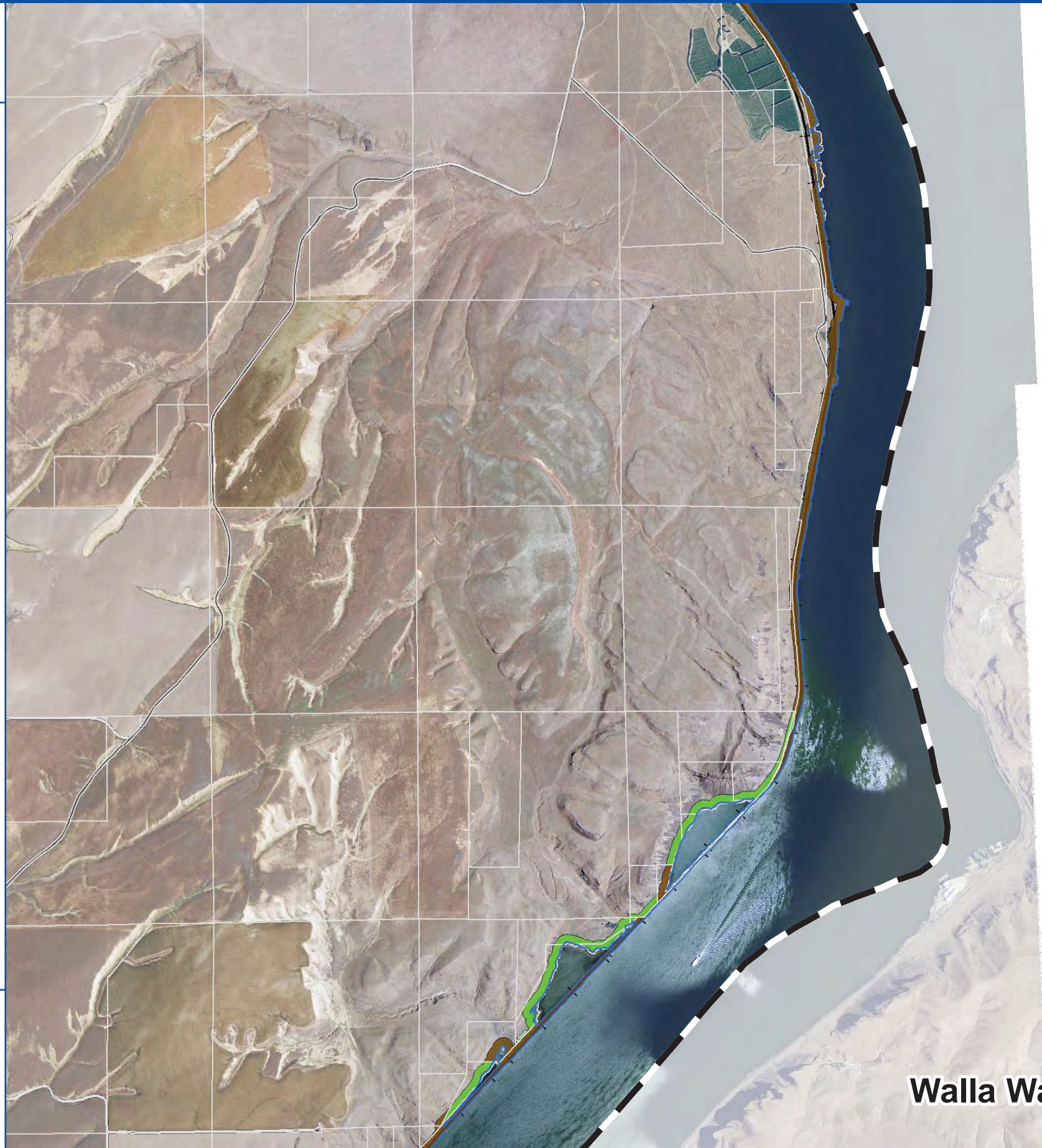
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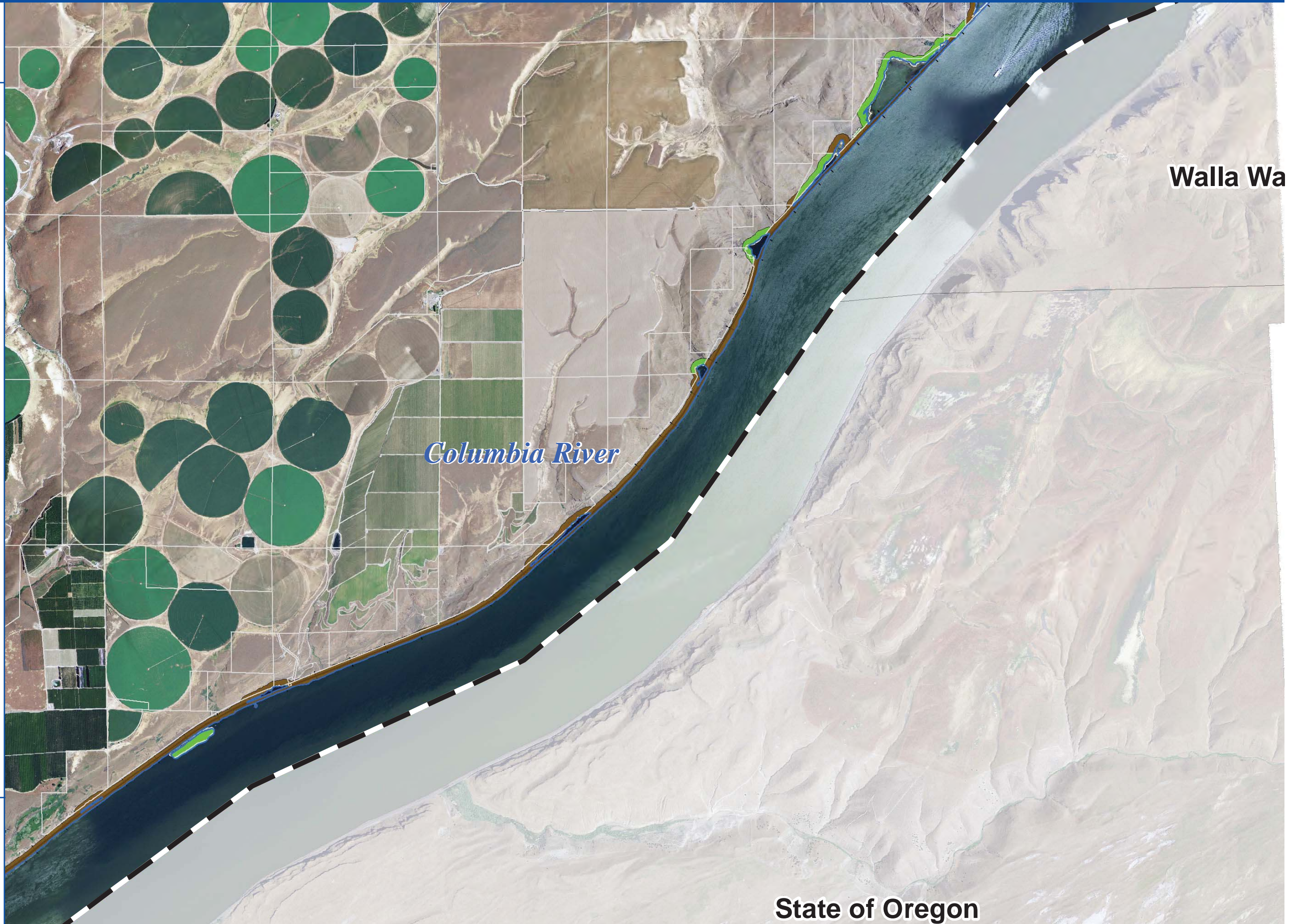
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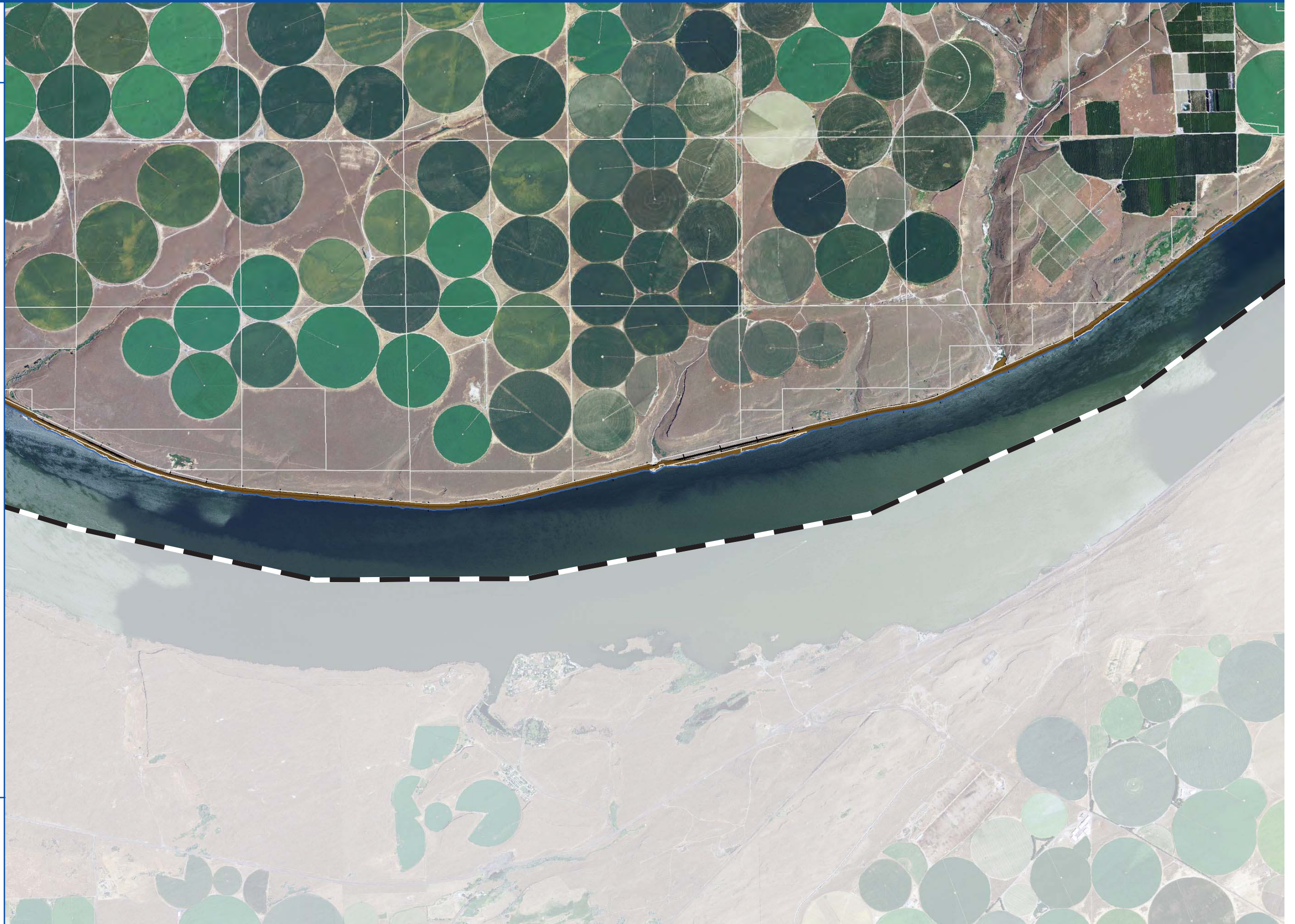
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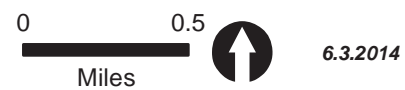
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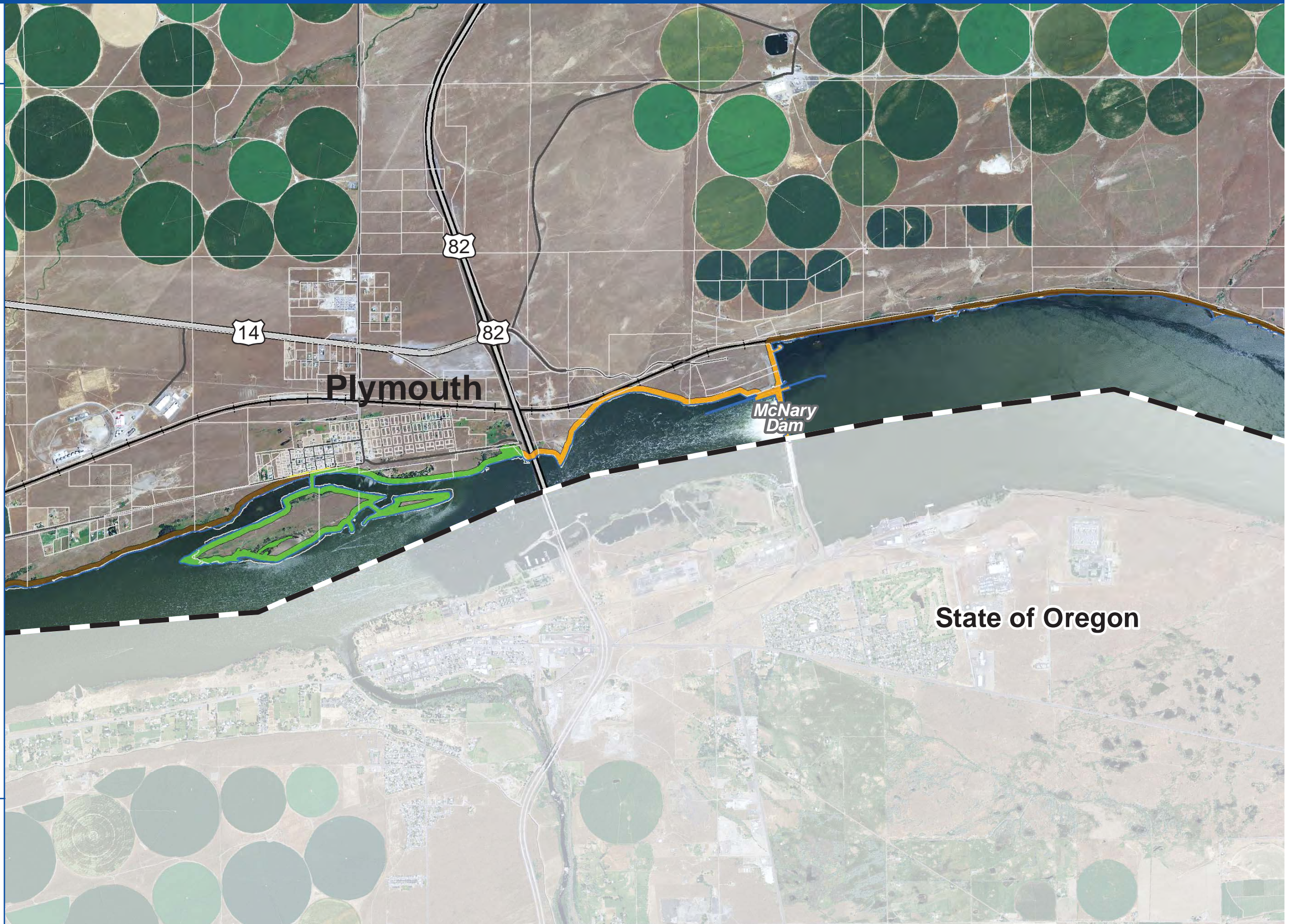
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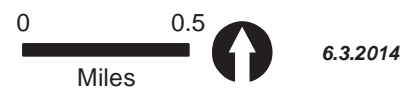
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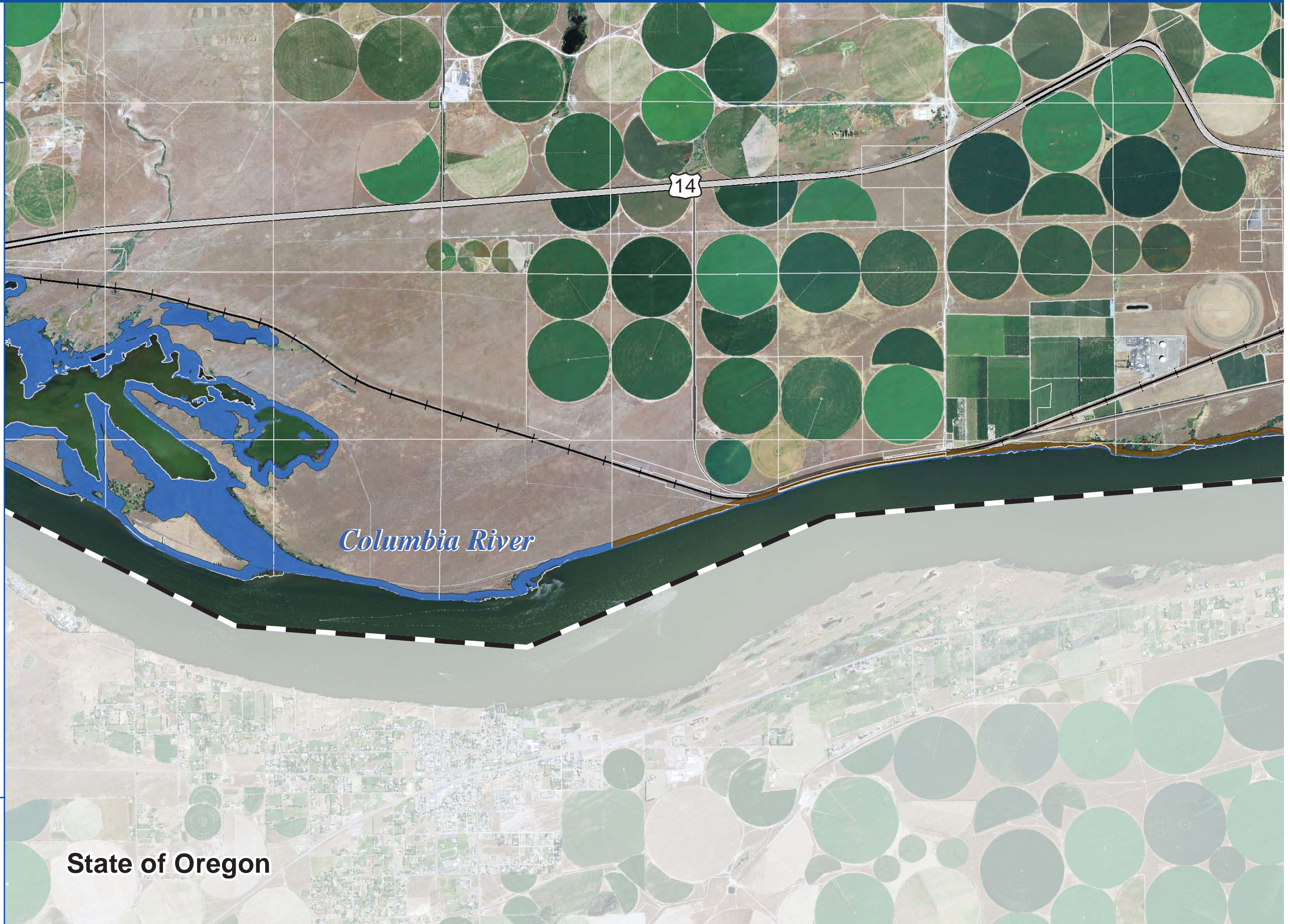
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State of Oregon



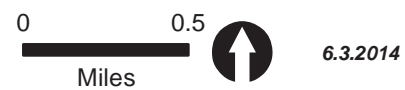
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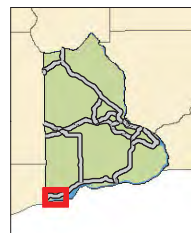




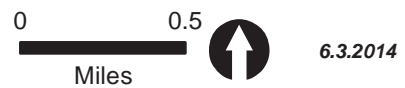
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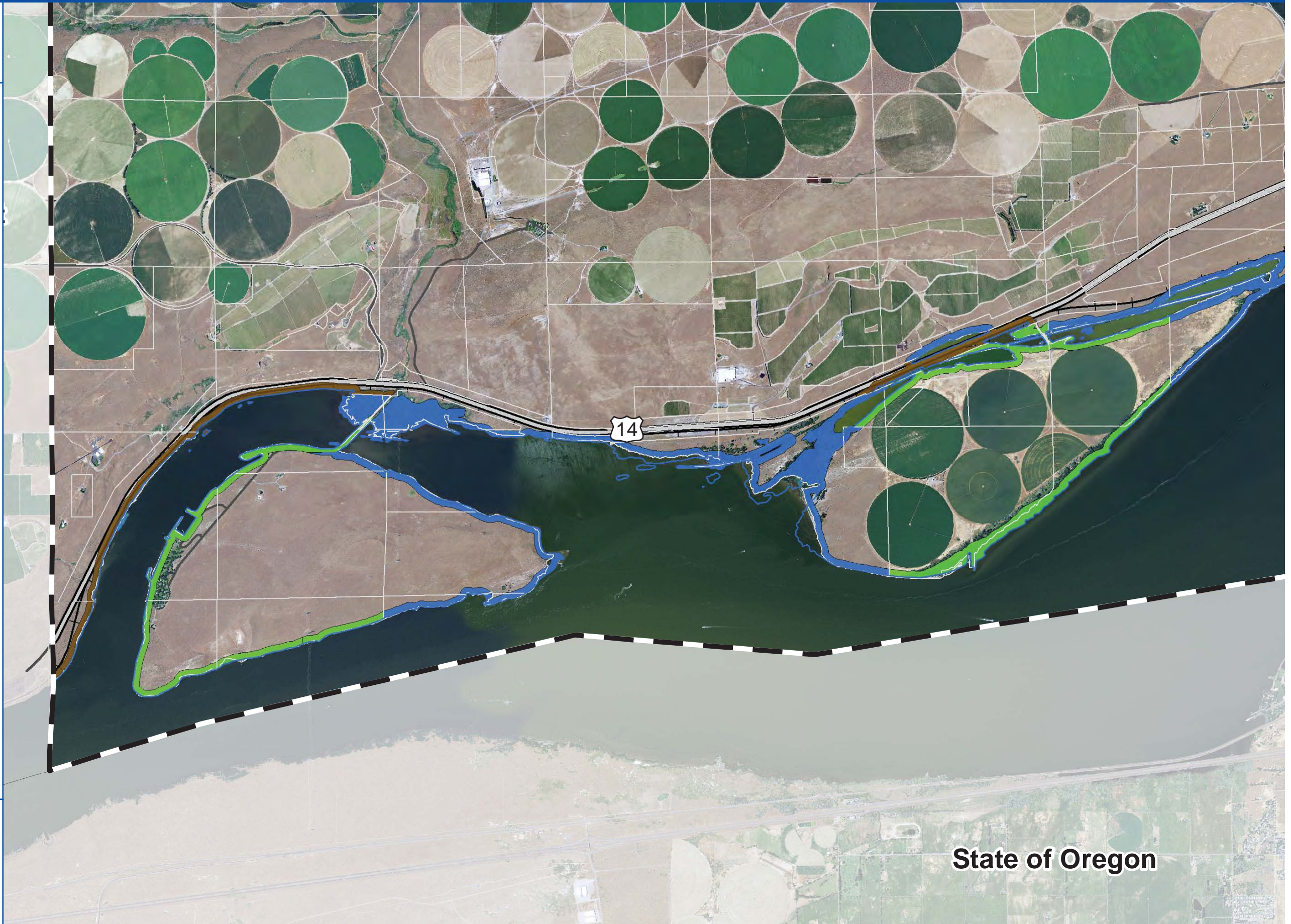
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State of Oregon



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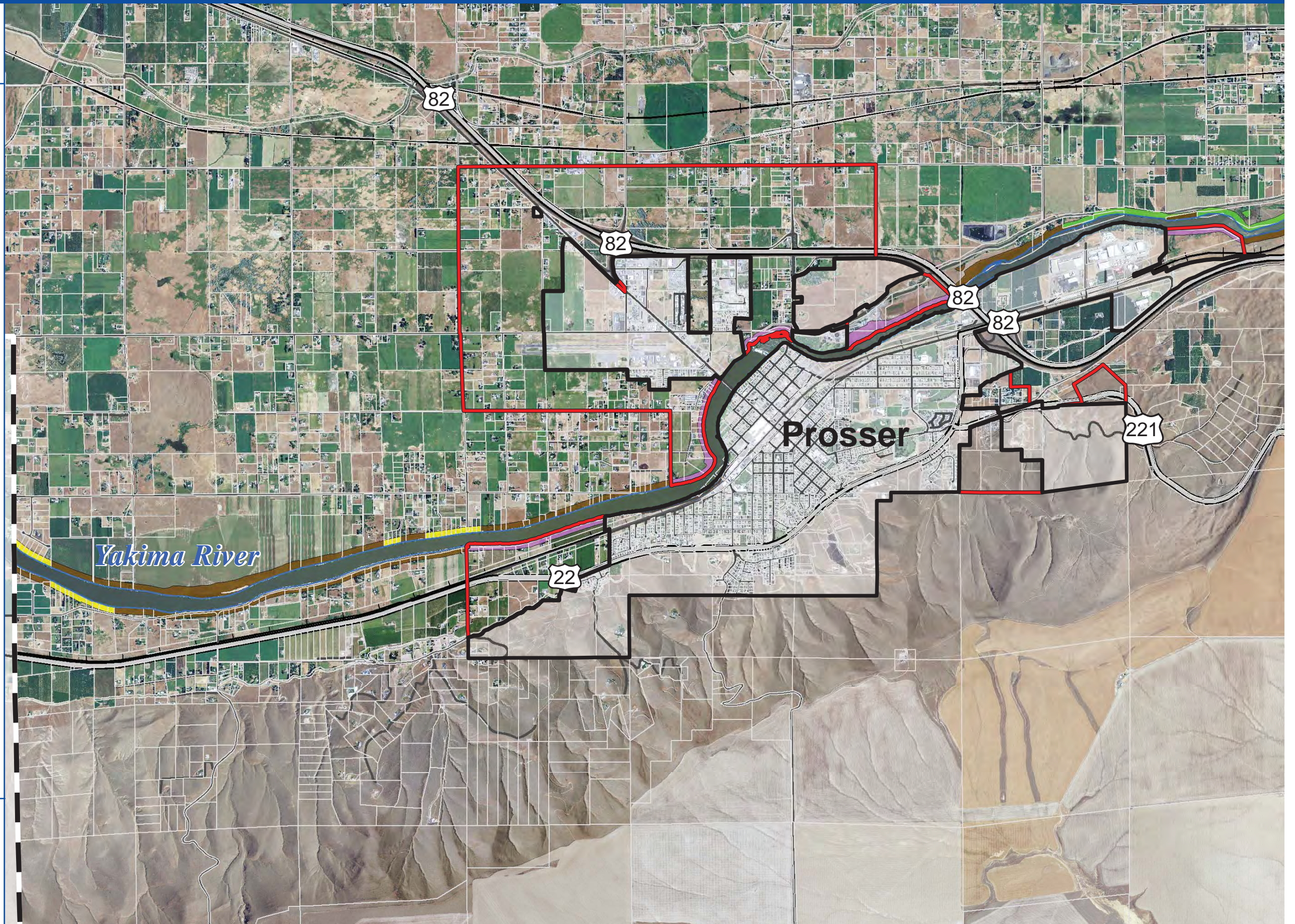
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6.3.2014



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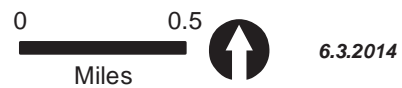
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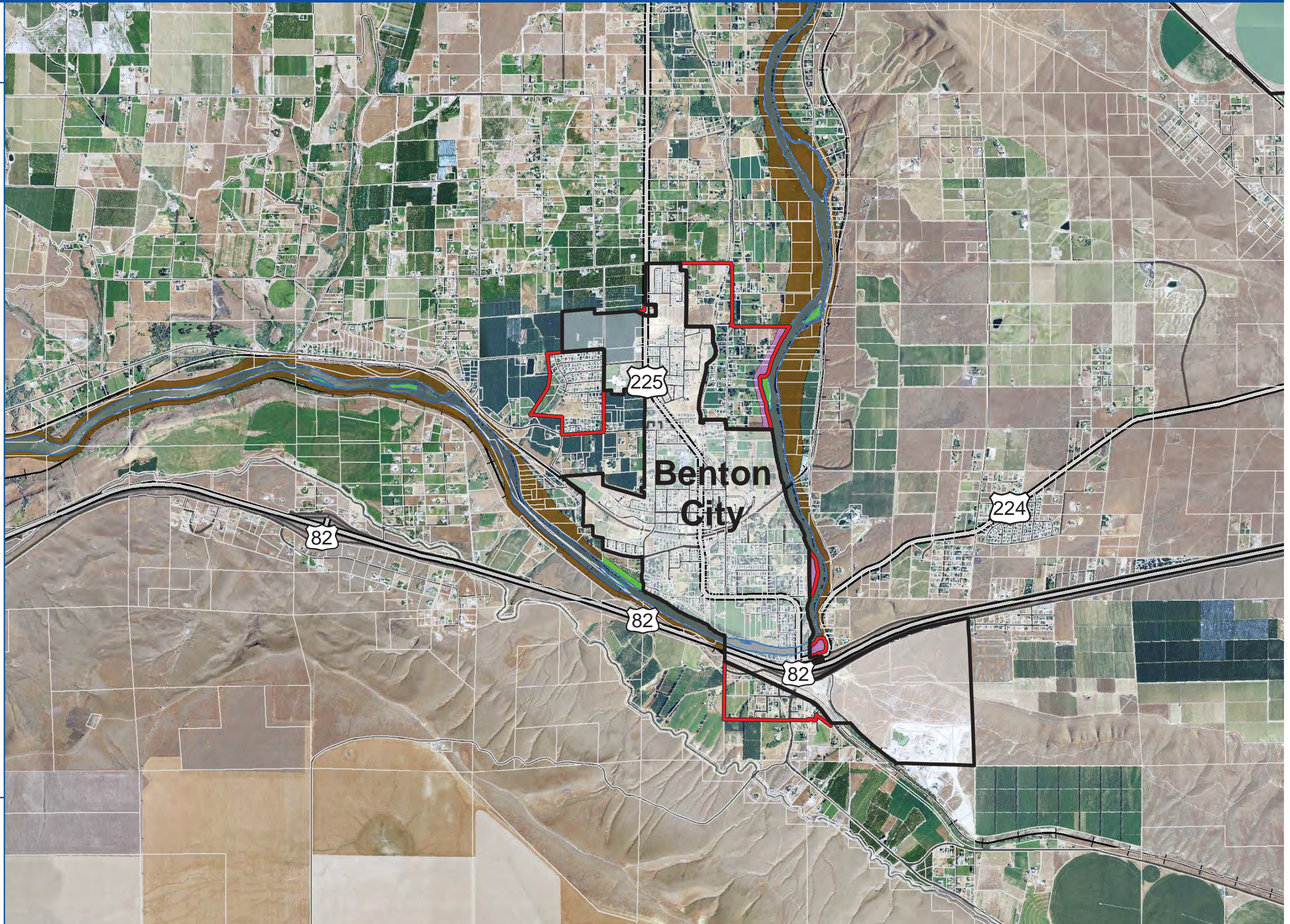
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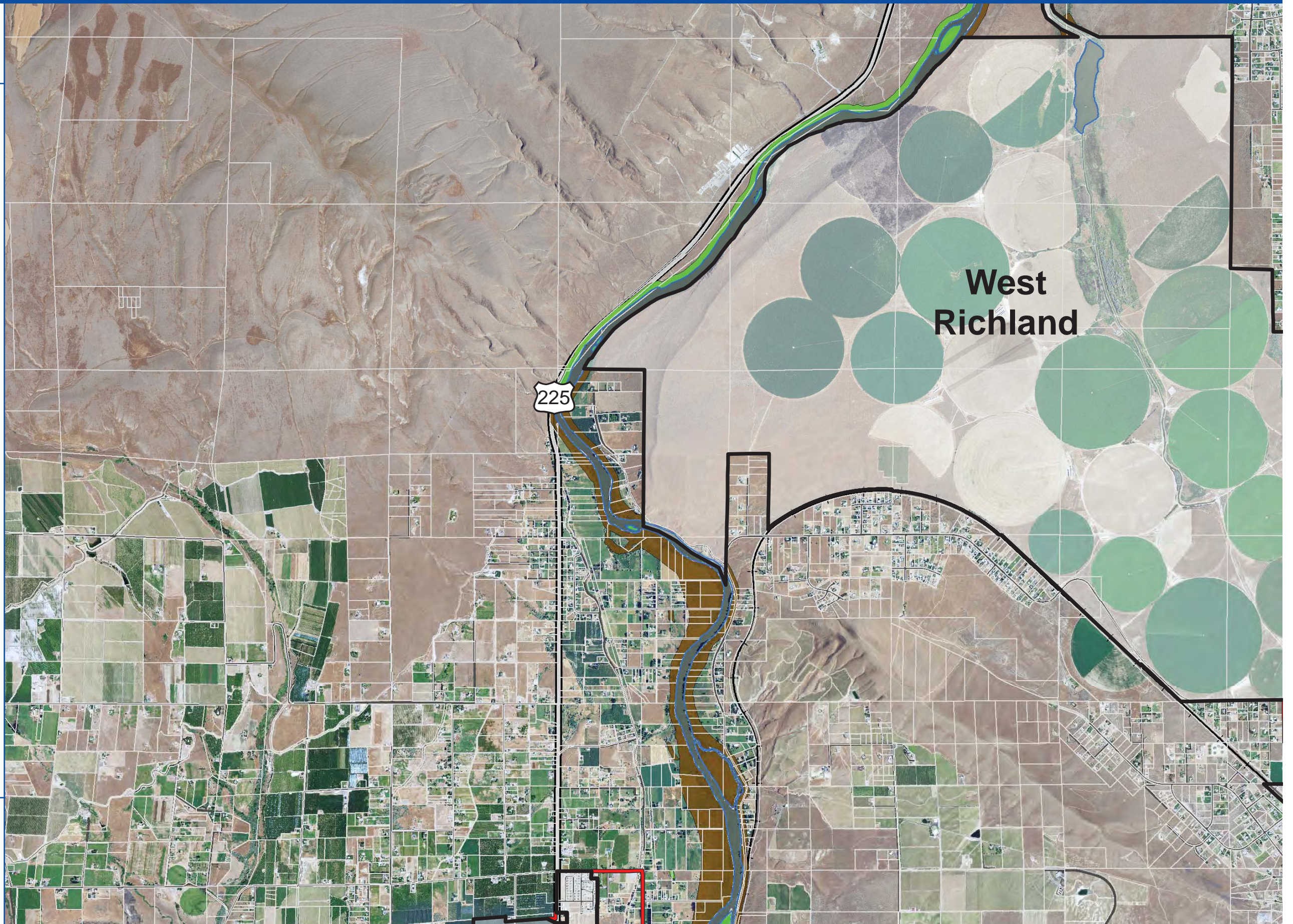
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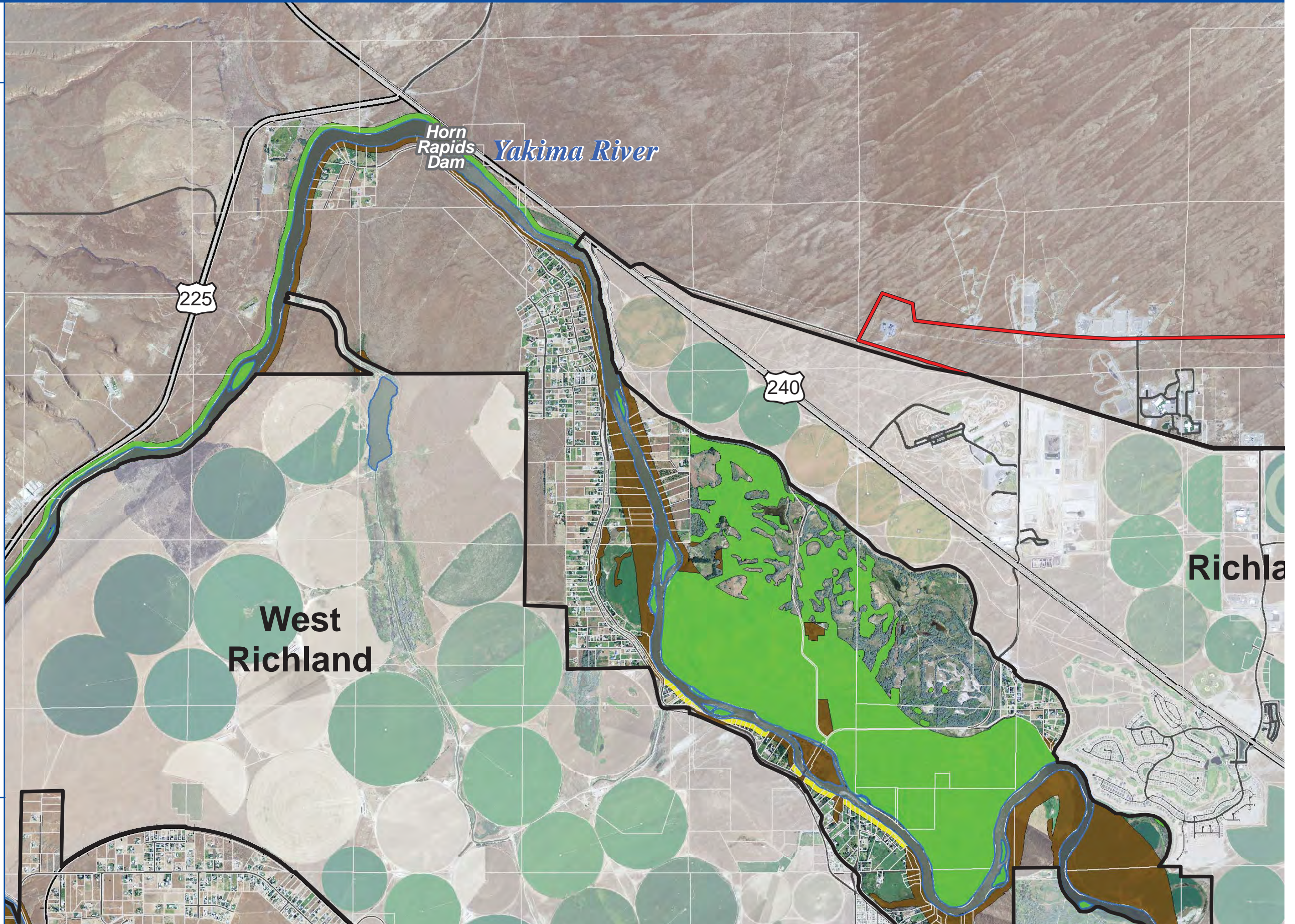
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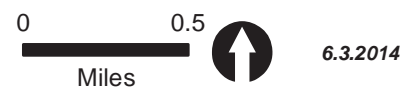
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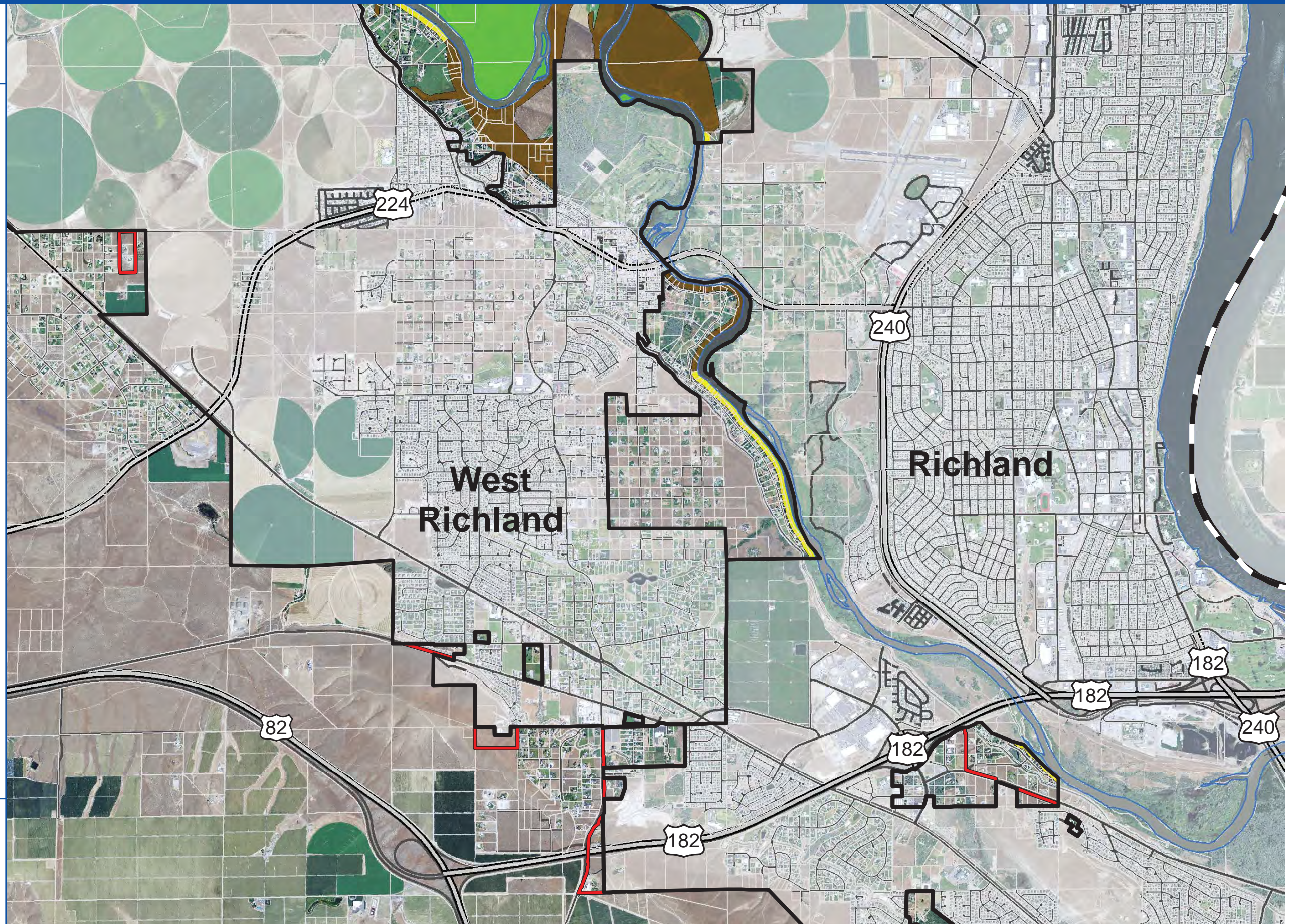
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Appendix G
Red Mountain AVA Master Site Plan
(2012)

RED MOUNTAIN AVA MASTER SITE PLAN

BENTON COUNTY, WASHINGTON

DECEMBER 2007/ *UPDATED SEPTEMBER 2012

*PER NEXT STEPS STATUS & MAP UPDATES PREPARED BY J.T. ATKINS COMPANY AND
GMA CONSISTENCY REVIEW BY BENTON COUNTY PLANNING STAFF

J. T. ATKINS  COMPANY PC
Landscape Architecture and Planning
1234 NW Iowa Avenue - Bend, Oregon 97701

BOXWOOD
CENTRAL WASHINGTON UNIVERSITY RECREATION & TOURISM PROGRAM
MACKAY & SPOSITO, INC.
TDA, INC
BOB ROSE/CONSERVATION CONSULTANT
DESCHUTES GEOGRAPHICS

ACKNOWLEDGEMENTS

ADVISORY TEAM

David Gelles – (Klipsun Vineyards) Red Mountain Estate Association (RMEA)
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Kelly Hightower – (Hightower Cellars) RMEA
Jim Holmes – (The Ancora Estate) RMEA
Ryan Johnson – RMEA
Ed Shaw – (E & E Shaw Vineyards) RMEA
Milton Johnston – Washington Department of Natural Resources
Duane Unland – Washington Department of Natural Resources
Gary Ballew – City of Richland
Bruce Etzel – Benton Rural Electric Association
Larry Fairleigh – Washington State Parks Commission
Christie McAloon – Benton County Public Utility District
Rob McKinney – Chateau Ste-Michelle
Larry Peterson – Port of Kennewick
Joetta Rupert – Kennewick Irrigation District
Scott Revell – Kennewick Irrigation District
Robert Sandoval – Washington Department of Community, Trade, and Economic Development
John Williams – (Kiona Vineyards) RMEA
Kris Watkins – Tri-Cities Visitor and Convention Bureau
Kathy Blasdel – Tri-Cities Visitor and Convention Bureau

LEAD AGENCY

Adam Fyall, Project Manager, Benton County Commissioners' Office
Phil Mees, Senior Planner, Benton County Planning Department

CONSULTANT TEAM

Tom Atkins (Project Manager), Jennifer Bass and Katie Atkins - J.T. Atkins & Company PC
Joe Chauncey, Karen Davis Smith and Jeremy Reding – Boxwood
Bill Eager –TDA Inc.
Derrick Smith, Paul Harmsen – MacKay & Sposito, Inc.
Dr. Barbara Masberg – Central Washington University, Recreation & Tourism Program
Bob Rose – Conservation Consultant
Deborah Quinlan – Deschutes Geographics

ADDITIONAL ACKNOWLEDGEMENTS

Special thanks to the **Washington State Legislature** and the **Washington Department of Community, Trade, and Economic Development** for their financial and organizational support of this project specifically, and for their continued support of community-based planning and economic development projects in general.

www.cted.wa.gov

Also, thanks and regards to the board, staff, and members of **Washington Wine Country** for their generous sponsorship of this project and their attention to quality and detail. Without the grant from their organization, completion of the Plan would not have been possible.

www.winecountrywashington.org

RED MOUNTAIN AVA MASTER PLAN – SEPTEMBER 2012 UPDATE

In June 2012, a review and update was initiated of the draft 2007 Red Mountain AVA Master Site Plan via a contract with J.T. Atkins Company, the Plans initial consultant. At its conclusion in September 2012, the update produced: revisions to the Red Mountain AVA ownership and Red Mountain Master Site Plan maps; an update of Chapter Seven, “Next Steps” providing direction for specific areas needing update, and strategies to assure the Plan’s future adoption and implementation. This Update also included the County Planning staff’s consistency review and recommendations to assure the Plans’ consistency with the County’s Comprehensive Plan, zoning code, and the Washington State Growth Management Act (RCW 36.70A). The review and update process was assisted by members of the Red Mountain AVA Alliance, public agencies and interested parties, and directed some minor modification to the Draft 2007 Red Mountain Master Site Plan. The modifications made are discussed and directed by Chapter Seven herein.

Benton County Planning Department
Susan M. Walker, Senior Planner
Valerie Smith, Associate Planner, AICP
Michael E. Shuttlesworth, Planning Manager

Executive Summary

The Red Mountain American Viticultural Area (AVA) is an approximately 4,600-acre, federally designated grape-growing and wine-producing region on the south-facing slope of Red Mountain. Located within unincorporated Benton County, the Red Mountain AVA is bounded by the Yakima River terrace to the west, the ridgeline of Red Mountain on the northeast and the lowlands bordered by Interstate 82 on the southeast.

The AVA is a place of beauty, where wineries lie within a sea of vineyards against the back drop of Red Mountain. The setting creates a landscape of significant scenic quality appreciated by residents and visitors alike. The area's rural beauty is reinforced by the natural character of the place; where topography, soils and solar aspect have combined to make Red Mountain a special place to grow grapes and make wine. These qualities have drawn national and international attention. Red Mountain wines consistently are rated at the highest quality: between 1998 and 2004 Red Mountain vineyards and wineries received 23 national and international awards including the distinction of receiving top-quality ratings on several occasions. Thus, Red Mountain's working landscape is an important economic resource for the region.

The beauty of Red Mountain and the quality of the wines produced have generated the desire to develop additional wineries and vineyards on Red Mountain. But if development pressures are not managed well, the qualities of Red Mountain that draw people to the place could be lost. These forces created a call to action to explore ways to accommodate new development that reinforce and enhance the existing qualities of the Red Mountain AVA.

The success of Red Mountain is attracting national and worldwide attention, and the AVA is a focal point for future vineyard and winery development.

MASTER SITE PLAN NEED AND BENEFITS

In 2005 Benton County, together with an alliance of vineyard and winery operators, local agencies and stakeholders, commissioned the Red Mountain AVA Master Site Plan planning process. The purpose of the planning process was to develop a vision for the Red Mountain AVA that enhances the region's economic opportunities for both the wine and visitor industries, manages the anticipated growth on Red Mountain, and increases the visibility of the Red Mountain AVA. The Master Site Plan presents a vision of a future development pattern for Red Mountain that expands and enriches visitor and resident opportunities while preserving the special qualities of the AVA.

The Master Site Plan has been developed in two phases. During Phase 1 existing AVA conditions were analyzed and the initial AVA visions for the future presented and evaluated. Meetings with the AVA Advisory Team composed of representatives from the project funding entities and other community and business representatives, as well as a public open house, were held to obtain information and comments. During Phase 2 the vision has been refined, site-specific concepts delineated, additional illustrative conceptual plans and character images drawn,

and supporting information developed. Phase 2 has also included public open houses and meetings with the AVA Advisory Team and other property owners.

The Master Site Plan presents a framework and process for managing future development within the AVA so that new development will advance the Red Mountain vision while protecting the qualities that make Red Mountain a special place. Developed from the Phase 1 Conceptual Plan this Master Site Plan (Phase 2) is a draft proposal intended to realize the future vision for Red Mountain. The contents of the draft proposal include land use maps, descriptive text, critical data and resource information, design guidelines and implementing ordinances.

The draft proposal is a coherent body of recommendations and alternative strategies (e.g., ways to provide for fire-flow capacity and process waste-water disposal) that will be considered as a whole or in part for adoption and sub-area amendment to the Benton County Comprehensive Plan by the Board of Benton County Commissioners. Adoption will occur only after the draft proposal goes through a public process (during 2008) that includes an additional review and comment period with County planning staff, and then public hearings by the County Planning Commission and Board of County Commissioners. Once amended to the County Comprehensive Plan, provisions of the Red Mountain Master Site Plan will supplement some of Benton County's current policy and land use controls for the area that is within the Master Site Plan boundary. The Phase 2 product provides the following:

Specifically, the Phase 2 information and documents provide the following:

- A framework for future development within the AVA that protects the qualities that make Red Mountain AVA a special place.
- Information that the Benton City, West Richland and Tri-Cities communities can use in their economic development plans.
- Assistance to Red Mountain vineyard and winery owners in their future development efforts.
- A vision that attracts additional quality wineries to the area.
- A rich range of visitor opportunities that will enrich their visit to the Red Mountain AVA.
- Information to be used to further define the Red Mountain area and supplement Benton County's Comprehensive Plan and preparation of zoning ordinances regarding the Red Mountain AVA, thus enabling implementation of the Master Site Plan.
- A foundation for a design review process of proposed commercial projects on Red Mountain.

AVA VISION

Implementing the Master Site Plan vision will preserve and enhance this unique area. The vision for the AVA builds on the globally competitive wines that the AVA now produces, presents a range of benefits to the vineyard and winery operators, and expands and enriches wine visitors' experiences by providing opportunities for recreation, interpretation and education. The Master Site Plan respects the quality of life for those who reside on Red Mountain as well as providing a framework for adjacent communities to participate in the wine-visitor-related economic benefits.

Master Site Plan elements include expansion of existing vineyard and winery operations, a number of new vineyards and wineries, new visitor-oriented facilities including a Wine Village and recreation and interpretive experiences, as well as additional development on adjacent areas.

Visitor projections show that, by the year 2025, the Red Mountain AVA will attract approximately 233,000 wine-oriented visitors (815,500 winery visits) – a nearly nine-fold increase over the current level.

The Red Mountain AVA will function as a primary destination and a premium wine-producing attraction of Washington Wine Country as characterized by the following conditions:

- The characteristics of Red Mountain land will attract grape growers and vintners focusing on particularly high-quality wine production (representing the upper end of the quality continuum for all wines in the region).
- The Red Mountain AVA will remain substantially in agricultural use, with most of the site dedicated to a viticultural reserve that maximizes the amount of land available for grapes, preserving over time a unique and desirable setting for visitors.
- Approximately 20-30 additional wineries will be located there; a portion will concentrate on vineyards only and a portion will operate tasting rooms, most of which will be open to the public.
- At least some individual wineries will develop specialized, small- to moderate-scale wine- oriented events and food service capability; small-scale lodging may also be expanded.
- A market will develop for fine dining, lodging, and events serving the AVA.
- Growing traffic to Red Mountain will foster commercial development on adjacent lands, in particular on land adjacent to I-82 and to Benton City, West Richland and the Tri-Cities.
- Opportunities for interpretive, educational and outdoor recreation experiences will further enrich the area.

The vision for the Red Mountain AVA is that the area become a “viticultural park” that provides visitors with a wide range of recreation and interpretive experiences that complement the vineyard and winery related experiences. The viticultural park builds on the intrinsic qualities of

Red Mountain as well as the excellence of the grapes grown and wine created within the AVA and gives visitors and residents a richer range of experiences and facilities than those found at other wine tourism destinations. The Wine Village will be a focal point for visitors' experiences. Within the Village visitors can visit the interpretive center, restaurants, shops and galleries. A network of hiking, equestrian and biking trails radiate from the Wine Village, immersing the visitor in the vineyards and linking wineries, viewpoints and interpretive areas. The village could also include offices, a hardware store, and small working shops that supply the wineries and vineyards with products and services like corks, capsules, labels, barrels, and cellar equipment.

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I. INTRODUCTION

The Red Mountain Site Master Plan presents a vision for the future of the approximately 5,400 acres (8.3 square miles) Red Mountain Area, as depicted on Figure 1-1, including the approximate 4,600-acre (6.9 square mile) of the Red Mountain American Viticultural Area (AVA). It is the result of an interactive process among the Advisory Team, composed of representatives from the funding entities that worked with staff and the consultant team on the project, stakeholders, the public, and the consultant team that began in June 2005 and concluded in December 2007. The Master Site Plan, shown on Figure 1-1, provides the following:

- A framework that focuses on the opportunities for future growth in the AVA and the creation of a viticultural park, while respecting and protecting private property and the intrinsic natural qualities that make the Red Mountain a special place.
- A mix of vineyards, wineries and visitor facilities and traditional “soft” wine industry suppliers that responds to site conditions and respects the patterns of existing and future vineyard and winery development.
- The Master Site Plan planning process will result in the adoption of the Master Site Plan and Master Site Plan inclusion into the Benton County Comprehensive Plan as a sub-area plan, development of new zoning categories and Red Mountain AVA commercial development design guidelines. All are important steps in implementing the vision presented in this plan.

WHAT IS AN AMERICAN VITICULTURAL AREA?

- An AVA is a delimited grape-growing region distinguishable by geographic features, with boundaries defined by the United States government’s Alcohol and Tobacco Tax and Trade Bureau (TTB). The TTB defines these areas at the request of wineries and other petitioners. As of April 2007 there were 187 AVA’s in the United States.¹
- They range in size from the Ohio River Valley AVA at 16,640,000 acres (26,000 square miles) covering parts of four states, to the Cole Ranch AVA in Mendocino County, California, at only 62 acres (.1 square mile). The Augusta AVA in Augusta, Missouri was the first recognized AVA, obtaining the designation on June 20, 1980.²
- An AVA specifies only a geographic location; it does not limit the type of grapes grown, the method of vinification, or the yield. The Red Mountain AVA was established in 2001. The technical European equivalents of the American Viticultural Areas include historic names like Burgundy, Champagne, or Tuscany.

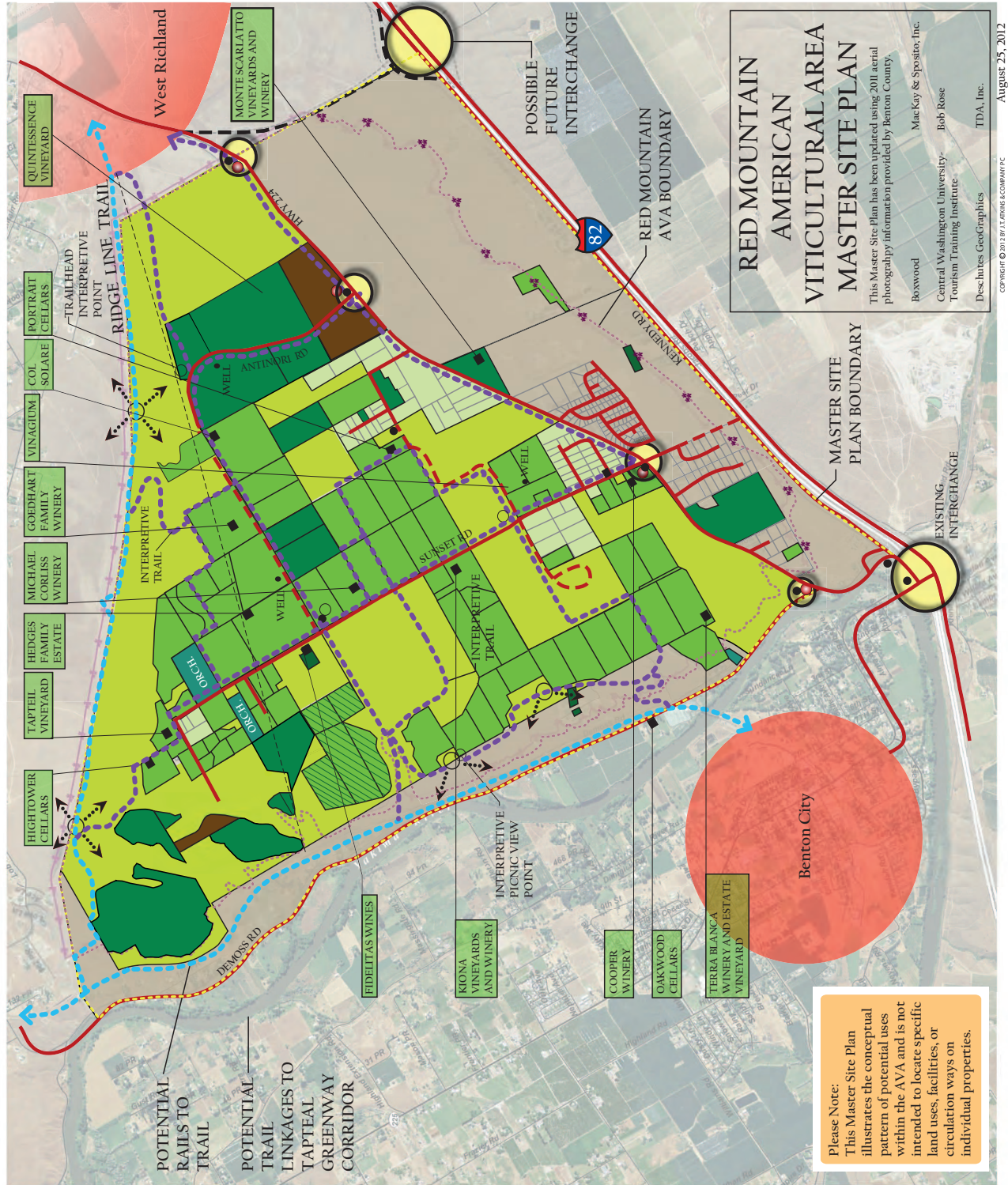


FIGURE 1-1

PLANNING APPROACH

The size and shape of the Red Mountain AVA is ideal for this kind of master site planning; it lends itself to defining a vision for the total area while at the same time addressing the needs of the Red Mountain residents and visitors. The Red Mountain AVA Master Site Plan is the second of a two-phase planning process. The Master Site Plan presents a vision for the AVA's future. It is based on early efforts of several AVA vineyard and winery owners, the Phase 1 conceptual planning, and the Phase 2 master site planning process.³

As with the Conceptual Plan, this plan has been developed through an iterative planning process that inventoried, mapped and analyzed existing natural, cultural and economic resource information for the site and region to identify the opportunities and challenges that will shape the future of the Red Mountain AVA. The consultant team worked closely with the Advisory Team, AVA vineyard and winery owners and operators, other community leaders and stakeholders and the public (see Appendix A for the summaries of comments from the public meetings and responses to those comments) to capture and articulate a common vision for the future of the AVA.

The Master Site Plan planning approach:

- Builds on the foundation of earlier work carried out by the project sponsors and the Phase-1 Conceptual Plan
- Defines how a successful viticultural visitor destination could be created without losing its rural character
- Generates local support and a sense of ownership for an inspiring vision
- Builds support for managing the future of the Red Mountain AVA
- Presents a vision for the Red Mountain AVA and identifies the steps to be taken to implement the vision
- Presents guidelines for the development of future commercial projects within the Red Mountain AVA

MASTER SITE PLAN – GUIDING PRINCIPLES

The following guiding principles were developed through the planning process to assist in decision making regarding Red Mountain AVA's future development:

Make Red Mountain the place all wine lovers want to visit.

- Make and sell highest quality wines
- Attract grape growers and vintners who focus on high-quality wines
- Increase Red Mountain AVA visibility
- Provide elements that support wine production and sale

Protect Red Mountain AVA character.

- Preserve the quality soils to grow grapes
- Respect the area's rural scale and character
- Encourage sustainable development and operation
- Incorporate a high standard of design and materials
- Respect private property rights

Provide high-quality visitor amenities and experiences.

- Provide lodging and dining opportunities **of appropriate quality and scale.**
- Develop compatible recreation amenities
- Expand visitor interpretation and education opportunities

Support local economies.

- Focus a majority of the AVA-generated visitor facility opportunities in Benton City and West Richland and the Tri-Cities

Create Red Mountain as a model of sustainable design, construction and operation.

- Encourage future development to incorporate sustainable design principles in the design, construction and operation of the facilities
- Preserve and restore native shrub-steppe vegetation where such preservation and restoration complements vineyard and winery operations

The Master Site Plan presents a framework and process for managing future development within the AVA so that new development will advance the Red Mountain vision while protecting the qualities that make Red Mountain a special place. Developed from the Phase 1 Conceptual Plan, this Master Site Plan (Phase 2) is a draft proposal intended to realize the future vision for Red Mountain. The contents of the draft proposal include land use maps, descriptive text, critical data and resource information, design guidelines, and implementing ordinances.

The draft proposal is a coherent body of recommendations and alternative strategies (e.g., ways to provide for fire-flow capacity and process waste-water disposal) that will be considered as a whole or in part for adoption and amendment to the Benton County Comprehensive Plan by the Board of Benton County Commissioners. Adoption will occur only after the draft proposal goes through a public process that includes an additional review and comment period with County planning staff, and then public hearings by the County Planning Commission and Board of County Commissioners. Once amended to the County Comprehensive Plan, provisions of the Red Mountain Master Site Plan will supplement some of Benton County's current policy and land use controls for the area that is within the Master Site Plan boundary.

THE RED MOUNTAIN AVA VISION

The vision for the Red Mountain AVA is that the area will become a “viticultural park” providing visitors a wide range of recreation and interpretive experiences that complement the vineyard and winery related experiences. The viticultural park builds on the intrinsic qualities of Red Mountain – the excellence of the grapes grown and the wine created within the AVA – and provides visitors and residents a richer range of experiences and facilities than those found at other wine tourism destinations. The Wine Village will be a focal point for visitors’ experiences. Within the Village visitors can visit the interpretive center, restaurants, shops and galleries. A network of hiking, equestrian and biking trails radiate from the Wine Village, immersing the visitor in the vineyards and linking wineries, viewpoints and interpretive areas. Visitors can plan to spend the day, or multiple days at Red Mountain and tour many wineries or visit the wineries on their favorites list. Throughout their visit, visitors will be immersed in the wine experience and the beauty of the Red Mountain AVA.

The Red Mountain AVA vision is inspired by the beauty of the place and the globally competitive wines created at Red Mountain. The existing vineyards and wineries grow grapes and make wines that attract national and international attention to this special place. Between 1998 and 2004 Red Mountain vineyards and wineries have received national and international awards including the distinction of being on the world’s top wine list on several occasions. Red Mountain wines continue to be consistently rated at the highest quality.

Visitors first view the Red Mountain AVA as they approach the area along Interstate-82, De Moss Road, or State Route (SR) 224. At present, they see a landscape composed of scattered vineyards enclosed by native shrub steppe vegetation, with the backdrop of Red Mountain. The landscape is in transition, and is experiencing the pressures of success. If not managed wisely, development pressures could reshape this landscape in ways that would destroy the special qualities of the place. This same landscape provides rich opportunities to accommodate new development that will reinforce and enhance the existing qualities of the Red Mountain AVA.

Future AVA visitors will be greeted by a sea of vineyards, with rural two-lane roads and well-designed wineries creating a beautiful landscape mosaic framed by the distinctive Red Mountain ridge. Visitors will be welcomed to the AVA at “gateways” located at the AVA entry points on public roads. These entry points will be enhanced with vegetation, welcome signs and way-finding signage directing visitors to their desired destinations. All gateway elements will be located within public rights of way. As they enter the AVA, they will sense that they are in a special place. The AVA will provide the vineyard and winery experience they are expecting and more – at Red Mountain, visitors will encounter experiences not found at the other viticultural areas. They will experience Red Mountain as a Viticultural Park where they will enjoy globally competitive wines as well as a range of visitor amenities.

On Red Mountain visitors will be immersed in the vineyards: They can walk with their families along interpretive paths that describe how grapes are grown and how globally competitive wines are made. They can also view the remnants of the Ice Age Floods that shaped Red Mountain and created the soils and striking topography that define the place.

The existing road system will be enhanced by the continuation of Antinori Road to Sunset Road. New two-lane paved roads will wind through the vineyards and provide loops linking the vineyards, wineries and visitor facilities. The location, scale and character of these roads will respect the existing pattern of the vineyards and the rural character of the AVA. Gateways announcing the visitor's entry into the AVA will be developed within the public rights of way at the intersections leading into the AVA. Area information and way-finding maps will be located at each gateway.

A system of non-motorized hiking, equestrian and biking trails will form a network of trails linking wineries and visitor facilities. Interpretive and way-finding signage, benches and shade areas, picnic areas, restrooms and viewpoints will be located at strategic points along the trails. These trails will connect to the potential ridgeline trail system as well as the potential Yakima River greenway and the potential rail-to-trail corridor on the western edge of the AVA. The opportunity exists to link the trail system to Benton City via the old railroad bridge across the Yakima River or via SR224 to the Benton City bridge at the interchange.

One of the guiding principles established during the planning process is to “Create Red Mountain as a model of sustainable design, construction and operations”. To address this principle, future developments on Red Mountain should be encouraged to respect the intrinsic qualities of the place and reinforce the qualities of the existing Red Mountain vineyards, wineries and wines.

As development continues on Red Mountain the area's shrub-steppe vegetation will disappear, unless a collective decision is made by landowners to be proactive in preserving areas of shrub steppe for its intrinsic beauty as indigenous flora complementary to the vineyard landscape, for its unique biology, and for its xerophytic and weed-resistant attributes. The development process should preserve and restore native shrub-steppe vegetation where such preservation and restoration complements vineyard and winery operations. These “islands” of native landscape can be an important native landscape network on Red Mountain as well as a connecting feature to the native landscapes found along the Yakima River corridor and the Red Mountain ridge. These areas of native shrub-steppe vegetation can also give visitors an opportunity to experience and better understand the integration of high-quality agricultural production and stewardship with an on-the-ground reference to the landscapes that makes the Red Mountain AVA unique.

From an agricultural practices standpoint, the challenge is to develop an appropriate sustainability system that tests and incorporates current and evolving environmentally friendly management practices. These practices should be designed to produce a managed vineyard ecosystem that enhances biological complexity while complementing and supporting vineyard operations, minimizes economic costs to the growers, and provides the Red Mountain visitor with an aesthetic, educational and environmentally satisfying experience unique to Red Mountain.

The Wine Village forms the heart of visitor's Red Mountain experience and will be located within the AVA. A centralized location will immerse the village in the surrounding vineyards and provides a trail hub. Visitors can start their visit at the Wine Village, where they can taste wines, purchase a picnic lunch to enjoy in the vineyards, stroll through the wine-related shop area, or simply rest on the village green and watch their children play. They can also enjoy the fine dining, lodging and meeting accommodations at the Wine Village. Trails and rural roads will lead from the Village to wineries nestled in the vineyards. Visitors can also eat and spend the night at several of the wineries.

The Wine Village will also be a focal point for the residents, winery and vineyard operators at Red Mountain. The Wine Village general store will provide bakery goods, coffee shop, postal substation and other amenities that will draw residents and visitors alike to the village. The village meeting facilities within the lodge can be a center for community meetings. The village green will be used for small-scale performances, wine celebrations and displays. The village could also include offices, a general store, and small working shops that supply the wineries and vineyards with products and services like corks, capsules, labels, barrels, and cellar equipment.

The Wine Village architectural and landscape elements will respect Red Mountain's rural character and reinforce the overall quality of the new development occurring within the AVA. The Draft 2007 Master Site Plan suggests a preferred location for the Wine Village. Should the land owner decide not to focus on the Wine Village development opportunity, additional sites could be identified through site selection planning efforts using the site selection criteria that were used to select the preferred site.

There are opportunities for additional visitor facilities and wine industry support facilities to be developed in Benton City, West Richland and the Tri-Cities. The recreational resources of the Yakima River corridor will also enrich the visitor's stay in the area.

The AVA will provide a wealth of interpretation opportunities for the visitor. Interpretive signage will be located along the trails and at strategic points along the road system. The interpretive center will be a focal point for the Wine Village. A demonstration vineyard with an interpretive trail will immerse visitors in rows of grape vines. Other displays will present information on how grapes are grown. The story of Red Mountain's contribution to the agricultural industry will be a part of the presentations of Washington's agricultural history and resources. Natural history information will be presented at several view points, where the visitors can view Red Mountain and the surrounding landscape and learn about the Ice Age Floods and how they shaped Red Mountain and the surrounding region. The AVA interpretive information and facilities will complement and reinforce the messages and experiences found at the Walter Clore Wine and Culinary Center in Prosser, as well as Ice Age Floods interpretive elements being developed by various federal, state, and local entities.

Figure 1-1 illustrates how elements of the Red Mountain AVA Vision would be sited to augment existing facilities.

2. MASTER SITE PLAN ELEMENTS

The Master Site Plan presents an overall vision for the future of the Red Mountain AVA. The plan builds on the success of the existing vineyards and wineries, road network, land use, land ownership patterns, and the proposed plans of several major land owners within the AVA. The Master Site Plan planning area includes approximately 5,400 acres. There are approximately 4,600 acres within the AVA. That acreage includes approximately 3,600 acres within agricultural zoning. At present approximately 1,300 acres of vineyards are planted in the AVA. Thirteen wineries are in operation at the printing of this report, with at least eight more being planned, designed or under construction. The Master Site Plan anticipates an additional 18 to 22 wineries as well as approximately 2,000 acres of new vineyards. There are several existing residential areas within the AVA. Figure 2-1 presents the distribution of the land use patterns within the AVA. Appendix B contains additional analysis maps that were developed during the Phase 1 and Phase 2 planning process.

The AVA area south of SR 224 presents a range of opportunities for vineyard and complimentary development. Currently the area is composed of clusters of residential development, a power utility substation, shrub-steppe vegetation, and a rock quarry. The land ownership pattern presents a mix of public and private lands. A gentle ridge divides the area, with the area to the south of the ridge being influenced by the proximity of Interstate 82. There is an opportunity to develop the area with a distinctive, complementary mix of residential, commercial and vineyard areas and winery dependent uses. This Rural Lands Five area could provide a range of development that compliments the Red Mountain AVA.

The challenge for this area is less about land uses than it is about water and sewer services and the application of a development process and guidelines that create a built environment that is integrated functionally and visually with and complements the scenic qualities of the Red Mountain backdrop and environment, as it is viewed from within the AVA and from the SR 224 and Interstate 82 travel corridors. This area will be one of the gateways to Red Mountain where carefully planned and designed development should be located. A concept that could be considered for this area, which has been used successfully in other areas, would be for land owners to partner to create a development master plan including all parcels within a Tourist Serving Area (TSA) or work with a master developer to create a coordinated plan for the TSA. That concept would assist in creating a coordinated design form for the area that respects and reinforces Red Mountain's qualities.

The future development of the existing Benton City / Interstate 82 interchange and the possible future Red Mountain Interstate 82 interchange at the eastern edge of the AVA, as well as the lands adjacent to the AVA, are significant to the success of the AVA. It is important that the quality and character of development of these areas be managed so that the future development reinforces the quality and character of the AVA.

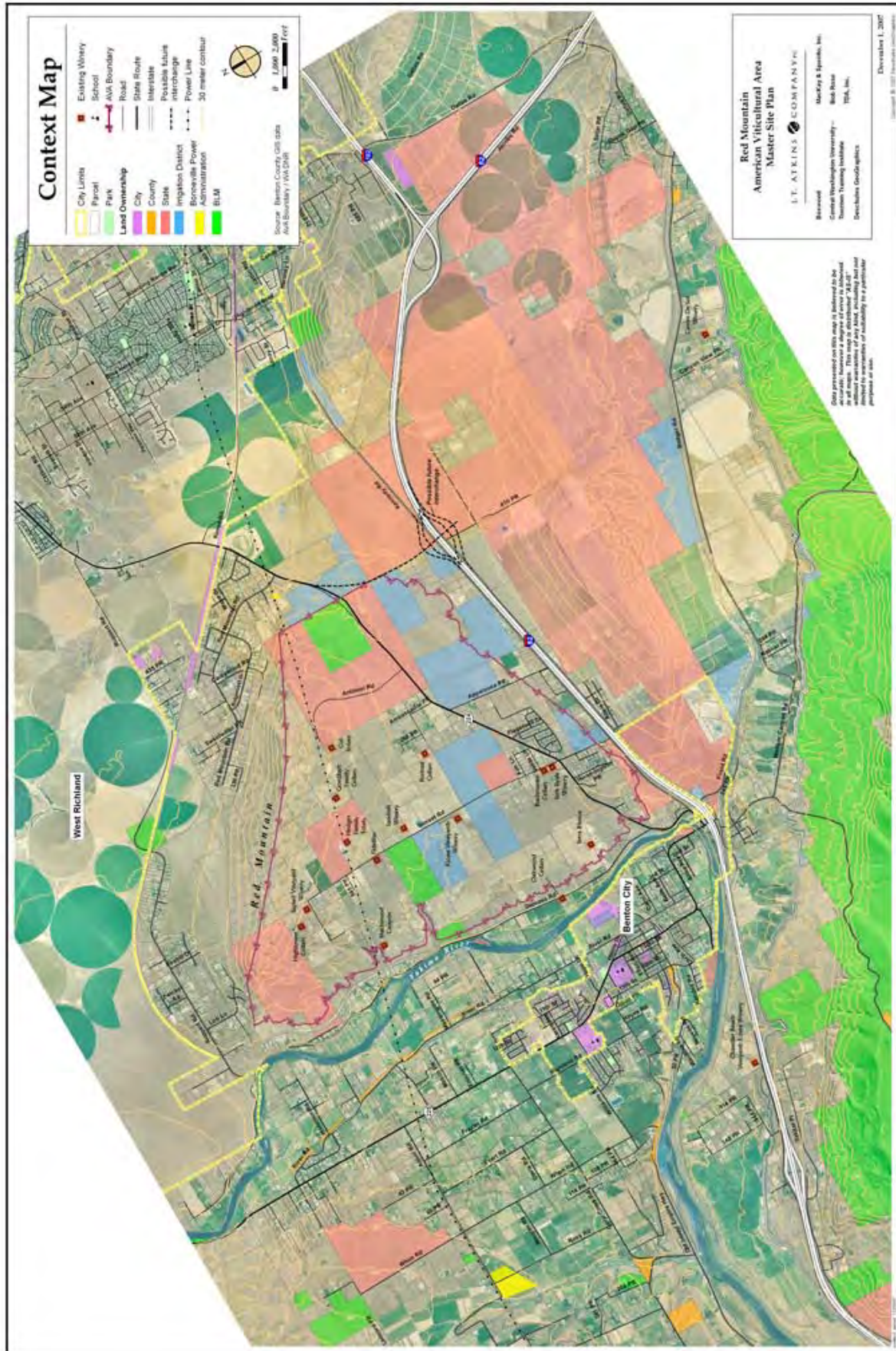


Figure 2-1-1. Project Context

At present the AVA is outside of the Urban Growth Areas (UGAs) for Benton City and West Richland. Several of the ideas presented in the Master Site Plan are not consistent with state planning law; others require changes to rural land use regulations. The Master Site Plan planning process has included working with Benton County planning staff; they are developing draft, zoning ordinances that will pave the way for implementing the ideas presented in the Master Site Plan.

Table 2-1 identifies the Red Mountain AVA program elements.

Table 2-1. Master Site Plan Elements	
Vineyards	
Existing	1,300 acres
Potential	2,000 acres
Total vineyards acres	3,080 acres
Wineries	
Existing	13
Proposed	8
Potential	18 – 22
Total wineries	40 – 42
Wine support facilities	
Wine purchase pickup point	At the Wine Village
Wine and compatible sales	At the Wine Village
Wine support	In the adjacent communities, the wine village, the Rural Lands Five Designation, and the Tourist Serving Area.
Gateways at road entries into the AVA	
	Welcome and way-finding information located on public rights of way
Circulation	
Proposed 2-lane roads	2 miles
Proposed multi-use trails (hiking, equestrian and biking)	20 miles
Education / Discovery	
Way-finding information	At gateways to the AVA and at trail and road intersections within public rights of way
Interpretive information	At the Wine Village, interpretive view points and on trails
Interpretive trails	A series of trails leading visitors to viewpoints, and immersion trails in an interpretive vineyard. The interpretive elements would focus on the natural history of Red Mountain, Washington agricultural history and how to grow grapes. Interpretation of wine making could occur within individual wineries.
Visitor Experiences and Amenities	
Wine tasting	At individual wineries and at the Wine Village
Picnic supplies	At the Wine Village
Picnic areas	At the Wine Village and on trails
Trails	Connecting Wine Village to wineries and view points
Trail amenities	Benches, shade areas, restrooms located at strategic points along the trails.
View Points	At strategic points along the trails
Lodging	Wine Village Inn - 20 to 50 rooms and at approximately 5 - 10 wineries with an assumed 4 rooms each (20 - 40 rooms)
Dining	At Wine Village and at several wineries
Conference facilities	At Terra Blanca. Small scale meeting facilities within the Wine Village Inn

Table 2-1. Master Site Plan Elements

Event space	At Terra Blanca, and the Wine Village green (small-scale events)
Restrooms	At wineries, on trails and at the Wine Village
Parking	At wineries and at the Wine Village
Residential condominiums	Located above the shops and artisan studios.
Benton City, West Richland and Tri-Cities will be focal points for a majority of visitor related facilities	The attraction of Red Mountain will provide visitor service facilities development opportunities for adjacent land owners and communities

WINE VILLAGE

The Red Mountain AVA Site Master Plan presents a vision for a “vicultural park,” a unique concept that reinforces the existing and future qualities of the Red Mountain AVA. In many ways the AVA is modeled after a state or national park, where visitors are immersed in the environmental qualities of the area. Generally at these parks (as well as at Red Mountain), a visitor welcoming center is an important element. The Wine Village is the welcoming center for Red Mountain. At the Wine Village visitors can learn more about what they are going to see and experience, plan their visit, and find food, restrooms and other support facilities. The Wine Village will also be a focal point for the Red Mountain community where Red Mountain residents can take advantage of the amenities found at the Wine Village.

The Red Mountain Wine Village concept diagram (Figure 2-2) presents the general character of the Wine Village. As presented in Figure 2-2, the Wine Village “foot print” occupies approximately 21 acres (including building foot prints, village green, parking, entry and perimeter roads and small vineyard areas) within an 80-acre parcel of land west of Sunset Road. As indicated in the diagram, the remaining site area could be in agricultural crops. The Wine Village diagram is conceptual and presents initial ideas, program elements and opportunities that could be found at the Wine Village. The final design character, program elements, land use mix and size of the Wine Village will be determined during future design phases.

Wine Village Elements

Red Mountain’s Wine Village will provide welcoming, educational, recreation and support functions. The Wine Village will be connected to Sunset Road by a winding entry drive that immerses visitors in vineyards as they approach the village. The interpretive center will be a focal point that visitors first experience as they enter the village. At the interpretive center visitors can plan their day on Red Mountain. In addition, interpretive displays will present information on how Red Mountain grapes are grown. Additional displays will illustrate how the Ice Age Floods helped shape the Red Mountain landscape. Elements of the native shrub-steppe landscape will be displayed and complemented by plantings of native and desert-adapted, water conserving vegetation. Visitors can also walk along a loop trail through the demonstration vineyard where the Red Mountain grape varieties have been planted.

In addition to the interpretive center, visitors can enjoy food and refreshments found at several restaurants, stroll through a range of wine related shops, visit art galleries and interact with artisans as they create their work. Restrooms and other visitor amenities will also occur within



LEGEND

- 1. INTERPRETIVE CENTER
- 2. DEMONSTRATION VINEYARD
- 3. FAMILY RESTAURANT
- 4. GENERAL STORE
- 5. BICYCLE RENTAL
- 6. VISITOR RESTROOMS
- 7. BIODIESEL FUEL STATION
- 8. GROCERY/DELI
- 9. COFFEE SHOP

- 10. VILLAGE OPERATIONS, MAINTENANCE AND STORAGE AREA
- 11. ARTISAN STUDIOS
- 12. RETAIL/ GIFT SHOP
- 13. FOUR STAR INN
- 14. FOUR STAR RESTAURANT
- 15. ART GALLERY
- 16. VILLAGE GREEN
- 17. PICNIC SHELTER/ PLAYGROUND
- 18. FIRE POND



PROJECT TEAM:
J. ATKINS & COMPANY PC
BOXWOOD

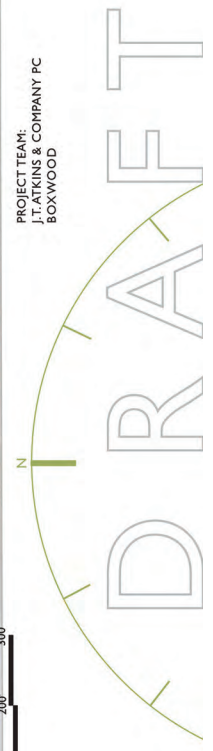


Figure 2-2. Wine Village

the Wine Village. The Wine Village Inn will provide visitors with the opportunity to extend their stay on the mountain. The Inn could include small meeting rooms for small conferences and retreats. Service access to the shops and Inn will be from the road that loops around the perimeter of the village.

The village is intended to provide services and amenities for both Red Mountain residents and visitors. A “post office” (central location for mail boxes) located within the general store will provide a convenient place for residents and businesses to pick up and deliver mail. This focal point will also serve as an informal meeting place for mountain residents. Other village amenities will include a grocery and deli, coffee and retail shops. The village could also include offices, and small working shops that supply the wineries and vineyards with products and services like corks, capsules, labels, barrels, and cellar equipment.

The village elements will be clustered around a village green. The remaining sides will be left open to provide views of Red Mountain, vineyards and the Horse Heaven Hills as well as providing openings for cold air and surface water drainage from the vineyards located upslope from the village. Limited parking is located around the village core to provide disabled parking (ADA) as well as parking adjacent to the shops. Additional parking will be located at the Inn and the large parking lot adjacent to the entry road. Care has been taken to locate the central parking area in an area that allows for adequate visual screening. The central parking area will be connected to the village by a series of pedestrian trails.

The village green is the second focal point for the village. Here visitors can rest or picnic in the shade of the trees that define the park space or enjoy to small-scale performances.

The Wine Village design should include adequate space for plazas, outdoor dining, wide sidewalks and street trees that will enrich the architectural character of the village. The architecture should reflect the building character and quality found at Red Mountain and meet the commercial development design guidelines for the wine village. A possible development scenario could be for the land owner to partner with a commercial developer or master developer to create a well-coordinated development that fits the Red Mountain quality and context. This process has been used successfully in many communities and usually involves the land owner developing a Request for Proposals (RFP) that presents the land owner’s vision for the future development and other project requirements. Interested developers present their credentials, a development concept, land owner/developer partnership structure, pricing, and other required information. The land owner can use the RFP information in selecting the developer that they desire to work with.

The Wine Village will function as a hub for the hiking, equestrian and biking trails that connect the village to view points, wineries and regional trails. Visitors can park at the village and use the trails for recreation as well as access to the wineries. On peak visitor week ends the Wine Village could serve as a point of departure for a shuttle transportation system that could transport visitors to the wineries.

Table 2-2 lists the elements proposed for the Wine Village.

Table 2-2. Wine Village - Conceptual Program

Use	Approx. Size (Sq. Ft.)	Description
General store	4,500	A little bit of everything including, "post office", winemaking supplies from a reputable name such as The Complete Winemaker.
Grocery/deli	3,000	"Oakville" style with wine, gourmet food products, picnic supplies, fresh baked goods, hand-made cheeses and a complete deli where freshly crafted sandwiches and salads can be made to order.
Four star restaurant	3,000	Seating for 50, fine dining.
Family restaurant	3,000	Seating for 50, family dining.
Coffee shop	750	Espresso, lattes, inside seating for 8 at small tables, outside seating for 8.
Four star inn	12,000-30,000	Reception, lobby, 20 to 50 rooms, conference/meeting rooms, spa/work out area, offices and support spaces.
Retail/gift store	3,000	Visitors like to shop...
Retail/gift store	3,000	Visitors like to shop...
Art gallery	3,000	Art pieces for sale.
Artisan studios	6,000	Studios and work space that allow visitors to watch art production and discuss process with artists.
Bicycle rental	1,500	Day rental of trail bikes.
Residential condominiums	15,000	10 units at 1,500 SF each two bedrooms, two baths, decks located above the shops and artisan studios.
Interpretive center	3,000	Present information on the Ice Age Floods and local agriculture including viticulture - Potential State Parks facility. Restrooms, display/exhibit area, small meeting/presentation space, administration office and support space.
Demonstration vineyard	43,560	Integral part of the interpretive experience. Multiple varieties that grow well on Red Mountain.
Village Green	30,000	Water conserving lawn with shade trees along edges, open in the middle and along two sides with views to Red Mountain and demonstration vineyard. The Green can be used for small scale performances and other events.
Playground	1,500	Equipment for young people and seating for adults located within the Green.
Picnic shelter (s)	600	Located on the Village Green.
Visitor restrooms	1,000	Located close to the Village Green within the shop area. Events may require additional temporary facilities.
Streets/sidewalks		13-foot-wide sidewalks, some diagonal street parking interspersed between sidewalk bump outs, a one way drive aisle flows around the green. Parking is included in front of the shops to provide easy access parking for the commercial activities. Approximately 26 parking spaces.

Table 2-2. Wine Village - Conceptual Program

Use	Approx. Size (Sq. Ft.)	Description
Trailhead		Parking and trailhead function for trail uses.
Parking - accessible from Sunset Road		Approximately 146 parking spaces. A bulk of the parking, for the inn, bicycle shop and visitors to Red Mountain that are touring, to be located behind the buildings especially at the inn (approximately 15 parking spaces). All parking areas will include water gardens for surface water retention, strong pedestrian connections and distinctive landscape including native plants.
Natural areas		Part of the site will include natural vegetation habitat areas related to the cold air drainages. These natural areas will be enriched by interpretive trails and signage.
Village operations, maintenance and storage area	2,000	Office and maintenance and materials storage area. Could include first aid station if appropriate.

The Draft 2007 Master Site Plan suggests a preferred location for the Wine Village. Should the land owners decide not to realize the Wine Village development opportunity, additional sites could be identified through site selection planning efforts using the site selection criteria used to select the preferred site.

During the Phase 1 Concept Plan planning process, two alternatives were developed, each presenting a range of land use and visitor facility location concepts. A major difference discussed during the alternative evaluation process was the concept of a dispersed versus a central visitor services and experience concept. Participants in the planning process discussed the assets and liabilities of the each of the concepts and decided that the central concept was most appropriate for Red Mountain. The consultant team used the criteria presented below in selecting the Wine Village site presented in the Master Site Plan.

Wine Village Site Selection Criteria

The proposed site for the Wine Village was selected during the Phase 1 Conceptual Plan planning process using the site selection criteria presented below.

- Land marginal for growing grapes – least suitable soils and cold air drainage areas. This is a threshold criteria that must be met before considering other site selection factors
- Site topography suitable for village – flat to slight slopes
- Centrally located - providing opportunities for a distinctive visitor experience where the village is immersed in vineyards and not located adjacent to or close to roads
- A site that is visible while not being visually dominant

- A site that provides views to Red Mountain, Horse Heaven and Rattlesnake Hills, the surrounding vineyards and the valley below
- Centralized location – providing “hub” opportunities for trails, parking and shuttle transportation systems and provides a focal point for visitor activities
- Diversity in trail experiences - river, vineyards, and different habitat type views
- Ability to screen/hide parking and support facilities

INTERPRETIVE OPPORTUNITIES - CONNECTING PEOPLE WITH PLACES

The intent of interpreting natural and cultural history of an area is to connect and involve people with the place. At Red Mountain an exciting range of interpretive opportunities exists to present information to visitors about how grapes are grown and wine is made. In addition, there is the opportunity to interpret the Ice Age Floods and how they shaped Red Mountain during the Ice Age.

The interpretive center located at the Wine Village will be hub of interpretive activities. A range of presentation technologies, including graphic panels, video presentations and models will be located at the interpretive center and adjacent demonstration vineyard. Trails radiating from the Wine Village will connect the visitors to view points and interpretive signs that present information better told where the visitor is immersed in the landscape that is being interpreted.

A second interpretive point will be located along the trail system. At this point interpretive graphics and models, located within an interpretive kiosk, could be used to present how the Ice Age Floods shaped Red Mountain and how the resulting natural conditions created a place for creating globally competitive grapes and wines. An ideal location for this second interpretive point would be within or close to the glacier boulder (erratic) field near the base of Red Mountain. The location of the trails and interpretive opportunities is presented in Figure 1-1. Individual wineries could interpret how wine is made.

There are a number of existing and proposed interpretive facilities within the region that provide the opportunity to develop an interpretive network where facilities reinforce the messages presented at the other facilities. Such a network will encourage visitors to visit the other facilities and deepen their appreciation and enjoyment of the region as a whole. It is important that the interpretive information presented at Red Mountain be coordinated with the proposed Walter Clore interpretive facility to be developed in Prosser and at other Ice Age Floods interpretive elements being developed by various federal, state, and local entities.

The following information outlines the many of the interpretive opportunities at Red Mountain.

Goals

Use recreational and interpretive opportunities to:

- Immerse visitors in sense of place and romance of wines.

- Create intellectual linkages to off-site viticultural, agricultural and Ice Age Floods interpretive facilities.
- Create layers of experiences that lengthen and enrich the visitor's time at Red Mountain.

Principles

- Keep it simple – the less words and themes the better.
- Do not let the interpretive elements dominate the landscape.
- Relate all to humans – wine history, site selection criteria – why Red Mountain and the history of wine development on Red Mountain

Themes

- Grapes and wines
- What does it mean to grow grapes and create wine
- The place was formed by the Ice Age Floods
- Landscape Features
- Ice Age Interpretation - Tie to Ice Age Floods trail experience
- Tie Ice Age Floods to the terroir of the place – latitude, climate, soils, aspect, slopes, erratic (soils and rocks came from Montana)
- Great natural forces shaped what you see – Ridge system and Ice Age Floods
- Native shrub - steppe landscape experience
- Wildlife Habitat
- Wild flowers
- Native American History

Presentation systems

- Printed material
- Interpretive panels in the interpretive center
- Video presentation of growing grapes and creating wine
- Interpretive kiosks with panels – at points of interest
- Overview point (great view of Red Mountain) where Red Mountain geology (uplift and ice age floods) shaped the area for excellent wines (graphic depicting the wave coming over the top of Red Mountain) – soils and glacial boulder (erratic) deposition on lee side of Red Mountain can be told

- Direct visitors to erratic deposition and soil cross section at the overview interpretative point
- Stand-alone interpretive panels – at points of interest
- Demonstration vineyard with agricultural equipment
- Physical exhibits
- Soil cross sections
- Model of Red Mountain and Ice Age Floods
- Audio - Tapes and car radio

TRANSPORTATION

The Master Site Plan planning process has included the analysis of existing and future traffic conditions within the Red Mountain AVA focusing on both the existing traffic volumes and the 2025 traffic volumes related to the planned development of the AVA. SR 224 provides primary access to the AVA.

The traffic analysis provides estimates for traffic conditions for the average High Season Weekend Day and for a Major Event Weekend Day that were defined as part of the visitor volume analysis (see Appendix C).

Traffic conditions are expressed in terms of their impact on levels of service (LOS). Levels of service are descriptions of traffic operating conditions. These levels of service are designated with letters ranging from LOS A, which indicates good conditions with little or no delay, to LOS F, which indicates stop-and-go conditions with frequent and lengthy delays. More specifically, level of service criteria for un-signalized intersections are as follows:⁴

Level of Service	Average Delay (seconds/vehicle)
A	Less than 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.00

High Season Weekend Day

Existing (2007) Traffic Volumes Along SR 224

Figure 2-3 shows existing 2007 turning movements at intersections along SR 224. These traffic counts were conducted by Benton County Public Works in March 2007. These were weekday, mid-afternoon counts (mid-afternoon is expected to be a peak time for AVA traffic). Saturday mid-afternoon counts were assumed to be nearly identical.⁵

Year 2025 Background Traffic Volumes

Figure 2-4 shows estimated year background 2025 turning movements without the planned development of the Red Mountain AVA. These 2025 background volumes were developed by increasing the existing 2007 volumes by 3% per year. The growth percentage is based on the continuation of average annual traffic volume increases on SR 224 near Red Mountain Road since 1996.

Red Mountain AVA Population – High Season Weekend Day

A review of the visitor volumes data, existing traffic volumes, and visitor volume projections was done to estimate the anticipated traffic volumes associated with the proposed AVA development. Table 2-3 presents 2025 visitor numbers and the resulting mid-afternoon traffic volumes.

- Red Mountain AVA Master Site Plan information was provided by J.T. Atkins & Company PC⁶
- The number of visitor parties (1,500) is based on market analysis information provided by Dr. Barbara Masberg of Central Washington University (see Appendix C).⁷ An average party size of 2 persons has been assumed. The projected visitor volumes were increased by adding the results of a “what if” analysis process where the number of core wine drinkers were identified to be increasing at a rate of 8% per year while marginal wine drinkers numbers are declining.⁸
- Vehicle trips are estimated for parties to and from Puget Sound and other locations, and for day visitors, overnight visitors and employees.
- During the assumed weekend day, approximately 225 employees are projected to be on site.

These projections assume that the AVA is developed as shown on the Master Site Plan (see Figure 1-1) for the area north of SR 224. The character of the potential Tourist Serving Area (TSA) and supporting agricultural and residential development south of SR 224 has not been defined to a point where traffic projections can be developed. This analysis does not include traffic volume projections associated with this area at full development.

2025 Traffic Volumes, Saturday

Figure 2-5 shows estimated 2025 project-only turning movement volumes using the visitor volume projections presented in Table 2-3. Figure 2-6 adds the project-only volumes of Figure 2-5 to the 2025 Background volumes of Figure 2-4 for an estimate of total peak hour traffic volumes in 2025.

2025 Intersection Levels-of-Service

Table 2-4 shows estimated intersection levels-of-service (LOS) for 2007 Existing, 2025 Background only, and 2025 with the planned development of the AVA. Table 2-4 presents LOS

information for individual movements at each intersection and also for the overall intersection. Generally, with the exception of the Interstate 82 East bound off ramp and Webber Road, and the SR 224 / SR 225 intersection, the LOS conditions at each of the analyzed intersections are very good. The LOS issues at the two intersections occur when only the 2025 background levels are considered as well as when both 2025 Background with AVA development volumes are considered.

At the Interstate 82 Eastbound Off-Ramps, the eastbound left turn, exiting Interstate 82 toward Benton City, currently operates at LOS C and drops to LOS F with 2025 background growth. It continues at LOS F with the project added. Overall intersection operation is at LOS A for all three conditions. The critical left turn does not improve from LOS F when turn lanes are added and the overpass is widened to allow a center two-way left-turn lane. By adding a semi-actuated signal with a 60-second cycle, this intersection would operate at an overall LOS B with the critical left turn at LOS C for both the 2025 Background and 2025 Background plus AVA development traffic.

At the SR 224 / SR 225 intersection, the westbound left turn from SR 224 toward Interstate 82 also currently operates at LOS C and drops to LOS F with 2025 background growth. Overall intersection operation drops from the existing LOS A to LOS D with background growth and to LOS E with the proposed AVA development traffic volumes added. The Washington State Department of Transportation (WSDOT) is considering a modern roundabout as one alternative for this location. Mitigating this intersection with a roundabout with an outside diameter of 55 feet and an inside diameter of 25 feet allows all movements to operate below capacity at 55.2% or LOS B for a roundabout. The proximity of the Interstate 82 ramps could be a problem, however, for two reasons:

- The time for drivers to perceive the roundabout layout may be too limited
- Under certain conditions, traffic could back up into the roundabout, causing a LOS breakdown of roundabout operations

This situation requires further analysis at a more detailed level. Some possible solutions could include a revision to the SR 224/SR 225 intersection and/or use of a traffic signal.

AVA Roads

This traffic volume analysis of roads within the AVA found that with the projected volumes as noted, the two-lane road configuration for existing and future internal roads will be adequate to carry the existing and projected traffic volumes. Later, more detailed, site analysis may show a need for added turn lanes at certain key intersections.

Summary

During a High Season Weekend Day, 1,500 parties (two people within a single vehicle) are expected to visit the AVA. Of these, about 45% (675 parties) of the total number of parties are expected to be on-site at one time. The traffic analysis reviewed the Level of Service (LOS) for nine intersections. The results of the analysis indicate that only two of the intersections along SR

224 failed, both for Background (existing) Conditions without the planned development for the AVA by 2025 and for Background Conditions plus the planned 2025 AVA development. The failing intersections were at the end of the Benton City Interstate 82 eastbound off-ramp at the intersection with Webber Road, and at the intersection of SR 224 / SR 225. Implementing mitigating measures can bring both intersections back to acceptable levels of service.

Major Event Weekend Day

Finally, traffic conditions for a Major Event weekend with three to four times as many parties visiting the AVA were analyzed.

The impact of increased traffic that could occur on major special event weekends that occur periodically throughout the year was evaluated. Table 2-5 shows 2025 visitor volume projections and the resulting mid-afternoon traffic volumes for a major event day that is about 4 times the level of the average high-season weekend day. Except for the increase in the number of parties, based on market information provided by Dr. Barbara Masberg of Central Washington University (see Appendix C), the assumptions on distribution of these parties are the same as those associated for the High Season weekend day.

Figure 2-7 presents the 2025 AVA traffic turning movements traffic. Figure 2-8 shows total 2025 traffic with AVA proposed development traffic added to 2025 Background traffic volumes.

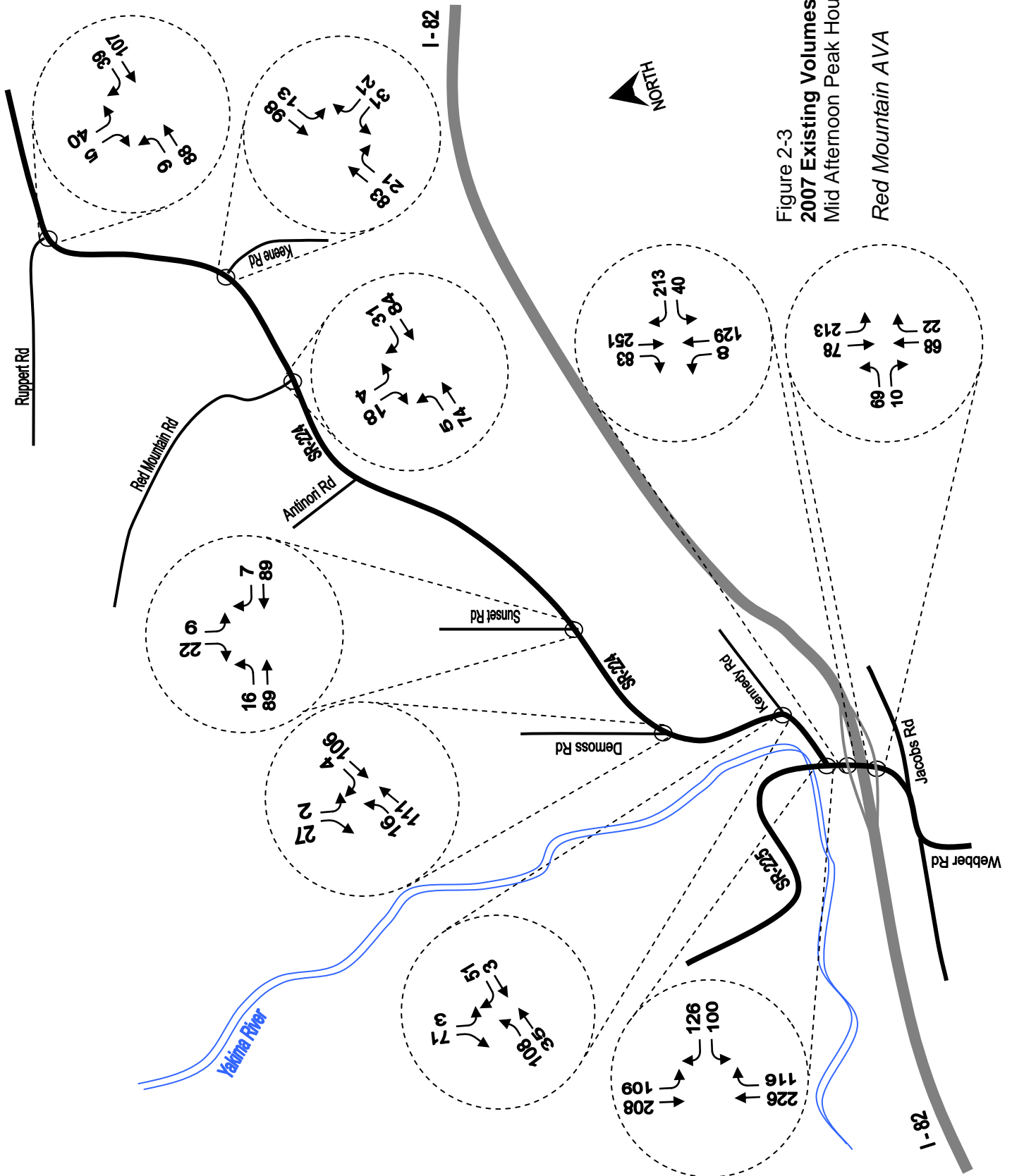
Table 2-6 reproduces the information in Table 2-4, but adds two columns with results for the Major Event Weekend Day. Traffic operational considerations include:

- The roundabout at SR 224/225 drops to LOS F with 99.1% utilization. The roundabout will function under these conditions, yet with considerable delay. As described for the High Season Weekend day, there may be problems with the roundabout because of the proximity of the Interstate 82 ramps.
- Police officers may be needed at peak times at other intersections along SR 224 in order to direct traffic turning movements. With these major events occurring only about five - six times per year, mitigation through intersection redesign of individual intersections would be too expensive to justify the intersection changes.
- The southbound approach at SR 224/Sunset changes from LOS C to LOS F for the peak event periods. Potential mitigation includes widening this approach to add a 150-foot southbound left turn. The left turn continues to operate at LOS F, but the right turn operates at LOS B. Directing more traffic to the Antinori Road intersection may improve conditions during a major event by distributing the traffic volumes more evenly throughout the AVA. A traffic officer stationed here directing traffic flows during a major event weekend would assist in traffic flows.
- A level of service change occurs at the southbound left-turn lane at the Antinori Road, where the LOS changes from LOS B to LOS F with peak event volumes. Again, adding a 150-foot southbound left-turn lane improves only the level of service

at the right-turn lane. A traffic officer stationed here for a peak event would assist in traffic flows.

- A similar problem occurs at the SR 224 / Keene Road intersection. The northbound left turn volume is not, however, related to the project. This movement drops from LOS C to LOS F as a result of the increase in conflicting through traffic on SR 224. Again, adding a northbound left-turn lane improves the right turn level of service from F to C, yet the left turn lane remains at LOS F.
- The same left-turn issue arises at the SR 224 / Rupert Road intersection. The southbound left turns are not related to the project, yet conflict with the higher through volume along SR 224. Adding a separate southbound left turn lane here again improves the right turn LOS from F to A, but the left turn remains at LOS F.
- Widening the entire length of SR 224 to include a two-way left turn lay could resolve some of these issues, but would be expensive and probably not justified by these infrequent major event weekends.
- One option to consider is the use of off-site parking and a shuttle bus system to reduce the volume of individual vehicle traffic flowing through the AVA intersections. Satellite parking could occur at parking areas associated with the Tourist Serving Area or other commercial/industrial areas within the cities that could have surplus parking available on major event weekends. Buses could bring visitors to the Wine Village as well as to individual wineries.

With the exception of traffic flow management or added turn lanes described above, the 2-lane internal roads will be adequate to serve the projected volumes associated with major event weekends in both the Background and Background plus 2025 projected AVA development conditions.



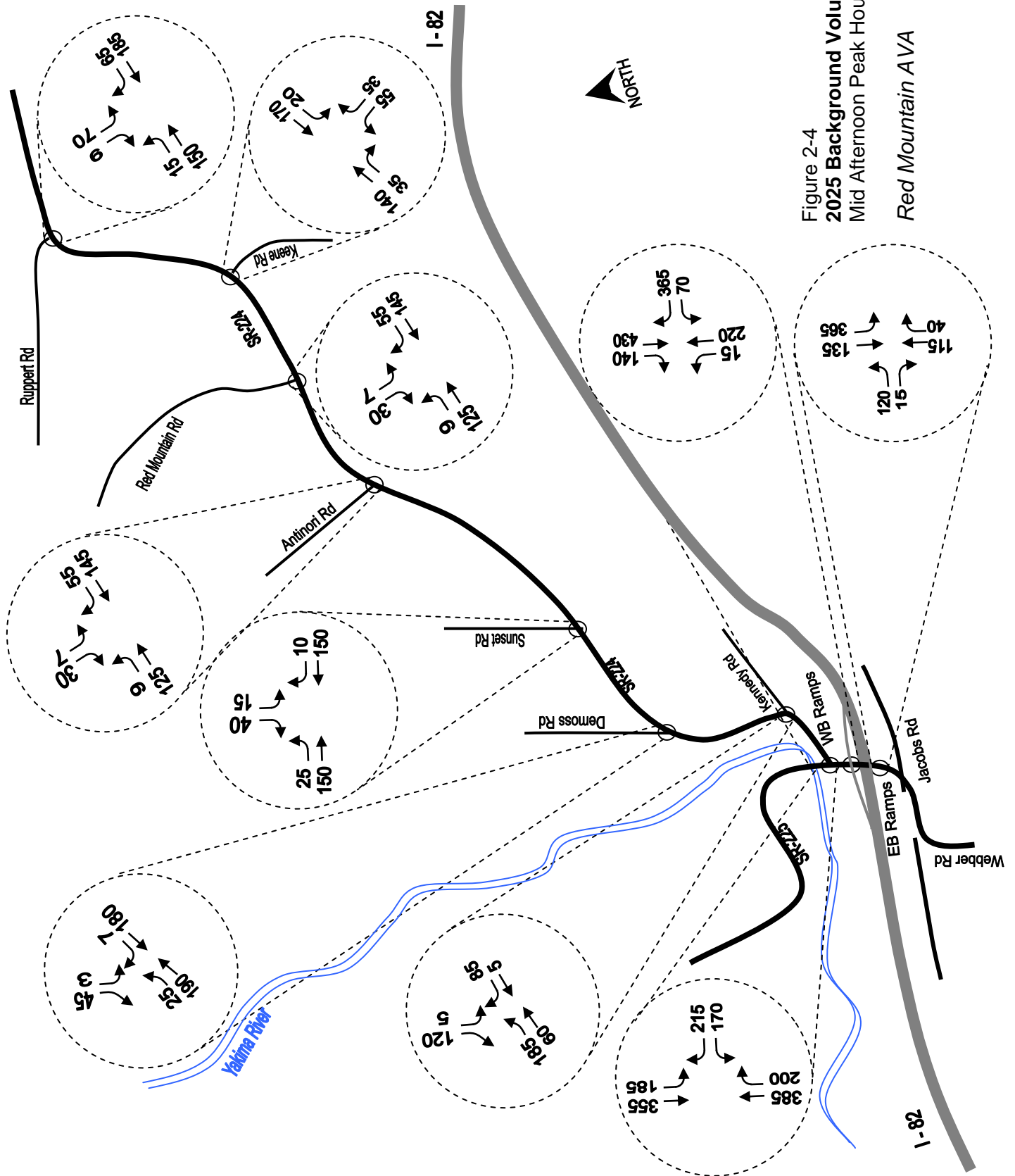


Figure 2-4
2025 Background Volumes Only
Mid Afternoon Peak Hour

Red Mountain AVA

Table 2-3

Day of week: Saturday
 Scenario: 2025, Core Wine Drinkers +8% per year (purple line 45)
 Party size: 2 persons
 Time: 3-4 PM

DEVELOPMENT	
Wineries with lodging	20 Lodging units per winery =
Wineries without lodging	20
Lodging at Village	20 rooms (keys)
Tasting rooms	40
Village Restaurants	2
Village Sales Points	2

GUEST PARTIES	
Total parties for day =	1,502 Ref. 3, page 1 line 45
Lodging units on site =	120
Lodging occupancy =	80%
Lodging on site =	96 parties

TRIPS BY POPULATION GROUP	No. of Parties	Trip Orientation		3-4 PM Outbound Trips		3-4 PM Inbound Trips			
		East	West	Percent	East	Percent	East	West	
Puget Sound Parties @	1,202								
Day visitors @	120	20%	80%	20%	5	19	10%	2	10
Overnight @	1,082								
On-site @	77	0%	0%	20%	-	-	10%	-	-
Benton City @	100	0%	100%	20%	-	20	10%	-	10
Tri-Cities	904	100%	0%	20%	181	-	10%	90	-
Non-Puget Sound Parties @	300								
Day visitors @	150	80%	20%	20%	24	6	10%	12	3
Overnight @	150								
On-site @	19	0%	0%	20%	-	-	10%	-	-
Benton City @	13	0%	100%	20%	-	3	10%	-	1
Tri-Cities	118	100%	0%	20%	24	-	10%	12	-
EMPLOYEES	Total								
Tasting Rooms @	40								
Sales Points	2								
Restaurants @	2								
Village @	1								
total	227	10%	90%	25%	6	51	10%	2	20
				total	239	99		119	44

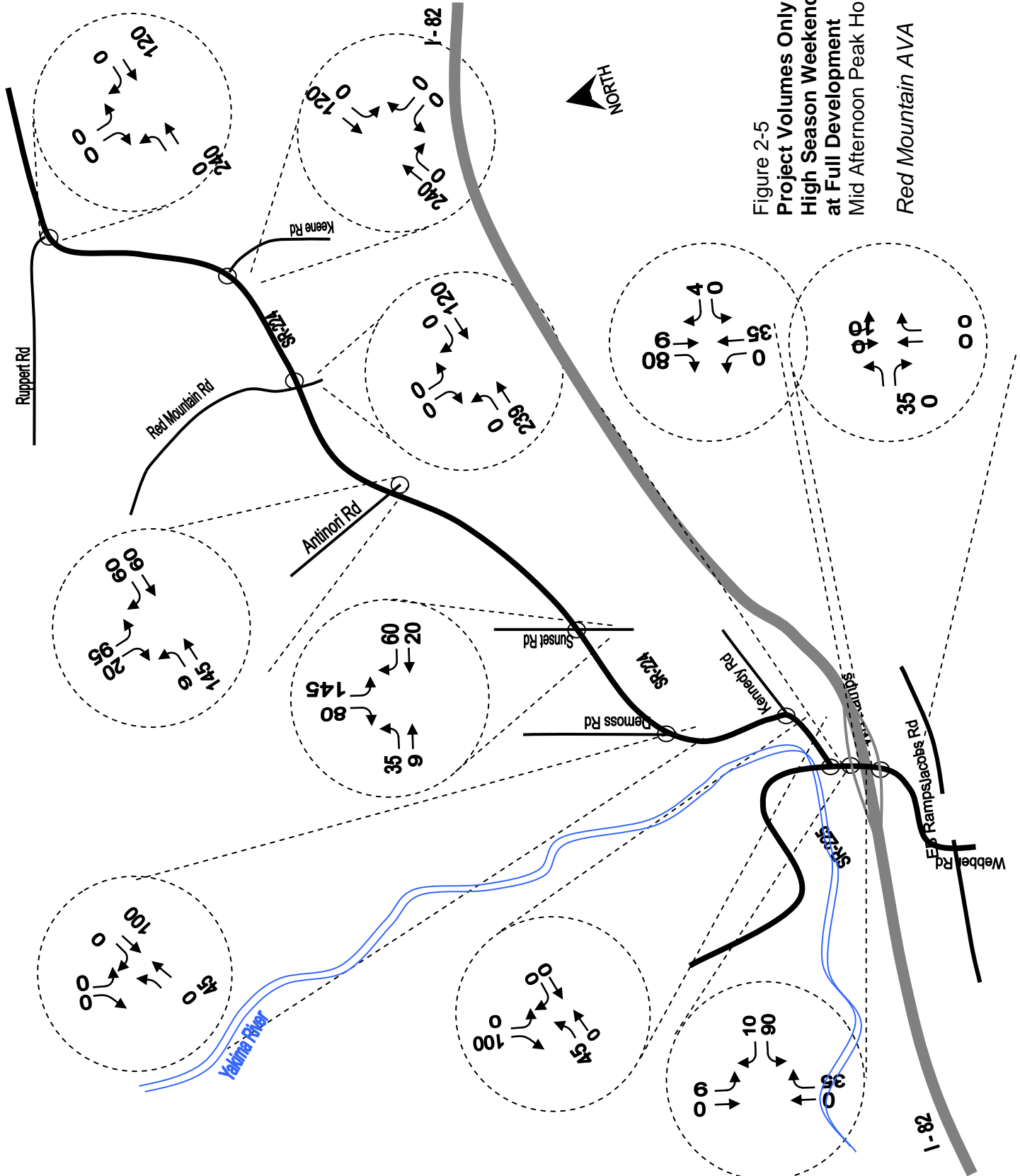


Figure 2-5
 Project Volumes Only
 High Season Weekend
 at Full Development
 Mid Afternoon Peak Hour Volumes
 Red Mountain AVA

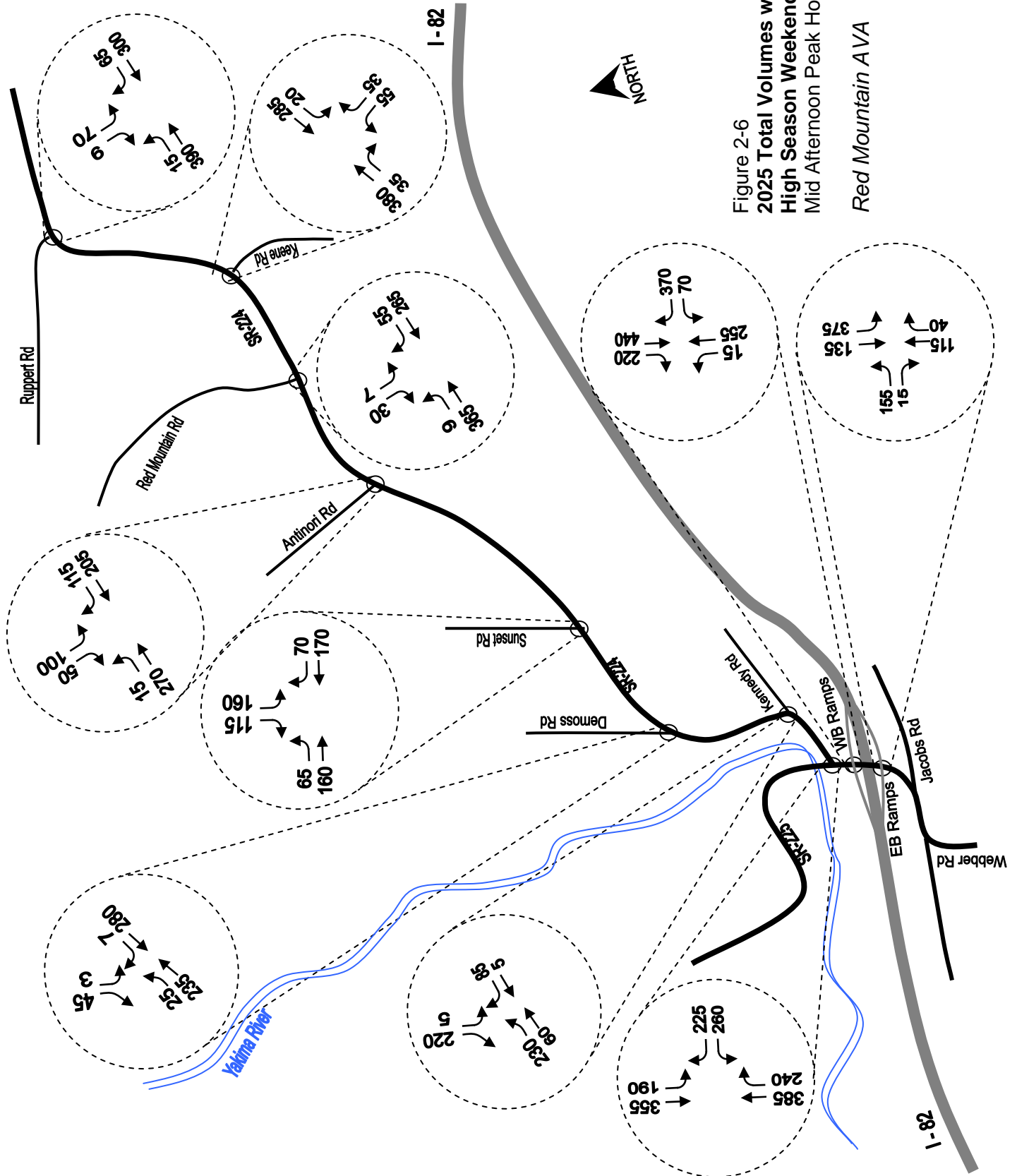


Figure 2-6
 2025 Total Volumes w/ Project
 High Season Weekend
 Mid Afternoon Peak Hour

Red Mountain AVA

Table 2-4
High Season Weekend Day, Mid-Afternoon Peak Hour
Intersection Level of Service (seconds of delay)
Red Mountain AVA -- Washington

<i>Intersection and Critical Movements</i>	<i>Approach Priority</i>	<i>Approach Control</i>	<i>2007 Existing Mid Afternoon Peak Hour</i>	<i>2025 Mid Afternoon Pk Hr Background Only</i>	<i>2025 Mid Afternoon Pk Hr w/ Project at Buildout</i>	<i>2025 Mid Afternoon Pk Hr Total w/ Mitigation</i>
I-82 EB Off Ramp & Webber Rd			Unsignalized	Unsignalized	Unsignalized	Signalized
Eastbound Left	minor	Stop	C (18.2 sec.)	F	F	C (22.8 sec.)
Eastbound Right	minor	Stop	A	A	A	A
Northbound Thru	Major	Free	A	A	A	A
Northbound Right	Major					
Southbound Left	Major	Free	A	A	A	A
Southbound Thru	Major					
Average Intersection Delay sec/veh			6.7 sec.	19.1 sec.	37.8 sec.	10.7 sec.
Overall Intersection LOS			A	A	A	B
I-82 WB Off Ramp & Webber Rd			Unsignalized	Unsignalized	Unsignalized	
Westbound Left	minor	Stop	B (12.9 sec.)	C (21.6 sec.)	D (25.2 sec.)	
Westbound Right	minor	Stop	B (10.3 sec.)	B (13.8 sec.)	B (14.9 sec.)	
Northbound Left	Major					
Northbound Thru	Major	Free	A	A	A	
Southbound Thru	Major	Free	A	A	A	
Southbound Right	Major					
Average Intersection Delay sec/veh			3.8 sec.	5.4 sec.	5.6 sec.	
Overall Intersection LOS			A	B	C	
SR 224 & SR 225		T intersection	Unsignalized	Unsignalized	Unsignalized	Roundabout
Westbound Left	minor	Stop	C (23.3 sec.)	F	F	Single-Lane Roundabout: Intersection Capacity Utilization
Westbound Right	minor	Stop	B (10.8 sec.)	C (16.3 sec.)	C (17.2 sec.)	
Northbound Thru	Major	Free	A	A	A	
Northbound Right	Major					
Southbound Left	Major	Free	A	A	A	
Southbound Thru	Major					
Average Intersection Delay sec/veh			5.8 sec.	33.1 sec.	101.2 sec.	55.2%
Overall Intersection LOS			A	D	E	B
SR 224 & Kennedy Rd		Wye intersection	Unsignalized	Unsignalized	Unsignalized	
East to North Left	Major	Free	A	A	A	
Eastbound Right	Major	Free				
South to West Thru	Major	Free	A	A	A	
South to East Left	Major	Yield				
East to North Right	minor	Stop	A	B (10.2 sec.)	B (10.6 sec.)	
East to West Thru	minor	Stop				
Average Intersection Delay sec/veh			2.0 sec.	2.1 sec.	1.7 sec.	
Overall Intersection LOS			A	A	A	
SR 224 & Demoss Rd		Wye intersection	Unsignalized	Unsignalized	Unsignalized	
Eastbound Left	Major	Yield	A	B (10.1 sec.)	B (10.9 sec.)	
Eastbound Thru	Major	Free				
Westbound Thru	Major	Free	A	A	A	
Westbound Right	Major					
Southbound Left	minor	Stop	B (11.2)	B (13.8)	C (18.8)	
Southbound Right	minor	Stop				
Average Intersection Delay sec/veh			8.6 sec.	9.3 sec.	9.9 sec.	
Overall Intersection LOS			A	A	A	
SR 224 & Sunset Rd		T intersection	Unsignalized	Unsignalized	Unsignalized	
Eastbound Left	Major	Yield	A	A	A	
Eastbound Thru	Major	Free				
Westbound Thru	Major	Free	A	A	A	
Westbound Right	Major					
Southbound Left	minor	Stop	A	A	C (16.5)	
Southbound Right	minor	Stop				
Average Intersection Delay sec/veh			1.8 sec.	2.0 sec.	6.9 sec.	
Overall Intersection LOS			A	A	A	

Table 2-4
High Season Weekend Day, Mid-Afternoon Peak Hour
Intersection Level of Service (seconds of delay)
Red Mountain AVA -- Washington

<i>Intersection and Critical Movements</i>	<i>Approach Priority</i>	<i>Approach Control</i>	<i>2007 Existing Mid Afternoon Peak Hour</i>	<i>2025 Mid Afternoon Pk Hr Background Only</i>	<i>2025 Mid Afternoon Pk Hr w/ Project at Buildout</i>	<i>2025 Mid Afternoon Pk Hr Total w/ Mitigation</i>
SR 224 & Antinori Rd		T intersection	Unsignalized *	Unsignalized	Unsignalized	
Eastbound Left	Major	Yield	A	A	A	
Eastbound Thru	Major	Free	A	A	A	
Westbound Thru	Major	Free	A	A	A	
Westbound Right	Major	Free	A	A	A	
Southbound Left	minor	Stop	A	A	B (13.9 sec.)	
Southbound Right	minor	Stop	A	A	B (13.9 sec.)	
Average Intersection Delay sec/veh			1.1 sec.	1.2 sec.	1.2 sec.	
Overall Intersection LOS			A	A	A	
SR 224 & Red Mountain Rd		T intersection	Unsignalized	Unsignalized	Unsignalized	
Eastbound Left	Major	Yield	A	A	A	
Eastbound Thru	Major	Free	A	A	A	
Westbound Thru	Major	Free	A	A	A	
Westbound Right	Major	Free	A	A	A	
Southbound Left	minor	Stop	A	A	B (11.0 sec.)	
Southbound Right	minor	Stop	A	A	B (11.0 sec.)	
Average Intersection Delay sec/veh			1.1 sec.	1.2 sec.	0.7 sec.	
Overall Intersection LOS			A	A	A	
SR 224 & Keene Rd		T intersection	Unsignalized	Unsignalized	Unsignalized	
Eastbound Thru	Major	Free	A	A	A	
Eastbound Right	Major	Free	A	A	A	
Westbound Left	Major	Yield	A	A	A	
Westbound Thru	Major	Free	A	A	A	
Northbound Left	minor	Stop	A	B (11.0 sec.)	C (15.6 sec.)	
Northbound Right	minor	Stop	A	B (11.0 sec.)	C (15.6 sec.)	
Average Intersection Delay sec/veh			2.2 sec.	2.5 sec.	1.9 sec.	
Overall Intersection LOS			A	A	A	
SR 224 & Ruppert Rd		T intersection	Unsignalized	Unsignalized	Unsignalized	
Eastbound Left	Major	Yield	A	A	A	
Eastbound Thru	Major	Free	A	A	A	
Westbound Thru	Major	Free	A	A	A	
Westbound Right	Major	Free	A	A	A	
Southbound Left	minor	Stop	B (10.0 sec.)	B (11.7 sec.)	C (17.2 sec.)	
Southbound Right	minor	Stop	B (10.0 sec.)	B (11.7 sec.)	C (17.2 sec.)	
Average Intersection Delay sec/veh			1.8 sec.	2.1 sec.	1.8 sec.	
Overall Intersection LOS			A	A	A	

TDA Inc. 31-July-07

TABLE 2-5

Day of week: Saturday
Scenario: 2025, 5X HIGH SEASON WEEKEND DAY
Party size: 2 persons
Time: 3-4 PM

DEVELOPMENT			
Wineries with lodging	20	Lodging units per winery =	5
Wineries without lodging	20		
Lodging at Village	20	rooms (keys)	
Tasting rooms	40		
Village Restaurants	2		
Village Sales Points	2		

GUEST PARTIES			
Total parties for day =	5,486	Ref. 3, page 2, line 68	
Lodging units on site =	120		
Lodging occupancy =	80%		
Lodging on site =	96	parties	

TRIPS BY POPULATION GROUP			No. of Parties	Trip Orientation		3-4 PM Outbound Trips			3-4 PM Inbound Trips		
				East	West	Percent	East	West	Percent	East	West
Puget Sound Parties @			80% of Total =	4,389							
Day visitors @	10%	of Puget Snd Parties =	439	20%	80%	20%	18	70	10%	9	35
Overnight @	90%	of Puget Snd Parties =	3,950				-	-	10%	-	-
On-site @	80%	of lodging on site =	77	0%	0%	20%	-	-	10%	-	-
Benton City @	10%	of lodging off-site=	387	0%	100%	20%	-	77	10%	-	39
Tri-Cities	90%	of lodging off-site=	3,486	100%	0%	20%	697	-	10%	349	-
							-	-	10%	-	-
Non-Puget Sound Parties @			20% of Total =	1,097					10%	-	-
Day visitors @	50%	of non-Puget Snd Parties	549	80%	20%	20%	88	22	10%	44	11
Overnight @	50%	of non-Puget Snd Parties	549				-	-	10%	-	-
On-site @	20%	of lodging on site =	19	0%	0%	20%	-	-	10%	-	-
Benton City @	10%	of lodging off-site=	53	0%	100%	20%	-	11	10%	-	5
Tri-Cities	90%	of lodging off-site=	476	100%	0%	20%	95	-	10%	48	-
EMPLOYEES			Each	Number of Units		Total					
Tasting Rooms @	5	40	200								
Sales Points	5	2	10								
Restaurants @	6	2	12								
Village @	5	1	5								
total			227	10%	90%	25%	6	51	10%	2	20
						total	903	231		451	111

TDA Inc., 17-May-07 Revised: 24-Jul-07

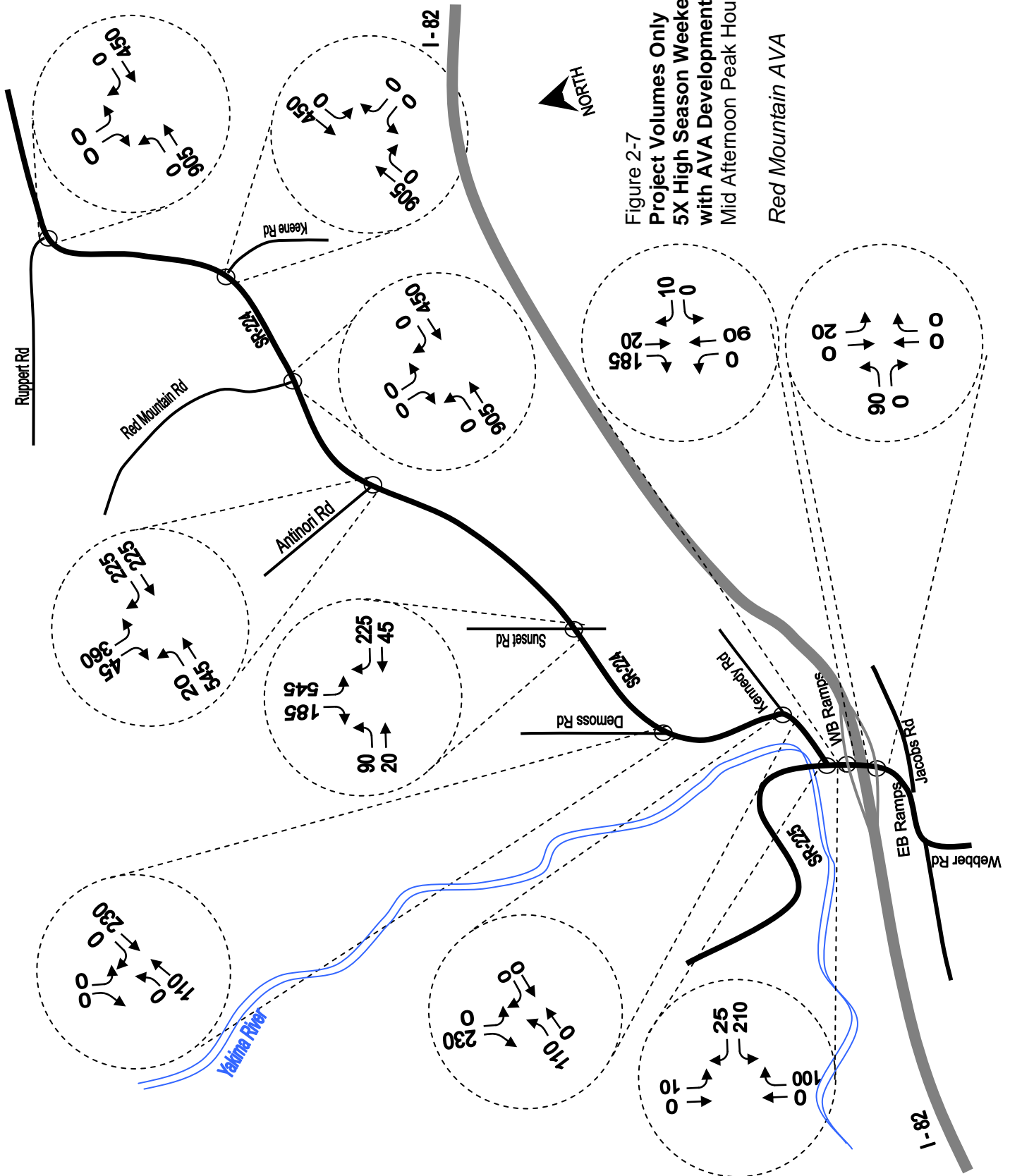


Figure 2-7
 Project Volumes Only
 5X High Season Weekend
 with AVA Development
 Mid Afternoon Peak Hour Volumes
 Red Mountain AVA

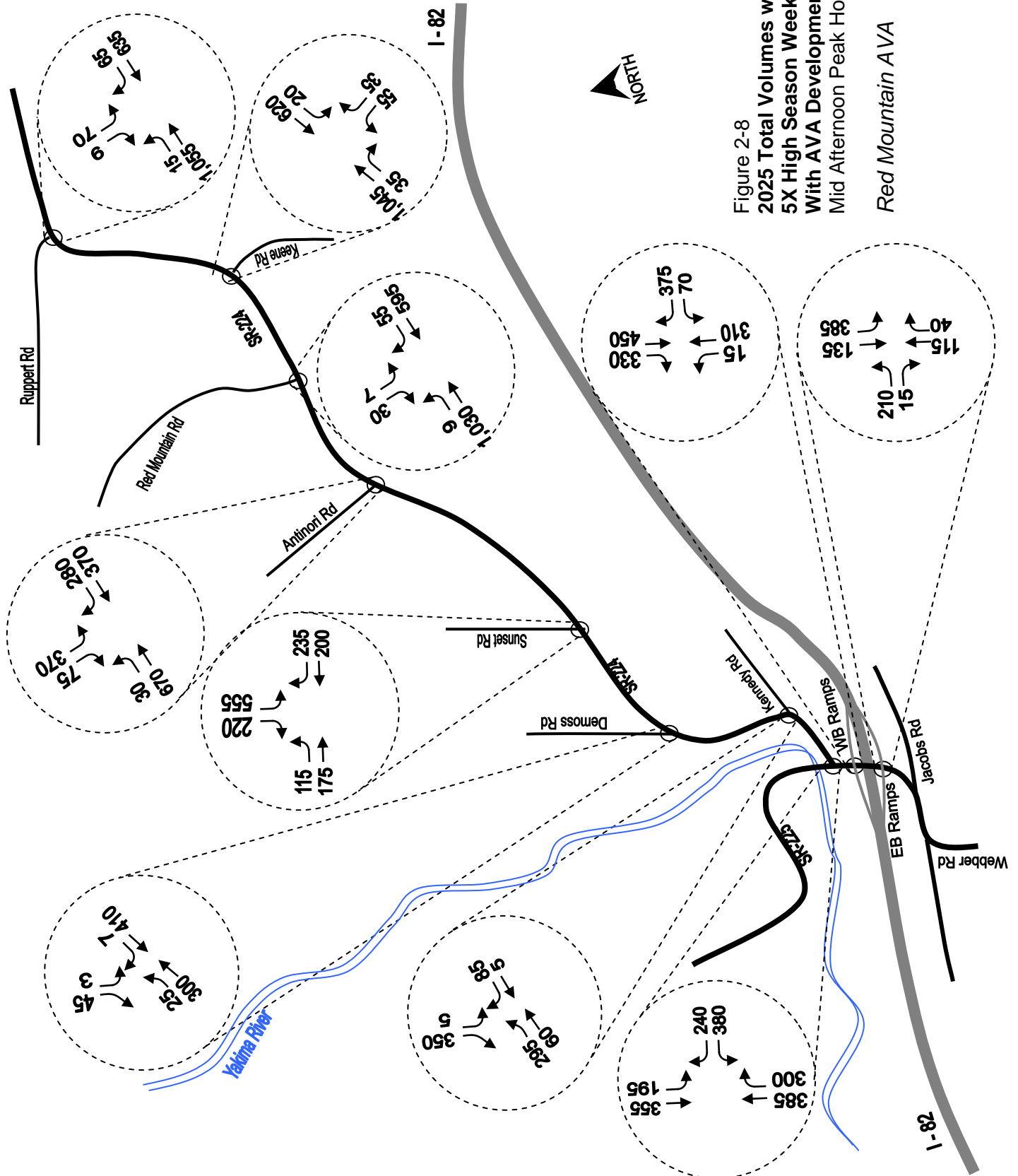


Figure 2-8
 2025 Total Volumes w/ Project
 5X High Season Weekend
 With AVA Development
 Mid Afternoon Peak Hour

Red Mountain AVA

Table 2-6
5X High Season Weekend Day, Mid Afternoon Peak Hour
Intersection Level of Service (seconds of delay)
Red Mountain AVA - Washington

				High Season Weekend Day			Peak Event Weekend	
Intersection and Critical Movements	Approach Priority	Approach Control	2007 Existing Mid Afternoon Peak Hour	2025 Mid Afternoon Pk Hr Background Only	2025 Mid Afternoon Pk Hr w/ Project at Buildout	2025 Mid Afternoon Pk Hr Total w/ Mitigation	2025 Mid Afternoon Pk Hr w/ Peak Event	2025 Mid Afternoon Pk Hr Peak Event w/ Mitigation
I-82 EB Off Ramp & Webber Rd			Unsignalized	Unsignalized	Unsignalized	Signalized	Signalized	
Eastbound Left	minor	Stop	C (18.2 sec.)	F	F	C (22.8 sec.)	C (24.3 sec.)	
Eastbound Right	minor	Stop	A	A	A	A	A	
Northbound Thru	Major	Free	A	A	A	A	A	
Northbound Right	Major	Free	A	A	A	A	A	
Southbound Left	Major	Free	A	A	A	A	B (12.8 sec.)	
Southbound Thru	Major	Free	A	A	A	A	B (12.8 sec.)	
Average Intersection Delay sec/veh			6.7 sec.	19.1 sec.	37.8 sec.	10.7 sec.	13.7 sec.	
Overall Intersection LOS			A	A	A	B	B	
I-82 WB Off Ramp & Webber Rd			Unsignalized	Unsignalized	Unsignalized		Unsignalized	
Westbound Left	minor	Stop	B (12.9 sec.)	C (21.6 sec.)	D (25.2 sec.)		D (32.2 sec.)	
Westbound Right	minor	Stop	B (10.3 sec.)	B (13.8 sec.)	B (14.9 sec.)		C (16.9 sec.)	
Northbound Left	Major	Free	A	A	A		A	
Northbound Thru	Major	Free	A	A	A		A	
Southbound Thru	Major	Free	A	A	A		A	
Southbound Right	Major	Free	A	A	A		A	
Average Intersection Delay sec/veh			3.8 sec.	5.4 sec.	5.6 sec.		5.6 sec.	
Overall Intersection LOS			A	B	C		D (32.2 sec.)	
SR 224 & SR 225			T intersection	Unsignalized	Unsignalized	Roundabout	Roundabout	
Westbound Left	minor	Stop	C (23.3 sec.)	F	F	Single-Lane Roundabout: Intersection Capacity Utilization	Single-Lane Roundabout: Intersection Capacity Utilization	
Westbound Right	minor	Stop	B (10.8 sec.)	C (16.3 sec.)	C (17.2 sec.)			
Northbound Thru	Major	Free	A	A	A			
Northbound Right	Major	Free	A	A	A			
Southbound Left	Major	Free	A	A	A			
Southbound Thru	Major	Free	A	A	A			
Average Intersection Delay sec/veh			5.8 sec.	33.1 sec.	101.2 sec.	55.2%	99.1%	
Overall Intersection LOS			A	D	E	B	F	
SR 224 & Kennedy Rd			Wye intersection	Unsignalized	Unsignalized		Unsignalized	
East to North Left	Major	Free	A	A	A		A	
Eastbound Right	Major	Free	A	A	A		A	
South to West Thru	Major	Free	A	A	A		A	
South to East Left	Major	Yield	A	A	A		A	
East to North Right	minor	Stop	A	B (10.2 sec.)	B (10.6 sec.)		B (11.4 sec.)	
East to West Thru	minor	Stop	A	B (10.2 sec.)	B (10.6 sec.)		B (11.4 sec.)	
Average Intersection Delay sec/veh			2.0 sec.	2.1 sec.	1.7 sec.		1.4 sec.	
Overall Intersection LOS			A	A	A		A	
SR 224 & Demoss Rd			Wye intersection	Unsignalized	Unsignalized		Unsignalized	
Eastbound Left	Major	Yield	A	B (10.1 sec.)	B (10.9 sec.)		B (12.8 sec.)	
Eastbound Thru	Major	Free	A	B (10.1 sec.)	B (10.9 sec.)		B (12.8 sec.)	
Westbound Thru	Major	Free	A	A	A		A	
Westbound Right	Major	Free	A	A	A		A	
Southbound Left	minor	Stop	B (11.2 sec.)	B (13.8 sec.)	C (18.8 sec.)		D (31.9 sec.)	
Southbound Right	minor	Stop	B (11.2 sec.)	B (13.8 sec.)	C (18.8 sec.)		D (31.9 sec.)	
Average Intersection Delay sec/veh			8.6 sec.	9.3 sec.	9.9 sec.		11.4 sec.	
Overall Intersection LOS			A	A	A		A	

Table 2-6
5X High Season Weekend Day, Mid Afternoon Peak Hour
Intersection Level of Service (seconds of delay)
Red Mountain AVA - Washington

Intersection and Critical Movements	Approach Priority	Approach Control	2007 Existing Mid Afternoon Peak Hour	High Season Weekend Day			Peak Event Weekend	
				2025 Mid Afternoon Pk Hr Background Only	2025 Mid Afternoon Pk Hr w/ Project at Buildout	2025 Mid Afternoon Pk Hr Total w/ Mitigation	2025 Mid Afternoon Pk Hr w/ Peak Event	2025 Mid Afternoon Pk Hr Peak Event w/ Mitigation
SR 224 & Sunset Rd		T intersection	Unsignalized	Unsignalized	Unsignalized		Unsignalized	Unsignalized
Eastbound Left	Major	Yield	A	A	A		A	A
Eastbound Thru	Major	Free	A	A	A		A	A
Westbound Thru	Major	Free	A	A	A		A	A
Westbound Right	Major	Free	A	A	A		A	A
Southbound Left	minor	Stop	A	A	C (16.5 sec.)		F	F
Southbound Right	minor	Stop	A	A	C (16.5 sec.)		F	B (11.2 sec.)
Average Intersection Delay sec/veh			1.8 sec.	2.0 sec.	6.9 sec.		210.9 sec.	107.7 sec.
Overall Intersection LOS			A	A	A		D	C
SR 224 & Antinori Rd		T intersection	Unsignalized *	Unsignalized	Unsignalized		Unsignalized	Unsignalized
Eastbound Left	Major	Yield	A	A	A		A	A
Eastbound Thru	Major	Free	A	A	A		A	A
Westbound Thru	Major	Free	A	A	A		A	A
Westbound Right	Major	Free	A	A	A		A	A
Southbound Left	minor	Stop	A	A	B (13.9 sec.)		F	F
Southbound Right	minor	Stop	A	A	B (13.9 sec.)		F	B (11.5 sec.)
Average Intersection Delay sec/veh			1.1 sec.	1.2 sec.	1.2 sec.		141.5 sec.	108.0 sec.
Overall Intersection LOS			A	A	A		F	E
SR 224 & Red Mountain Rd		T intersection	Unsignalized	Unsignalized	Unsignalized		Unsignalized	
Eastbound Left	Major	Yield	A	A	A		A	
Eastbound Thru	Major	Free	A	A	A		A	
Westbound Thru	Major	Free	A	A	A		A	
Westbound Right	Major	Free	A	A	A		A	
Southbound Left	minor	Stop	A	A	B (11.0 sec.)		C (21.4 sec.)	
Southbound Right	minor	Stop	A	A	B (11.0 sec.)		C (21.4 sec.)	
Average Intersection Delay sec/veh			1.1 sec.	1.2 sec.	0.7 sec.		0.7 sec.	
Overall Intersection LOS			A	A	A		C	
SR 224 & Keene Rd		T intersection	Unsignalized	Unsignalized	Unsignalized		Unsignalized	
Eastbound Thru	Major	Free	A	A	A		A	
Eastbound Right	Major	Free	A	A	A		A	
Westbound Left	Major	Yield	A	A	A		B (11.1 sec.)	
Westbound Thru	Major	Free	A	A	A		A	
Northbound Left	minor	Stop	A	B (11.5 sec.)	C (16.8 sec.)		F	
Northbound Right	minor	Stop	A	A	B (11.0 sec.)		C (22.3 sec.)	
Average Intersection Delay sec/veh			2.2 sec.	2.4 sec.	1.8 sec.		7.1 sec.	
Overall Intersection LOS			A	A	A		C	
SR 224 & Ruppert Rd		T intersection	Unsignalized	Unsignalized	Unsignalized		Unsignalized	Unsignalized
Eastbound Left	Major	Yield	A	A	A		A	A
Eastbound Thru	Major	Free	A	A	A		A	A
Westbound Thru	Major	Free	A	A	A		A	A
Westbound Right	Major	Free	A	A	A		A	A
Southbound Left	minor	Stop	B (10.0 sec.)	B (11.7 sec.)	C (17.2 sec.)		F	F
Southbound Right	minor	Stop	B (10.0 sec.)	B (11.7 sec.)	C (17.2 sec.)		F	A
Average Intersection Delay sec/veh			1.8 sec.	2.1 sec.	1.8 sec.		8.2 sec.	7.5 sec.
Overall Intersection LOS			A	A	A		D	D

UTILITY INFRASTRUCTURE

Infrastructure feasibility analyses and preliminary concepts for water, wastewater, and fire suppression were developed in support of the Red Mountain Site Master Site Plan. This section summarizes the alternative analysis and presents preliminary cost opinions generated for each utility option.

Context: County Comprehensive Plan and the Washington State Growth Management Act

Generally (that is, unless certain specific conditions stated in law exist) the Washington State Growth Management Act (GMA) does not allow the extension of municipal infrastructure and service (e.g., water and sewer service) outside of a city's Urban Growth Area (UGA).

In general, cities are the units of local government most appropriate to provide urban governmental services. In general, it is not appropriate that urban governmental services be extended to or expanded in rural areas except in those limited circumstances shown to be necessary to protect basic public health and safety and the environment and when such services are financially supportable at rural densities and do not permit urban development (RCW 36.70A.110(4))

The Red Mountain AVA is approximately 4,600 acres in size with no part of it being within a city's corporate boundary or UGA. Figure 2-9 shows the AVA boundary and the GMA boundaries of the adjacent cities.

Approximately 3,600 acres of the AVA are zoned Agriculture in the Benton County Comprehensive Plan. The application of such zoning for long-term commercially productive agricultural land is required under GMA, and will be applied as well in the Red Mountain Master Site Plan. It is not anticipated that the 3,600 acres of agriculturally zoned land, which is where the Red Mountain AVA vineyards are located, will be included with a city's UGA. Approximately 15 to 20 acres of the land that is currently designated GMA Agriculture in the County Comprehensive Plan will be changed to a Master Planned Resort designation in the Red Mountain Master Site Plan, to accommodate the proposed Wine Village (see Section 6, Zoning). It is possible to designate 15 to 20 acres for a land use other than agriculture when it can be found that the soils and micro-climate in a particular location are marginal or are not suitable for long term productive agriculture.

The remaining approximately 1,030 acres of the AVA not designated as Agriculture are currently designated Rural Lands 5 Acre (one dwelling unit per five acres) in the County Comprehensive Plan. It is conceivable that in the future some or all of this rural acreage could be included within a city's UGA, contingent upon satisfying GMA provisions, including a rigorous demonstration by a city that a specific amount of the land is needed for inclusion within its UGA in order to accommodate a projected population growth, per the official growth projections from the Washington State Office of Financial Management.

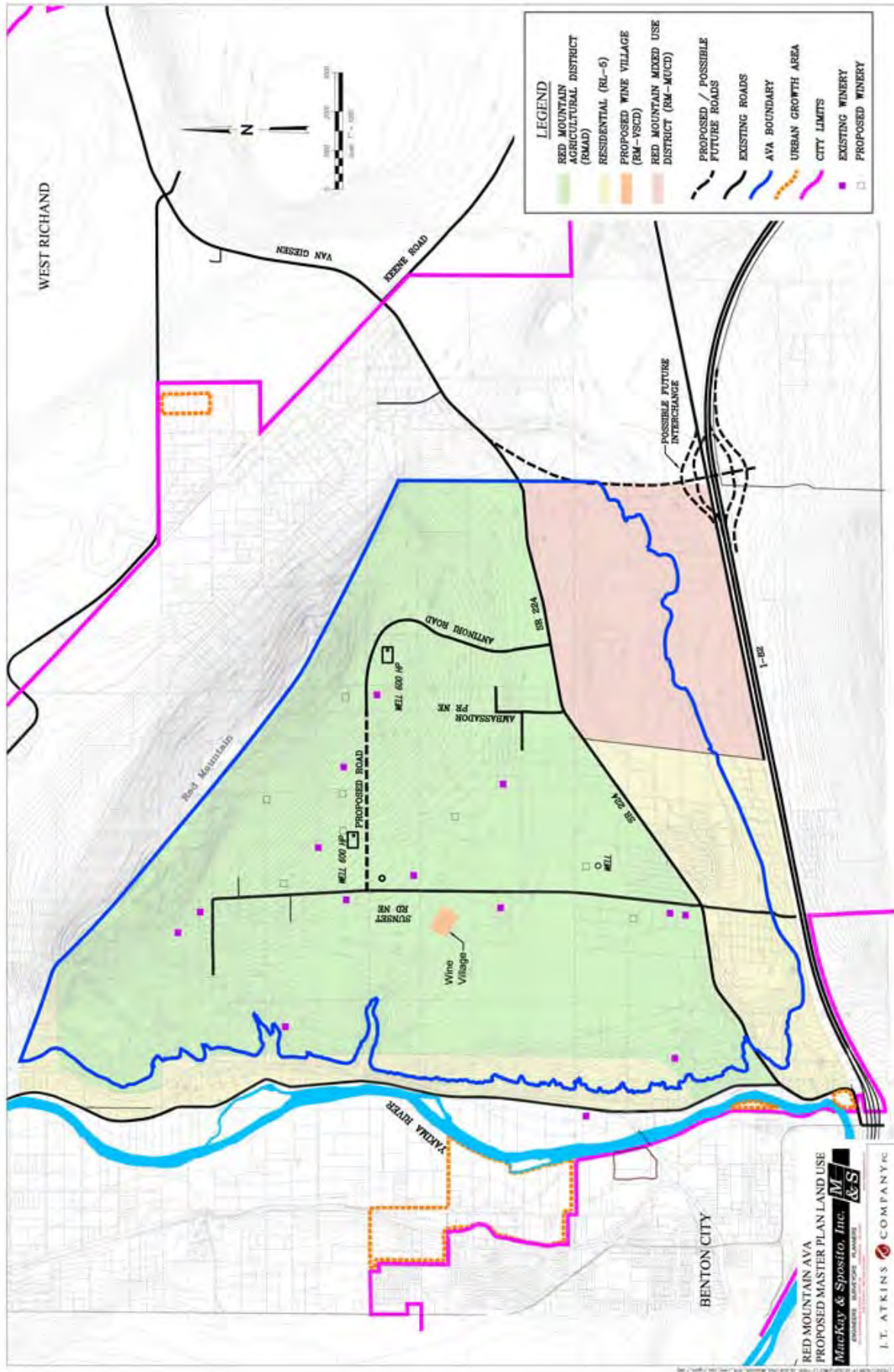


Figure 2-9. Land Use

Without disregard of the constraints imposed by GMA relative to the extension of municipal services outside of UGAs, the Red Mountain Master Site Plan proposes specific developments in all its land use designations (Agricultural, Wine Village Rural Lands Five and Visitor Serving) that will require solutions for domestic water, fire suppression, and wastewater disposal. As the Red Mountain AVA develops, additional wineries, tasting rooms, restaurants, boutique hotels, residences, and support service facilities will be constructed. These land uses all consume water and generate sanitary sewer wastewater in varying quantities.

There are three general options for utility service: municipal system, private regional system, and individual private on-site solutions. Any constructed water or sanitary sewer system must be built and maintained to Washington State Department of Ecology (WSDOE) and the Benton Franklin Health Department standards.

Municipal Utility Service to the Red Mountain AVA

There are options under GMA for provision of municipal utility service to the Red Mountain AVA from either West Richland or Benton City. Counties are permitted the extension of municipal infrastructure and services outside of UGAs if the service is for either a “Master Planned Resort” (36.70A.360 RCW) or a Major Industrial Development (36.70A.365 RCW).

A Master Planned Resort is defined as a self-contained and fully integrated planned unit development, in a setting of significant natural amenities, with primary focus on destination resort facilities consisting of short-term visitor accommodations associated with a range of developed on-site indoor or outdoor recreational facilities. Per RCW 36.70A.360 (2) utilities and services, including those related to sewer, water, storm water, security, fire suppression, and emergency medical, may be provided to a Master Planned Resort by outside services providers, including municipalities and special purpose districts, provided that all costs associated with service extension and capacity increase directly attributable to the Master Planned Resort are fully borne by the resort, and provided that the service extension to the Master Planned Resort designation from the boundary of the city cannot serve land uses that lie outside of the City UGA and the Master Planned Resort. A Major Industrial Development can be a natural resources-based industry requiring a location near agricultural land, forest land or mineral resource land upon which it is dependent (36.70A365(1)(b)).

Because the GMA provisions for Master Planned Resort clearly do not apply to a circumstance where the agricultural use is the principal recreational activity of the Master Planned Resort (RCW 36.70A.360(4)(c)), Benton County staff has determined that Master Planned Resort designation is not appropriate for the entire AVA (that is, including the lands designated Agriculture). Therefore, assuming that it would be feasible economically and for other reasons to do so, as a matter of State planning law the individual wineries will not be able to connect to a municipal wastewater system through the use of a Master Planned Resort overlay. Additionally, the very low development density of the Agricultural designation of the AVA raises questions relative to the cost effectiveness of serving the Agricultural designation with municipal service.

Select areas of the AVA where higher density is proposed, such as the Wine Village and Visitor Serving Area, may, however, be eligible under GMA to become designated as a Master Planned

Resort. If these areas were successfully designated as such, the adjacent cities could provide utility service to these areas of the AVA. The proposed land use designations within the AVA are shown in Figure 2-9. The Tourist Serving Area is located at the southeast corner of the AVA between Interstate 82 and SR 224. This area should undergo further site planning to provide assurances that this area serves the tourism needs of the Red Mountain AVA and does not promote residential or commercial sprawl.

In preliminary discussions with the City of West Richland, staff indicated that there is domestic water availability and wastewater treatment plant capacity to serve the Tourist Serving and Wine Village properties, but that service to these areas would depend on future UGA decisions, which are determined in large measure by provisions within GMA. Staff indicated that under current water and sewer fee structures, it may not be feasible for the City to provide urban services to areas within the AVA even if the users paid the entire cost of extending services. Under the Master Planned Resort designation, the Wine Village and the 3,600 acres in the Agricultural designation are anticipated to remain in the unincorporated County for the foreseeable future. If the City of West Richland were to extend service to the Tourist Serving Area under the provisions of a Master Planned Resort, it would receive no retail sales tax from the service area. The value of sales tax revenue is built into the City fee structure; therefore, it might not be economically feasible for the City of West Richland to provide service to the Tourist Serving area without a revenue-sharing agreement with the County.⁹

Benton City's wastewater treatment system is close to the AVA as well, specifically to the Wine Village. The closest route for sanitary service would be across an abandoned train bridge over the Yakima River, and then across private property. Water service to the AVA from Benton City would either require a river crossing or long pipe run as well. It may be difficult to obtain easements across the old railroad bridge and private property. The City, however, is currently proceeding with permitting and grant acquisition to extend its water and sewer across the river on the SR 225 bridge at the Benton City interchange. As with the West Richland option for using the Master Planned Resort provisions to extend service outside of its UGA, Benton City's sales tax revenue is built into the City sanitary sewer fee structure. The City would not receive sales tax revenue from businesses located outside of the city limits without a revenue sharing agreement with the County. Benton City staff has indicated that the existing wastewater treatment plant has adequate capacity to serve the Wine Village.

Ultimately, the cities' decision to provide utility service areas within the AVA will depend on their urban growth boundaries and decisions by their respective city councils, the Benton County Planning Department, and Benton County Commissioners. The merits of municipal service to various land areas in the AVA are discussed further below.

Irrigation Water

Irrigation water is used throughout the AVA for vineyard irrigation. Currently, the source for this water is groundwater. A significant portion of the AVA is within the boundaries of the Kennewick Irrigation District (KID). KID has prepared an Irrigation Master Plan for Red Mountain AVA and has identified a water right that can be used as the irrigation source. This proposed irrigation system would obtain water from the Yakima River near the AVA and pump

raw irrigation water into and throughout the AVA. With the introduction of KID irrigation water to the AVA, fewer properties will depend on groundwater for irrigation. This could free up water right capacity currently used for irrigation to be used for other uses such as commercial, retail, and wine tasting rooms. This water right transfer option is discussed further in the following section. Figure 2-10 shows the proposed KID irrigation pipe distribution system.

Domestic Water

There are numerous current and proposed uses of domestic water within the AVA such as kitchens, restrooms, residential uses, winery process water, and other commercial uses. Each facility on Red Mountain has four options for obtaining domestic water: exempt wells, permitted wells, municipal services, and a regional private water purveyor.

Sources of Water

Exempt Wells

Currently, many of the existing properties on Red Mountain use exempt wells for domestic water, irrigation, and winery process water. Exempt wells are provided for in the state law; RCW 90.44.050 provides the limitations of exempt wells as follows:

There are four types of groundwater uses exempt from the state water-right permitting requirements:

- *Providing water for livestock (no gallon per day limit or acre restriction).*
- *Watering a non-commercial lawn or garden one-half acre in size or less (no gallon per day limit).*
- *Providing water for a single home or groups of homes (limited to 5,000 gallons per day (gpd)).*
- *Providing water for industrial purposes, including irrigation (limited to 5,000 gpd but no acre limit).*

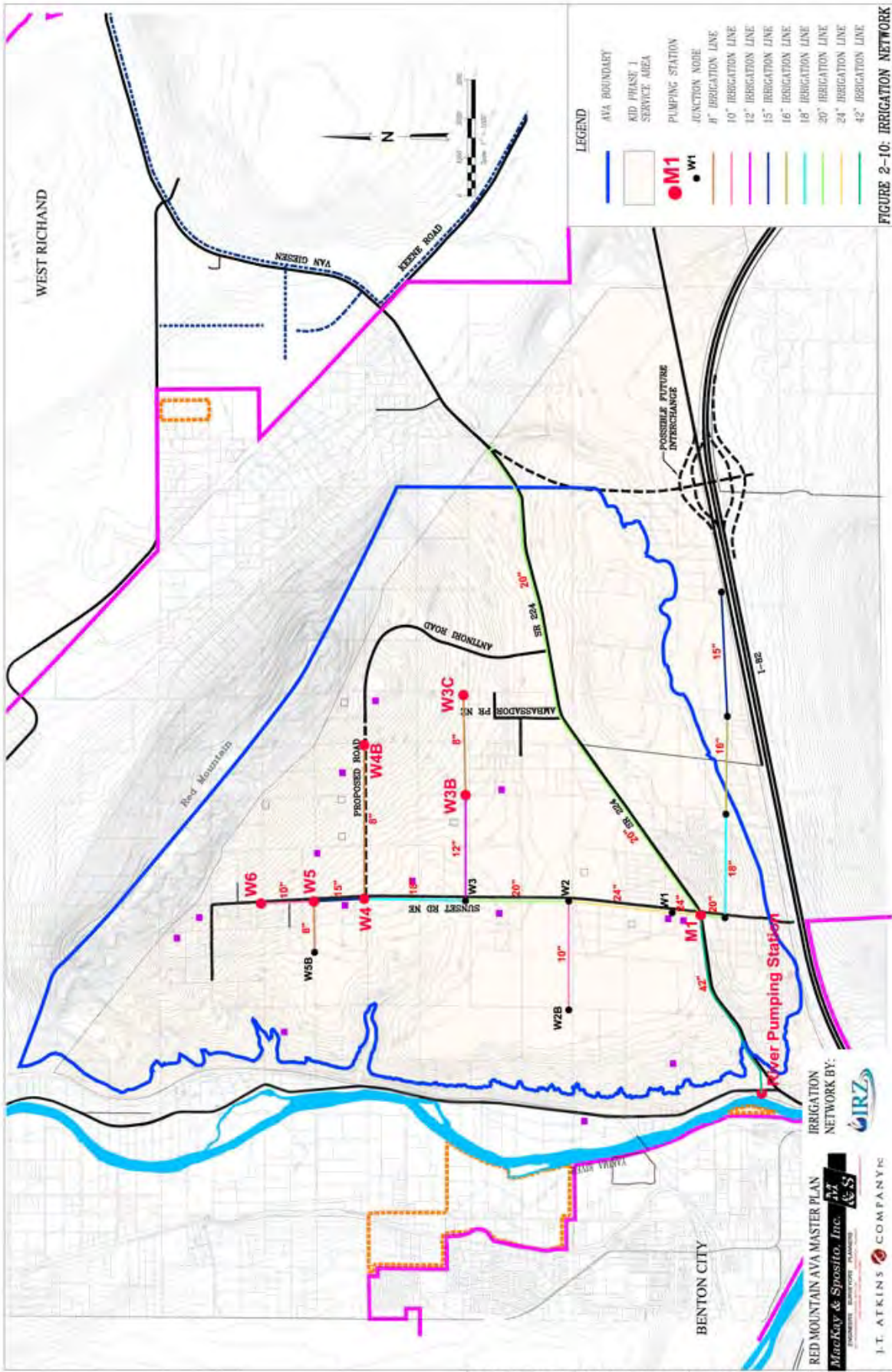


Figure 2-10. Irrigation Network

Under this exempt water right, up to 5,000 gpd can be used for vineyard irrigation and winery operations. Exempt well water could not be used for the commercial/ retail/ hotel uses proposed within the AVA.

For the foreseeable future, the residents, land owners, and business owners on Red Mountain will continue to rely on high-quality groundwater for domestic and other uses. It is recommended that all well owners install Reduced Pressure Backflow Assemblies (RPBA) on the well pump discharge piping to prevent any water or contamination from flowing backwards through the well and into the groundwater. The use of these simple devices will help protect groundwater quality.

Permitted Wells

Non-exempt ground water withdrawals require a water right permit or certificate. A new water right requires a water right application which will be reviewed per the following criteria:

- The water will be put to beneficial use
- There will be no impairment (harmful effects) to existing rights
- Water is available
- The water use will be in the public interest.

New water rights in the State of Washington are extremely difficult to obtain, and according to conversations with staff from the WSDOE's Water Resources Group, a new water right on Red Mountain will not be possible to secure at this time, or any time in the foreseeable future.¹⁰

Municipal Services

Because of GMA restrictions and the low-density of development within the AVA, municipal water supply is not likely to be a viable option for the general properties within the AVA. Through the use of the Master Planned Resort designation, the Wine Village property might be able to receive domestic water from either West Richland or Benton City. As previously stated, municipal service from either City would be unlikely without an agreement between the City and County to share retail sales tax.

A potential new interchange from Interstate 82 directly into the Red Mountain AVA area at Highway 224 is proposed to provide additional access to the City of West Richland. The interchange would also provide beneficial access to the Red Mountain AVA and surrounding communities. This interchange has been labeled the Interstate 82 Red Mountain Interchange. WSDOT is in the process of preparing an interchange justification report for the federal government concerning this proposed interchange. This report will analyze and evaluate the need for and feasibility of a new interchange on the federal interstate system. This possible future interchange would provide improved access to the Red Mountain AVA and also allow for faster response times for emergency services to areas south of the freeway and for the utility crews that service the Red Mountain area.

With the construction of the Red Mountain Interchange, a Tourist Serving Area could be considered for inclusion within the West Richland UGA. If the designated area were annexed, it

would be possible to extend city services into the area. Prior to annexation, dense development of the Tourist Serving Area is unlikely except through the use of the Master Planned Resort provisions of the GMA. If this did occur, it could generate additional traffic demand to hasten the justification for construction of the Interstate 82 Red Mountain interchange.

Regional Private Water System

Another option for domestic water service to properties within the AVA is a private water system. The most viable source for water supply to a private system serving the Wine Village is to change one or more of the existing perfected water rights within the AVA. With the introduction of KID water to the AVA, some of the existing well water rights might become available for a private water system. WSDOE might consider the following changes to an existing water right:

1. Place of use
2. Point of diversion or withdrawal
3. Additional point of diversion or withdrawal
4. Purpose of use
5. Season of use

There are several aspects of water rights that cannot be changed:

1. Instantaneous withdrawal rate or annual quantity
2. The status of the water right (perfected or unperfected)
3. Whether the water right is from a ground water or surface water right

Additionally, a water right that has not been perfected (a water permit) cannot be changed. Therefore, until a water right is perfected, the place of use or purpose of use cannot be changed. Only perfected water rights on Red Mountain will be available for potential sources of water for a private water system serving the Wine Village or other properties. The Washington State Department of Natural Resources (WSDNR) has several well water permits in the process of being perfected. If WSDNR receives irrigation water for its properties and is able to perfect their existing water permits, this water may be available for a private water system source. WSDNR has water permits for approximately 965 acre-feet (annual) and approximately 3,200 gpm maximum peak withdrawal. This is a substantial water permit that could be used to provide potable water to the Wine Village and Tourist Serving area. It is likely that only a fraction of this water right would be required for the potable water needs of these areas.

The development of a private water system would require Washington State Department of Health (WSDOH) approval and the drafting and approval of a Small Water System Management Program (SWSMP) or a full Water Plan. Such a water system would need to be built to WSDOH

standards, have water quality control measures, maintain a reliable supply, and provide adequate water for all ranges of demand.

Water Demands

Water demands and the ability to meet them vary by type of use within the AVA, as described below.

Wine Village

The Master Site Plan includes a Wine Village consisting of retail shops, a small hotel or hotels or inns (totaling 50 rooms), and restaurants. One possible location for the proposed Wine Village is on KID property, along Sunset Road. Potential sources of water for uses within the Wine Village are municipal, well, or regional water systems. The estimated average water demand for the Wine Village is 15,000 gpd (see Table 2-7). This is more than could be provided with an exempt well, but the water demand for the Wine Village could be provided through the change of use of one of the perfected water rights on Red Mountain.¹¹ With the introduction of KID water to the AVA, perfected water rights could be made available to change use from irrigation to commercial use. Certain aspects of perfected water rights could be changed so that these water rights could be used in the Wine Village for commercial / retail / residential use.

Table 2-7: Estimated average daily Wine Village water demand

Structure	Units	1,000 sq ft	Equivalent Residential Unit ERUs Per 1,000 sq ft	gpd
General store w/ hardware	1	4.5	0.3	338
Grocery/ deli	1	3.0	1.0	750
Retail / gift shop	2	3.0	0.3	450
Four star restaurant (per 10 seats)	5	3.0	1	1,250
Family restaurant (per 10 seats)	5	3.0	1	1,250
Coffee shop (per 10 seats)	1.6	3.0	1	400
Four star inn	20	12.0	0.6	3,000
Art gallery	1	3.0	0.3	225
Artisan studio	1	6.0	0.3	450
Bicycle rental	1	1.5	1.0	375
Residential condo	10	15.0	0.7	1,750
Interpretive center	1	3.0	0.3	225
Visitor restroom	400	1.0	0.025	2,500
Total (gpd)				12,963
Average Demand (gpm)				9.0
Peak Day Demand (gpm)				36

Additionally, an independent private water purveyor with perfected water rights and an approved water system could provide water to the Wine Village. For example, there is an existing private water purveyor, Harrison Water Company/Kiona, LLC, that provides domestic water to existing residential properties near SR 224.

The Wine Village is located approximately 2 miles from Benton City's water system and approximately 4 miles from West Richland's water system. Because of the low number of users and the cost of infrastructure construction (versus the cost of using perfected water rights), it is unlikely that municipal services will be extended to the Wine Village from either adjacent community.

Rural Lands Five Area

The Rural Lands Five (RL5) area is located between SR 224 and Interstate 82 in the Red Mountain Master Site Plan, and represents an area of more intense development than the rest of the Red Mountain AVA. The Rural Lands Five Acre zoning district for this designation allows a density of one dwelling per five acres and allows a wide range of uses, including: residential, agriculture, wineries under 3000 square feet, and with the approval of a conditional use permit: agricultural markets, wineries over 3000 sq. feet, ag related industries, reception facilities under 200 attendees, etc.

Further site planning in an area north of the proposed I-82 interchange in the Rural Lands Five area could contain a Tourist Serving Area to facilitate visitor facilities including commercial, indoor and outdoor recreation, vineyard and winery related industrial, overnight accommodations, residential, and other tourism related uses. A Tourist Serving designation in this area would also provide an important Red Mountain AVA "front door" area as a cohesive, coordinated development that reinforces the Red Mountain AVA vision. Depending upon the level of services required by the developments, municipal water and sewer services may be necessary. This area is closer to West Richland's infrastructure than to Benton City, but it could be served by either jurisdiction depending on future urban growth boundaries. With the construction of the proposed Red Mountain interchange, this area could be considered for annexation into West Richland and, thus, utility services would be provided by West Richland under this scenario.

This area will not likely develop to the higher density uses until it is annexed into one of the adjacent cities or unless it is developed as a Master Planned Resort under the County. A Master Planned Resort designation could allow for the extension of municipal services to the Tourist Serving Area prior to its inclusion within a UGA, whereupon all or a portion of it could be annexed to a city if a city's UGA were to expand in that direction consistent with the provisions of GMA.

Winery / Tasting Rooms

There are approximately 13 existing wineries in the Red Mountain AVA. These wineries use either exempt wells or permitted wells for their irrigation, processing, kitchen facilities, and associated uses. Estimated water demand for a 20,000 case/year winery is summarized in Tables 2-8 and 2-9. The estimated demand is broken into process water and potable water use.

Month	Annual Water Use (%)	Average Monthly Water Use (gal)	Average Working Day Water Use (gpd)	Max Work Day Use (gpd)
January	7	16,660	641	1,282
February	7	16,660	641	1,282
March	5	11,900	458	915
April	2	4,760	183	366
May	2	4,760	183	366
June	2	4,760	183	366
July	2	4,760	183	366
August	7	16,660	641	1,282
September	15	35,700	1,373	2,746
October	18	42,840	1,648	3,295
November	18	42,840	1,648	3,295
December	15	35,700	1,373	2,746
Total	100	238,000		

Variables Used in the Calculation of Table 2-8	Amount	Unit
Total number of acres planted	85	Acres
Proposed yield	3.5	tons/acre
Wastewater per gal wine produced	5	gal/gal
Gallons of wine/ton of grapes	160	gal/ton
Cases of wine produced	20,021	Cases
Work days per month	26	Days/month
Work hours per work day	10	Hours/day
Max work day peak factor	2	

Use	Parameter	Daily Water Use (gpd)
Winery process water ^b	Peak day, Oct.	3,295
Tasting room /visitors ^c	200 visitors/day	1,200
Employees	8 full time	200
Total		4,695

^aPeak month water consumption for a 20,000 case/year winery
^bWinery process water peak month obtained from Table 2-8, month of October
^cPeak day, holiday weekend

With the introduction of KID irrigation water to the AVA, the vineyard and winery operators will not need to use their well water for crop irrigation. The exempt wells with limit of 5,000 gpd should be adequate to supply the operational water needs for most moderate sized vineyard or winery operations with access to KID water.

Since there are established, viable, low-cost solutions for winery potable water demands, a regional potable water system alternative was not investigated. If a group of property owners were interested in a potable water delivery system, the owners could combine resources and form a small water company to operate, maintain, and provide distribution of potable water. Analysis of such a system is beyond the scope of this study.

Residential

Residential demands within the AVA could be supplied from exempt wells, permitted wells, or a private water purveyor. With the low level of development within the agricultural area of the AVA, a municipal source is not necessary to supply the domestic water demand.

Residential demand is estimated at approximately 250 gpd average with a peak use of approximately 800 gpd (this excludes irrigation). This flow is well under the allowable 5,000 gpd limit for an exempt well for residential water use.

In the existing residential areas within the AVA, potable water is either obtained from wells or from a private water purveyor (Harrison Water Co. / Kiona, LLC). Since there are viable, low-cost, established solutions for residential potable water demands, a regional potable water system alternative was not investigated for the AVA.

Fire Suppression

In terms of protecting their investment, fire protection is a critical component for any property owner within the AVA. The wineries on Red Mountain represent a significant investment and typically these systems are protected by a fire suppression system. There is no regional high-volume water system for fire suppression within the AVA except for the Harrison Water Co. /Kiona, LLC system, which serves the existing residential communities within portions of the AVA near Highway 224. Each of the wineries on Red Mountain has installed private fire suppression systems consisting of tanks, water storage ponds, pumps, and distribution systems. These systems typically cost between \$150,000 and \$200,000 per winery. With individual costs this high, it is possible to realize savings with a regional system, and as such one of the greatest driving factors for a regional fire suppression system is the monetary benefit.

The AVA is served by two local fire districts, Benton Fire District #4 and Benton Fire District #2. Benton Fire District #2 services Benton City east to Sunset Road in the AVA. Fire District #4 services West Richland west to Sunset Road. Another rationale for a regional fire suppression system is to provide a reliable, accessible, and standardized system to which these fire districts could connect as a means to effectively fight fires on Red Mountain. The existing individual fire suppression systems do not provide firefighting capabilities to Red Mountain as a whole, and as such the fire districts could provide better fire suppression service to Red Mountain if a regional system were in place.

To analyze a potential regional fire suppression system, a subcommittee was formed to review the system parameters, water sources, flow criteria, and other system features. Based on input from the Benton Fire District #4, WSDNR, KID, and comments from the AVA Master Site Plan Advisory Team, three regional fire suppression alternatives were analyzed. All alternatives assume a piped distribution fire suppression system installed parallel to the proposed KID pipe system with a new reservoir to supply water for the system. Water to fill the reservoir would likely be obtained from the KID irrigation system during the irrigation season and required makeup water in the winter would be provided from WSDNR or some other permitted water source. Required makeup water would occur because of evaporation loss and reservoir use during a fire. KID water could be used for fire suppression water without further permitting or water right changes.

System alternatives included a range of fire suppression system capacities and service areas. All proposed system alternatives provide a minimum flow rate of 1,500 gallons per minute (gpm) and all alternatives provide coverage to the vineyard and winery areas of the AVA Master Site Plan. The following alternatives were evaluated:

- Alternative 1a: Coverage includes the agricultural area of the AVA Master Site Plan. Fire suppression flow of 1,500 gpm [adequate for wineries up to 11,000 – 30,000 sq-ft (sprinklered)]
- Alternative 1b: Coverage includes the agricultural area of the AVA Master Site Plan. Fire suppression flow of 3,000 gpm [adequate for wineries up to 11,000 – 30,000 sq-ft (without sprinklers) or larger wineries with sprinklers]
- Alternative 2: Fire suppression flow of 3,000 gpm to each winery and delivers 3,000 gpm to the Tourist Serving Area

The International Fire Code was used as the design basis for the fire system alternatives. The fire districts recommend that fire suppression systems be designed and built to the International Fire Code. As a result, for the analysis it was assumed that only one winery fire would occur at once. The details of each alternative follow.

Alternative 1a

Alternative 1a includes the construction of a 300,000-gallon open reservoir, segments of 12-inch-diameter water pipes, and a distribution network of 8-inch-diameter pipes. This pipe network can provide 1,500 gpm for 3 hours. Based on the International Fire Code, this flow is adequate for an 11,000 sq-ft Type 5B building with sprinklers or up to a 30,000 sq-ft Type IV or Type 5A building with sprinklers. This alternative provides adequate fire hydrant flow as well as adequate flow to buildings without fire sprinklers. This is the minimum recommended system for providing fire suppression coverage to the AVA (see Figure 2-11).

Alternative 1b

Alternative 1b builds on Alternative 1a by doubling the size of the reservoir, adding 16-inch-diameter pipe to the system, and including more 12-inch-diameter water mains. This pipe

network can provide 3,000 gpm for 3 hours. Based on the International Fire Code, this flow is adequate for an 11,000 sq-ft Type 5B building without sprinklers or up to a 30,000 sq-ft Type IV or Type 5A building without sprinklers. Additionally, this flow allows for a 47,000 sq-ft Type 5B building with sprinklers or up to an 116,000 sq-ft Type IV or Type 5A building with sprinklers. This alternative provides additional fire hydrant flow for fighting wild fires and structure fires as well as adequate flow to buildings without fire sprinklers. This alternative may provide fire suppression for buildings larger than are proposed on Red Mountain; the property owners would need to decide what the typical structure size will be and therefore how much fire suppression flow is necessary. It may be determined that this alternative provides more fire suppression coverage than is required, and as such may not warrant the added expense (see Figure 2-12.)

Alternative 2

Alternative 2 builds on Alternative 1b by extending 12-inch-diameter water mains into the Tourist Serving Area. This system would provide 3,000 gpm for 3 hours to all areas of the Master Site Plan. The purpose of extending fire suppression to the Tourist Serving area would be to provide fire suppression to facilities in this area that may develop prior to the extension of municipal services from West Richland or Benton City. The AVA property owners and land owners within the Tourist Serving area would need to weigh the benefits (such as earlier development, reduced insurance premiums, and improved security) against the cost of extending fire suppression service to the area (approximately \$500,000) (see Figure 2-13).

Summary

Based on the analysis performed, a regional fire suppression solution is viable given broad participation by multiple winery owners. An additional feasibility study or survey should be undertaken to evaluate interest and potential participation for a regional solution. If interest is high, project funding through a local improvement district could be initiated.

Preliminary estimated costs for each alternative are summarized in Table 2-10.

Table 2-10: Preliminary cost opinions, fire suppression system							
Alternative	Option Description	Estimated Construction Cost (\$)	Construction Contingency (10%) (\$)	Engineering and Administration (20%) (\$)	Right-of-Way Acquisition (5%) (\$)	Total Estimated Cost (\$)	Cost per Winery^a (\$)
1a	8" Fire system, delivery, 1,000 gpm	1,938,533	193,853	387,707	96,927	2,617,020	65,425

Table 2-10: Preliminary cost opinions, fire suppression system							
Alternative	Option Description	Estimated Construction Cost (\$)	Construction Contingency (10%) (\$)	Engineering and Administration (20%) (\$)	Right-of-Way Acquisition (5%) (\$)	Total Estimated Cost (\$)	Cost per Winery^a (\$)
1b	8" / 12" Fire system, 1,500 gpm	2,341,339	234,134	468,268	117,067	3,160,808	79,020
1c	12" / 16" Fire system, 3,000 gpm	3,180,183	318,018	636,037	159,009	4,293,247	107,331
2 ^b	12" / 16" Fire system, 3,000 gpm + service to Tourist Service Area	3,497,477	349,748	699,495	174,874	4,721,594	N/A

^aAssumes 100% Participation from the estimated 40 total future wineries within the AVA.
^bDoes not include cost to provide domestic water to the Tourist Serving area.

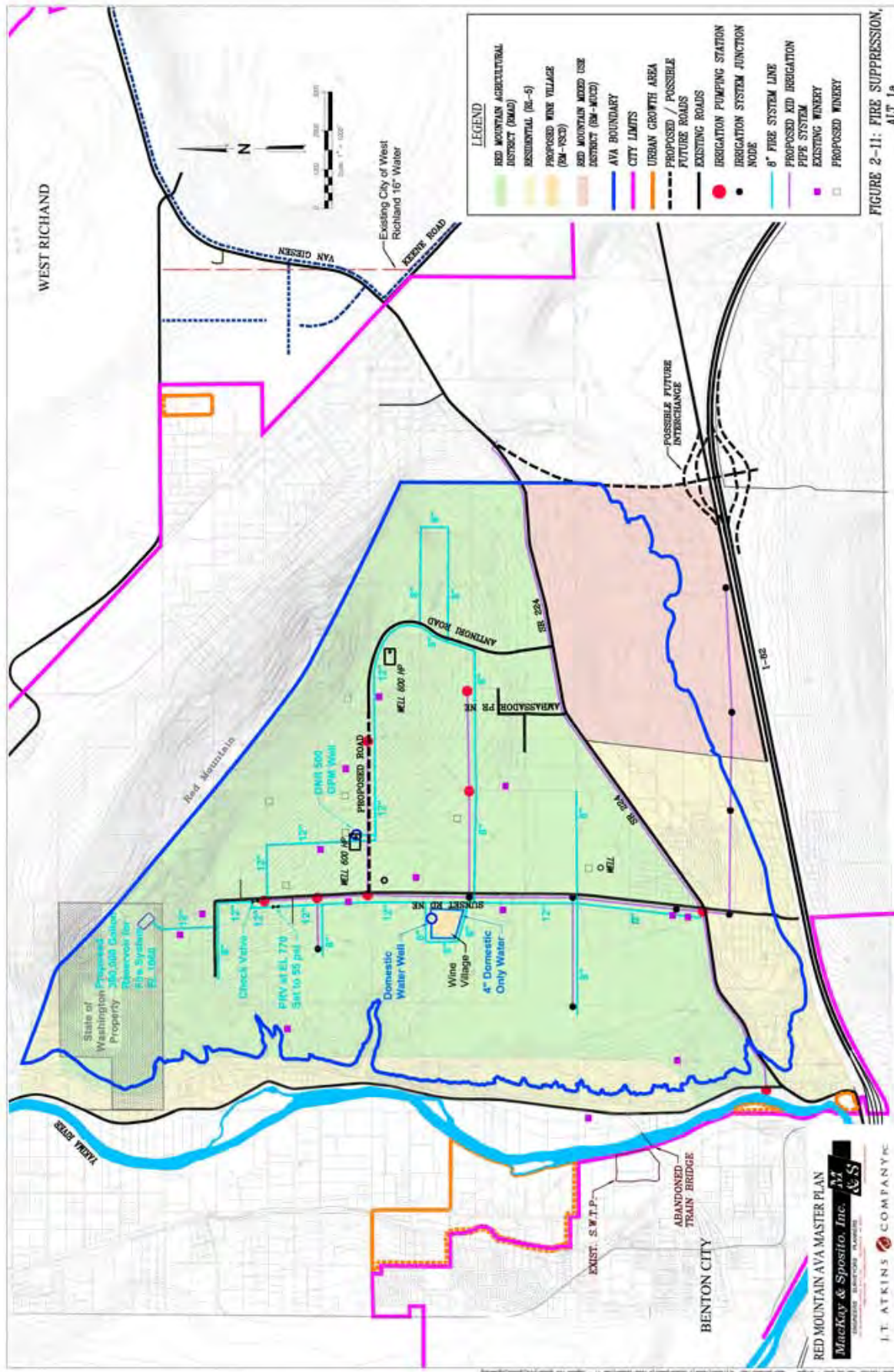


FIGURE 2-11: FIRE SUPPRESSION, ALT 1a

Figure 2-11. Fire Suppression, Alt 1a

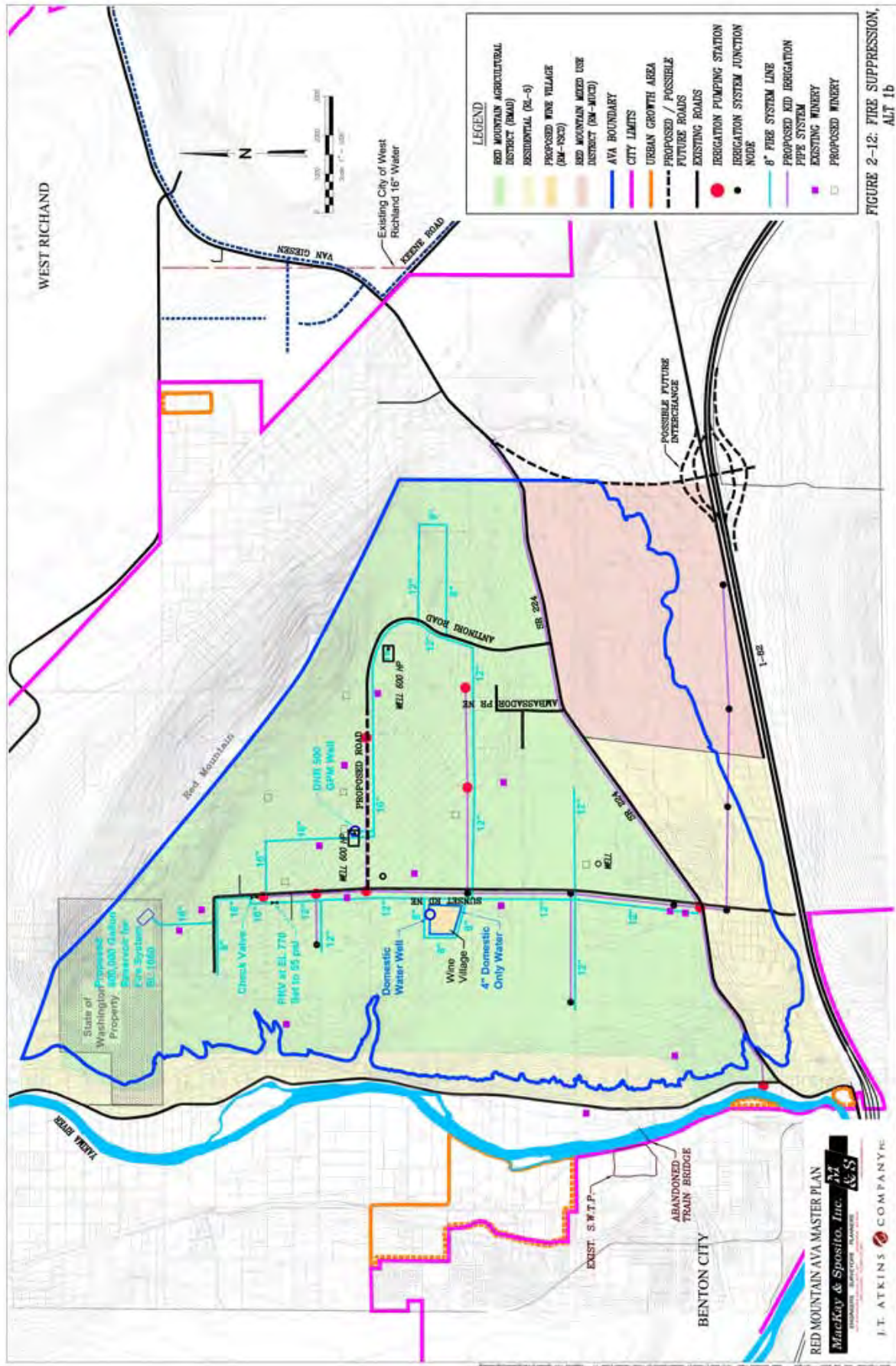


Figure 2-12. Fire Suppression, Alt 1b

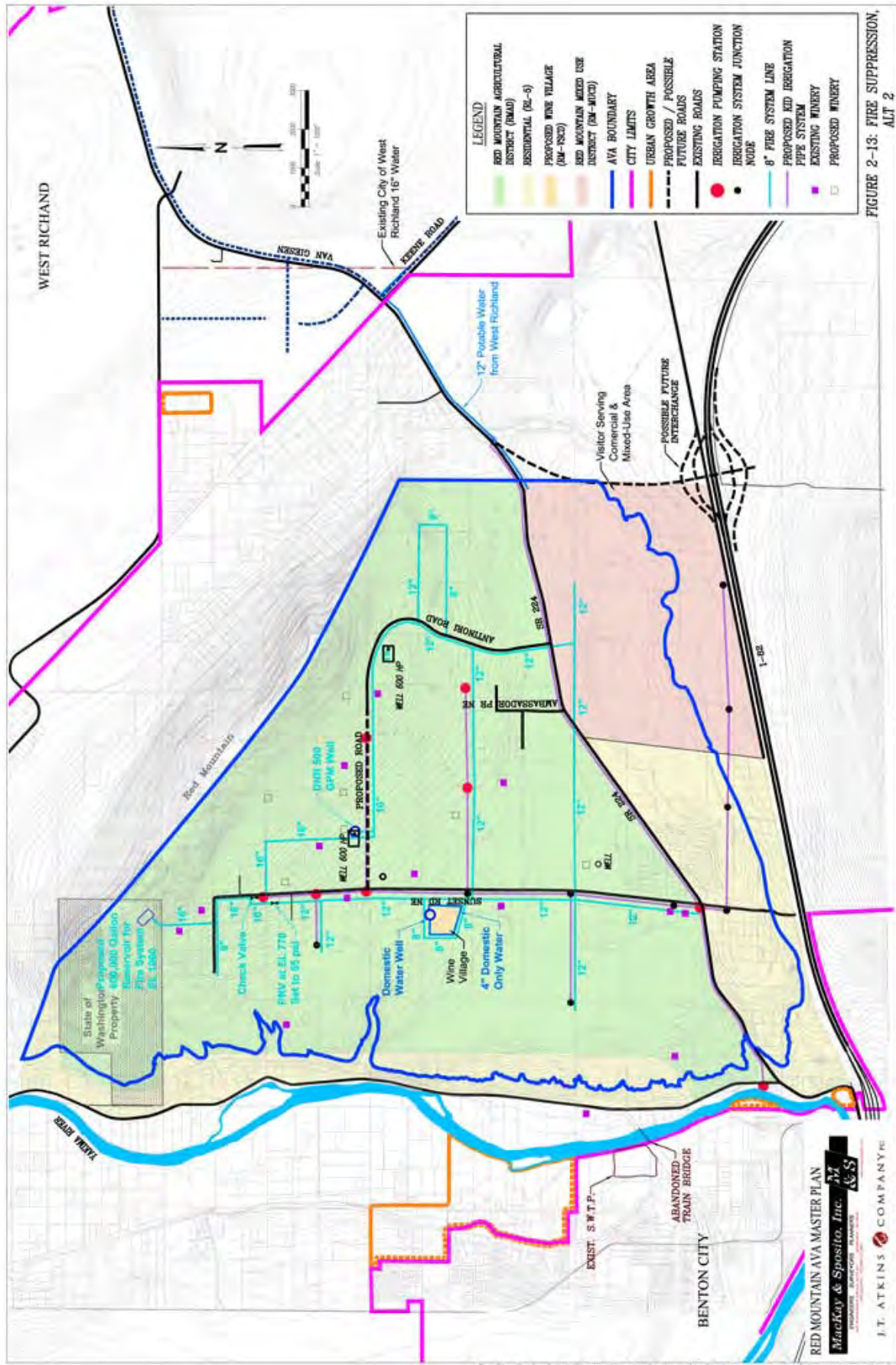


FIGURE 2-13. FIRE SUPPRESSION, ALT 2

Figure 2-13. Fire Suppression, Alt 2

Sanitary Wastewater Collection Alternatives

There are two primary sources of sanitary sewer waste within the Red Mountain AVA, domestic waste and industrial waste.

Domestic Wastewater

Domestic waste is generated from the homes, tasting rooms, kitchen facilities, restaurants and overnight facilities. Domestic wastewater contains pathogens and thus some level of treatment is required before it can be released to the natural environment. In an urban setting, domestic waste is collected by a City or special service district municipal system and conveyed to a treatment plant where it is processed for disposal to a local water body. In rural settings, domestic wastewater is typically collected, routed to an on-site septic tank, and discharged on-site to a drainfield.

Process Wastewater

The other source of wastewater developed within the AVA is wine processing wastewater. Wine processing wastewater is considered industrial waste. Industrial wastewater typically does not contain pathogens.

Wineries generate several times as much wastewater as they produce wine, the ratio is estimated to be in the range of twice to ten times as much wastewater as wine. The strength of the wastewater ranges from a few hundred milligrams per liter (mg/L) of BOD (a measure of the organic content and the potential impact on water quality) to tens of thousands, with most [winery] wastewater in the range of one to ten thousand milligrams per liter. For comparison, the water in a stream is unlikely to meet the water quality criterion for dissolved oxygen if the BOD is much over 10 mg/L and domestic wastewater, before treatment, is typically 250 mg/L and in the range of 5 to 30 mg/L after successful treatment. Groundwater is even more sensitive to addition of oxygen consuming substances, since there are no photosynthetic organisms to replace oxygen and exchange with the atmosphere is severely restricted.¹²

Because of the high concentration of organic matter in industrial wastewater from wine production, discharge of industrial wastes to a municipal system or to the ground requires a discharge permit. With proper pre-treatment, industrial wastewater may be land applied, discharged to a municipal system, or stored in lagoons or tanks and re-used as supplemental irrigation water. These alternatives are evaluated below.

The process of converting grapes to wine creates sanitary wastewater during several steps of the process. The sources of wastewater during wine production are as follows:

- Significant sources of wastewater in wine production
- Machinery washing

- Floor washing
- Must production process (Must is the pulp of grape skins used to make red wine; the must production process involves the harvesting the grapes and releasing the juice from the individual fruits into the tanks)
- Barrel or tank pre-washing prior to the fermentation process
- Cleaning of tanks or barrels after the wine has been removed
- Other sources of wastewater during wine production
- Fermentation process
- Fermentation vessels post-washing
- Storage tanks pre-washing
- Washing of transportation pumps
- Storage tanks post-washing

Wastewater production from winery processes is typically expressed as a function of the product produced; gallons of wastewater per case of wine produced is a good matrix to use. Wastewater production from wineries varies tremendously based on several factors including scale of operation, scarcity of water, commitment to water conservation, special winery equipment, methods of swelling and rinsing new barrels for cellar use, use of dry methods for cleaning (vacuum, compressed air, etc)¹³, and the extent to which lees filtration is used. The primary determinate of wastewater production is the scale of the operation. Table 2-11 summarizes the typical range of winery process wastewater production.

Production Capacity (cases/year)	Water Use Per Case of Wine (gal/case)	Process Wastewater Production (gal/case)	Process Wastewater (gal/gal)<u>a</u>
> 1,000,000	10-14	8 - 10	3.4 – 4.2
200,000 – 1,000,000	14-16	12 - 14	5.0 – 5.9
50,000 – 200,000	16-18	14 - 18	5.9 – 7.6
< 50,000	18-25	16 - 23	6.7 – 9.7

^aOne case of wine is 12-750 ml bottles or 2.38 gallons.

Sanitary Wastewater Disposal Alternatives

Several alternatives exist for providing sanitary sewer service to the AVA for both the domestic and industrial wastewater streams. This section summarizes the alternative analysis performed for each wastewater stream.

Municipal Wastewater System

See *County Growth Management Area (GMA) Issues* at the beginning of this section for a discussion of how GMA applies to the extension of municipal infrastructure and service.

Ultimately, the cities' decision to serve select areas within the AVA (Wine Village and Tourist Serving area) will depend on the considerations and decisions that land owners, Benton County and the Cities make regarding: the degree to which they want to facilitate the natural pace of build-out of the Red Mountain Master Site Plan; the options available to them for cost effective development and service to those areas; and the consistency of the options with the provisions of state planning law. Extensions of UGAs under GMA are determined by the pace of population growth over time. In the shorter term, because extensions of UGAs and annexation may be problematic relative to the requirements of GMA, the use of the Master Planned Resort designation would allow for development via the extension of municipal services to the Tourist Serving area, and the Wine Village, if needed.

Domestic Wastewater

Provision of Washington State's GMA does not allow the extension of municipal services to areas outside of the designated UGAs of cities except for Master Planned Resorts and Industrial developments. No part of the AVA is currently within a designated urban growth area. The 3,600 acres of the AVA that are currently designated and zoned for commercial agriculture are unlikely to be included within an urban growth area for the foreseeable future. As the cities of Benton City and West Richland experience population growth into the future there are provisions and criteria within GMA that would enable those portions of the AVA not zoned for agriculture to be included in an urban growth area if the land is needed to accommodate population growth; currently additional lands are not needed. Consequently, a municipal service system is not a viable alternative for domestic wastewater collection.

Industrial Wastewater

Generally, because the Agricultural designation of the AVA will remain outside of a UGA or Master Planned Resort, the wineries within it will not be able to connect to a municipal sanitary sewer system for industrial wastewater collection. Additionally, municipal wastewater plants cannot receive such wastewater without it being first pre-treated. As discussed in *County Growth Management Area (GMA) Issues* at the beginning of this Infrastructure section, RCW 36.70A.365 (1)(b) raises a possibility that an industrial wastewater pre-treatment plant located within or outside the AVA could be designated as a Major Industrial Development under RCW 36.70A.365 and connected to a municipal wastewater plant. According to County planning staff, preliminary conversations with staff of the State office for GMA on this possibility were not discouraging.

Municipal System Alternatives

Several alternative configurations have been developed for municipal collection systems serving the Wine Village and future Tourist Serving area development. The alternatives include

infrastructure as required to connect to Benton City and West Richland’s sanitary collection system. Table 2-12 summarizes the features and construction cost opinions for each of the alternatives. Each alternative are shown in Figures 2-14 through 2-18.

Table 2-12: Preliminary cost opinions, municipal sanitary collection system alternatives						
Alternative	Option Description	Estimated Construction Cost (\$)	Construction Contingency (10%) (\$)	Engineering and Administration (20%) (\$)	Right-of-Way Acquisition (5%) (\$)	Total Estimated Cost (\$)
1	Wine Village to Benton City WWTP (Gravity)	736,180	73,618	147,236	36,809	993,843
2	Wine Village to Benton City WWTP (Pressure)	602,168	60,217	120,434	30,108	812,927
3	Tourist Serving Area to West Richland WWTP	1,425,470	142,547	285,094	71,273	1,924,384
4	Tourist Serving Area and Wine Village to West Richland WWTP	1,696,090	169,609	339,218	84,804	2,289,721
5	Tourist Serving Area to Benton City and Tourist Serving Area to West Richland WWTPs ^a	2,161,650	216,165	432,330	108,082	2,918,227
^a This alternative is simply the combination of Alternative 1 and Alternative 3						

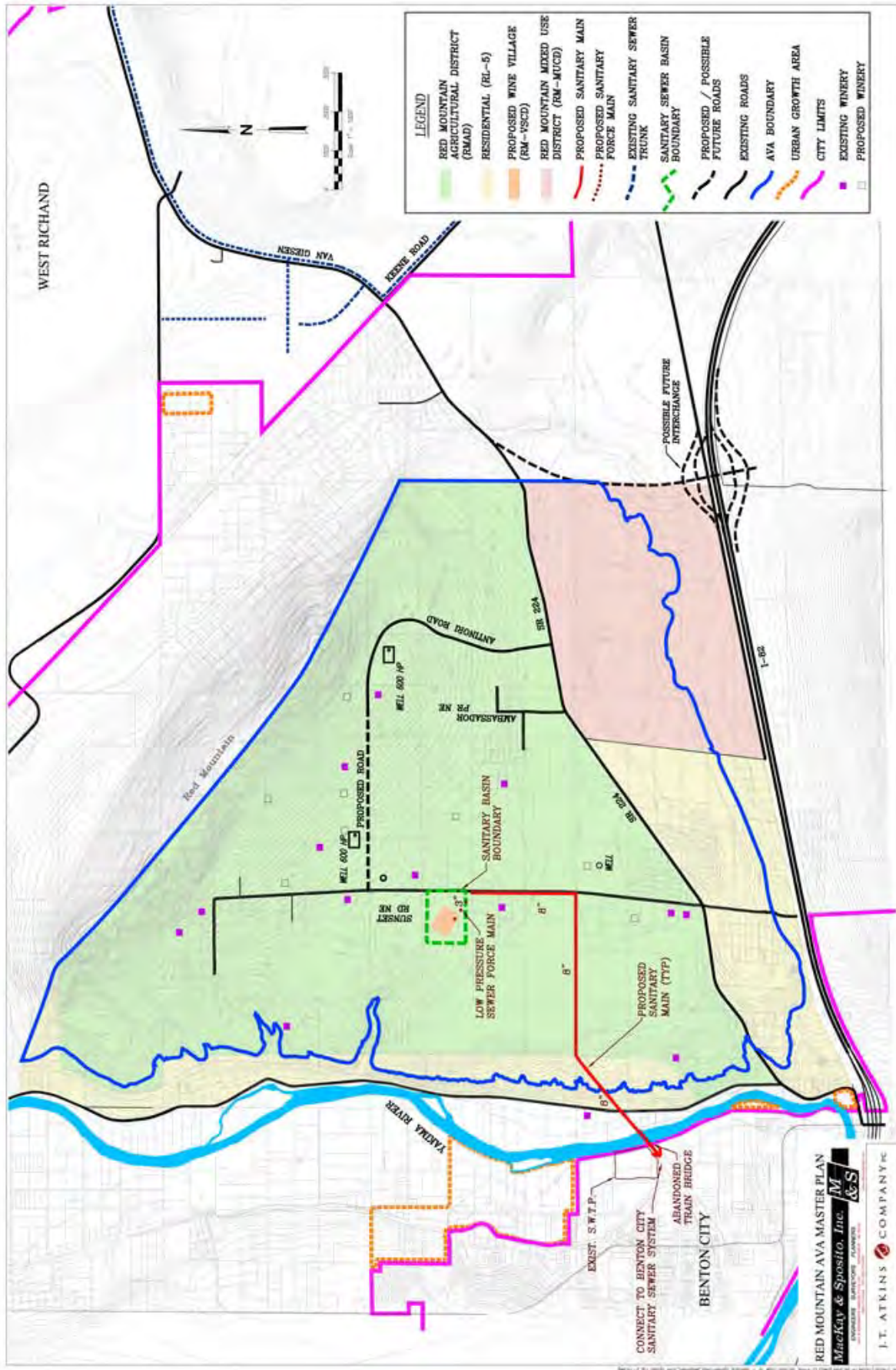


Figure 2-14. Municipal Collection System, Alt. 1

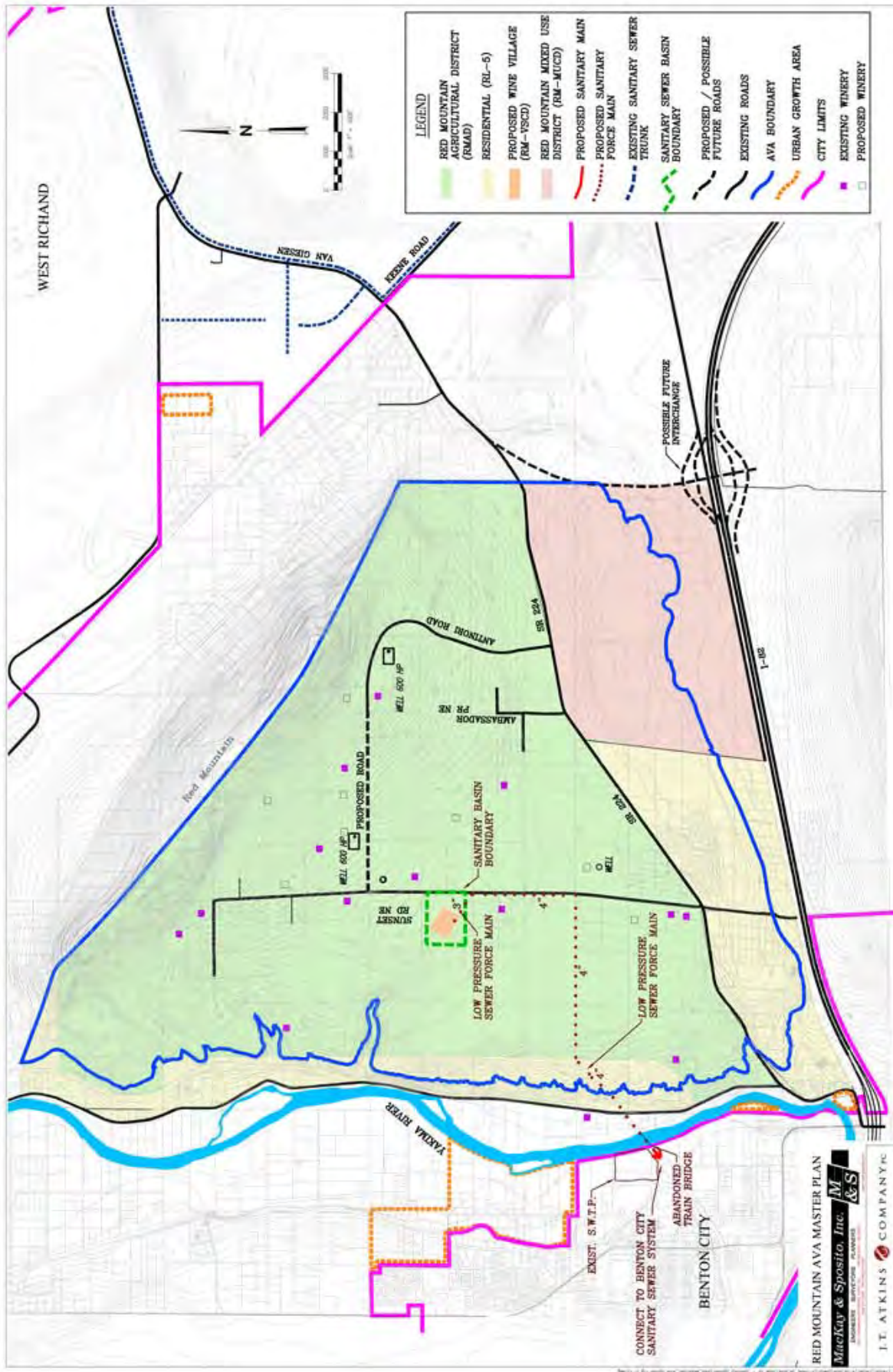


Figure 2-15. Municipal Collection System, Alt. 2

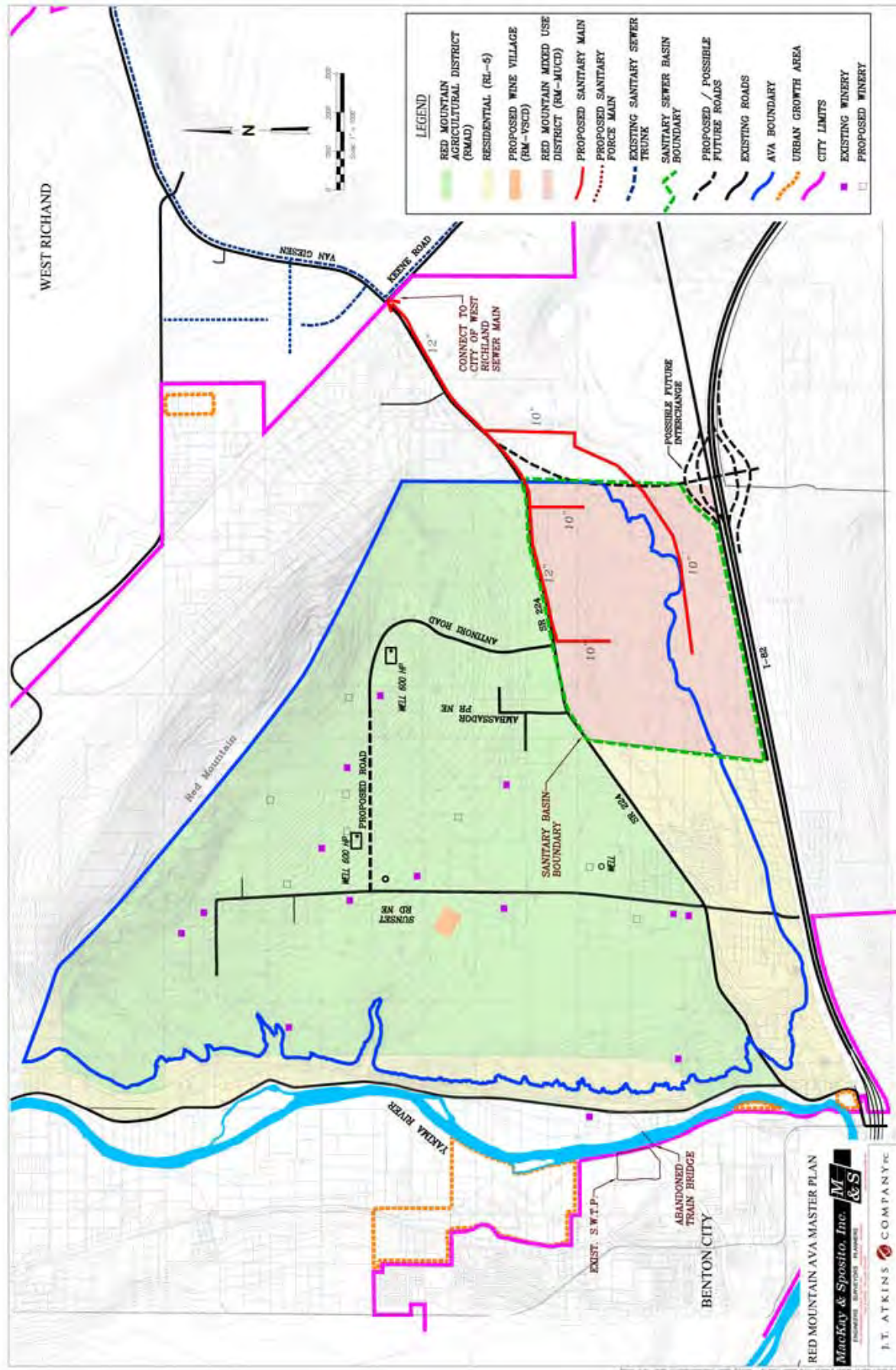


Figure 2-16. Municipal Collection System, Alt. 3

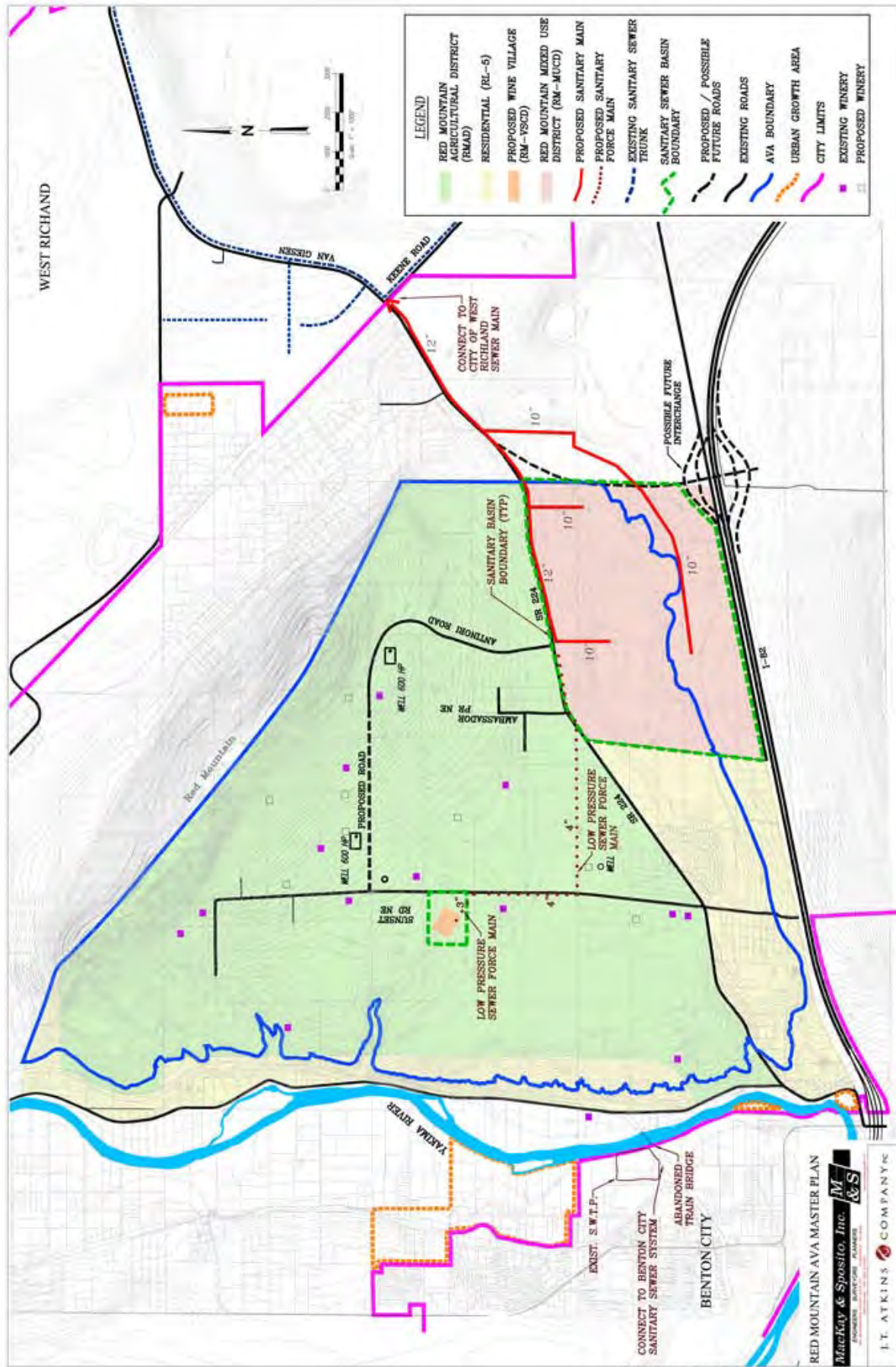


Figure 2-17. Municipal Collection System, Alt. 4

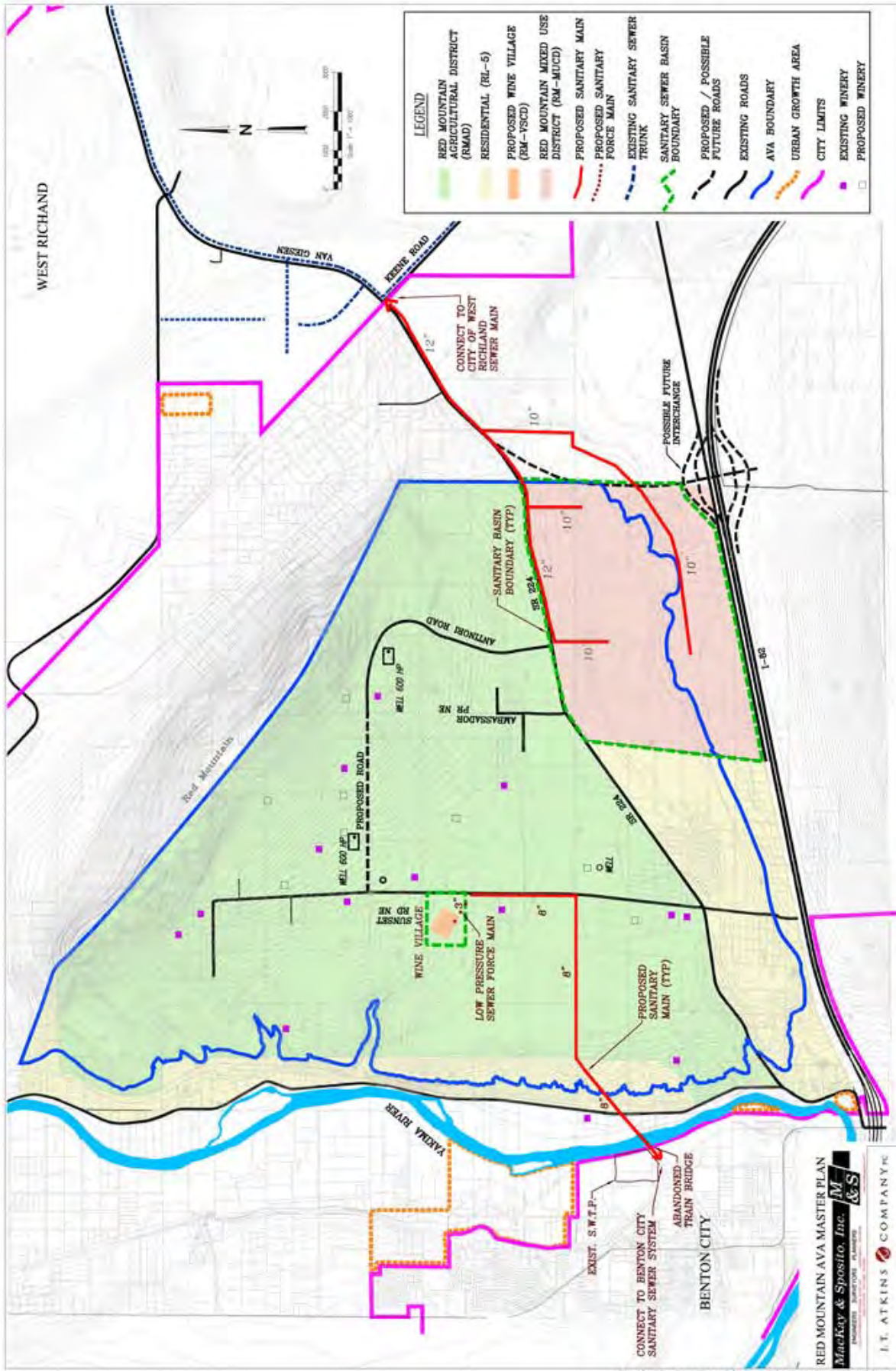


Figure 2-18. Municipal Collection System

Advantages and Disadvantages of Municipal System

The municipal system has the primary advantage of convenience. If a municipal sanitary sewer system were available within the AVA, the Wine Village and other densely developed areas could simply connect to the system eliminating the need to maintain an on-site wastewater disposal system. The municipal system would provide for disposal of domestic wastewater from the Wine Village, as long as the system did not extend outside of the designated Master Plan Resort and Tourist Serving area. Because of the size and level of development proposed for the mixed use area, it is likely that this area will not be able to develop without the availability of a municipal wastewater system, unless the water were first pre-treated.

A municipal system does have several disadvantages. Perhaps the greatest disadvantage is the system cost. The AVA may be considered small relative to other AVA's, however, the development level is sparse, and the sanitary system required to provide service to the Wine Village will be expensive. The only provision for a municipal sanitary system serving the Wine Village is the Master Planned Resort designation. Under this scenario the entire cost of infrastructure between the Wine Village and the municipal system must be borne by the Wine Village development. Additionally, winery process water from the individual wineries can not connect to the municipal system, so the municipal system does not provide a solution for disposal of the process wastewater.

Soil Treatment

Sanitary wastewater treatment through the soil matrix has been used for many years to successfully treat sanitary wastewater.

Domestic Wastewater

A properly sized, installed, and maintained system of septic tanks and drainfields can be used for effective treatment and disposal of domestic wastewater. With a proper loading rate (gallons of wastewater per square-foot of drainfield), the soil matrix will remain aerobic and treatment will continue with little or no maintenance. For the soil types typical in the Red Mountain AVA, approximately 2,000 sq-feet of property is required for every 450 gallons of domestic wastewater. There are areas within the AVA with shallow soil over rock—in these areas septic systems might not be permitted.

The Benton-Franklin Department of Health will review and permit properly designed and constructed domestic wastewater systems up to a capacity of 3,500 gpd. The local Health Department is not aware of any health problems or groundwater problems associated with the current use of septic tank and drainfields for domestic wastewater treatment and disposal. The Health Department will continue to approve future septic systems for the Red Mountain AVA area as long as the systems are properly sized for the local soil conditions.¹⁴ Kay Rotell, Environmental Health Specialist, Benton-Franklin Health District, March 28, 2007

The estimated daily wastewater volume from the Wine Village is approximately 12,000 gallons. An on-site disposal system could be designed for this magnitude of wastewater; a system of this

size would need to be reviewed and approved by the Department of Ecology. Because of the cost of extending municipal service to the Wine Village, an on-site disposal system for the Wine Village wastewater may be the only viable alternative for this source of wastewater.

Cost Opinion

The estimated costs for septic systems with a range of flows are summarized in Table 2-13. Septic systems serving commercial uses such as tasting rooms, commercial kitchens, and other public uses will need to have oil/water separators and generally will need to be a more robust system than the standard residential-type septic system and drainfield. One option for this type of system, called a recirculating gravel filter system, consists of multiple septic tanks, recirculating tank, effluent filters, flow splitter, and a gravel filter.

Table 2-13: Estimated septic system costs			
System Capacity (gpd)	Wastewater Source	System Type	Estimated Total Cost (Material and Labor) (\$)
800	Residential	Standard Gravity	3,000 - 5,000
1,250	Residential	Standard Gravity	3,500 - 5,500
1,600	Residential	Standard gravity	4,400 - 6,000
2,500	Tasting room/ Commercial kitchen	Recirculating gravel Filter and drain field	15,000 - 30,000
3,000	Tasting room/ Commercial kitchen	Recirculating gravel Filter and drain field	30,000 - 50,000

Industrial Wastewater

The wastewater from wineries is dominated by soluble organic compounds (sugars and ethyl alcohol); particulate solids are present at lower concentrations. Wineries generally use heat and non-halogen compounds for disinfection, so that troublesome (e.g., toxic or hazardous) chemicals are not expected to be present. Treatment of winery wastewater is thus a matter of achieving an adequate level of removal of simple organic compounds rather than treating difficult compounds. Treatment options range from application of the waste to land with treatment by ordinary soil processes through the various treatment technologies used to treat domestic wastewater and total evaporation. Wastewater from a winery has much higher ratio of organic carbon to nutrients, such as nitrogen and phosphorus, and usually a low pH (4 or less), which can require correction or adjustment in order to achieve successful treatment.

Disposal of industrial wastewater through the use of standard septic systems and drainfields typically results in failure of the drainfield due to excessive carryover of solids and soluble biological oxygen demand (BOD) into the drainfield. With proper pre-filtering of lees and proper sizing of septic tanks for adequate retention time, septic tanks can function as anaerobic treatment chambers. Individual winery process water alternatives are evaluated in the following section.

Package Wastewater Treatment Facility

Package wastewater treatment plants are available from various manufacturers. These facilities range in treatment capacity from 15,000 gpd to 200,000 gpd and larger. Package treatment plants can produce a very clean effluent when used to treat a consistent wastewater inflow. Residential and commercial wastewaters are good candidates for package plant treatment. A small package treatment plant could be used to treat the wastewater production from the Wine Village or Tourist Serving areas. Because of the variation in flow, high BOD concentrations, low pH, limited nitrogen and phosphorous and other wastewater variations, these facilities may not be suitable to treat winery wastewater. The estimated cost for 15,000-gpd facility treating domestic and commercial wastewater is approximately \$500,000 and the estimated cost for a 125,000-gpd facility is approximately \$1,100,000. Any of the package plants could be used in any of the land use designations (Agricultural District, Wine Village, or Tourist Serving area) proposed in this Master Site Plan.

On-site (within the AVA) Industrial Wastewater Disposal

Operational Practices and Effect on Wastewater

Wastewater is generated primarily from the following stages of the wine production process:

1. Washing the grape crushing / de-stemmer machine and pad during harvest
2. Tank rinsing after fermentation
3. Rinsing the holding tank after wine is transferred to barrels
4. Washing barrels
5. Floor washing in bottling area

Through winery operational practices and use of various filters, winery operators can dramatically alter the volume and concentration of organic matter in process wastewater.

Several practices that can be implemented to minimize organics and solids in the wastewater are summarized as follows:

- Installing a catch basin or trench drain with a removable screen at the crush pad to collect wash-downed solids from the crusher and de-stemmer equipment.
- Drawing wine from the bottom of the fermenting tanks through a centrifugal filter to extract wine and separate lees. The lees can then be routed through a lees filter to extract more wine and dry the lees for disposal in a compost area. This process prevents the lees/wine slurry from entering the wastewater stream. Lees filters can be rotary vacuum filters, plate and frame filters, sand media filters, or diatomaceous earth filters.



ASSO Spadoni Rotary Vacuum Filter



Alfa Magic Plate and Frame Filter

- Cleaning tank walls by hand with a squeegee, collecting solids into tubs for disposal in vineyard, compost, or hauled off-site. If the solids are applied to the land, there should be no free liquid or readily dissolved sugars. Once this is completed, the tank can be rinsed into the sanitary system.
- Floor washing can be routed into floor drains with removable screens for final collection of any solids that may have fallen on the floor.

Procedures like this can reduce the winery process water volume and halve the biological oxygen demand (BOD) concentration of the wastewater (from approximately 7,000 mg/liter to approximately 3,500 mg/liter). Procedures like this can dramatically improve the performance of an individual wastewater treatment system.

Some vintners prefer not to filter their wines for risk of removing tannin, flavors, and aging potential. This is not counter to producing a lower BOD wastewater; the winery operation simply must be configured in such a manner to filter lees slurry and other wastewater prior to discharging to the wastewater system.

Individual Winery Solutions

Treatment of process wastewater could be accomplished through several alternatives with variations on each alternative. The selection of a wastewater treatment system ultimately will depend on winery practices, wastewater constituents, site configuration, preference and other variables. One of the critical variables in wastewater treatment alternatives is BOD concentration of the wastewater. BOD concentration of winery wastewater is a function of operational practices, conservation practices, wastewater filtering, and other factors.

Two overall wastewater alternatives exist for treatment. The first alternative is on-site treatment at each winery. Several alternatives exist for individual on-site winery treatment alternatives. Four such alternatives were evaluated for this report: on-site irrigation lagoon, on-site evaporation lagoon, anaerobic treatment with solids settling and land application, and aerated primary

treatment with clarifiers. Schematic figures of each of these alternatives are shown in Figures 2-19, 2-20, 2-22, and 2-23.

Evaporation Lagoon

One of the options is for each winery to have an independent on-site evaporation lagoon. Each winery would construct and maintain an on-site evaporation lagoon to store and evaporate the entire annual process water volume. The evaporation lagoon would be designed to receive only winery process wastewater and so that the pond was dry at the beginning of the crush season each year. These lagoons would vary in size depending on winery scale. A winery producing approximately 20,000 cases/year could expect to construct an evaporation pond with an area of approximately 30,000 square-feet. This pond would have a double liner with leak detection between the layers. Figure 2-19 shows the basic components of this alternative. The features of this alternative include pre-screening to remove lees and other bulk solids that could lead to significant algae growth and other odorous buildup in the lagoon and the use of aerators to provide oxygen to the liquid for biological treatment. The evaporation lagoon would have a double liner and would completely evaporate the wastewater each summer prior to the fall crush. This pond could be planted with perimeter landscaping, but it would not likely be an attractive property feature and it has the potential to generate unpleasant odors.

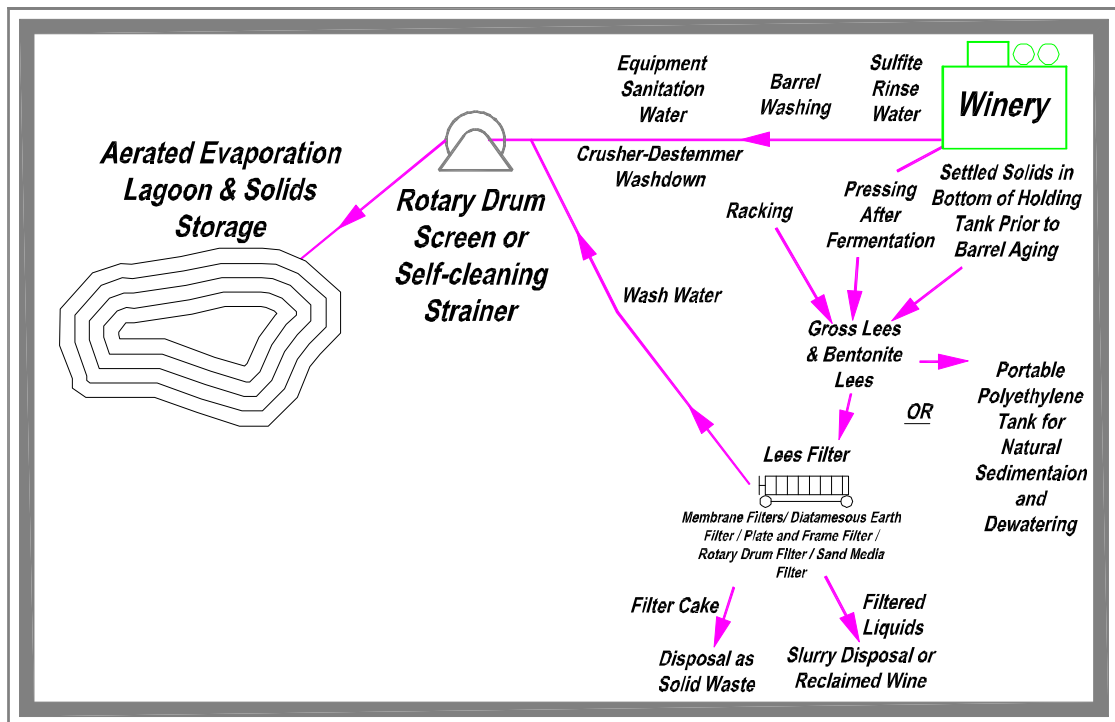


Figure 2-19: Individual Evaporation Lagoon

Irrigation Lagoon

Another option is for a winery to have an independent on-site irrigation lagoon. A winery would construct and maintain an on-site irrigation lagoon to store process wastewater during the winter. After initial filtering to remove lees and other BOD from the wastewater stream, the wastewater would be discharged to a lined storage and treatment lagoon. Water from the lagoon would be blended with irrigation water during the irrigation season and applied to the vineyard. The use of the wastewater for irrigation may require an efficient removal of BOD depending upon the vulnerability of the irrigation system to clogging from organic matter. The depth of water in such a lagoon would vary between 4 feet in the middle of the summer to 8 feet in the winter. An irrigation pond such as this would collect and store rain water during the winter and experience wastewater evaporation in the summer months.

A winery producing approximately 20,000 cases / year could expect to construct an irrigation pond with an area of about 15,000 square-feet and a volume of 300,000 gallons. This pond would be a double lined pond with leak detection between the layers. Figure 2-20 shows the basic components of this alternative. A winery owner could choose how much wastewater to blend with irrigation water. The Department of Ecology recommends that a maximum of 10 pounds of BOD per acre per week be applied to the vineyard. This mass of BOD applied to the vineyard could be determined by measuring the BOD concentration of the wastewater in the lagoon and measuring how much wastewater from the lagoon is being mixed with irrigation water. The wastewater volume produced is a small fraction of the irrigation water requirement, thus, there is adequate irrigation volume with which to blend the wastewater to achieve the maximum BOD loading.

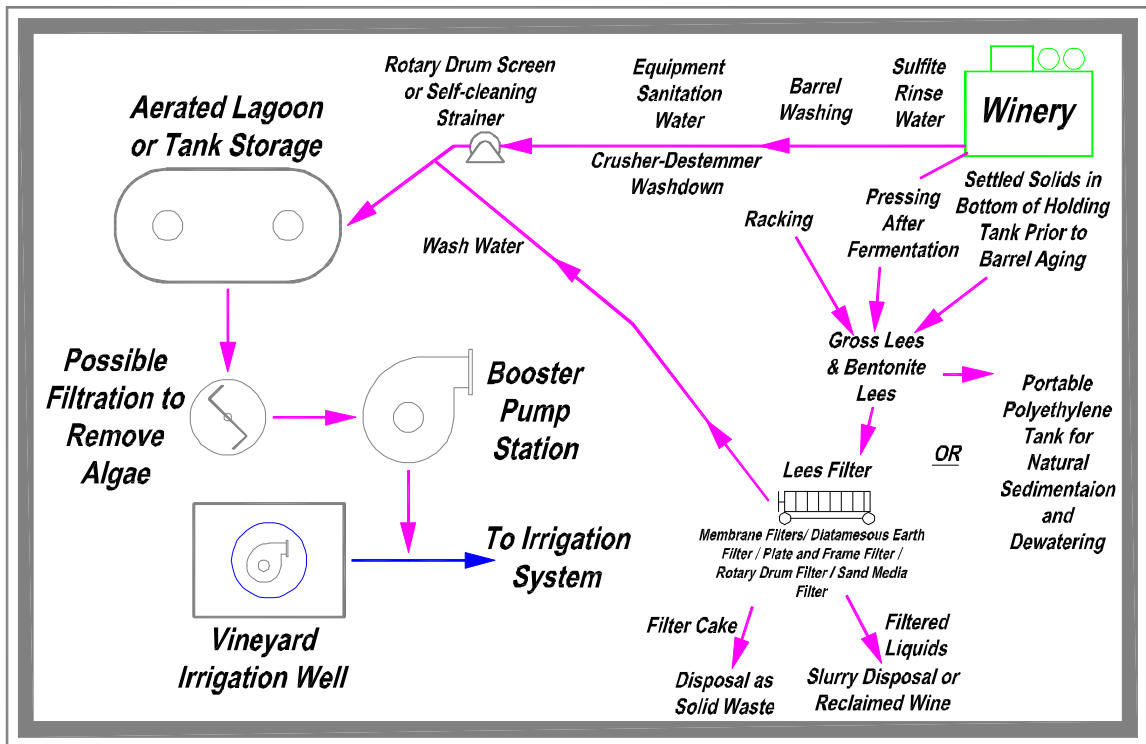


Figure 2-20: Individual Irrigation Lagoon

The high BOD concentration of the wastewater means that open storage lagoons will require aeration to control odors and to provide some aerobic treatment. Aeration of the wastewater will convert soluble organic matter to particulate matter. This improves the retention of the organic matter in the upper part of the soil column and promotes better treatment during passage of the wastewater through the soil. This mode of treatment is quite suitable for the dry climate east of the Cascades.

Figure 2-21 shows a typical annual cycle of a 300,000-gallon irrigation lagoon. The minimum depth in the summer is 4 feet and the maximum winter depth of 8 feet. Wastewater is pulled out of the pond and blended with irrigation water during the months of April, May, September, and October. This is just one of the many schedules that could be chosen for water withdrawal from the lagoon—for instance, water could be drawn out of the lagoon throughout the summer with less withdrawal in the fall if the vineyard operator determined that such a program would better suit the vineyard. Figure 2-12 shows the seasonal water depth of an example pond for an 85-acre vineyard, 20,000 case winery, with a maximum application of 6 pounds BOD/acre/week (with an estimated wastewater BOD concentration of 7000 mg/liter).

For a vineyard of this size, annual irrigation water use would be approximately 41 million gallons (18 inches of water over the vineyard) and wastewater used from the lagoon would be approximately 150,000 gallons/year. The 150,000 gallons of wastewater would need to be

blended with 2.7 million gallons of irrigation water to achieve the maximum loading of 6 lbs/BOD/acre/week that was used for the example. In this example, wastewater is not drawn out of the lagoon during June, July, and August in an effort to keep some water in the lagoon for aesthetic and odor reasons.

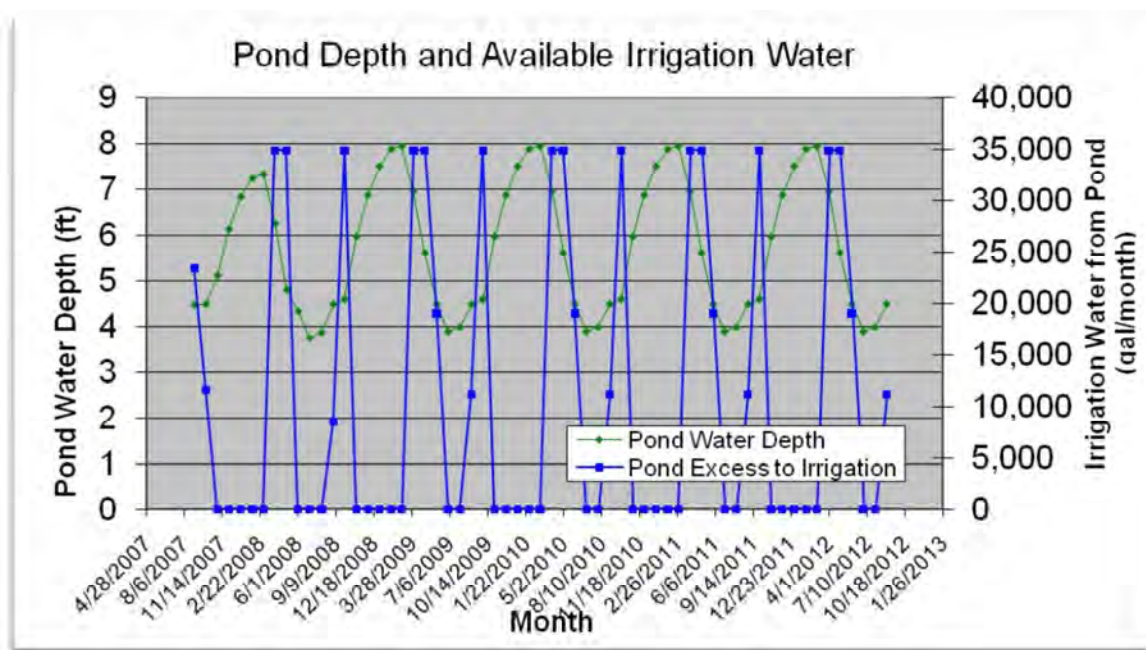


Figure 2-21: Season Irrigation Lagoon Cycle

Settling Tanks/Ponds, Winter Storage, and Land Application

Another option is for a winery to have an anaerobic treatment and settling system with winter storage and land application of wastewater. This system is suitable for a winery with a maximum daily wastewater production of approximately 1,500 gallons. This alternative is not suitable for a winery operation with wastewater containing a high BOD concentration. With this system a winery operator would remove gross lees, bentonite lees, and other BOD as part of the wine production process. Wastewater would be discharged to anaerobic treatment and settling tanks to remove additional settleable solids. A chemical flocculent and/or pH stabilization may need to be added to the settling tanks to encourage additional settling of dissolved organic material as necessary to prevent excessive carryover of organics to the winter storage lagoon. The effluent from the settling tanks will generally be fairly high in BOD. This wastewater will generally be too high in BOD to apply to directly to vineyards, but it could be blended with irrigation water or applied to the soil surface in an area of the property that may not be suitable for growing grapes. Figure 2-22 shows an example of such a system.

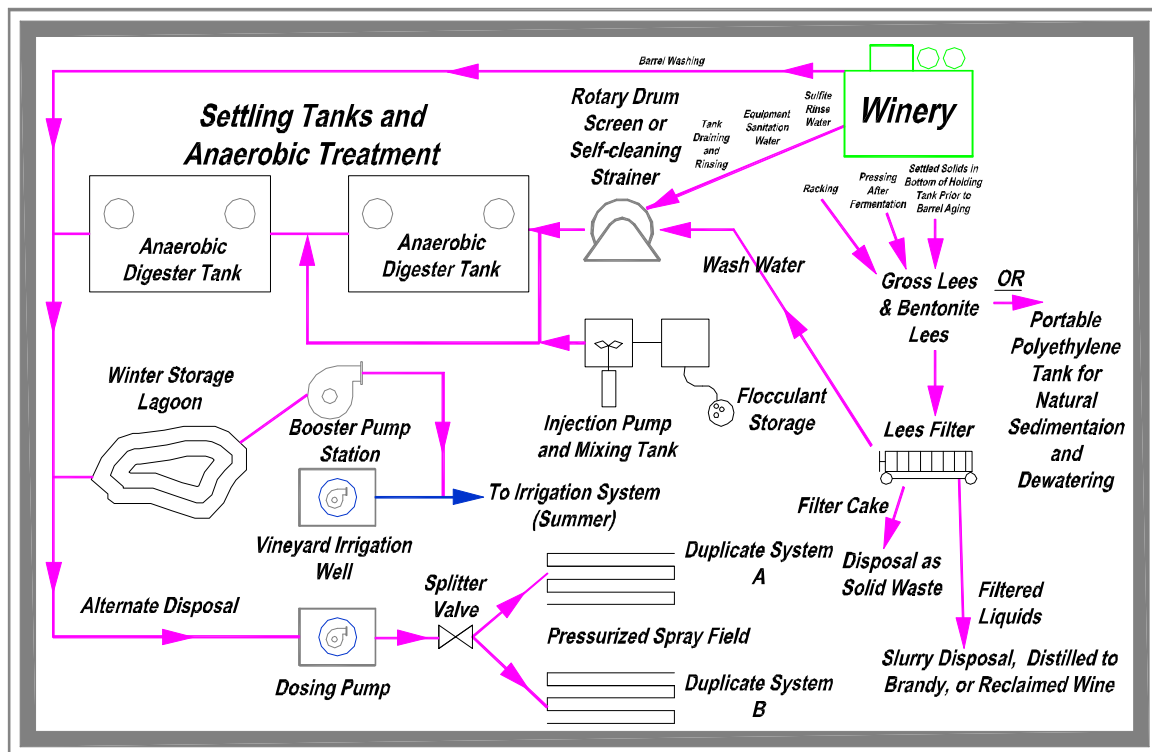


Figure 2-22: Anaerobic Treatment, Settling, and Winter Storage

Soil is a complex biologic community supported by a fine granular mineral or weakly reactive particulate organic matrix. Warm aerobic soil will convert the soluble organic compounds in winery wastewater to carbon dioxide and particulate organic matter, which will be converted to carbon dioxide at a slower rate. Conversion of the organic matter to carbon dioxide requires oxygen. Experience with land application and treatment of other organic-rich wastewaters has established that the effective treatment capacity for warm soil is 10 pounds of soluble BOD per acre per day. For wastewater with 20,000 mg BOD/L (a typical maximum value for a winery), this is equivalent to applying 0.015 inch (1/65th inch) of wastewater per week. Reducing the BOD content to 200 mg/L by treatment (or dilution with irrigation water) would allow application rates up to 1.5 inches per week, as long as the soil does not become saturated. Much of the wastewater will be generated in the late fall and winter, after soil temperatures have declined and the potential soil treatment rate has decreased or not available (frozen conditions). Based on this, the majority of the wastewater will likely need to be stored during the winter. After winter storage, the wastewater from the storage lagoon could be applied to a spray field or blended with irrigation water and applied to the vineyard.

Individual Aerobic Reactor and Clarifying

For larger wineries, with annual production greater than 25,000 cases, the treatment system might need to be more sophisticated to adequately protect the soils and groundwater. One alternative is

to have a complete mixed aerated lagoon primary treatment with clarifying lagoons. The clarifiers are basically primary and secondary settling ponds with sludge return to the aerated lagoon to insure an adequate supply of biological matter. The effluent from such a system would be fairly clean and could be stored during the winter in a lagoon or tank storage prior to vineyard application with irrigation water. Figure 2-23 shows a schematic of such a system.

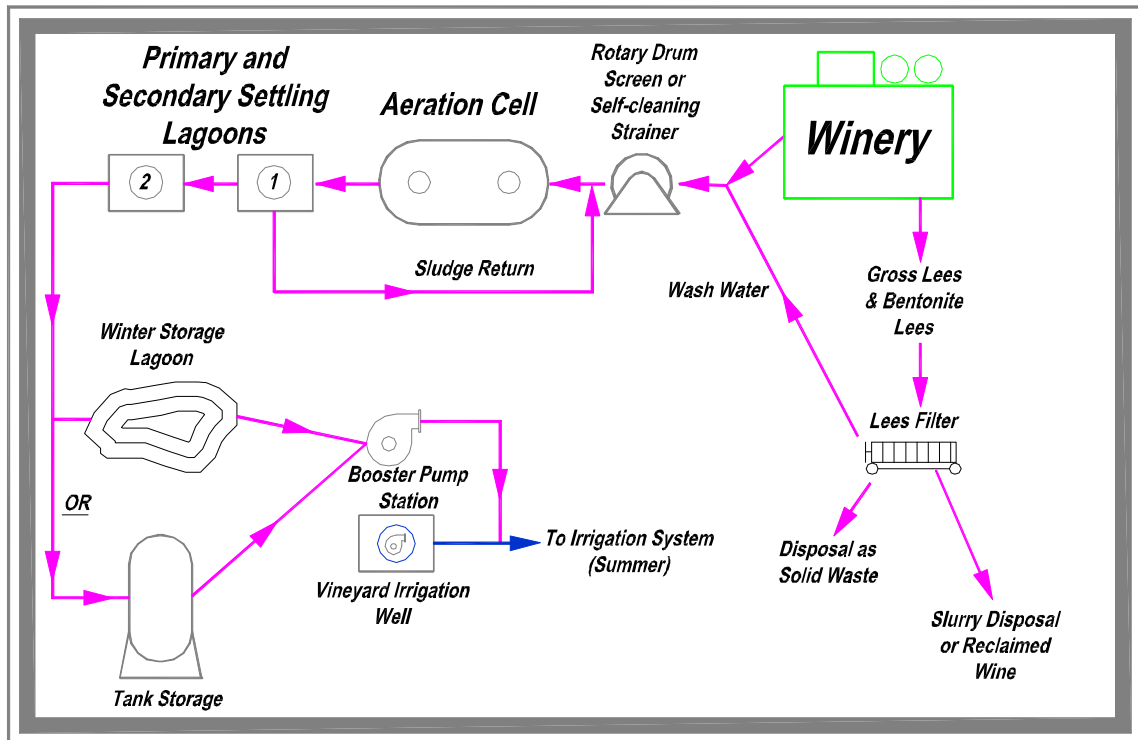


Figure 2-23: Aerobic Treatment with Clarifying Ponds (for Large Wineries)

There are several benefits to diversion of lees waste, such as a reduction in solids loading on the treatment works and reclamation of a significant volume of wine that would otherwise be lost with the lees. Another feature of this system is the “sludge return”. This is used to optimize the performance of the aerobic reactor by supplying freshly settled sludge containing a large and active biomass. The waste settled in the bottom of the settling lagoons can be dried and land applied or hauled off-site through a commercial septic tank pumping service. The operation and maintenance of this type of system would need to be performed by an experienced operator. The winery’s waste treatment operator will need to anticipate the type of wine production operations that are occurring in the winery on any given day and will need to fine tune the operation of the system to insure that the wastewater is receiving adequate treatment prior to discharge to the irrigation storage lagoon.

Regional Solutions

In addition to individual treatment alternatives, several regional treatment solutions for process wastewater were evaluated. Two alternatives were evaluated; regional irrigation lagoon and regional aerobic pass through primary treatment lagoon. The specifics of each alternative are described below.

Regional Irrigation Lagoon

This solution would be similar to individual irrigation lagoons except that the wastewater from each winery would need to be conveyed to the regional irrigation lagoon, which would be located near the low point of the AVA. The lagoon would be aerated to facilitate treatment and to reduce odors. The wastewater effluent from the lagoon would be routed through primary and secondary settlement clarifiers for final treatment and sedimentation and then pumped into the KID irrigation distribution system and blended with irrigation water and applied to landscape and vineyard areas. This lagoon could be built in phases and enlarged as more wineries are connected to the system.

Because of the inevitable growth of algae and potential odor problems associated with high concentrations of lees and other BOD in wastewater, each winery would need to pre-filter lees prior to discharge to the wastewater collection system, or a regional filtration system would need to be implemented. This system alternative is water wise in that wastewater is reused as irrigation. Figure 2-24 depicts this regional alternative.

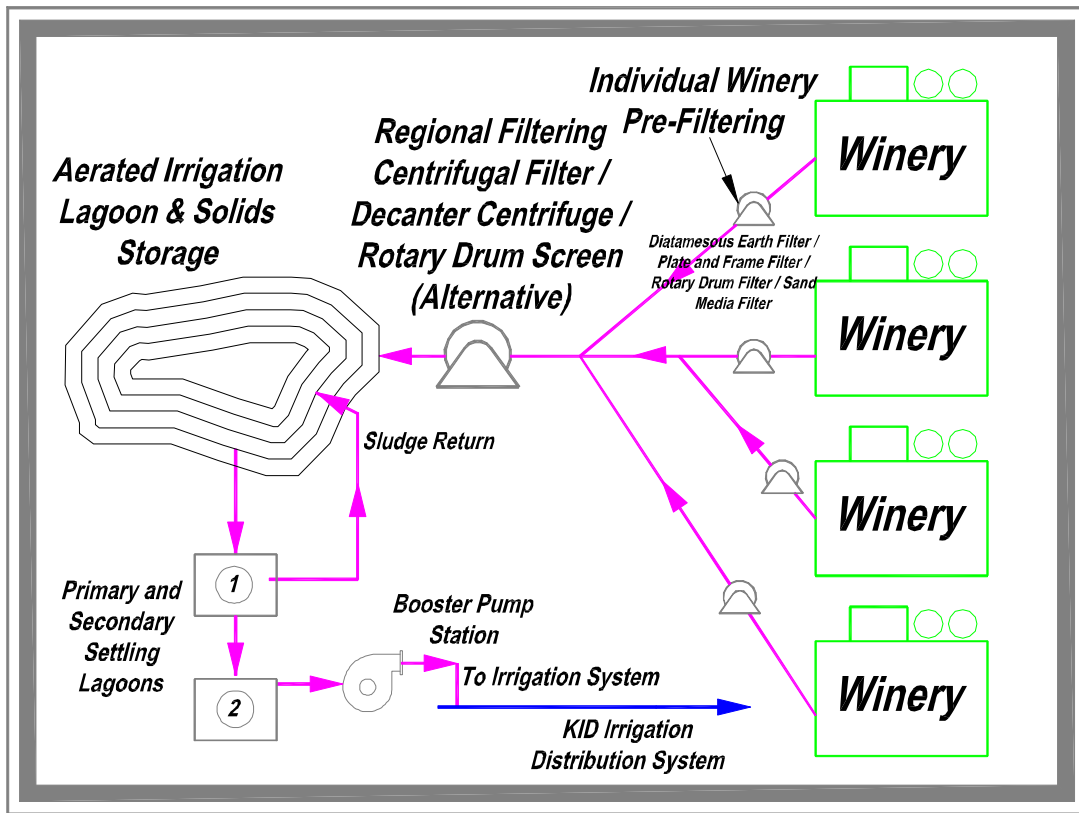


Figure 2-24: Regional Irrigation Lagoon

Conveyance of wastewater from the individual wineries to the regional facility could be accomplished through the use of a piped gravity conveyance network, a pressurized collection system, or through the use of holding tanks and truck delivery to the regional system.

Regional Aerobic Pass-Through Primary Treatment Lagoon

Under this alternative, the AVA wineries would initially convey process wastewater to the regional irrigation lagoon. As more wineries were connected and once the Tourist Serving area was annexed and annexed into the city, municipal sanitary sewer service may be extended, to the tourist serving area and therefore, the irrigation lagoon could be converted to an aerobic pre-treatment lagoon. After pre-treatment in the lagoon, effluent from the lagoon would go the City of West Richland and / or Benton City’s wastewater treatment plant. Wastewater would receive adequate pre-treatment such that it would enter the City of West Richland or Benton City sanitary system near residential waste strength, which would not result in high discharge fees. One benefit of this system is that once the sanitary sewer collection system is built to West Richland or Benton City, the lagoon would not need to be enlarged as the Red Mountain AVA develops and more wineries are added. Figure 2-25 depicts a typical schematic of such a system.

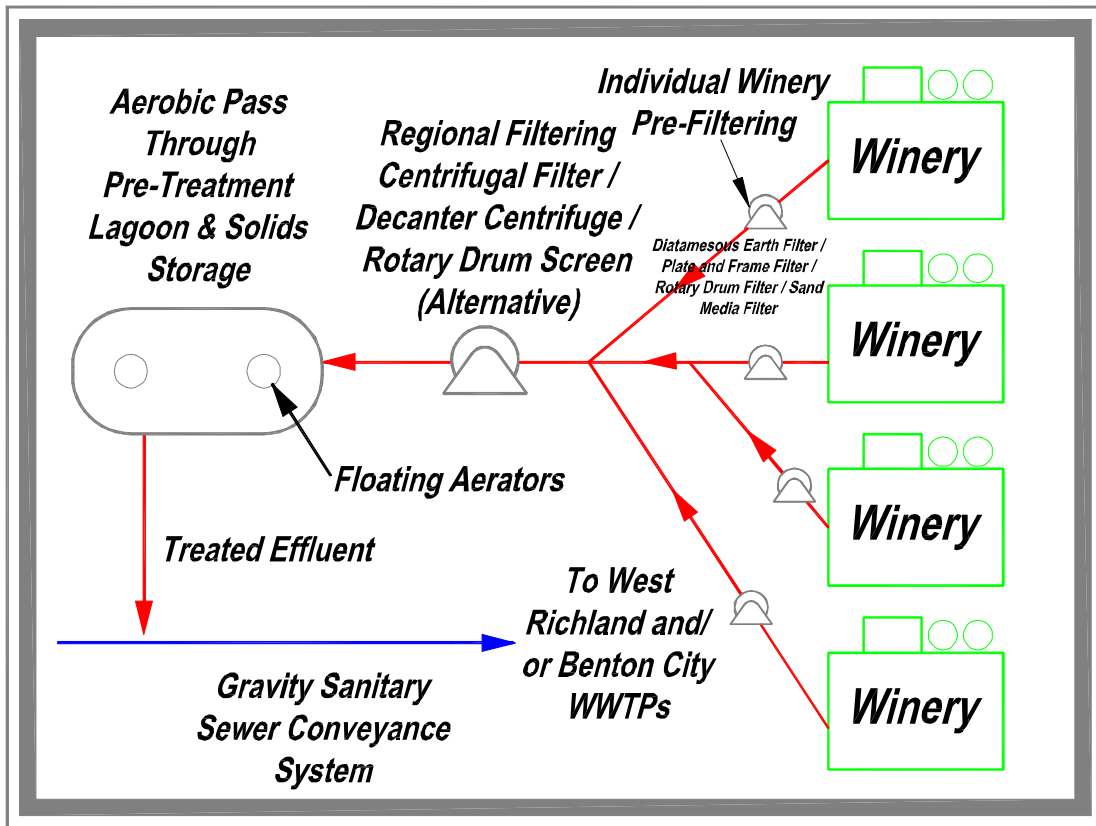


Figure 2-25: Regional Aerated Pass Through Lagoon

Cost Opinions

Preliminary cost opinions were prepared for each individual and regional industrial wastewater treatment alternatives. Table 2-14 summarizes the estimated initial capital costs of each alternative.

Table 2-14: Preliminary Cost Opinions Wastewater Treatment Alternatives					
Option Description	Estimated Construction Cost (\$)	Construction Contingency (5%) (\$)	Engineering and Administration (10%) (\$)	Total Estimated Cost (\$)	Cost per Winery^c(\$)
Individual evaporation lagoon ^{a,d}	146,718	7,336	14,672	168,725	168,725
Individual on-site winter storage and irrigation lagoon ^{a,d}	133,148	6,657	13,315	153,120	153,120
Individual settling tanks and spray field ^{a,d}	120,178	6,009	12,018	138,205	138,205
Aerated lagoon and clarifying	153,891	7,695	15,389	176,974	176,974
Regional irrigation lagoon (pressure collection system) ^{a,e}	2,208,414	110,421	220,841	2,539,676	63,492
Regional irrigation lagoon (no collection system, truck delivery) ^a	1,217,958	60,898	121,796	1,400,652	35,016
Regional aerated pass through lagoon (pressure collection system) ^{a, b,e}	1,510,777	75,539	151,078	1,737,393	43,435
<p>^aLees filtration has been excluded from all alternatives in an effort to normalize the alternatives.</p> <p>^bInitially before the gravity wastewater collection system to West Richland is constructed, the construction cost of this facility would be spread between the approximately 12 existing wineries at a cost of \$135,000 per winery.</p> <p>^cAssumes 100% participation from the estimated 16 current and proposed wineries within the AVA (40 total).</p> <p>^dCost estimate based on a 85 acre vineyard producing 20,000 cases/year.</p> <p>^eCost estimate based on 2,900 acres of vineyard and approximately 680,000 cases/year.</p>					

Advantage and Disadvantages

With each process wastewater alternative there are advantages and disadvantages that may transcend a simple cost comparison. Table 2-15 summaries some of the advantages and disadvantages of each winery process wastewater alternative evaluated.

Table 2-15: Comparison of winery process wastewater alternatives		
Option	Advantages	Disadvantages
Individual on-site evaporation pond	Simple Lowest On-Site Solution O&M	Large pond footprint Possible odor issues Algae Buildup in Lagoon Possibly highest on-site cost alternative
Individual on-site irrigation pond	Re-use of Waste Water for Irrigation Preferred Option for DOE Smallest Pond Footprint	Additional filtration may be required (depending on irrigation methods) Must pre-filter yeast prior to discharge to lagoon
Individual on-site solids settling and land application	No Pond High filtration (under re-use alternative)	Winter storage issues Land application issues (large area tied up) Must pre-filter yeast prior to discharge
Aerobic treatment and clarifying	Works well for large wineries Storage Lagoon could be used as a site water feature. Reuses wastewater for irrigation	Requires a skilled operator High initial and operating costs
Regional irrigation pond	Moderate individual user costs Lowest individual O&M and management Quick winery to-market advantage	Huge initial financing hurdles Participation / buy-in Arguably a visual / aesthetics issue Odor? Consensus on location
Regional aerated pass through lagoon to West Richland WWTP	Minimizes size of regional lagoon Low individual O&M and management Lowest total capital cost per winery	Cost of system must initially be borne by few property owners Participation / buy-in Consensus on location Addition of future wineries would be limited until piped system to West Richland is constructed

All reviewed sanitary sewer alternatives are viable and will work for Red Mountain AVA wineries. The ultimate selection of a specific wastewater treatment alternative will depend on winery practices, wastewater constituents, site configuration, preference and other variables.

Shared Facilities

If a group of wineries were interesting in the formation of a co-op, they could realize savings associated with winery equipment and wastewater handling. A group of wineries could share a crusher/de-stemmer, lees filtering equipment, bottling facility, and even a wastewater treatment and reuse facility. Such a co-op could be beneficial to start-up wineries that are more able to pay monthly operating expenses than large capital expenses.

3. VISITOR PROJECTIONS

The visitor studies consisted of four (4) elements:

1. A survey of current visitors to Red Mountain American AVA wineries, included here as the *Red Mountain AVA Winery and Vineyard Visitor Study*
2. An online survey targeting Red Mountain wine club members in Washington, Oregon and Idaho; Online Survey of Potential Visitors to Red Mountain AVA (Potential Visitors)
3. Interviews of Red Mountain winery personnel
4. A research analysis and compilation (review of research studies of wine tourism development and international and national wine drinkers)

These data were used to determine capacities of such facilities and infrastructure as parking, visitor center(s), and roads as well as other “attractions” proposed for the master plan for the Red Mountain AVA. The following reports are the results of the above activities.

RED MOUNTAIN AVA WINERY AND VINEYARD VISITOR STUDY (CURRENT VISITORS)

The purpose of the Red Mountain AVA Visitor Study was to profile the current visitors and investigate their likelihood of visiting the area upon completion of the development planned. Four (4) wineries in the Red Mountain AVA; Hedges Family Estate, Kiona Vineyards Winery, Seth Ryan Winery, and Terra Blanca were identified as having the most open hours and thus more survey distribution; however, the questions on the questionnaire addressed the entire Red Mountain AVA.

The questionnaire was implemented beginning August 5, 2006. Each of the four (4) wineries was visited and permission was gained from the owner or manager. Through this process, it was determined data collection would continue through November 2006. All owner/managers indicated the visitors varied during this time frame. Table 3-1 indicates the number of surveys collected during each of the months. These data do not indicate the visitation levels at the wineries due to the nature of the sampling. Each winery received a supply of questionnaires, directions for staff, information sheets, contact cards, writing utensils, and posters. The winery staff was asked to encourage visitors to complete the questionnaire. Participation was not required and visitors self-selected. An incentive was provided for completion of the survey.

Various analyses were completed in order to describe the winery visitors including analyzing differences between respondents whose primary residence was in the Tri-Cities zip code and those not in the Tri-Cities zip code (Non Tri-Cities). When significant differences were seen

between Tri-Cities Resident Visitors and Other Visitors (Non Tri-Cities), the results are reported separately. A total of 596 surveys were deemed usable and are included in the results.

Table 3-1: Number of surveys completed by month

Month	#	%
August 2006	129	21.6
September 2006	333	55.9
October 2006	77	12.9
November 2006	57	9.6
Total	596	100.0

Demographics

Washington dominated the residence of the respondents (n=423, 76.3%). (see Table 3-2) The highest number of visitors was split between Western Washington and the Tri-Cities area.

Table 3-2: Zip Code (postal code) at primary residence

Area	#	%
Western Washington	190	34.3
Tri-Cities	189	34.1
Oregon and Idaho	48	8.7
Other Eastern Washington	44	7.9
Montana, California and Alaska	26	4.7
East Coast	21	3.8
Mid-section of U.S. including from MN to TX	15	2.7
Southeast	9	1.6
West	6	1.1
Canada and I from the UK	6	1.1
Total	554	100.0

NOTE: Discrepancies are due to non-reporting of zip or other data on comparison items

The three (3) variables of Gender, Income, and Age (Figure 3-1; Tables 3-3 and 3-4 respectively) had no significant differences between the visitors from the Tri-Cities and non Tri-Cities visitors. Sixty percent of the respondents were female, 48.6% had a household income greater than \$100,000.00 per year, and 59.5% were either from 51 to 60 years of age (35.0%) or from 41 to 50 years of age (21.5%).

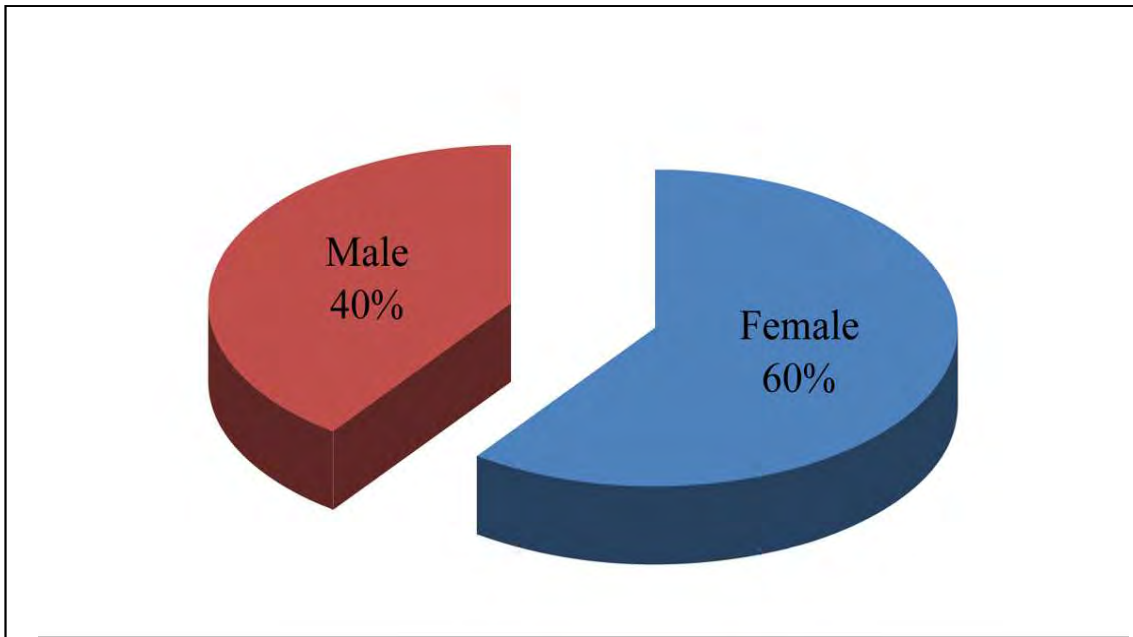


Figure 3-1. Gender

Table 3-3: Annual Household Income

Income Level	#	%
Less than \$25,000	14	2.7
\$25,000 to \$39,999	30	5.8
\$40,000 to \$59,999	57	10.9
\$60,000 to \$79,999	71	13.6
\$80,000 to \$99,999	94	18.0
More than \$100,000	255	48.9
Total	521	100.0

Table 3-4: Age of the respondents

Age Range	#	%
21-30 years old	51	8.6
31 to 40 years old	85	14.3
41-50 years old	128	21.5
51-60 years old	208	35.0
61-70 years old	94	15.8
Over 70 years of age	28	4.7
Total	594	100.0

The mean number of individuals traveling together in one party was 3.83 with a mean of 2.46 males (n=515) and 2.66 females (n=493). (see Table 3-5) A very small number (n=27) of the

respondents reporting traveling with children or teens. A comment was made that the next time they would bring his/her children as the wineries were “kid friendly.”

Table 3-5: Party Size

All Respondents	Mean	#
Adult Males (over 21 years)	2.46	515
Adult Females (over 21 years)	2.66	493
Children/Teens (less than 21)	1.7	27
Total	3.83	
Tri-Cities		
Adult Males (over 21 years)	2.64	163
Adult Females (over 21 years)	3.13	155
Children/Teens (less than 21)	1.33	12
Total	4.49	
Non Tri-Cities		
Adult Males (over 21 years)	2.41	312
Adult Females (over 21 years)	2.48	309
Children/Teens (less than 21)	2.08	13
Total	3.53	

Wine Behavior

Frequency of wine consumption, winery visitation, and other “wine behavior” has been reported on other locations around the world. A “wine lifestyle” or level of wine expertise has been shown to indicate visitation. This survey did not ignore this knowledge and requested responses to questions related to consumption and purchasing. Table 3-6 reports the frequency of wine consumption. The respondents drink wine either *one or two times per week* (36.0%) or *almost every day* (46.3%). Tri-Cities residents drink wine *one or two times per week* (43.3%) where the Non Tri-Cities residents drink wine *almost every day* (53.4%).

Table 3-6: Frequency of wine consumption

	All		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
Never I am not a wine drinker	10	1.7	1	0.5	8	2.2
Only on special occasions	31	5.2	14	7.5	15	4.1
One or two times per month	64	10.8	34	18.2	28	7.7
About 1 or two times per week	213	36.0	81	43.3	118	32.5
Almost every day	274	46.3	57	30.5	194	53.4
Total	592	100.0	187	100.0	363	100.0

The number of wineries or tasting rooms visited in the last year (Table 3-7) and the number of Eastern Washington wineries or tasting rooms visited in the last year (Table 3-8) indicated a high level of participation both with Tri-Cities residents and Non Tri-Cities residents. The proximity to a location for leisure activities correlates highly with level of participation. This correlation is seen in the difference based upon residence in visitation to the Eastern Washington wineries as

Tri-Cities residents have visited more frequently. Thirty-three and 1/10% of Non Tri-Cities residents were visiting an Eastern Washington winery for the first time. There is an opportunity for all Eastern Washington wineries including Red Mountain wineries as many times the first visit if perceived as a positive experience insures a return visit.

Table 3-7: Number of wineries or wine tasting room visited in the last year

	All Respondents		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
This is my first trip to a winery	61	10.3	10	5.3	48	13.2
1-2 wineries	51	8.6	9	4.8	39	10.7
3-10 wineries	226	38.0	84	44.4	124	34.2
11 to 20 wineries	113	19.0	41	21.7	65	17.9
More than 20 wineries	143	24.1	45	23.8	87	24.0
Total	594	100.0	189	100.0	363	100.0

Table 3-8: Number of Eastern Washington wineries or wine tasting room visited in the last year

	All Respondents		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
This is my first trip to a winery	143	24.1	14	7.4	120	33.1
1-2 wineries	50	8.4	14	7.4	34	9.4
3-10 wineries	209	35.2	76	40.4	117	32.2
11 to 20 wineries	105	17.7	42	22.3	54	14.9
More than 20 wineries	86	14.5	42	22.3	38	10.5
Total	593	100.0	188	100.0	363	100.0

The respondents also traveled taking extended trips to wine regions. They took an average of 3.25 trips in the last three (3) years with at least 2 nights away from home. No significant difference was found between Tri-Cities residents and Non Tri-Cities residents. Table 10 lists the destinations for these “wine tours”. 52.7% of the respondents had visited one of the following four (4) wine regions; 1) Yakima Valley including Yakima, Zillah, and Prosser; 2) Walla Walla; 3) Napa and/or Sonoma; and 4) Oregon (see Table 3-9).

They were asked what influences their decision to visit a particular region and the top three (3) influences were:

- 1) Prior experience with the wines of the area
- 2) Recommendation from a friend or family
- 3) Distance to the area from home (see Table 3-10)

Table 3-9: Wine areas where wine trips occurred

Wine Region	All Respondents	
	#	%
Yakima/Prosser/Zillah	111	15.3
Walla Walla	104	14.4
Napa and/or Sonoma Valley	91	12.6
Oregon	75	10.4
Columbia Valley Area	71	9.8
Eastern Washington (not specified)	45	6.2
Western Washington	35	4.8
Southern California (i.e. Santa Ynez)	34	4.7
West Excluding WA OR CA	26	3.6
British Columbia	23	3.2
North California (All other regions)	18	2.5
California (not specified)	17	2.3
Washington state (not specified)	12	1.7
New York and Other East Coast	12	1.7
France	10	1.4
Italy	8	1.1
Canada (excluding British Columbia)	6	0.8
New Zealand/Australia	5	0.7
Midwest	4	0.6
Georgia, Tennessee, Alabama	4	0.6
South Africa	4	0.6
Chile and Argentina	3	0.4
Texas	2	0.3
Spain	2	0.3
Germany & Austria	2	0.3

Table 3-10: Influences when selecting a particular wine region to visit

List of Influences	All		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
Prior experience with the wines of the area	410	68.8	136	21.6	247	22.7
Recommendation from a friend or family	367	61.6	112	17.8	232	21.3
Distance to the area from your home	240	40.3	96	15.2	132	12.1
Advertising	44	7.4	19	3.0	21	1.9
Prior visit	235	39.4	87	13.8	134	12.3
You are with a group	131	22.0	50	7.9	75	6.9
A particular winery you want to visit	292	49.0	92	14.6	176	16.1

Table 3-10: Influences when selecting a particular wine region to visit

List of Influences	All		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
Other attractions or activities in the area	122	20.5	38	6.0	73	6.7

Red Mountain AVA Visit

The current trip to Red Mountain was also described by the respondents (Table 3-11). The type of trip the respondents were on reflected their residential location. Only Non Tri-Cities Residents are reported as the Tri-Cities residents were on a day trip. A large portion of Non Tri-Cities Residents were on a *multi-day trip* and Red Mountain AVA was part of that trip (n=218, 60.7%). 17.5% (n=63) indicated that Red Mountain AVA was their *primary destination*. The mean number of nights away from home of Non Tri-Cities Residents was 4.22.

**Table 3-11: Description of this visit to Red Mountain AVA?
Non-Tri-City Residents only**

Type of Visit	#	%
Day trip from home	78	21.7
Multi-day trip with Red Mountain as the primary destination	63	17.5
Multi-day trip with Red Mountain as part of a larger trip	218	60.7
Total	359	100.0

The respondents indicated that their primary destination was in the Pacific Northwest and also to such locations as California, but 57.7% indicated that Eastern Washington or the Tri-Cities were their primary destination (Table 3-12). Twenty-seven percent were in the area for some purpose such as business, or an event not related to wine tourism (for example, a wedding).

Table 3-12: Primary destination if Red Mountain is part of a larger trip

Destination	#	%
Idaho	80	27.0
Purpose Based	80	27.0
Walla Walla or other Eastern Washington Locale	46	15.5
Tri-Cities	45	15.2
Oregon	12	4.1
Midwest upper tier WI MI MN WY	11	3.7
Western Washington	9	3.0
Pacific Northwest	7	2.4
"Home"	2	0.7
British Columbia	2	0.7
Napa Valley and other California Wineries	2	0.7

Even with the large number of respondents residing in Washington, 46.6% (n=227) were visiting the Red Mountain AVA for the first time (see Table 3-13). This number is deceiving, however, as 62.4% (n=118) of the Tri-Cities respondents had visited over 3 times and 60.2% (n=219) of the Non Tri-Cities respondents were visiting for the first time. Even with the number of the Non Tri-Cities residents visiting for the first time, 74.7% (n=437) respondents for both groups were aware of Red Mountain wineries and wines.

Table 3-13: Number of times visited the Red Mountain AVA

	All		Tri-Cities		Non Tri-Cities	
	#	%	#	%	#	%
First visit	277	46.6	40	21.2	219	60.2
1-3 times	109	18.3	31	16.4	66	18.1
Over 3 times	209	35.1	118	62.4	79	21.7
Total	595	100.0	189	100.0	364	100.0

The amount of money spent on wine and wine-related items during this particular trip was indicated for all wineries visited and for Red Mountain AVA. Table 3-14 indicates a mean response of \$308.34 overall and \$173.28 at Red Mountain wineries only. There was a statistical significant difference between the amount spent by Tri-Cities and Non Tri-Cities Residents. It is

interesting to note that the Tri-Cities spend less; however, they visit more often. With this in mind, individuals taking local or day trips should not be discounted relative to long-haul tourists, especially during the winter months.

Table 3-14: Amount spent at wineries overall and at Red Mountain AVA this trip.

	All	Tri-Cities	Non Tri-Cities
	Mean	Mean	Mean
Approximately how much will you or are you planning on spending on wine and other wine related items on this trip?	\$307.05	\$117.05	\$403.08
Approximately how much will you or are you planning on spending on wine or wine related items from Red Mountain on this trip?	\$176.13	\$102.54	\$216.57

The number of wineries visited (see Table 3-15) also reflects the longer trips taken by Non Tri-Cities residents. If an assumption is made that Red Mountain AVA visits were completed in one (1) day, average daily visits were 3.68, which reflects previous research reporting 3 to 4 wineries per day.

Table 3-15: Number of wineries visited or are planning on visiting on this trip

	All Respondents	Tri-Cities	Non Tri-Cities
	Mean		
On this trip, how many wineries have you and your party visited or are you planning on visiting?	7.09	4.67	8.62
On this trip, how many Red Mountain wineries have you and your party visited or are you planning on visiting?	3.68	3.42	3.9

A description of the Red Mountain AVA Conceptual Plan was included and individuals were asked to indicate whether they would visit; whether they would visit more than 1 time; and whether they would visit for longer than 1 day. They were asked to respond on a scale from 1=Definitely Yes to 10=Definitely No. The mean response to each of these questions is shown in Table 3-16. Tri-Cities and Non Tri-Cities resident responses are reported separately.

Imagine that you are choosing a destination for a weekend trip to Washington Wine Country. The Red Mountain AVA now has 40 wineries linked together by a two-lane paved road bordered by vineyards. Interpretive paths and hiking and biking trails link the Wine and Artisan Village and wineries. The Village contains shops, a village green, picnicking and children’s play areas, dining, lodging, interpretive displays, and meeting facilities.

	All	Tri-Cities	Non Tri-Cities
	Mean		
Would you visit?	2.25	2.12	2.3
Would you visit more than 1 time?	2.62	2.17	2.87
Would you visit for longer than 1 day?	3.45	4.21	3.05

Finally, respondents were asked an open-ended question about what they enjoyed most about this visit. Table 3-17 lists the categorized responses. The top three (3) responses were 1) “The Wine”, 2) Friendly Servers or Staff, and 3) Scenery or Landscape. It is interesting that “The Wine” as the top item enjoyed is supported by the fact that respondents were aware of Red Mountain AVA and had prior experience with the region. An assumption could be made that they had tasted Red Mountain wines and were interested in visiting the actual production facilities of wines they already enjoyed. They also spent money on wine while visiting.

Category	#	%
The Wine	159	25.0
Friendly Servers/Staff	118	18.6
Scenery or Landscape	73	11.5
Climate or Weather	38	6.0
Companions and other Activities	37	5.8
Information on Wines and Tours	32	5.0
Atmosphere	30	4.7
Tasting Room	26	4.1
Tasting	22	3.5
Specific Winery	21	3.3
Good Time	19	3.0
Variety	17	2.7
Winery/Vineyard Atmosphere	17	2.7
Good Service	10	1.6
People Generally	9	1.4
Food	6	0.9
Proximity	2	0.3

ON LINE SURVEY OF POTENTIAL VISITORS TO RED MOUNTAIN AVA (POTENTIAL VISITORS)

The purpose of the research was to describe the residents living in Oregon, Washington and Idaho most likely to visit the Red Mountain AVA (Potential Visitors). A survey was designed, tested, and implemented containing questions on 1) general wine behavior, 2) wine tourism behavior, 3) preferences for visiting wineries and wine regions, 4) opinion on the Red Mountain Conceptual Plan proposed, and 5) demographics. Members of wine clubs and enological societies located in

Oregon, Washington and Idaho were contacted via club leadership. An email notice was sent to club leadership and forwarded to membership. The notice requested members to access the survey at <http://www.surveymonkey.com/winelovers> and complete the survey. The survey was accessible to “wine lovers” from May to June 2007. Respondents self-selected. Three hundred fifty usable surveys were received.

The respondents were asked where they had heard about the survey (see Table 3-18). The majority of the respondents (66.3%) had heard about the survey from their wine club. Accessing respondents through a wine club or society was the recruiting tool used.

Table 3-18: Where did you hear about this survey?

	#	%
Wine Club	232	66.3
Internet	40	11.4
Word of Mouth	35	10.0
Wine Ambassadors	21	6.0
NW Wine Press Web	11	3.1
Wine Event	6	1.7
Washington Wine Commission	5	1.4
Total	350	100.0

Demographics

The majority (59.5%, n=207) of the respondents were residents of the Puget Sound area ranging from Everett to Olympia (see Table 3-19). A total of 317 or 91.1% were residents of Washington State. Again, this reflects the recruiting method used as the wine clubs were contacted in Washington, Oregon, and Idaho. The highest number of wine clubs or societies was located in Washington State.

Table 3-19: Zip Code at primary residence

Zip Code Area	#	%
Puget Sound	207	59.5
Tri Cities	45	12.9
Eastern Washington except Tri Cities	33	9.5
Other Western Washington (Vancouver, Olympic Peninsula)	32	9.2
Oregon	15	4.3
Idaho	4	1.1
Montana, California and Alaska	4	1.1
Georgia	3	0.9
Minnesota, Texas, and Ohio	2	0.6
International	2	0.6
West	1	0.3
Total	348	100.0

NOTE: Discrepancies are due to non-reporting of zip or other data on comparison items

The gender of the respondents is shown in Figure 3-2. The respondents were fairly evenly split between males and females.

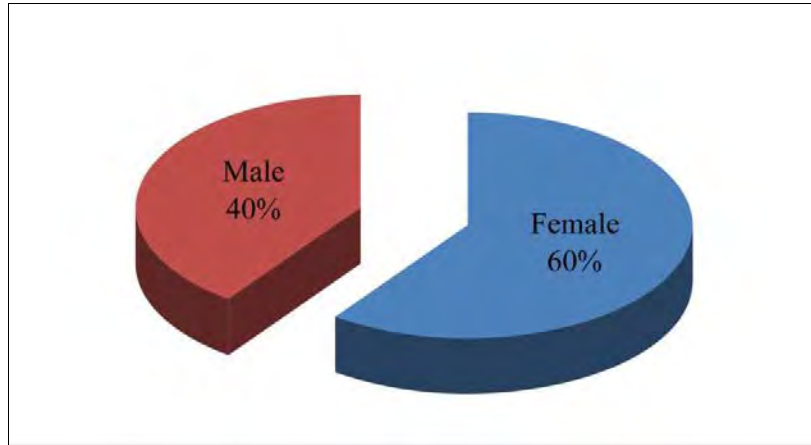


Figure 3-2. Gender of Respondents

The majority of the respondents were from *51 to 60 years old* (36.6%) and *41 to 50 years old* (22.5%) (See Table 3-20). The age of the respondents reflected results seen in the Red Mountain Visitor Study (Current Visitors) completed in 2006.

	#	%
21 to 30 years old	15	4.7
31 to 40 years old	58	18.1
41 to 50 years old	72	22.5
51 to 60 years old	117	36.6
61 to 70 years old	48	15.0
71 to 80 year old	9	2.8
Over 80 years of age	1	0.3
Total	320	100.0

The highest level of education held by the majority of the respondents was a college or university degree (bachelor’s degree) or higher (72.1%; see Table 3-21).

	#	%
Some high school	0	0.0
Completed high school or GED	7	2.2
Vocation or trade school	10	3.1
Some college/university	46	14.4
Two year degree	26	8.2
Four year degree	140	43.9
A graduate degree (e.g. M.S., Ph.D. or an M.D.)	90	28.2
Total	319	100.0

The number of people living in the individual’s household including himself or herself was 2.16 (mean). The range of responses was from 1 to 5 with the majority of households containing two

(2) individuals (n=190; 59.2%). Respondents were given a list of professions and asked to check the item that most closely reflects his or her profession currently. Management (19.3%), Retired (16.8%) and Technical (16.1%) were the more frequent responses. “Other” included such positions as Professional or Administrator.

Table 3-22: Profession

Type of position	#	%
Management	61	19.3
Retired	53	16.8
Technical	51	16.1
Sales	31	9.8
Educator	22	7.0
Medical	16	5.1
Government	14	4.4
Financial or Accounting	14	4.4
Self-employed or Consultant	13	4.1
Marketing or Media	8	2.5
Law	5	1.6
Agriculture/Forestry/Sciences	5	1.6
Trades	4	1.3
Recreation or Tourism	4	1.3
Food and Beverage	4	1.3
Other	4	1.3
At Home or Volunteer	3	0.9
Veterinarian	2	0.6
Unemployed	1	0.3
Real Estate	1	0.3
Student	0	00.0
Total	316	100.0

Table 3-23 indicates the income level of the respondents. The majority of the respondents had an income over \$100,000.00 (54.1%). These results also reflect the income level of the Red Mountain Visitors (Current Visitors) from 2006.

Table 3-23: Annual household income

Income	#	%
Less than \$25,000	1	0.3
\$25,001 to \$39,999	12	4.2
\$40,000 to \$59,999	30	10.5
\$60,000 to \$79,999	46	16.1
\$80,000 to \$99,000	42	14.7
\$100,000 to 124,999	75	26.2
\$125,000 to 149,999	32	11.2
\$150,000 to 199,999	29	10.1
\$200,000 to 250,000	9	3.1
Over \$250,000	10	3.5
Total	286	100.0

Wine Behavior

The respondents were asked *how many wine clubs sponsored by a winery (Winery Clubs) they belong to?* The respondents either did not belong to any winery wine clubs (37.8%) or belonged to only 1 or 2 clubs (38.1%) (see Table 3-24).

Table 3-24: Winery wine club membership

	#	%
Do not belong	132	37.8
1 to 2 clubs	133	38.1
3 to 4 clubs	50	14.3
5 or more clubs	34	9.7
Total	349	100.0

Wine oriented activities were seen by the respondents to be *one of my more important leisure activities* (65.0%; n=227) (see Table 3-25). This is also reflected in their frequency of wine consumption (Table 3-26) as they are consuming wine either *almost every day* (46.0%) or *3 or 4 times per week* (28.3%).

Table 3-25: Importance of wine oriented activities compared with other leisure activities

	#	%
My most important leisure activity	22	6.3
One of my more important leisure activities	227	65.0
No more important than any leisure activity	79	22.6
Less important than most of my other leisure activities	19	5.4
Not at all important to me as a leisure activity	2	0.6
Total	349	100.0

Table 3-26: Frequency of wine consumption

	#	%
Never I am not a wine drinker	0	0.0
Only on special occasions	3	0.9
One or two times per month	12	3.7
About 1 or two times per week	68	21.1
3 or 4 times per week	91	28.3
Almost every day	148	46.0
Total	322	100.0

Respondents were asked to rank the top 3 types of location where they most often purchase wine when not traveling. *At the Grocery Store* (mean= 1.92) and *Through a wine club* (mean=1.96) gained the highest average ranking; however, *At the Grocery Store* (74.8%) and *At a Specialty Store* (56.1%) were most often used (see Table 3-27).

Table 3-27: When not traveling, where do you most often purchase wine? (n=350)

	Mean	Rank 1	Rank 2	Rank 3	Total	%
At a Grocery Store	1.92	130	76	58	264	75.4
Through a Wine Club	1.96	39	45	43	127	36.3
At a nearby Winery	2.05	60	68	55	183	52.3
At a Specialty Store (i.e. wine, gourmet, gift)	2.15	64	58	76	198	56.5
At a Discount Retailer (i.e. Costco, Target)	2.21	38	70	56	164	46.9
Through a Website	2.69	11	13	19	43	12.3
At a Government Liquor Store	2.71	13	18	36	67	19.1

Portion of respondents choosing location as 1, 2 or 3

They purchase wine at these locations and spend from \$8.00 to \$15.00 (42.1%) or \$16.00 to \$25.00 (37.0%) when they are at home (see Table 3-28). When traveling, however, the respondents spend more money on a bottle of wine; \$16.00 to \$25.00 (47.7%) or \$26.00 to \$35.00 (28.5%).

Table 3-28: How much do you usually spend on a bottle of wine at home and when traveling

	At Home		When Traveling	
	#	%	#	%
Less than \$8.00	10	2.9	2	0.6
\$8.00 to \$15.00	147	42.1	51	15.8
\$16.00 to \$25.00	129	37.0	154	47.7
\$26.00 to \$35.00	48	13.8	92	28.5
\$36.00 to \$50.00	12	3.4	21	6.5
Over \$50.00 per bottle	3	0.9	1	0.3
Total	349	100.0	323	100.0

Visiting Wine Regions

A series of questions asked about his or her visitation to selected northwest wine regions and also about a recent extended trip taken to a wine region. The minimum number of wineries needed when trying to decide upon a wine region to visit for a weekend was 7.84 wineries. Figure 3-3 shows that from 5 to 7 wineries are preferred by 34.2% of the respondents.

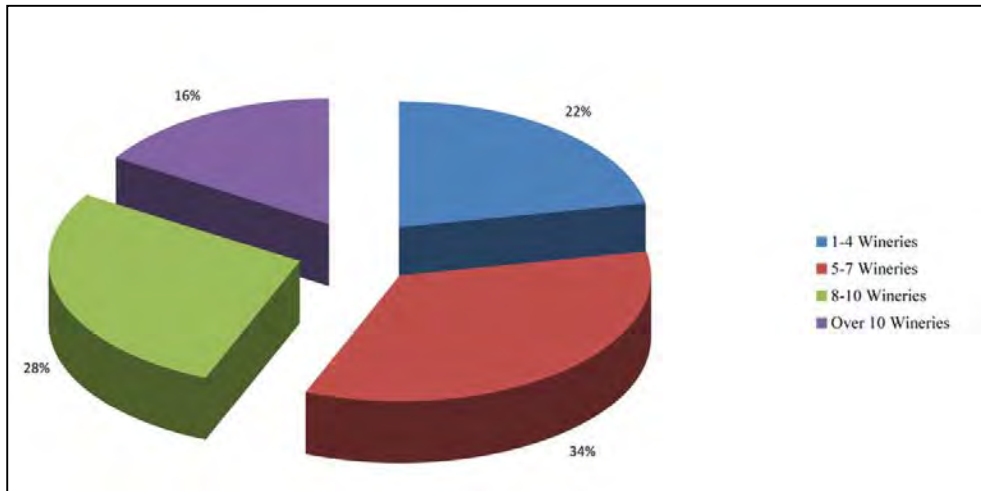


Figure 3-3. Preferred Number of Wineries for an Overnight Trip

A list of wine regions was provided and respondents were asked to indicate the number of trips taken to the wine region during 2006 and so far in 2007. Table 3-29 is a display of the results. The most visited regions were 1) *tied* Woodinville and Yakima Valley, 2) Walla Walla, 3) Red Mountain. Red Mountain is the fourth most-visited region among the respondents. Red Mountain AVA was not mentioned specifically in any of the instructions on the survey.

Table 3-29: Number of trips taken to the following wine regions during 2006 and so far in 2007

Wine Region	Total Responses #	Number of Trips						Took a trip of any duration %	# of trips Mean
		0 trips	1 trip	2-3 trips	4-5 trips	more than 5 trips			
Columbia Cascade, WA including Wenatchee, Leavenworth & Chelan	305	158	87	50	4	6	48.2	1.9	
Okanagan Valley, British Columbia	290	243	40	6	1	0	16.2	1.3	
Red Mountain, Washington	301	126	84	57	18	16	58.1	2.4	
Snake River Valley, Idaho	276	264	11	1	0	0	4.3	1.1	
Southern Oregon	280	227	45	6	1	1	18.9	1.3	
Spokane, WA	287	214	44	22	4	3	25.4	1.9	
Walla Walla, Washington	299	122	102	47	17	11	59.2	2.1	
Willamette Valley, OR	296	160	89	32	9	6	45.9	1.8	

Table 3-29: Number of trips taken to the following wine regions during 2006 and so far in 2007

Wine Region	Total Responses #	0 trips #	1 trip #	2-3 trips #	4-5 trips #	more than 5 trips #	Took a trip of any duration #	Took a trip of any duration %	# of trips Mean
Woodinville, WA	318	90	54	61	36	77	228	71.7	4.0
Yakima Valley including Zillah, Prosser, & Yakima, WA	311	88	107	72	19	25	223	71.7	2.5

Table 3-30 displays the number nights spent in the wine region they visited. The nights spent in the region ranged from 1.62 to 2.63 nights with shortest stays at Red Mountain. The greatest number of nights spent was in the Okanagan Valley followed by the Columbia Cascade region.

Table 3-30: Number of nights spent in the region(s) visited

Wine Region	Mean	Median	Mode	#	%
Columbia Cascade, WA including Wenatchee, Leavenworth & Chelan	2.45	2	1	11	31.8
Okanagan Valley, British Columbia	2.63	2	2	43	12.2
Red Mountain, Washington	1.62	1	1	73	20.7
Snake River Valley, Idaho	2.13	2	1	23	6.5
Spokane, WA	2.2	2	1	54	15.3
Walla Walla, Washington	1.93	2	1	13	38.4
Willamette Valley, OR	2.24	2	2	10	31.0
Woodinville, WA	2	1	1	41	11.6
Yakima Valley including Zillah, Prosser, & Yakima, WA	1.92	2	1	13	37.2

Events did not seem to motivate this group as fewer than 25% of the respondents had attended an event during their visit except when visiting Woodinville (26.4%) (see Table 3-31).

Table 3-31: Attendance at a wine when in the wine region(s)

Wine Region	#	%
Columbia Cascade, WA including Wenatchee, Leavenworth & Chelan	34	6.7

Table 3-31: Attendance at a wine when in the wine region(s)

Wine Region	#	%
Okanagan Valley, British Columbia	13	2.6
Red Mountain, Washington	70	13.9
Snake River Valley, Idaho	4	.8
Southern Oregon	10	2.0
Spokane, Washington	21	4.2
Walla Walla, Washington	76	15.1
Willamette Valley, OR	43	8.5
Woodinville, WA	133	26.4
Yakima Valley including Zillah, Prosser, & Yakima, WA	100	19.8
Total	504	100.0

The respondents indicated that in the future they would be taking longer trips as 30.0% were definitely taking at least one overnight wine tasting trip and 36.3% will probably be taking day trips and a longer trip (see Table 3-32).

Table 3-32: Future plans for wine trips for the remainder 2007 into 2008?

	#	%
I will definitely be taking at least 1 day trip to taste wine at a winery	64	20.0
I will definitely be taking at least one overnight wine tasting trip	96	30.0
I will probably be taking many day trips	41	12.8
I will probably be taking day trips and a longer trip	116	36.3
I will not be taking any wine related trips	1	0.3
Other	2	0.6
Total	320	100.0

Respondents were asked to name their favorite wine region. Table 16 categorizes the open-ended responses. The top three areas identified were 1) Walla Walla, 2) Yakima Valley, and 3) Red Mountain.

Table 3-33: Favorite Wine Region

	#	%
Walla Walla	91	30.8
Yakima Valley including Yakima/Prosser/Zillah	59	20.0
Red Mountain	29	9.8
Oregon	23	7.8
Woodinville area	21	7.1
Napa Valley and/or Sonoma	15	5.1
Columbia Cascade	11	3.7
California excluding Napa Valley and Sonoma	7	2.4

Table 3-33: Favorite Wine Region

	#	%
No preference or Any	7	2.4
Columbia Valley Area	5	1.7
Eastern Washington (not specified)	5	1.7
Okanagan Valley, BC	5	1.7
Washington State (not specified)	3	1.0
New Zealand/Australia	3	1.0
France	2	0.7
Chile/Argentina	2	0.7
Spokane	2	0.7
Idaho	1	0.3
Italy	1	0.3
South Africa	1	0.3
Germany	1	0.3
Europe (not specified)	1	0.3
Total	295	100.0

A Recent Overnight Visit to a Wine Region

71.8% (n=234) had recently taken an overnight trip to a wine region participating in wine tasting and other activities. The wine regions visited are displayed in Table 3-34 with 1) Walla Walla (20.8%), 2) Yakima Valley (18.8%), and 3) Oregon (13.3%) being the top three destinations visited.

Table 3-34: Wine region visited on recent overnight trip

Wine region	#	%
Walla Walla	50	20.8
Yakima Valley including Yakima/Prosser/Zillah	45	18.8
Oregon	32	13.3
Napa Valley and/or Sonoma	24	10.0
Columbia Cascade	21	8.8
Red Mountain	16	6.7
Columbia Valley Area	8	3.3
Woodinville area	8	3.3
Southern California (i.e. Santa Ynez)	7	2.9
British Columbia	6	2.5
Spokane	4	1.7
Chile and Argentina	3	1.3

Table 3-34: Wine region visited on recent overnight trip

Wine region	#	%
Olympic Peninsula	3	1.3
New York and Other East Coast	2	0.8
France	2	0.8
New Zealand/Australia	2	0.8
Event Related	2	0.8
Eastern Washington (not specified)	1	0.4
California excluding Napa Valley and Sonoma	1	0.4
Italy	1	0.4
South Africa	1	0.4
Germany & Austria	1	0.4
Total	240	100.0

This recent visit was the primary purpose for the trip for 69.5% of the respondents (See Table 3-35). The “other” responses included visiting the area on business including 2 individuals whose business was wine related.

Table 3-35: The visit to this wine region was

	%	#
The primary purpose for the trip	162	69.5
Part of a larger trip	66	28.3
Other	5	2.1
Total	233	100.0

The number of persons traveling with the respondent tended to be *one other person* (48.9%) and less often but still a high portion was 2 to 3 persons (24.5%) (see Table 3-36).

Table 3-36: The number of persons traveling with the respondent on this trip

	#	%
I was alone	17	7.3
I had one other person with me	114	48.9
I had from 2 to 3 others with me	57	24.5
I had 4 to 6 others with me	23	9.9
Over 6 persons were traveling as a group	22	9.4
Total	233	100.0

The average number of nights spent away from home on their self identified trip was 4.20 (mean) nights (median=2, Mode=2). Table 3-37 displays the frequency of the responses. The trips were mostly 2 or more nights.

	#	%
1 night	43	19.1
2 nights	89	39.6
3 to 4 nights	45	20.0
More than 4 nights	48	21.3
Total	225	100.0

The respondents spent anywhere from 1 day to 3 to 4 days tasting wine. Figure 3-4 indicates that “2 days is the most frequent number of days tasting wine. The average number of nights away from home was 4.2 nights and the number of days tasting wine was 2 days. It raises the question as to what the respondents’ activities were during the other 2 days. Or was this travel time?

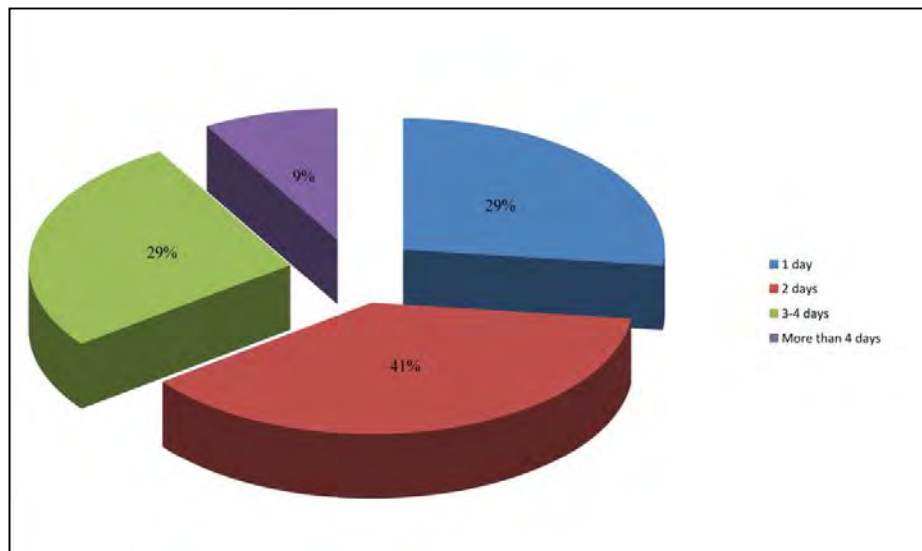


Figure 3-4 Number of Days Tasting Wine

The respondents slept at *hotels or motels* (60.9%; Table 3-36), ate *2 meals per day in a restaurant* (49.8%; Table 3-38), purchased at least 1 case of wine (50.6%; Figure 3-5), and chose the region 1) because of an event (barrel tasting, release); 2) because of its proximity, convenience, “it was nearby,” 3) because they like the wine; 4) because of its location is beautiful (scenery, weather). (see Table 3-40).

Type of accommodation	#	%
Hotel/motel	156	60.9
Bed and Breakfast	23	9.0
Campground	11	4.3
Stayed with friends or family	39	15.2

Table 3-38: Accommodations used on this trip

Type of accommodation	#	%
Condominium, Vacation Rental, Timeshare	20	7.8
Winery or Vineyard Lodging	7	2.7
Total	256	100.0

Table 3-39: Number of meals eaten at a restaurant during this trip

	#	%
3 meals per day	41	17.7
2 meals per day	122	52.8
1 meal per day	49	21.2
3-5 meals for the whole trip	13	5.6
No restaurant meals....My meals were prepared and served at my campground or with friends	6	2.6
Total	231	100.0

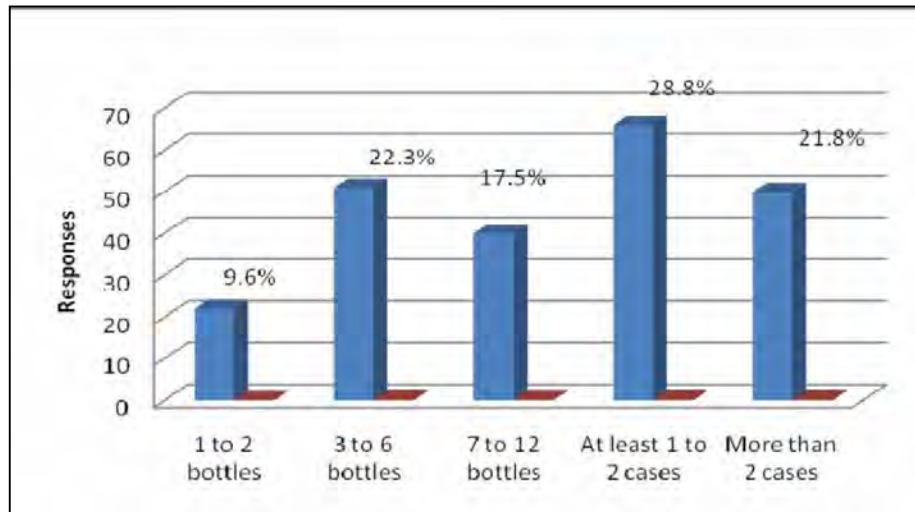


Figure 3-5. Amount of Wine Purchased on This Trip

Table 3-40: Reason for choosing this wine region

	#	%
An Event	33	12.6
Proximity, convenience, it was nearby	30	11.5
“Like the wine”	29	11.1
Best wine or region	27	10.3
Visiting family and friends	26	10.0
Location is beautiful	19	7.3
Curiosity, it is a new area for me	19	7.3

Table 3-40: Reason for choosing this wine region

	#	%
Return visit	17	6.5
Other activities and attractions	17	6.5
Business	12	4.6
Reputation	10	3.8
Fun	4	1.5
People at winery	4	1.5
Wine attraction	3	1.1
Word of mouth	3	1.1
Number of wineries	3	1.1
Vacation	2	0.8
Ad	2	0.8
Less well known	1	0.4
Total	261	100.0

This trip was taken during *regularly scheduled time off (e.g. weekend)* (41.7%) or *time off with pay* (31.5%) (see Table 3-41). If the respondents had not taken the trip, they would have *worked around the house* (34.5%) or *worked* (23.2%) (see Table 3-42). The alternative leisure activities they would have undertaken included 1) travel to another destination; 2) other recreation such as golf, biking, hiking or reading; or 3) visited family and friends (see Table 3-43).

Table 3-41: The trip was taken during.....

	#	%
Regularly scheduled time off (e.g. weekend)	98	41.7
Time off without pay	11	4.7
Time off with pay (vacation, sick, personal time)	74	31.5
I am retired	42	17.9
Business related travel	5	2.1
Self Employed time off	5	2.1
Total	235	100.0

Table 3-42: If you had not taken this trip, what would have likely done instead?

	#	%
I would have worked	51	23.2
I would have tasted wine somewhere else	23	10.5
I would have worked around the house	76	34.5
I would have participated in another leisure activity at home or nearby	39	17.7
I would have traveled elsewhere participating in other leisure activities	31	14.1

Table 3-42: If you had not taken this trip, what would have likely done instead?

	#	%
Total	220	100.0

Table 3-43: Alternative leisure activity

	#	%
Recreation activity (hiking, fishing, reading)	67	28.5
Dancing, movie, dinner, galleries(local attractions)	26	11.1
Travel	84	35.7
Visit family and friends	40	17.0
Beer/wine tasting or visits locally	18	7.7
Total	235	100.0

An AVA Vision

A description of the Red Mountain AVA Conceptual Plan was included (without Red Mountain being identified) and individuals were asked to indicate 1) whether they would visit; 2) whether they would visit more than 1 time; and 3) whether they would visit for longer than 1 day. They were asked to respond on a scale from 1=*Definitely Yes* to 10=*Definitely No*. The mean, median, and mode to each of these questions are shown in Table 3-44. The text on the survey did not indicate the specific AVA.

Imagine that you are choosing a destination for a weekend trip to Washington Wine Country. There is an area near the Tri-Cities in Washington which is a designated American Viticultural Area (AVA) and its hallmark is premium red wines. The area has 40 wineries linked together by a two-lane paved road bordered by vineyards. Interpretive paths and hiking and biking trails link the Wine and Artisan Village and wineries. The Village contains shops, a village green, picnicking and children’s play areas, dining, lodging, interpretive displays, and meeting facilities.

The respondents indicated they would definitely visit (mean=1.64) but are less likely to visit more than 1 time (mean 2.34) or longer than 1 day (mean=2.40). The most prevalent responses to all three (3) questions, however, were “1” or “Definitely Yes”.

Table 3-44: Response to scenario

	Mean	Median	Mode
Would you visit	1.64	1	1
Would you visit more than 1 time	2.34	1	1
Would you visit for longer than 1 day?	2.4	1	1

Then respondents were given a list of items and asked how important the items were to them when selecting a winery or wine region to visit. The response categories were 5=*Crucial*; 4=*Very important*; 3=*Important*; 2=*Somewhat important*; 1=*Not at all important*.

The four (4) most important items were 1) *knowledgeable winery staff*, 2) *desirable lodging options*, 3) *clear directional signage*, and 4) *wineries open daily with regular hours*. There is, however, a discrepancy between this list and the reasons the respondents provided on why they chose the wine region during a recent visit (Table 3-45).

Table 3-45: Importance when selecting a winery or winery region to visit

	Mean
Knowledgeable winery staff	3.97
There are desirable lodging options	3.42
Has clear directional signage	3.41
Wineries are open daily with regular hours	3.38
Open year round	3.03
There are more than 15 wineries to visit.	2.83
The wineries are typically less crowded	2.73
Located in the countryside	2.59
There are opportunities to meet people	2.52
It is permitted to wander the vineyard	2.41
“Easy on and off” to a major highways	2.38
Not more than a 2 hour drive each	2.30
The area is new to me and my party	2.24
The wines have received at least 85 on the Wine Spectator/Robert Parker list	2.13
There are walking/bicycling paths between wineries	1.98
The wineries have other activities beyond tasting	1.98
There is an event or festival happening	1.93
Access to people with disabilities	1.68
Visited previously	1.66
Membership in a wine club in the area	1.33

Note: 86.9% to 92.0% responded

VISITS AND VISITOR PROJECTIONS FOR RED MOUNTAIN AVA MASTER PLANNING PROCESS

Forecasting or making projections as to the number of visitors to a tourism destination, attraction, or facility is nebulous at best. What is tourism traffic going to be like this summer? Next year? Who is traveling? Where are they traveling? Will it be a good year? The tourism industry is plagued with unknowns and variables that impact the type of travel, number of travelers, or the destination choices of travelers. This is seen with such events as the 9/11 attacks on the World Trade Center and the Pentagon when many tourism operators saw a drastic decrease in travel (that is, fly-in destinations and attractions), but others, where visitors drive, saw a booming business. The price of gasoline continues to increase. As a result the cost of travel increases , which generally decreases the number of travelers and trips. The following information provided by the Associated Press has a different view for Summer 2007.

.....motorists are expected to use nearly 400 million gallons of gasoline from April to September, a 1.2 percent increase over the same months last year. "Demand for fuel is strong. We've not seen a reduction in fuel use."¹⁵

Impacts on a regional or local level may be felt as a nearby attraction might reduce the number of weekend events, thereby affecting the occupancy at area hotels and other businesses. The weather and construction during the summer season are factors. In the case of the Red Mountain AVA, if the weather and road conditions over Snoqualmie Pass are hazardous, visitation drops dramatically.

The purpose of this portion of the visitor studies was to describe the process and results for projecting the number of visits and visitors to the Red Mountain AVA from 2007 to 2025 based on the vision outlined in the Red Mountain AVA Conceptual Plan. By the year 2025, forty (40) wineries are proposed. A Wine Village will be developed containing restaurants, lodging, shops, and other amenities. The year 2015 is estimated as the year in which the wine village will be at full operation. Additional features, based upon the Conceptual Plan, will include trails, interpretation, and other attractions such as events, fairs and meetings.

Four (4) methods of data gathering were used to provide input into visitor studies for the Red Mountain AVA Master Planning process. Data and results from the following studies provided needed information and also supported assumptions:

1. Red Mountain Visitor Study (Current Visitors)
2. Research Analysis and Review
3. Winery Owner/Manager Interviews
4. Potential Winery Visitor Study

Two terms, visits and visitors are used throughout. Visits are described as an individual making a stop at a winery. An individual may stop at several wineries and it is considered a "visit" at each of the wineries; however, this is only one visitor. A visitor is an individual who travels to Red Mountain for wine tasting and other wine related activities (wine tourism).

Current Visits and Visitors

The current number of visitors and visits to Red Mountain was determined first. Interviews were conducted with winery owners or managers. They were asked to estimate the number of visits to their winery on a high season weekend day, a high season weekday, low season weekend day, and low season weekday. They also estimated the time period considered to be high season and low season. Finally, they provided comments on the increase in visitation during events. Table 3-46 displays the results of these interviews and also the resultant calculation of current visits and visitors. The manner of tracking the number of visits to tasting rooms varies. This is typical of the entire industry. From the data provided an average level of visitation was determined.

The following variables were taken into consideration during the analysis of current visits and also in the future projections; 1) number of days open/week and 2) the number of wineries visited/trip. The number of days tasting rooms are open varies; some wineries are open “when we are here” or “it is a big weekend” while others are open year-round, 7 days a week. An average of open days/week/winery (Open Days Average) for Red Mountain was calculated. Currently the Open Days Average for Red Mountain is 3.4 days/week. The typical number of wineries visited in one (1) day is estimated to be from 3 to 4 wineries (Winemakers’ Federation of Australia, 2007). The average of 3.5 wineries was used for breaking down visits to visitors and vice versa.

Table 3-46: Current Visitation 2007

	Average Daily Visits/Winery
*High season weekend 33 weeks high season	120
*High season weekday	40
*Low season weekend 19 weeks low season	45
*Low season weekday	10
Average number of visits/day or visits average	49.89
Visits/winery/year based upon # of open days/week	
Total visits/ winery open 7 days/week	17,192
Total visits/winery open 3 days/week	7,348
Total visits/winery open weekends only	4,898
Total visits/winery if open sporadically	2,449
Total visits for Red Mountain based upon current open days	88,313
Total visitors for Red Mountain with average 3.5 wineries/trip	25,232
Average number of visits /winery/year	8,831
Average number of visitors/winery/year	2,523
Number of visitors per winery /day	50
*Based upon interview data	

Visits Average is the average number of visits/winery/day year round taking into consideration seasonality. The total number of visits/year to Red Mountain is 88,313 visits. The total number of visitors to Red Mountain is 25,232 visitors/year.

Red Mountain AVA Future Projections for 2025

Current visitation figures and averages were used as a foundation for making future projections for the time intervals of 2010, 2015, 2020, and 2025. Layers were added to the current figures. Each layer is another variable affecting visitation levels. Each of the variables or layers is added to the previous layer in order to effectively create a progressively higher visitation.

The report of the U.S. Census Population Projections for the United States and specifically, Washington State constituted the first layer. The increase in the 21 years and older population in Washington State and the United States was used to provide a basic constant in the increase in visitors over time. The 21 years and older population in Washington State is predicted to increase 32.3% from 2005 to 2025. The 21 years and older population in the United States is expected to

increase by 20.8% from 2005 to 2025 ¹⁶(United States Census, 2006). 76.3% of the visitors to Red Mountain are from Washington State (see Visitor Study included above in this section). 23.7% of visitors to Red Mountain reside throughout the United States from Oregon to Florida. Table 3-46 illustrates the number of visitors projected from Washington State. The same calculations were used to estimate the visitors to Red Mountain living outside of Washington State.

17.4% of the population is considered to be Core Wine Drinkers. 17% of the population is considered to be Marginal Wine Drinkers (Wine Marketing Council, 2006). Based upon the data collected from visitors to Red Mountain in 2006, the demographics of Core Wine Drinkers are similar to the Red Mountain visitor demographic. An assumption was made that 17.4% of the population overall and in Washington State are Core Wine Drinkers and therefore most likely to visit Red Mountain. Marginal Wine Drinkers did not fit the demographic; however, ½ or 8.5% of Marginal Wine Drinkers were considered potential visitors. Using the current estimates as a base and the increasing size of the population, the number of visitors to Red Mountain from Washington State in 2025 would be 25,472 with no new wineries or development. The number of visitors from outside of Washington State in 2025 with no new wineries or development would be 7,227 for a total equaling 32,699.

Table 3-47: Projected visitors to Red Mountain from Washington State based upon the 21 years and older population increases estimated by the U.S. Census Bureau

Washington State	July 1, 2005	Projection July 1, 2010	Projections July 1, 2015	Projections July 1, 2020	Projections July 1, 2025
21 years and older (U.S. Census)	4,440,648	4,770,246	5,125,332	5,480,188	5,875,594
Core Wine Drinkers 17.4%	772,673	830,023	891,808	953,553	1,022,353
Marginal Wine Drinkers 1/2 of 17% = 8.5%	377,455	405,471	435,653	465,816	499,425
Wine drinkers most likely to visit	1,150,128	1,235,494	1,327,461	1,419,369	1,521,779
Visitors to RM now from WA 76.3%	877,548	942,682	1,012,853	1,082,978	1,161,117
Estimate for 2005 projected visitors	19,252	20,677	22,227	23,761	25,472

Table 3-48 contains an estimate of visits and visitors from 2005 to 2025 with wineries increasing from 10 to 40 wineries as shown. The average/open days/week/winery remains constant at 3.4 days. The number of visitors increases at the same rate as the 21 years and older age group. The number of visits total increases to 32,675 by 2025. If, however, the number of visits/winery/day remains constant with today’s average of 49.89, the number of visits in 2025 would be 352,850 visits, resulting in 100,814 visitors at that time (3.5 visits per trip).

Table 3-48: Current visitation as base, population projections, and number of wineries increasing						
		Projections				
		2005	2010	2015	2020	2025
Current Visitation and increase in 21 years and older population						
Number of Wineries		10	25	30	35	40
Total Red Mountain days open	3.4 days per week Open Average	1,770	4,420	5,304	6,188	7,072
# of visitors 49.89 visits 2007 estimate	Total visitors	25,232	26,994	28,874	30,681	32,675
# of visits total	Total Visits	88,312	94,479	101,062	107,385	114,364
# of wineries/ trip	Total visits/day	3.5	3.5	3.5	3.5	3.5

Current visits/winery/day continues and number of wineries increasing as shown above						
Average 49.894 visits/winery/day continues		88,312	220,781	264,937	309,093	353,250
# of visitors		25,232	63,080	75,696	88,312	100,928
Average # of visits/winery/year # per winery does not change		8,831				
# of visitors/winery/year		2,523				
# of visits/ winery/day		50				

The next layers include the following variables:

1. Increase in average number of days open/week, with the average increasing from 3.4 days/week currently to a high of 5.25 days/week in 2025
2. The average number of visits increases (Visits Average 51.89)

3. An estimated impact of the opening of additional wineries (2% per winery)
4. The impact of the Wine Village (beginning in 2015; a 10% increase in Visitors).

Each variable contributes some effect and numbers increase based upon this effect, building upon the current foundation and adding layers with each new variable.

An assumption is made that there will be an increase in the average open days/week/winery from 3.4 in 2007 to 4.6 days/week in 2010, and, finally, 5.25 days/week in 2025. Also assuming that the wineries will serve an average of 49.89 visitors/day, the number of visits in 2025 would be 648,622 visits/year and 185,321 visitors/year. The number of visits to a winery/year would be 16,216 and an average of 59 visitors/day/winery.

The number of average visits/day is expected to increase. The current Visits Average is 49.89 visits/winery/day. A new Visits Average was calculated based upon a 10% increase of average daily visits. The revised Visits Average is 51.858. The total number of visits/year becomes 674,154 in 2025.

Wineries will be opening over time. An assumption was made that there will be an additional number of visits based upon the attraction of a “new” winery. There is usually a bump of 10% based upon the literature due to new exhibits at zoos and new attractions or rides at amusement parks. To be conservative and provide a reasonable figure, 2% per winery is used. Table 3-49 displays the effects of this increase with the number of visits per year at 741,569.

	Projections 2010	Projections 2015	Projections 2020	Projections 2025
Additional wineries	15	5	5	5
Increase of 2% visits for each additional winery	30%	10%	10%	10%
# of visits per year	403,144	498,335	581,390	741,569
# of visitors per year	115,184	142,381	166,112	211,877
Visits/winery/year	16,126	16,611	16,611	18,539
Visitors/winery/year	4,607	4,746	4,746	5,297
Visitors/winery/day	67	69	69	68

Another assumption was made that the Wine Village will result in additional visitors who might not be considered part of the target market (Core and Marginal Wine Drinkers). A 10% increase in visitors is further added to the projections beginning in 2015. The number of visitors to Red Mountain in 2025 would equal 23,065 visitors and 815,726 visits, resulting in 20,393 visits/winery/year and 75 visitors/winery/day. The average visits and visitors projected for 2025 at Red Mountain AVA are shown in Table 3-50.

Table 3-50: Number of visitors and visits to Red Mountain AVA

	Projections 2015	Projections 2020	Projections 2025
Total visits/year	548,168	639,529	815,726
# of visits per winery/year	18,272	18,272	20,393
# visitors/winery/year	5,221	5,221	5,827
# visits/winery/day	76	76	75
Note: Average number of winery visits per trip 3.5 visits/trip			

Table 3-51 highlights how many visits and visitors would be on Red Mountain if it were high season on a Saturday or Sunday and all wineries were open. The winery owner/managers indicated that event weekends generally resulted in a tenfold boost in visits over a typical high-season weekend. Tenfold and fivefold boosts were calculated. The average party size, 3.83, was determined from data collected during the Red Mountain Visitor Study in 2006. The assumption is that the average car would contain 3.83 passengers; therefore, the number of parties would estimate number of cars on Red Mountain. An estimate was made based upon the number of potential locations where parties (cars) could physically be (# wineries + 3) resulting in an average of 13 cars per location and 50.7 visitors per location.

Table 3-51: Visitors and visits for high season and events

	Season Saturday or Sunday Traffic		Event Weekend /day 10X		Event Weekend /day 5X	
	2020	2025	2020	2025	2020	2025
If all wineries are open on a high season weekend	2020	2025	2020	2025	2020	2025
# of wineries	35	40	35	40	35	40
# visits/day on Red Mountain high season weekend	6,720	7,680	67,200	76,800	33,600	38,400
# of visitors/day on Red Mountain high weekend	1,920	High 2,194	19,200	21,940	9,600	10,971
Average total party size from survey 3.83						
Average number of parties/day high season weekend	503	573	5,030	5,730	2,507	2,865
Average # of parties/weekend during high season	1,005	1,146	10,060	11,460	5,013	5,729

Table 3-51: Visitors and visits for high season and events

	Season Saturday or Sunday Traffic		Event Weekend /day 10X		Event Weekend /day 5X	
# of parties/location based upon # wineries +3 locations	13	13	130	130	58	67
# of visitors at each location	50.7	51.0	510	510	223	255

OTHER PROJECTIONS (WHAT IFS)

Tables 3-52 and 3-53 provide the planning team and advisory and executive membership with “what ifs” based upon published research. High season daily activity is reported in each case. The following addresses each “what if” individually.

In conversation with winery owners/managers from other Washington AVAs, it was found that a winery averages approximately 1,500 visits/week during high season and 800 visits/week during low season. Using this data for Red Mountain, there would be 604 visitors/winery/day on a high season weekend day (see 52a). In order to further explore this phenomenon, a lower level of visitation than reported by the other AVA winery owners/managers was used - 1,000 visits/week during high season and 500 visits/week during low season. This resulted in a daily visitor figure of 397/winery during high season (see 52b). As the wine industry grows, the current levels of visitation would also increase. What if the current level of visitation (1,500 visits/week) at the other AVAs is increased by 10% every 5 years (see 52c) or is increased by 20% every 5 years (see 52d).

Table 3-52: Projections based upon current visitation at other AVAs in Washington

	High season weekend daily visits/winery	Red Mtn high season weekend daily visits	Red Mtn high season weekend daily visitors	High season weekend # parties/day; Party size 3.83	High weekend # of parties /day; Party size 2
Projections as calculated	192.0	7,680	2,194	573	1,097
52a: What if visits were at the same level as reported at other AVAs & 800/ per week during low season	604	24,174	6,907	1,803	3,453

52b: What if visits were 1,000/week during high season and 500/week during low season					
	397	15,879	4,537	1,185	2,268
52c: What if the current level of visitation at other AVAs increased by 10% every 5 years					
2025 # of visits	677	27,078	7,737	2,020	3,868
52d: What if the current level of visitation at other AVA increased by 20% every 5 years					
2025 # of visits	959	38,350	10,957	2,861	5,479

Table 3-53 draws from two (2) research studies completed by the Wine Marketing Council (2006) and Travel Industry Associates and Edge Research (2006): Consumer Tracking Study and Profile of Culinary Travelers, respectively.^{17 18} Data used initially about Core and Marginal Wine Drinkers is again drawn upon. Two (2) situations are examined: 1) what if the number of Core Wine Drinkers doubled by 2015 to 35% of the population then increased another 20% by 2025 (see 53a); and 2) what if Core Wine Drinkers increased 8% per year and Marginal Wine Drinkers decreased .5% per year (see 53b). In each of these situations, the impact of a cohort of individuals traveling into and out of the demographic seen of Red Mountain visitors is examined (2006).

Culinary tourism is growing and visitors to wine regions are considered culinary tourists. The Profile of Culinary Travelers was commissioned by a coalition of state wine commissions, convention and visitors bureaus, and state tourism organization in the United States. The research was broad, covering a large geographic area of wine tourism. Some important points from this research are:

Total number of individuals traveling for <i>Leisure Activities</i>	160,588,235
Total number of individuals very likely to travel for wine activities	64,235,294
64% of the Profile respondents rated Washington as having a great deal of opportunities for winery tours or tasting locally made wine	41,110,588
Washington is rated #3 and attracts 28.7% (behind Oregon and California)	
The total number of visitors attracted to Washington for wine tourism	11,798,739

Three (3) scenarios are explored, with responses shown in Table 3-53:

1. What if Red Mountain attracts 1/3 of Washington State wine visitor potential (see 53c)
2. What if Red Mountain attracts ¼ of Washington State wine visitor potential (see 53d)
3. What if Red Mountain attracts 1/10 of Washington state wine visitor potential (see 53e).

Table 3-53 Projections based upon core and marginal wine drinkers (53a & 53b) and culinary wine tourism (53c).

	High season weekend /daily visits /winery	Red Mtn high season weekend daily visits	Red Mtn High season weekend daily visitors	High season weekend day Parties/day; Party size 3.83	High season weekend day parties/day; Party size 2
53a: What if the # of core wine drinkers doubled by 2015 or at 35% level then increased another 20% by 2025	295	11,810	3,374	881	1,687
53b: What if core wine drinkers increased 8%/year and marginal wine drinkers decreased .5%/year In 2025	262	10,486	2,996	782	1,498
53c: What if Red Mountain could attract ____ of the potential of wine tourism potential					
Red Mountain attracts 1/3 of Washington State potential/year	262	10,486	2,996	782	1,498
Red Mountain attracts 1/4 of Washington State potential/year	197	7,872	2,249	587	1,125
Red Mountain attracts 1/10 of Washington State potential/year	79	3,149	900	235	450

Economic Multiplier

Economic impact of tourism in a particular region, with the inception of a new attraction or in the case of an event or festival is needed in order for a destination to be viable. A recent report which provides a good synopsis of the subject is authored by Glen Kreag.¹⁹ A number of methods are used to collect data and calculate the economic impact of tourism. A definitive “industry standard” or “number” does not exist as the factors influencing the amount visitors spend, indirect and induced impact, and the multiplier factor are limitless. Such things as geographic location, number and scope of attractions, number of tourism businesses, access to locally generated goods and services, and commitment to tourism development are just a few items that affect how tourism impacts a particular region. Numerous studies and research reports have documented the economic impact of travel and tourism at various locations and events.

In the case of the Red Mountain AVA and Benton County, the ability to generate visitor spending is affected by its location, number of tourism businesses, marketing, and number of events among other things. The following examples of visitor spending at other locations may provide a perspective in order to support the Red Mountain AVA Site Master Plan.

- Currently, Benton County sees an economic impact from tourism of \$222,200,000.00.²⁰
- In 2005, an economic impact study of the economic impact of Napa Valley visitors was completed. Napa Valley is a known wine region with an immense impact from tourism. According to this study, visitors who did not stay overnight within Napa County spent an average of \$146 per-day, while overnight visitors spent \$233 per-day. Average total daily spending of both categories is \$197.²¹
- The Walla Walla area has been used as a benchmark for the Red Mountain region.
- According to the Washington State Department of Commerce and Economic Development (2006), travel spending in Walla Walla County is \$71,600,000.00 per year from tourism and generates 6.2% of the total Washington State tourism spending.²²
- Festivals and events also generate local economic development. The Niagara region, although nearer a higher population than the AVA, attracts over 500,000 visitors to wine festivals in the area.²³

Figure 3-6 illustrates the increases due to the variables described in the projections.

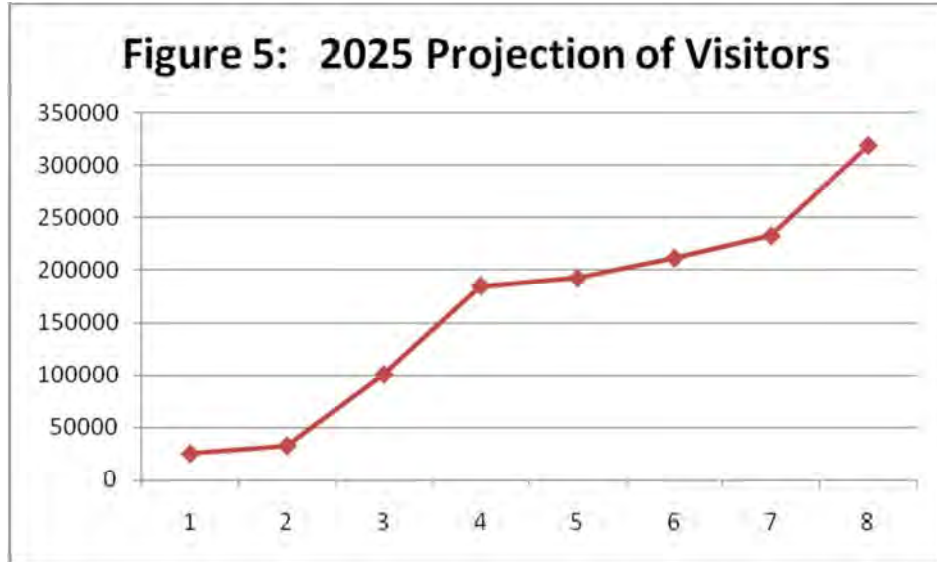


Figure 3-6. 2025 Projection of Visitors

Figure 3-5 Legend	
1 Current	2 Population increases
3 40 wineries Impact	4 Days open increases
5 Average visits increases	6 New winery effect
7 Wine Village	8 Market changes (core and marginal)

CONCLUSIONS AND ANALYSIS

Wine tourism is a growing phenomenon in the tourism industry. Wineries, tasting rooms, events and festivals, and other wine and vineyard attractions and activities are seen as an economic development tool, global, national, and regional marketing focus, a business strategy, an amenity for other tourism operators, and generally a positive force in the tourism environment. Red Mountain AVA, through the conceptual and master planning process, is embracing wine tourism and formulating a vision in order to maintain the agricultural nature of grape growing and wine production while providing facilities and amenities to facilitate tourism.

As of May 2007, there are 500 licensed wineries in Washington State. As wine tourism matures in Washington, the effect of such areas as Wahluke Slope, or new AVAs (Ancient Lakes, Lake Chelan) as competition for wine visitors is not known. It is significant that Red Mountain visitation does not seem to have been affected by the growth of wine tourism in the Columbia Cascade region. Red Mountain benefits from the increase in wine tourism in the Walla Walla area and even gains visitors because of it.

An important component of the Red Mountain AVA conceptual and master plan is to provide facilities and amenities attractive to wine tourists. The Visitor Studies, including the current visitor survey and potential visitor survey, reported that the current and potential visitors have similar demographic characteristics:

- Fairly evenly divided between males and females,
- Primarily between the ages of 51 to 60 years of age and to a lesser degree between the ages of 41 to 50 years old
- Travel either in parties of 3.83 (mean, current visitors) or 2.0 individuals (potential visitors)
- Have a household income over \$100,000.00
- Consume wine either “almost every day” or “about 1 or 2 times per week”
- Take trips specifically with the intention of visiting wineries and participating in other wine related activities
- Have visited a wide assortment of wine regions including Washington, Oregon, California and also South Africa, Chile, Italy, and France.

Additional information from the potential visitor survey includes the following:

- They have a bachelor’s degree or higher degree
- Do not belong to a winery wine club or 1 or 2 clubs
- Purchase wine when not traveling from grocery stores or specialty store
- Spend more on a bottle of wine when traveling than when they are at home
- Have future plans to take a longer trip and also day trips

Other findings are less clear as both the current visitors and potential visitors were asked whether they would visit, whether they would visit more than 1 time; and whether they would visit for longer than 1 day. They were asked to respond on a scale from 1=*Definitely Yes* to 10=*Definitely No*. Table 3-54 indicates the mean responses to these questions when given the conceptual plan scenario. It shows less inclination on the part of the Current Visitors to visit, make a return visit, and visit longer than 1 day.

Table 3-54: Current and potential visitors response to scenario

	Current visitors	Potential visitors
Would you visit	2.25	1.64
Would you visit more than 1 time	2.62	2.34
Would you visit for longer than 1 day?	3.45	2.40

There is some inconsistency between the reasons for choosing a wine region and the actual reason for taking a trip. When the potential visitors were asked whether they had attended a wine event when they visited the wine regions given, fewer than 25% of the respondents had attended a wine event except when visiting Woodinville. When asked the reason for choosing a wine region for a recent trip, however, the top response was “for an event” followed by proximity and convenience, and finally “like the wine”. Also, Potential Visitors said that whether “there is an event or festival happening” is *Not at all Important to Somewhat Important*. Current Visitors enjoyed the wine, friendly servers or staff, and scenery or landscape most during their visit. The Current Visitors indicated that *prior experience with the wine, recommendation from a friend or family*, and distance to the area from home were the most frequent influencers. It seems that proximity may be a priority, which is supported by the literature and is used to determine visitation with such things as demand methods and Travel Cost Analysis.

Potential Visitors indicated that they needed 7.84 wineries to visit when deciding on a region, however, when asked the importance of having more than 15 wineries to choose from they indicated that 15 wineries was Important.

The Red Mountain AVA is seeking the visitor who will travel and stay in the area more than 1 day. Wineries are the core built attraction, but related facilities are important, including museums, visitor information and interpretive centers, wine villages and their services. The level of wine tourism development varies among wineries and wine regions. Many wineries offer visitors a tasting room with wine tasting only (Level 1). Other wineries have a full complement of amenities and attractions such as restaurants, meeting space, cooking classes, lodging, and so on (Level 3). Red Mountain wineries do not offer lodging, some offer space for events such as meeting or weddings, and others offer gifts and souvenirs. Potential Visitors indicated that having desirable lodging options was Important to Very Important. Comments received from Potential Visitors were supportive of the Red Mountain AVA concept, but there were some cautionary comments.

“I take family and friends to wineries that offer great food and/or music, maybe even dancing . . . in a fun atmosphere. Gone are the days when it’s

enough just to approach the winery's bar, and get a 1 ounce pour and a brief lecture."

"The "Village" sounds awful. Customer will be primarily vacationers, some with (agh) children, interested in new experiences and drinking rather than tasting and buying. We would visit once to see if there were any new wineries whose products we would like."

"I can say that I will continue to visit [Yakima Valley] as long as the area stays rural, the wineries remain in the vineyards and it isn't crowded...."

"Of crucial importance: quality of dining options . . . I would certainly make more trips to central/eastern Washington if there were more fine dining options available in all price ranges."

"We look forward to our local area developing into the world-class AVAs that they are while maintaining their local and unique charm."

"I need kids' activities to be able to take my family on a wine-based trip. Bike riding helps, but my two boys (7 & 9) need some action – fishing, water park, go carts, something that allows them to have fun and burn juice."

"It would be a good idea to open up something similar to what Woodinville is doing. Having more of a "destination" . . . we can easily taste wine but also have great lodging and restaurants to choose from would make it more enticing to visit."

Several comments referred to tasting fees and are characterized by the following comments:

"As I almost buy at least one bottle of wine at all of the wineries we visit, I am concerned about tasting fees becoming more prevalent. If I buy a bottle of wine, I feel the tasting fee should be waived."

". . . the charge for tasting wine has become outrageous [in Napa Valley]. Many wineries do not even allow the tasting fee to be applied to purchase...."

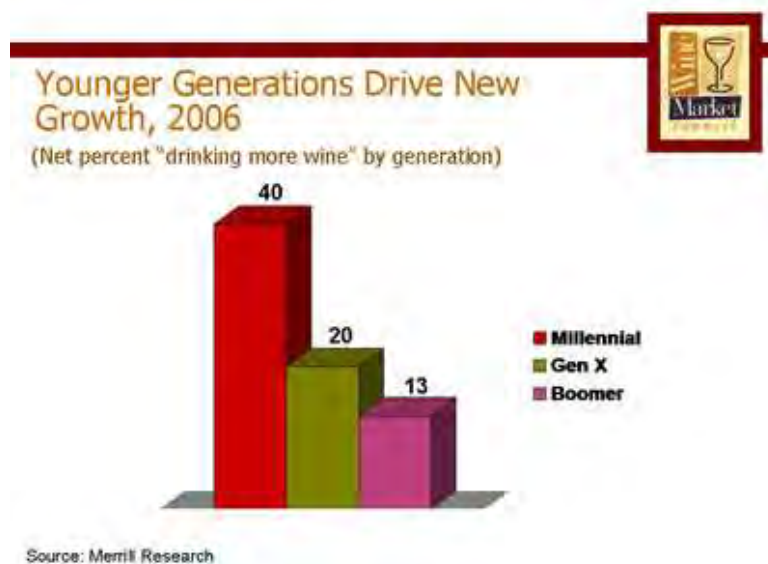
Few of the Potential Visitors belong to a winery wine club. Research has shown, however, that loyalty is important. Frequent visitors are more likely to make a post visit purchase. If they visited more than twice a year, they had made a purchase in the ensuing 6 to 9 months. If they purchased during their visit they are twice as likely to make a post visit purchase. Tourism does benefit the winery beyond the actual visit.

The demographic characteristics of both Current Visitors and Potential Visitors are similar to Core Wine Drinkers.²⁴ Core Wine Drinkers are expected to increase over time. Marginal Wine Drinkers (younger, lower income) will age and as their income increases and wine expertise improves this cohort will impact the wine industry.

In order to maintain a healthy market, the younger wine drinker and also newer wine drinkers should be a focus for marketing and tourism development as their wants and needs are different from their older counterpart. Younger wine tourists want more of an experience thus there is more dependence on amenities and regional appeal. Festivals and a more social convivial atmosphere would be a more attractive introduction to wine and a wine region. Wine tasting with friends and having a good time is more important than just tasting the wine; it is the experience. Baby Boomers (Core Wine Drinkers) are more satisfied with the standard wine and wine tasting experience. Generation Xers, 24 to 40 years old, need recognition of their individual needs as consumers and are more likely to develop a relationship with and brand loyalty to a winery with a well-trained and knowledgeable staff.^{25 26 27} In other words, winery wine club membership should increase but the focus on benefits of membership should address the needs of this younger demographic. The Wine Market Council has indicated that the younger generations are driving new growth (see Figure 3-7).

Many elements impact the tourism industry and the wine industry. The Visitor Studies for the Red Mountain AVA Master Planning Process has attempted to describe and quantify some of these elements: the visitor, both current and potential, and future visitation. Numerous variables, data points, and information were used to fully describe and quantify these elements. The results for the current visitor and potential visitor surveys have been reported. Future projections have been made and the process outlined. Lastly, the results have been supported by research published in various journals.

Figure 3-7. Younger Generations Drive New Growth.



4. DESIGN GUIDELINES

OVERVIEW

The future commercial development within the Red Mountain AVA should celebrate and reinforce the quality of viticulture and the resulting award-winning wine created from Red Mountain grapes. To realize this, it is proposed that design guidelines for commercial development be adopted for the commercial districts within the master plan area, and that within the Red Mountain Agricultural District (RMAD) the guidelines be applied to proposed commercial developments by a Design Review Committee. The Design Guidelines included in Appendix D present the administrative framework for the Red Mountain Agricultural District Design Review Committee (DRC), the two-step DRC project review process, and an objective set of guidelines that developers and their design team will use to design their projects and that the DRC will use to review the proposed projects.

The Design Guidelines are founded on the existing Red Mountain landscape setting, which has a distinctive rural character made up of buildings nestled in a sea of vineyards. Many of the existing commercial buildings are located away from roads, providing the opportunity to surround the buildings with vineyards. Most commercial buildings are of a quality that fits the character of Red Mountain. It is important that future commercial projects reflect the quality of the area (described in the Design Guidelines) and allow the working agricultural landscape to continue to dominate the scene.

A central focus on new commercial development in the AVA is that built elements at Red Mountain grow from the intrinsic qualities of the place and are of the highest quality. The Design Guidelines allow flexibility for individual creativity while fitting into the overall quality of Red Mountain.

Due to the subjective nature of design regulation standards, and the County's inability to administer and enforce them, the use of the Design Guidelines in this chapter will be encouraged on a voluntary basis by the Design Review Committee through a Red Mountain AVA Design Guidelines Handbook. Further discussion regarding this subject can be found in Chapter Seven, Next Steps.

A LIVING DOCUMENT

The Design Guidelines are a living document that will evolve over time in response to feedback from the developers and community stakeholders. The review process provides a framework allows refinement of the Design Guidelines. The Design Guidelines:

Foster a Sense of Place

Red Mountain's sense of place comes from the intrinsic qualities of its natural surroundings, the built environment, and the people who occupy Red Mountain as well as the stories that are written about the vineyards, the wine and the winemakers. All create a strong identity and foster

a perception of Red Mountain that is positive, authentic, and desirable. It is this perception that gives Red Mountain a strong sense of place for visitors as well as residents. Visitors and residents take better care of places that they become attached to and want to bring their friends to. Creating a place like no other in the world helps to sustain a high quality experience and high property values. Provide visual and physical connections to natural features and respect a vineyard fabric as the primary infill.

Use Existing Community's Amenities

With the exception of the Wine Village, neighboring communities offer lodging, restaurants and other amenities that do not need to be duplicated on Red Mountain. Preserve the land as much as possible for vineyards, wineries and related services. Development of areas outside the communities and lands adjacent to the AVA should be approached in collaboration to assure quality gateways and approaches to Red Mountain.

Promote Compact Build Forms and Subterranean Structures

Reduced development footprints leave more space for vineyards and other open space amenities. Subterranean structures take advantage of the earth's natural cooling properties and allow vertical development without excessive height.

Promote Clustered Projects, Park and Ride and a Variety of Transportation Choices

Wineries clustered around a single parking area, custom crush and condominium wineries reduce vehicle trips and potentially provide infrastructure savings. The parking areas should be well designed and environmentally sustainable, well shaded with trees and divided into smaller areas with clear and safe pedestrian connections. Park and ride areas would allow visitors to park their car and ride a bicycle, horse, or potential public transport (on peak event weekends) to various wineries.

Create and Administer Design Guidelines that Make Development Predictable and Cost Effective

Clear Design Guidelines promote development through increased understanding of design objectives and promote property owner investments. The Design Guidelines are clear and objective and offer sustainable ideas and alternatives. Administration of the Design Guidelines will be by a committee composed of design professionals and vineyard and winery owners.

Involve Stakeholders

The DRC project review process provides opportunities for neighbors to be involved in the project review. This collaboration between neighbors creates developments that fits better into its context and protects the land owner's investment.

Promote Environmental Sustainability

Promote a sustainable community where residents and businesses understand that not thinking sustainability can harm a neighbor or others in the community. Development should be designed to meet today's needs without scarifying the ability of future generations to meet their needs.

AVA LAND OWNER ACCEPTANCE OF THE DESIGN GUIDELINES CONCEPTS

Figure 4-1 presents the results of discussions that Red Mountain Estate Association (RMEA) members had with Red Mountain AVA vineyard and winery owners regarding their acceptance of the concept of design guidelines in assisting in managing the quality of commercial development within the Red Mountain AVA. Since the design guidelines do not cover single-family residential land uses, the owners of the existing residential properties were not contacted. The following results show that two thirds of the property owners contacted are in favor of the Design Guidelines.

- 67% (owners of 2,740 acres) are in favor of the Design Guidelines concept
- 28% (owners of 1,135 acres) are undecided or were unavailable for comment regarding the Design Guidelines concept
- 5% (owners of 205 acres) are opposed to the Design Guidelines concepts
- Figures exclude existing residential areas

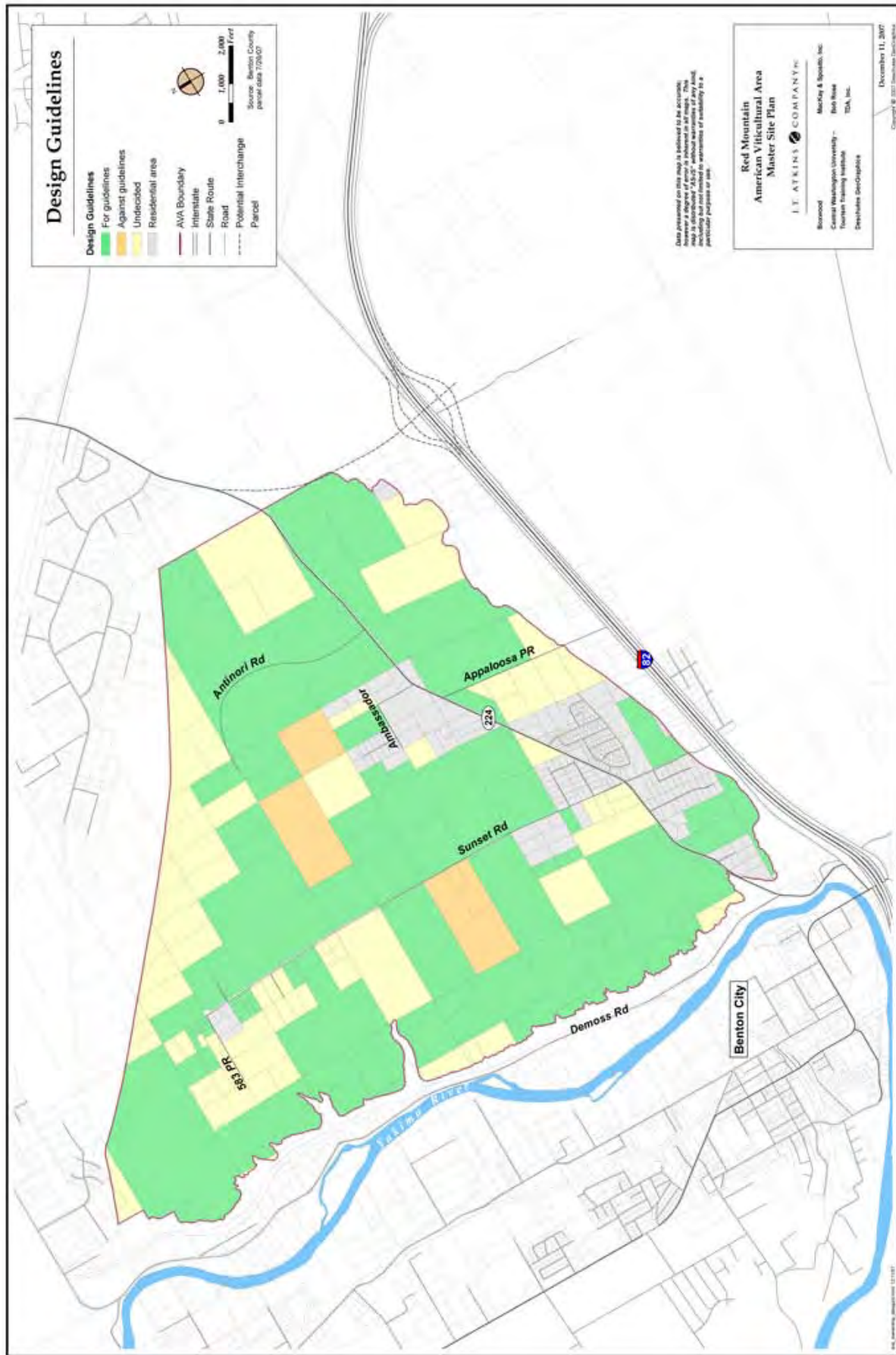


Figure 4-1. Landowner Support Levels for Design Guidelines

5. STEPS TOWARD SUSTAINABILITY

INTRODUCTION

One of the guiding principles established during the Conceptual Planning process is to “Create Red Mountain as a model of sustainable design, construction and operations,” including environmentally friendly agricultural practices. To incorporate this principle from an agricultural practices standpoint, the challenge is to develop an appropriate system for sustainability that tests and incorporates current and evolving management practices designed to produce a complex managed vineyard ecosystem.

The goal is to create a diverse managed vineyard ecosystem that enhances biological complexity while complementing and supporting vineyard operations, minimizes economic costs to the growers, and provides the Red Mountain visitor with an aesthetic, educational and environmentally satisfying experience unique to Red Mountain.

SETTING

The 4,600-acre Red Mountain AVA (the smallest in Washington) is located in one of the most challenging environments in North America for growing wine grapes.²⁸ Soils are generally sandy with areas of loam and light clay and are extremely alkaline (pH of 8.3-8.5). Organic content is very low (approximately 1.5%). All slopes are south facing with subtle variations. Reported summer temperatures are some of the hottest in the state, with marginal annual rainfall between November and March averaging 4 to 8 inches.

The intense heat, southern exposure, lack of moisture and alkaline soils provide a unique situation for cultivating grapes of intense flavor and character and creates an unmistakable and highly desirable “terroir.” These same qualities mean that many of the techniques and strategies directed toward environmentally friendly practices (sustainability) employed in other regions (ranging from California and Oregon to other parts of the Columbia and Yakima Valley AVA’s) may have limited or no utility for Red Mountain AVA operators. Thus, the conditions on Red Mountain will require strategies specific to the Red Mountain AVA.

SUSTAINABLE VITICULTURE IN WASHINGTON STATE

In 2003, the wine grape growing industry in Washington, led by the Washington Wine Industry Foundation (WWIF) and the Washington Wine Grape Growers Association (WWGGA) developed set of guidelines and checklists for viticulturists to assist them in incorporating sustainable principles into their vineyard operations. The website *VINEWISE, the Washington Guide to Sustainable Viticulture* (<http://www.vinewise.org>), grew from the original checklists as a way to address the entire spectrum of sustainability – the environment, viticulture practices and growers’ businesses.

The Vinewise website references a U.S. Congress definition of Sustainable Agriculture:²⁹

Sustainable agriculture is an integrated system of plant and animal production practices having site-specific applications that will, over the long term:

- Satisfy human food and fiber needs
- Enhance environmental quality and the natural resource base upon which the agricultural economy depends
- Make the most efficient use of non-renewable resources and on-farm resources
- Integrate, where appropriate, natural biological cycles and controls
- Sustain the economic viability of farm operations
- Enhance the quality of life for farmers and society as a whole

To put it simply: Sustainable agriculture is economically viable, socially supportive and ecologically sound.

(emphasis added)

As noted by Vinewise:

Most Washington wine grape growers practice some form of sustainable viticulture, with pest management, soil and nutrient management and water management practiced most frequently. However, the scarcity of knowledge, education and resources is a challenge for Washington growers wanting to improve their sustainable practices.³⁰

The congressional definition makes it clear that sustainability is not a cookie-cutter approach but instead is fine-grained and site-specific. The June 30, 2007, issue of Wine Spectator notes that relative to California and Oregon's "path to sustainability... Washington came out of the gate a bit later," and references the VINEWISE guidelines.³¹

Washington wine industry publications contain some instructive statements about the industry's evolving perspective on what constitutes sustainability:

The Washington wine grape industry recognizes that sustainability must be addressed on every level: environmental, economic, and social. Its commitment to:

- Environmental sustainability is evidenced in continuing efforts to reduce pesticide inputs, strong commitment to and growth in use of biological and cultural pest controls, and partnerships with Washington State University researchers and Extension personnel.

- Economic sustainability is self-evident; if a grower cannot make a profit over time, that grower cannot continue to participate in the industry.
- Social sustainability is addressed through a commitment to fair labor policies and to developing good relationships at the ag/urban interface.

Wine grapes hold a unique position in the agricultural community, as a commodity that is processed into a product with positive social connotations. Premium, super-premium, and ultra-premium wines are largely consumed by urban dwellers, further enhancing relations between agricultural producers and residents of metropolitan areas.³²

The Washington Wine Industry Foundation's website contains this observation:

The term "sustainable agriculture" is not easily understood, and in fact has been substituted with the term "environmentally enhanced agriculture." Washington wine grape growers have learned that their success is derived from an adherence to a philosophy of Integrated Pest Management (IPM) and use of other sustainable practices.

The growth of Washington's premiere wine industry will be accomplished through continued education on vineyard stewardship...and you will find some form of sustainable practices in every vineyard in the state. One focus of these programs is the economic management of pests with minimal environmental disruption...It is important to continually demonstrate and promote the success of these practices and low input approaches to the growers, industry leaders, decision-makers and the general public.³³

While the VINEWISE guidelines and checklist address many topics such as water management, soil management, and vineyard site selections, the topic of "whole farm ecosystems" is still under development:

The Whole Farm Ecosystems topic addresses sustainable practices that take the vineyard and surrounding ecosystem into consideration, such as the sunlight-nutrient cycle, the need for riparian areas, the function of vernal pools, local wildlife populations and species, water and air quality, erosion control and more. This topic looks at the vineyard as one piece in the whole ecosystem puzzle.³⁴

One result of the "late start" is that Washington growers (and specifically the estate owners on Red Mountain) have the opportunity to learn from what others have done and to evolve a set of sustainable practices specific to the conditions and requirements for the hostile desert environment of the Red Mountain AVA.

THE RED MOUNTAIN ECOSYSTEM

The installation of vineyards continues to change the current ecological state of Red Mountain. Even when the first vineyards were planted more than 30 years ago (Klipsun, Ciel de Cheval and Kiona), conditions on the mountain could not be characterized as “pristine.” Prior to the introduction of cattle, conditions on Red Mountain were probably similar to those found across the Yakima River on the Rattlesnake Mountain Arid Lands Reserve, hosting over 100 species of native plants and subject to periodic fire. The shrub-steppe landscape was dominated by sagebrush (*Artemisia tridentata*), blue bunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg’s bluegrass (*Poa secunda*). Following cattle grazing and human-caused fire disturbance, cheat grass, residual bunchgrass and sage became dominant factors.

Conversations with DNR ecologists indicate that Red Mountain probably has had an extensive history of grazing, fire and other disruptions. It cannot be characterized as “undisturbed, yet it retains certain features of the native shrub steppe ecology. Nearby, the Rattlesnake Mountain Arid Lands Ecology Reserve and the newly designated Hanford Reach National Monument are permanently designated areas that protect high-quality examples of the undisturbed native shrub-steppe ecosystem. Red Mountain’s location means that native insects, birds and terrestrial wildlife are likely to continue to maintain a dynamic connection between these benchmark natural areas and the future landscape of the AVA. As more and more vineyards are developed, the ridge crest of the mountain and the ravines draining to the Yakima River will increasingly become important as an “island-like” feature connecting to these major biological reserves to the north and west. The utility of these connections in terms of beneficial predators and other positive (or potentially negative) consequences for vineyard operations will likely be the subject of ongoing research and evaluation for many years to come.

In the managed vineyard landscape, providing some of the habitat elements of the nearby undisturbed landscapes may improve the opportunities for these species to remain as part of the area’s ecological complexity and increase the opportunities for connectivity. It will also provide the visitor to the AVA an opportunity to experience and better understand the integration of high-quality agricultural production and conscientious stewardship with an on-the-ground reference to the landscape that makes the Red Mountain AVA unique.

APPLYING SUSTAINABLE PRINCIPLES ON RED MOUNTAIN

Inherent in the nature of the Red Mountain AVA is the transformation of a shrub-steppe sagebrush/bunchgrass ecosystem to a cultivated vineyard ecosystem. In the process of this shift to planted vineyards and in the management of the disrupted areas, operators have a range of choices, many of which are over-lapping, depending on desired end-state conditions of the vineyard and associated land uses:

- Allow invasive species (such as cheat grass) to occupy recently bared ground as a way to conserve soil moisture and minimize dust and soil erosion
- Plant various cover crops (such as crested wheat grass) and attractive non-native horticultural materials

- Re-vegetate with native and/or other low maintenance species

California vineyard operators have evidently embraced the idea of integrating the native landscape into their vineyard operations as part of a low impact/low input approach that combines neatly with Integrated Pest Management (IPM) strategies (see below).^{35 36} In large degree, Washington growers have not yet seized this opportunity.

Native plants provide certain inherent advantages over non-native species, including:

- Adapted to an Eastern. Washington climate of cold winters with some rain and hot, dry summers
- Require less water and generally less maintenance than non-natives once they are established
- Improve water quality by needing less fertilizer and no pesticides
- Provide shelter, food and pollination opportunities for native wildlife
- Resist native pests and diseases better than non-natives, and may provide habitat for native beneficial insects
- Resist wildfire
- Conserve resources and encourage a sense of stewardship

Long-time Red Mountain landowners speak of the beauty of the phlox, lupine, larkspur, balsam root and other flowering native plants during the spring season.

The long-range conceptual thinking that has been a hallmark of the Red Mountain planning process gives the Red Mountain AVA growers an opportunity to be “ahead of the curve” in developing strategies to manage their vineyards in a low-impact, low- input manner while producing superior grapes in a managed landscape of high biological complexity.

It is the intent of the estate owners on Red Mountain to work with researchers from Washington State University and other research institutions. They will develop pilot projects designed to evaluate cover cropping strategies, propagation and use of native vegetation, creation of beneficial insectaries, the utility and productivity of wildlife and riparian corridors, and maintenance and installation of other landscape-based approaches to enhance sustainable vineyard operations.

The commitment by the RMOA to support research and pilot projects on IPM, use of native plants, and other resource conservation efforts will transition the AVA from its present condition of a disturbed sagebrush and cheatgrass dominated ecosystem with vineyards to a new ecological balance in which current and yet-to-be planted vineyards are part of an integrated managed ecosystem that incorporates, where practical, native plants.

INTEGRATED PEST MANAGEMENT

IPM is a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks... Washington has fairly limited pest problems and generally growers use fewer pesticides. Progress to improve this situation even further is slowly being made, but there is still a great deal researchers are learning about the biology and ecology of grape pests and their natural enemies in Washington State This information is essential to the development of ecologically stable IPM programs.³⁷

Biological control of vineyard pest depends upon the “untapped resource” of the complex of beneficial insects and mites found in the natural landscape. WSU researcher David James (Prosser) states with confidence that:

*We have the endemic natural enemy fauna available to deal effectively with most of the current vineyard pest problems, [though] taxonomic, biological and ecological information on specific predators and parasitoids is either completely lacking or incomplete.. .. Once we know which biological agents are the most useful we can research their life histories, their ecology in and around vineyards and their biological efficacy. This information may then allow us to optimize their effectiveness by providing alternative hosts, refugia, overwintering sites, or minimizing disturbance through modification of cultural practices.*³⁸

WATER MANAGEMENT

*Water management is an area where Washington wine grape growers are continually making great strides. Water is an important element when examining sustainability practices. Water management is vital to vine growth and therefore impacts management costs, fruit quality, early fruit ripening, and susceptibility to pests. Wine grapes are one of the most efficient water users, allowing growers the rare opportunity to turn a minimal amount of water into a high value crop. A great deal of viticulture research to date has focused on irrigation techniques, indicating it is an obvious priority to the industry. Water conservation practices implemented by growers include irrigation scheduling, soil moisture monitoring and regulated deficit irrigation. Water management is more than conserving water during drought conditions; it's the most important quality management tool for Washington growers!*³⁹

CULTURAL PRACTICES IN THE VINEYARD

Red Mountain vineyard operators work in an extreme desert environment where they favor water conserving plants that provide habitat for beneficial insects and provide visual beauty to the landscape. They also strongly favor plantings and structures that support perching and nesting opportunities for predators (raptors and owls) that feed on grape-eating birds and destructive small mammals, particularly ground squirrels.

Cover Crops

Washington wine grape growers have been leaders in testing out various cover cropping strategies, a necessity for most eastern Washington vineyards to minimize soil loss and to conserve scarce soil moisture. Cover crops can also help encourage a diverse ecosystem within the vineyard. However, cover crops compete with vines for water. Depending on whether and when stress to the vine is desired, cover crop competition can be a problem. The cover crop must match the site and vine vigor and growers need to be aware of cover crop/vine interactions and how they change as the vine matures. The biggest challenge with cover cropping has been to find beneficial cover crops that work well within a drip irrigation system with no supplemental water during the season.

To determine the range of native plants suitable and desirable in the Red Mountain vineyard setting, a series of long-term research plots will be required. The desired outcome would be a recommended group of preferred native plants that could be self-sustaining as cover crops in vineyard alleys. An added benefit would be if those plants could also fix nitrogen, provide refugia and food source for beneficial insects, be used for commercial native seed production, and provide some visual complements to the orderly vineyard plantings.

A subset of the cover-cropping requirement is for in-row, inter-vine plantings of native vegetation that are self-sustaining in conjunction with drip irrigation for vines. Proper establishment of compatible native plants would diminish or eliminate costly interplant weeding (manual and/or mechanical) and associated damage to ground-level grape vine stems (“hoe-blight”).

An important research agenda is to investigate native leguminous species capable of providing the required nitrogen for Red Mountain vineyards at desired rates of 5-10 # of nitrogen/acre/year. Trial nitrogen-fixing (leguminous) species might include native Velvet and Silky Lupines (*lupinus leucophyllus* and *lupinus sericeus*), Western Prairie Clover (*Petalostemon ornatum*), and Lanceleaf Scurfpea (*Psoralea lanceolata*), Bighead Clover (*Trifolium macrocephalum*) and various Milkvetches (*spp.Astragalus*). If successful, this strategy would minimize fertilizer inputs, energy requirements for fertilizer application and eliminate water quality issues (if any).

Native and Complementary Plantings to Enhance Vineyard Productivity

Leafhoppers and cutworms can be considered 'key' pests of grapes in Washington. Their control may be enhanced by cultural strategies such as growing roses as an over-wintering habitat for leafhopper parasitoids and allowing broad-leaved weeds to serve as a food source for cutworms. Researcher David James' studies point to roses providing over-wintering resource for Anagrus wasps and an enhancement for biological control of grape leafhoppers.⁴⁰

An additional component of the vineyard management protocol would be testing of various native roses (*Spp. Rosaceae*) to determine their utility as insectaries for *Anagrus* wasps and to determine if providing habitat for these predators helps in the control of leafhoppers and cutworms.

Important shrubs of the Rose Family (Rosaceae) in the Intermountain region are distributed from blackbrush and salt desert shrub communities through-high elevation forests and meadows.

Many of these species are highly valued for the cover, fruits, and forage they provide for wildlife and livestock. ...Those that produce fragrant flowers or colorful fall foliage are prized for their ornamental value. Because of their browse value, antelope bitterbrush and several other rosaceous shrubs were among the first species to be used in wildlife habitat improvement efforts. Members of the bitterbrush- cliffrose complex are...seeing increased use in response to the growing emphasis on use of native species for wildland revegetation and low maintenance landscaping, community restoration issues, mitigation for endangered species, and a general shift to employ revegetation when deemed necessary to conserve or restore ecosystem diversity and functionality.⁴¹

The efficacy of rose plantings for biological control, in conjunction with other cultural practices will need to be rigorously evaluated through joint research projects of WSU entomologists and biologists.

Where appropriate for raptor and owl perching and nesting, it may also be appropriate to consider certain drought tolerant tree species which do not serve as focal points for grape-eating birds. See Appendix E for suggested plant lists.

Opportunities to Retain and/or Replace Native Landscape Elements

A general “rule of thumb” in agriculture is that 15-20% of the nominal acreage of the farm or vineyard will not be used for production because of roads, farm structures, unfarmable areas, etc. These areas provide a key opportunity to incorporate elements of the native ecosystem into vineyard operations. While not necessarily providing the continuity of the undisturbed landscape, the islands and nodes created will provide a mosaic of attractive elements.

For existing vineyards, the opportunity is to consider planting native species in areas currently either barren or occupied by invasive species. While there will be an upfront cost for seedlings and for initial irrigation to ensure survival, once established, these plantings should be self-sustaining and will require little or no supplemental irrigation.

For those ownerships where vineyards have not yet been established, the following measures should be considered as a palette of suggestions rather than explicit requirements

- When clearing land for vineyards, buildings and roads, site plans should designate areas of thin soil or steep slopes (>10%) (such as gullies, ravines, scab land areas, exposed rock and adjacent uncultivable ground) where sagebrush and other native vegetation will be left undisturbed as “wild-land islands.” Such areas should be visibly marked and reviewed with contactors before land clearing operations begin. (The new Kiona Tasting Room is a good demonstration of this outcome).
- Encourage protection and enhancement of existing native vegetation in drainage pathways (air and water) to retain connections with the Yakima River riparian area on the west side of Red Mountain.

- Before land leveling and ripping for vineyard installation, encourage the gathering of seed from native plants for propagation purposes (possibly in conjunction with the WSU-Richland Botany Department) and use these propagated materials on site for landscaping purposes. Where feasible, encourage salvage of on-site native plants for landscaping purposes.
- Encourage use of native plants and desert-adapted horticultural materials when designing landscaping for tasting rooms, production facilities, rights-of-way, visitor facilities, reservoirs, and other non-vineyard areas. Where feasible, during vineyard establishment, incorporate native grasses and wildflowers in vineyard alleys to complement permanent plantings as part of a Red Mountain vineyard ecosystem management approach. Appendix E, Design Guidelines, includes a list of recommended plant species.
- Conserve water resources by designing landscaping for production buildings, visitor facilities, tasting rooms, and public areas to minimize lawns and other high water input landscaping in favor of low maintenance native and desert (xeric) adapted vegetation. Use water conserving irrigation technologies.
- Design buildings and structures to provide nesting and perching opportunities for kestrels, hawks and other raptors, and nesting boxes for owls to increase the biological control of birds, rodents and other ground dwelling mammals that have deleterious effects in the vineyard.
- Provide shade for resting workers as well as for visitors in appropriate locations by encouraging the use of columnar (non-branching) trees (to minimize use by grape-eating birds) or by constructing arbors and shelters consistent with the design guidelines. Appendix E, Design Guidelines, includes a list of recommended plant species.

RED MOUNTAIN LEADS THE WAY

Taking a leadership role in this type of integrated landscape management provides the vineyard owners on Red Mountain with the opportunity to “brand” their vineyards not only for highest quality wine but also for a high level of environmental stewardship and innovation. Some of these ideas (as well as many others) noted above have been operationalized in voluntary associations created by vineyard owners in Walla Walla (VINEA) and Oregon (LIVE). While useful as a reference, conditions on Red Mountain are so extreme that many of the recommended protocols from these areas may prove to be inappropriate for the Red Mountain AVA.

The proposed Wine Village, in conjunction with present and future capital improvements in the numerous vineyard, production and tasting room facilities, will be an ideal area to both focus visitor’s attention on this aspect of the natural landscape and demonstrate how these plants can form an attractive display of seasonal flowers. The Wine Village will also provide an interpretive

opportunity to educate the visiting public about transformation of sagebrush shrub-steppe to productive vineyard ground.

Incorporating a high degree of environmental stewardship using the sustainable concepts outlined above and featuring native plants and ongoing research and evaluation with WSU (and other institutions) staff is a winning combination for the Red Mountain vineyard operator, the Red Mountain Estate Association and the environmentally conscious consumer.

6. ZONING

Implementing the future vision for the Red Mountain AVA presented in this plan will require a number of actions including additional opportunities for public review and comment. The actions include amending the Benton County Comprehensive Plan to include the Red Mountain AVA Master Site Plan as a sub-area plan, and adopting new zoning ordinances that implement the Red Mountain Master Site Plan vision.

It is important to provide a context as the above implementing actions are considered. Benton County's agricultural landscape plays a large role in the County's economy, customs, and culture. A majority of the approximately 1,000,000 acres that comprise the County are within agricultural land use. This strong commitment to agriculture is evidenced by the fact that approximately 60% (+600,000 acres) of the county land area, including about 3,600 acres of the 4,600-acre Red Mountain AVA, is zoned for commercial agriculture. Though the Red Mountain AVA lands that will be covered by the new draft zoning ordinances equal only approximately 0.2% of the acreage of Benton County, the area's soils, micro-climates, renowned wines, and visual prominence along the main travel corridor through Benton County provide unique opportunities as a wine growing region that enhance the economy and enrich the lives of Benton County residents.

As part of the Red Mountain Master Site Plan (RM MSP) planning effort, the Benton County Planning Department staff will develop a set of draft zoning ordinances intended to implement the Red Mountain Master Site Plan. The draft ordinances will be the land use controls for three distinct land areas (Figure 6-1) within the boundaries of the Red Mountain AVA Master Site Plan. These areas are listed below.

Red Mountain Agricultural District (RMAD) – The RMAD area is located north of SR 224 within the AVA boundary, and covers the same area on Red Mountain that the existing Growth Management Act (GMA) Agricultural District designation. The Red Mountain Agricultural District (RMAD) will be prepared to be consistent with the Red Mountain Master Site Plan, the current zoning code, and state law. When adopted, the new RMAD ordinance will replace the existing GMA Agricultural District Ordinance.

Master Planned Resort (MPR) this designation will be applied to an area identified in the Red Mountain Master Plan as the Wine Village, initially proposed to be located west of Sunset Road. In the event that the site identified is found unavailable or unsuitable for development, an alternative site for the Wine Village site will be located using the site selection criteria developed in Chapter 2, page 2-9.

The Wine Village development is proposed to be sited utilizing the Master Planned Resort (MPR) provisions under the Growth Management Act (GMA) in RCW 36.70.360. The RCW defines MPRs as “a self-contained and fully integrated planned unit development, in a setting of significant natural amenities, with a primary focus on destination resort facilities consisting of short-term visitor accommodations associated with a range of developed on-site indoor or outdoor recreation facilities”. While it is noted that some uses may not be possible as originally

proposed, the MPR's designation offers compatibility with the County's agricultural district. Implementation of the Master Planned Resort provisions of the GMA will allow the provision of municipal water and other necessary services to be extended outside an urban growth area to a Wine Village designation in the RM MSP area.

Tourist Serving Area (TSA). This area will include an appropriately sized "site planned" area, developed specifically to provide tourist services and amenities near a possible future Red Mountain Interchange. The proposed interchange area is along I-82 near the south east corner of the Red Mountain AVA and shown in Figure 6-1. A potential alignment route north of I-82 that will connect to SR 224 will allow access and provide a "Gateway" opportunity to the Red Mountain AVA.

Lands that are not designated for Agriculture RMAD, or Wine Village developed through the MPR provisions, and found within the boundary of the Red Mountain Master Plan, are designated Rural Lands Five Acre (RL-5). Residential density is one dwelling unit per 5 acres within the RL-5 designation. The purpose, uses, and development regulations within the RL-5 zoning district are the same inside the Red Mountain Master Plan area as they are for other areas designated RL-5 within the County.

The following is a partial list of uses that would be allowed outright, by administrative review, or by a conditional use permit, within the RL-5 zoning district: horticulture, aquaculture, agriculture, agricultural buildings and accessory uses, wineries, nurseries, agricultural markets, Bed and Breakfasts, ag-related industry for processing ag products, home occupations, and small businesses that are consistent with and characteristic of the rural lifestyle. Feedlots, slaughterhouses, commercial poultry farms, and confined animal feeding operations (CAFOs) would not be allowed.

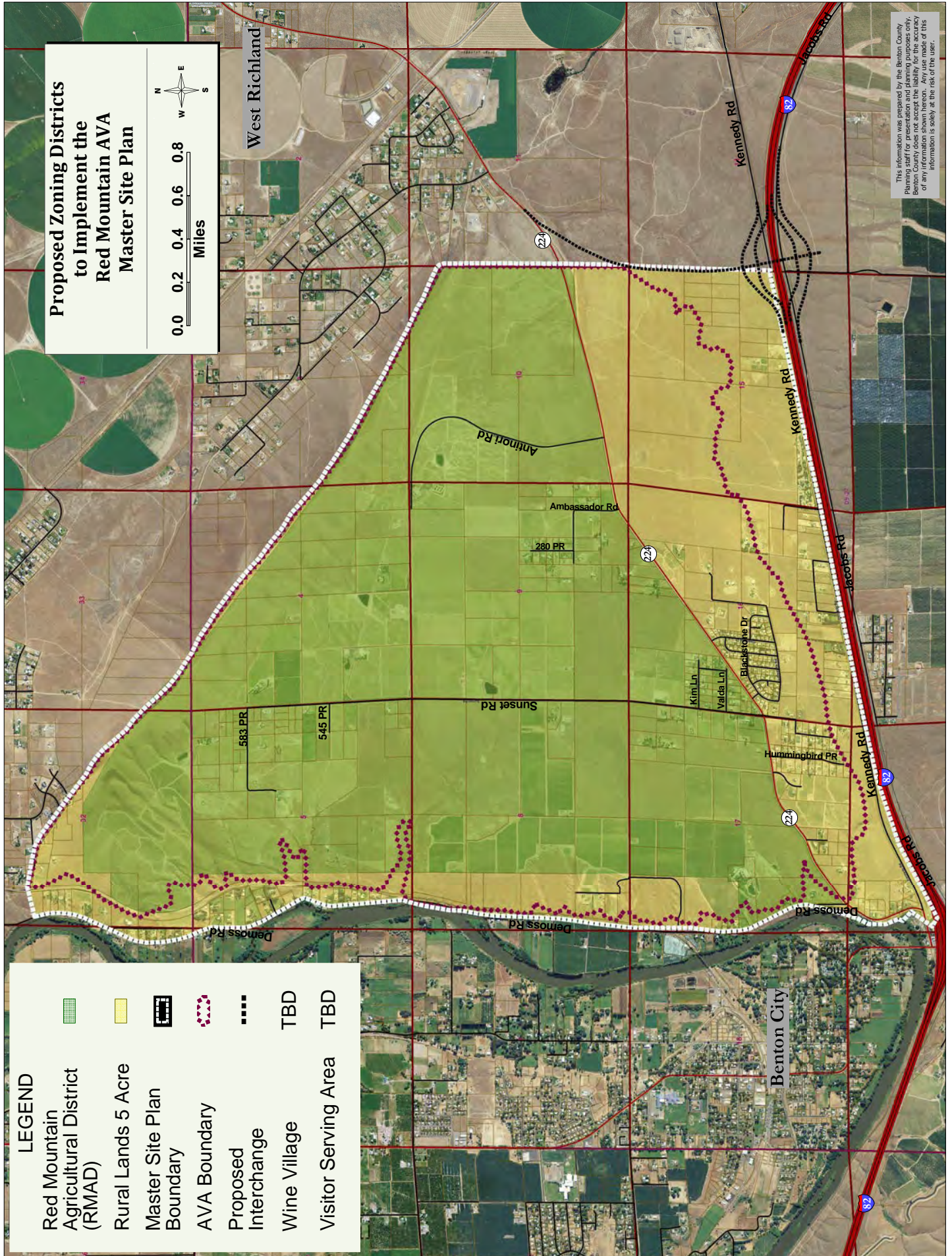


Figure 6-1. Proposed Zoning Districts to Implement the Red Mountain AVA Master Site Plan

7. NEXT STEPS

INTRODUCTION

During the spring of 2012, Benton County retained J.T. Atkins & Company PC to review and update the status of the “Next Steps” action elements and update the Master Site Plan map and the Ownership map (using ownership and 2011 aerial photographic information and ownership information provided by the County) that were presented in the Red Mountain AVA Master Site Plan (RM MSP), dated December 2007. The information shown in the “Next Steps” Chapter provides the findings of the review of the 2007 Red Mountain AVA Master Site Plan document.

RED MOUNTAIN MASTER SITE PLAN FINDINGS

Several of the concepts presented in the 2007 RM MSP are not allowed under the present Benton County Agricultural Zoning and Washington GMA land use regulations. The RM MSP presented a vision of the Red Mountain AVA including a mix of land uses supporting a sustainable agricultural district and conserving the intrinsic qualities and natural resources of the Red Mountain AVA.

A range of changes have occurred since the 2007 RM MSP was developed that may impact several of the 2007 RM MSP recommendations. The County Office of Sustainable Development and Planning Department staff and Red Mountain AVA Alliance (Alliance) members should consider modifications to the 2007 RM MSP document maps including the following:

- Revise the “Mixed Use Area” shown on the 2007 RM MSP map to exclude areas within the AVA boundary that are potential areas for vineyards and wineries. In addition, a large part of the mixed use area boundary is within the KID irrigation district and should be considered for agriculture and vineyard use. The “Mixed Use Area” should be designated as a Tourist Serving Area and reduced to an appropriate size to allow for planning for a future tourist services near the possible future Red Mountain interchange area.
- Revise the proposed zoning map shown in the 2007 RM MSP to reflect the current zoning map adopted by the County in September 2011.
- The Alliance should evaluate developing a Design Handbook to be used by winery and other land use developers within the AVA on a voluntary basis for their projects. The handbook could incorporate the elements of the RM MSP Design Guidelines that could not be incorporated in the zoning ordinances. The Administration section of the 2007 RM MSP in Chapter 4 should be modified to describe how this process will work.
- Alliance members should provide comments on proposed projects within the AVA. The Alliance should use the SEPA mailing list process to be notified as projects requiring SEPA review are received by the County Planning Department. This will allow the

Alliance to monitor and provide comments on the projects as they proceed through the County Planning Department or the Planning Commission review and Board approval processes.

RED MOUNTAIN MASTER SITE PLAN – VISION & GUIDING PRINCIPLES

The 2007 RM MSP presented a Vision and set of Guiding Principles that were identified during the planning process to assist in decision making regarding Red Mountain AVA's future development. As part of this updating process the Alliance has reviewed and confirmed the RM MSP Vision and Guiding Principles presented below.

THE RED MOUNTAIN AVA VISION

The Red Mountain AVA vision is inspired by the beauty of the place and the globally competitive wines created at Red Mountain

- Future AVA visitors will be greeted by a sea of vineyards
- Create Red Mountain as a model of sustainable design, construction and operations
- The Wine Village forms the heart of visitor's Red Mountain experience
- The Wine Village architecture and landscape elements will respect Red Mountain's rural character and reinforce the overall quality of the new development occurring within the AVA
- The AVA will provide a wealth of interpretation opportunities for the visitor

THE RED MOUNTAIN GUIDING PRINCIPLES

Make Red Mountain the place all wine lovers want to visit.

- Make and sell highest quality wines
- Attract grape growers and vintners who focus on high-quality wines
- Increase Red Mountain AVA visibility
- Provide elements that support wine production and sale

Protect Red Mountain AVA character.

- Preserve the quality soils to grow grapes
- Respect the area's rural scale and character
- Encourage sustainable development and operation
- Incorporate a high standard of design and materials
- Respect private property rights

Provide high-quality visitor amenities and experiences.

- Provide lodging and dining opportunities of appropriate quality and scale
- Develop compatible recreation amenities
- Expand visitor interpretation and education opportunities

Support local economies.

- Focus a majority of the AVA-generated visitor facility opportunities in Benton City, West Richland and the Tri-Cities

Create Red Mountain as a model of sustainable design, construction and operation.

- Encourage future development to incorporate sustainable design principles in the design, construction and operation of the facilities
- Preserve and restore native shrub-steppe vegetation where such preservation and restoration complements vineyard and winery operations

VINEYARDS AT RED MOUNTAIN

Since the 2007 RM MSP was developed additional vineyards has been planted and wineries built within the AVA. The approximate acreage in vineyards and wineries is presented below:

2007 – 1,080 acres and 14 wineries

2012 – 1,300 acres and 13 wineries

RED MOUNTAIN AVA ALLIANCE

The Red Mountain Estates Association was formed by a small number of growers to create a master plan for the Red Mountain AVA. Following completion of the RM MSP in December 2007, Association members decided that, in order to implement the RM MSP and to pursue related goals including marketing the AVA to a worldwide audience, the Association needed a more broadly based organization. The growers created a new group, the Red Mountain AVA Alliance (the Alliance), in order to attract additional members including more residents, growers and wineries associated with the Red Mountain AVA. The Alliance is now in its fifth year and well under way to achieving its broader goals, with the support of a large and enthusiastic membership. The Alliance meets monthly and elects Alliance officers at the annual meeting.

NEXT STEPS - REVIEW MEETING

The Alliance held a meeting on June 6, 2012 to review and update the status of the Next Steps for the RM MSP. Meeting participants included Alliance members, Benton County Commissioner and staff, KID representatives, interested property owners, and the consultant.

NEXT STEPS STATUS

The Red Mountain AVA Master Site Plan is the result of a two-year planning process during which the consultant team worked closely with an Advisory Team, Benton County staff, AVA property owners and the public. The plan presents recommendations for the future of the Red Mountain AVA. This plan, once endorsed by the County Commissioners, provides the foundation for the next steps needed to implement the Red Mountain AVA Master Site Plan vision. Those steps include:

REPORT TO COUNTY COMMISSIONERS

The 2007 RM MSP work scope included the requirement that the consultant team assist the Office of Sustainable Development in presenting the 2007 RM MSP (including all recommendations and work products) to the Board of Benton County Commissioners to conclude the planning project and close the contract.

Status

- A presentation to the Board of Benton County Commissioners occurred during December 2007. The RM MSP has not been adopted by the Board of Benton County Commissioners.
- A presentation of this Next Steps Status Update to the Board of Benton County Commissioners will be scheduled for late summer 2012.

RED MOUNTAIN AVA MASTER SITE PLAN ADOPTION

Status

This process has not been started at this time. The following steps will occur as part of the adoption process:

- County Planning Department staff has reviewed the 2007 RM MSP and have recommended edits to update the 2007 RM MSP to reflect current zoning within the red Mountain AVA and to be consistent with GMA land use regulations.
- Benton County Planning Commission will review the RM MSP when this update has been completed. This review is anticipated during the fall of 2012.
- The Planning Commission will hold its RM MSP hearings and make a recommendation to the Board of Benton County Commissioners for its adoption. The recommendation status and date are to be determined.
- The Board of Benton County Commissioners to consider adoption of the RM MSP. The adoption status and date are to be determined.

Actions

- The Alliance should attend hearings held by the County Planning Commission and Board of Benton County Commissioners during this process.
- Visibility/Interaction - It is important that the Benton County Planning Department, Planning Commission and Board of Benton County Commissioners know how important adoption of the RM MSP is to the Alliance and other Red Mountain property owners.
- Completion of necessary information (including a SEPA preparation and review of the RM MSP) is required prior to RM MSP adoption by the Board of Benton County Commissioners.

REVIEW UNDER THE WASHINGTON STATE ENVIRONMENTAL POLICY ACT (SEPA)

Initial plans were to develop (contingent on funding) an environmental impact statement (EIS) that addresses environmental issues identified during the 2007 RM MSP process. If an EIS is prepared for the RM MSP, the SEPA process will be included in a public meeting focusing on issue identification (scoping) as well as additional public meetings and an agency review and comment process.

An environmental review must be completed prior to the County Board of Commissions adoption of the RM MSP, which could take the form of this EIS. A preliminary estimate (December 2007) for developing the EIS was approximately \$75,000 -\$100,000. At the time the Kennewick Irrigation District pledged assistance to the County for funding for the EIS. In lieu of the EIS process, which requires environmental review of each action proposed on a case by case basis, County Staff proposes a State Environmental Policy Act (SEPA) Checklist review for the Final Red Mountain Master Site Plan as a non-project SEPA which reviews the environmental impacts of the RM MSP document itself. This checklist would accompany the subarea plan amendment application and be prepared by County Planning Staff.

Status

- The County Planning Department has determined that State Environmental Policy Act (SEPA) checklist must be prepared for the Final Red Mountain Master Site Plan.
- The County Planning Department has determined that an Environmental Impact Statement (EIS) may be prepared for each action or project presented in the RM MSP document on a case by case basis as projects are proposed.

Actions

- County Planning Department staff to prepare a SEPA checklist for the Final Red Mountain Master Site Plan.

RED MOUNTAIN AVA MASTER SITE PLAN ZONING

The RM MSP recommended several preliminary zoning ordinances and an ordinance for implementing a Design Review Process (for commercial developments within the Red Mountain Agricultural District) and Design Guidelines for development within the AVA (developed by the Alliance and County Planning staff as part of the RM MSP planning process) be reviewed by the Benton County Planning Commission, other government agencies, utility providers and the public. Public meetings and hearings at the Planning Commission and the Board of Benton County Commissioners will be part of the review process for the ordinances. The Board of Benton County Commissioners is the approving authority for ordinances.

Status

- A draft Red Mountain Agriculture Ordinance is being completed by County Planning staff with oversight by appointed Alliance committee members. A draft document will be reviewed by County PA legal staff before the document is circulated for public review and comments. It is anticipated that the draft ordinance will be reviewed by PA legal staff review during the fall of 2012. The draft Red Mountain Agricultural District Ordinance will be written to be consistent with the draft RM MSP, current zoning code, and state law and replace the draft ordinances presented in the 2007 RM MSP.
- The County Planning Department staff has reviewed the list of potential commercial and tourist serving uses proposed within the Wine Village. Staff believes these uses can be located through the Master Planned Resort (RCW 36.70A.360) provisions.
- County Planning Department staff is developing a draft Master Planned Resort Ordinance for use as an overlay district for use on Red Mountain and other areas within Benton County.
- Lands not designated as agriculture and south of SR 224 but within the RM MSP study area boundary have been zoned Rural Lands – Five Acre (RL-5) during the 2011 Zoning Update process. The Proposed Zoning Districts Map (figure 6-1) in the 2007 RM MSP should be updated to reflect the RL-5 zoning areas.

Actions

- The Alliance should meet with the County Planning Department to discuss their Draft Agricultural Zoning Ordinance issues and comments.

The goal is to develop a Red Mountain Agricultural Zoning Ordinance that:

- Meets Red Mountain Alliance goals for the Agricultural Zone while being consistent with the requirements of the State's Growth Management Act (GMA).
- Achieves goals for ancillary development while protecting agricultural interests.
- Creates zoning ordinances that are enforceable.
- Following the above Alliance and County Planning Department meeting and refinement of the Draft Ordinance, the County Planning Department will begin the Draft Red Mountain Agricultural Zoning Ordinance public review process, which follows the

typical procedure for public participation, including Planning Commission review and recommendations and adoption by the Board of Benton County Commissioners.

It is critical that progress occur on this element as soon as possible since the Red Mountain-specific language has been deleted from the existing County Agricultural Zoning Ordinance.

BENTON COUNTY AGRICULTURAL ZONING ORDINANCE

The Benton County Planning Department is in the process of drafting a new Agricultural Zoning Ordinance.

Status

- County Planning Department staff has reviewed the Growth Management Hearings Board decisions and case law rulings regarding the development of agricultural lands in Washington State. County Planning Department staff has also reviewed the 2008 draft zoning ordinance proposed for the Red Mountain GMA Agriculture District and determined that due to its inconsistency with the new zoning format, the inclusion of design standards, changes in the Growth Management statutes that created provisions allowing farmers some limited non-agricultural accessory uses that support, promote or sustain agricultural operations, created a need to develop a modified draft.
- County Planning Department staff is in the process of preparing a draft Red Mountain Agriculture District Ordinance using the recently adopted zoning ordinance format and modifying the existing Growth Management Act (GMA) Agriculture District by incorporating the compatible Red Mountain Master Site Plan uses and the 2008 draft Red Mountain Agriculture District uses and setbacks, and removing those uses from the existing GMA draft that are detrimental to, and incompatible with the RM MSP. The preparation of the draft is being completed with oversight by appointed Alliance committee members. A draft document will be reviewed by County PA legal staff before a public document is circulated for review and public comments. The draft ordinance for PA legal staff review is anticipated by October 2012.
- Although there are no RCWs adopted specifically for lighting and light pollution, many jurisdictions have Lighting Ordinances in place to regulate light nuisances. During Benton County's 2011 Zoning Update Program, a lighting ordinance was drafted, but put on hold pending the Red Mountain zoning process, to ensure that the ordinance provides the best regulatory procedures to benefit Red Mountain and meets the needs of the entire County.

Actions

- The Alliance should continue to provide comments regarding the Agricultural Zoning Ordinance during the public review process.
- The Alliance should review the County's draft lighting ordinance and work with County Planning Department staff to achieve implementation of the lighting ordinance.

DESIGN GUIDELINES

The 2007 RM MSP developed Design Guidelines to guide the character of future project development within the Red Mountain AVA. The recommendations included the County developing an ordinance establishing a Design Review Process (to be administered by the Alliance) for review and approval by the Board of Benton County Commissioners. It was also recommended that the Board of Benton County Commissioners identify and appoint Design Review Committee (DRC) members. To facilitate that process, the Alliance could provide a list of nominees to the Board of Benton County Commissioners for their review, selection and approval.

Status

- Benton County Planning department does not have adequate staffing to administer, regulate or enforce the proposed design guidelines as presented in the 2007 RM MSP.
- The County Planning Department will notify the Alliance of projects within the AVA so that the Alliance can review and comment on the projects through the existing County Planning Department and County Planning Commission review process. The Alliance could use the 2007 RM MSP Design Guidelines as the review format.
- The Alliance Board voted for a voluntary non-binding Red Mountain AVA project review and comment approach in December 2008. To date no projects have been reviewed by the Alliance.

Actions

- The Design Guidelines and project review process could be initiated through the following process:

The Alliance should meet with the County Planning Department to discuss how an AVA Design Guidelines Handbook could be implemented on a voluntary basis.

If the Alliance (or other appropriate group) were to commit to administering a Design Review Committee (DRC), then the Alliance's established procedures and processes would set forth the DRC's membership, authorities, procedures, responsibilities and limitations

The Design Guidelines would cover only proposed commercial projects. Single family residences are not subject to the Design Guidelines review.

The Design Guidelines may be used by the Alliance (or other appropriate group) to develop a Handbook for use by winery and other developers within the AVA on a voluntary basis. The Handbook could incorporate the elements of the 2007 RM MSP Design Guidelines that could not be incorporated in the zoning ordinances.

BENTON COUNTY COMPREHENSIVE PLAN

The 2007 RM MSP recommended that in a public process, prescribed by State planning law and the Benton County Code, the RM MSP will be adopted as a Sub-Area Plan to the Benton County Comprehensive Plan and ultimately adopted by the Board of Benton County Commissioners. The amendment process will involve agency and public review and comment.

Status

- During the 2011 Comprehensive Plan Amendment process Sub-Area Plan language was added to the Benton County Comprehensive Plan. The amendment explains the function and process of Sub-Area plans and is the nexus between sub-area plans and the Comprehensive Plan
- The Sub-Area Plan amendment process begins with planning staff review of the Red Mountain AVA Master Site Plan (RM MSP) for consistency with the County's Comprehensive Plan and State planning law. Staff will prepare a staff report and amending language for the Comprehensive Plan and schedule a hearing before the Planning Commission, where the RM MSP and the planning staff report will be presented. The Planning Commission will consider the staff report information and the public testimony received to make a recommendation to the Board of Benton County Commissioners. A second hearing will be held before the Board of Commissioners to review the Planning Commission's recommendation, take further testimony and make a final decision. The Board of Commissioners will approve, modify or deny the plan. If approved, the RM MSP is adopted by reference in the County's Comprehensive Plan as a Sub-area Plan and text describing the RM MSP is added to provide a nexus between the RMMSP and the Comprehensive Plan.

Actions

- The Alliance should work with the County Planning Department to ensure that the Red Mountain vision is reflected in the County Comprehensive Plan.
- The Alliance should attend hearings with the County Planning Commission and Board of Commissioners to support inclusion by reference of the RM MSP recommendations.

URBAN GROWTH AREA BOUNDARY CHANGES

During 2009 two urban growth area (UGA) boundary change requests were proposed by cities adjacent to the Red Mountain AVA that could have impacted the AVA.

Status

Benton City had proposed an extension of its UGA boundary to the western edge of the Rural Lands Five designation (formerly "Mixed Use Area") which was approved by the Board of County Commissioners. The decision by Benton County was appealed to the Eastern Washington Growth Management Hearings Board and remanded back to the

County for non-compliance. After discussions between County, City, and petitioners, in an attempt to resolve the appeal, the city opted to remove the land from its UGA and the County rescinded the previously adopted ordinances to settle the appeal and achieve compliance with the court order. West Richland had proposed an extension of its UGA into the eastern portion of the Rural Lands Five designation (formerly “Mixed Use Area”). The West Richland proposal was appealed to, and later denied by the Eastern Washington Growth Management Hearings Board.

Actions

- The Alliance should review all future requests for UGA boundary changes that fall within the Red Mountain AVA Master Plan boundary to assure that UGA boundaries do not include land within the Red Mountain AVA.

INFRASTRUCTURE

The infrastructure analysis developed as part of the 2007 RM MSP identified the following four steps to advance the infrastructure and utility service in the study area:

If necessary and desirable, the County could designate and implement the Master Planned Resort (MPR) provisions of the Growth Management Act in order to provide municipal water and service to the Wine Village designation presented in the RM MSP. The GMA provisions that allow municipal service extensions into MPR’s require that the resort must be self-contained and be a fully integrated planned unit development with a primary focus on destination resort facilities with services limited to meeting the needs of the master planned resort.

Status

Wine Village - Since the Wine Village site has not been selected. No action has occurred.
Visitor Serving Area (formerly the Mixed Use Area) – No action has occurred.

Action

None identified at this time. The Alliance should monitor the need for future action.

Initiate a feasibility study or other methods to evaluate interest in and the potential for upgrading the fire suppression and emergency response capabilities on Red Mountain.

Status

Benton County and Benton County Fire District #4 have had preliminary discussions about the possible construction of a new fire station at Red Mountain. The District understands the future need and wants to be proactive in addressing that need.

Action

None identified at this time. The Alliance should monitor the need for future action.

Initiate a feasibility study to evaluate interest in and potential for LID participation for a small cluster wastewater system serving 2 to 10 wineries.

Status

The need for this element has not yet been identified.

Action

None identified at this time. The Alliance should monitor the need for future action.

Once the site for the Wine Village has been selected, form a committee to identify and assess the need for a domestic water source for the Wine Village property.

Status

Since the Wine Village site has not been selected, no actions have occurred to date.

Action

None identified at this time. The Alliance should monitor the need for future action.

Other infrastructure projects include the following:

1. Extending Antinori Road to Sunset Road

Status

- A County Road Improvement District (CRID) has been formed to extend Antinori Road to Sunset Road.
- The County Public Works Department is designing the road extension. Alliance representatives have been meeting with the County to refine the road design to fit the needs of the community and the existing topography.
- The suggested roundabout at the intersection of Antinori and Sunset Roads was deleted from the project.
- The County Public Works Department is in the process on collecting commitment signatures from CRID members to advance the project to the construction stage.

Action

The Alliance should continue its efforts in promoting this project in the community.

2. Bringing irrigation water to Red Mountain

Status

Kennewick Irrigation District (KID) is in the final steps to bring irrigation water to land owners that were signatory to the irrigation agreement at the end of 2009. The agreement covers approximately 1,785 acres. Ground has been broken on the new pump station that will supply the water load, and it is anticipated that the project will be completed during the summer of 2014.

Action

The Alliance should continue its efforts.

3. Red Mountain Interstate-82 Interchange – This would be a new interchange along I-82 located at approximately Milepost 100 that would more directly service Red Mountain.

Status

A local coalition continues to promote the project and seek funds for the interchange.

Action

The Alliance should continue to monitor the project.

4. Benton City Interstate-82 Interchange – This would consist of improvements to the intersection on the north side of the existing interchange, mainly creation of a roundabout at this location to help traffic flow.

Status

Washington State Department of Transportation (WDOT) has developed several alternative concepts (dated December 2011) for the Benton City roundabout.

WDOT has funding for design and engineering services and is in the process of acquiring land for the roundabout.

Action

The Alliance should continue to monitor the project.

NATIVE PLANTS AND INTEGRATED PEST MANAGEMENT (IPM) RESEARCH

The Alliance is committed to support research and pilot projects on IPM, use of native plants and other resource conservation efforts. An additional element for the research could be testing of various native rose species to determine their utility as insectaries for *Anagrus* wasps and to determine if providing habitat for these predators helps in the control of leafhoppers and cutworms.

In addition, discussions should be initiated with the WSU, Benton Conservation District and other interested parties regarding the opportunity to encourage native plant seed gathering and propagation for native plant propagation purposes.

Status

- A research program is underway at Ciel du Cheval vineyard to develop ground cover crops from native species that are indigenous to Red Mountain. The program is being conducted by WSU. The cover crops being tested are those which add Nitrogen to the soil or provide beneficial insect habitat.
- The Alliance has completed research on native plants. The wine industry (nationally and worldwide) is moving to a sustainable approach to vineyards and wine production. An Alliance goal is to establish a regimen of naturalism for Red Mountain.

Actions

- The Alliance should continue to be involved and monitor these projects.

WINE VILLAGE (MASTER PLANNED RESORT - MPR)

The 2007 RM MSP planning process identified the KID property immediately west of Sunset Road as the preferred location for the Wine Village. During review of this document at the June 6, 2012 meeting the participants discussed the importance of the Wine Village concept to the Red Mountain AVA. The group also stated that since KID has not confirmed their interest in the Wine Village on their property that the RM MSP should not identify a specific site. Any potential site for the future Wine Village should meet the site selection criteria presented in the 2007 RM MSP to be considered as a viable Wine Village site.

Status

- At this time KID is in the process of evaluating the best use of their entire property inventory and has not taken action or confirmed whether or not the proposed Wine Village use of their property meets their goals for the property.
- During 2011 the County Planning Department reviewed the Wine Village concept presented in the 2007 RM MSP for consistency with the Growth Management Act, County Comprehensive Plan, and the GMA Agricultural District. The County Planning Department has noted that while some uses may not be possible as originally proposed, alternative methods such as Master Planned Resorts (MPR's) may offer compatibility within the agricultural district.
- The County Planning Department has held discussions regarding the use of the Master Planned Resort statute (36.70A.360) in siting the Wine Village on Red Mountain. Policies for MPR's were adopted in the Comprehensive Plan process in 2007.
- The County Planning Department believes that the Wine Village concept is possible in the GMA Agricultural District through the Master Planned Resort (MPR) provisions under RCW 36.70A.360. The RCW's define MPR's as "a self-contained and fully integrated planned unit development, in a setting of significant natural amenities, with a primary focus on destination resort facilities consisting of short-term visitor accommodations associated with a range of developed on-site indoor or outdoor recreation facilities".
- The County does not currently have an adopted zoning classification for MPR's but does have adopted policies in the Benton Comprehensive Plan that allows MPR's.
- The County Planning Department has developed a MPR district ordinance for in-house review. As proposed in the draft the district will be implemented as an "Overlay" zone which will allow MPR developments in certain designated zoning districts in the County. MPR's must also have the significant natural amenities and resources that make them suitable for a range of recreational or tourist and visitor serving types of land uses. Within the Red Mountain AVA, the MPR site selected must be on lands with "marginal soils" and have the support of the Alliance and other Red Mountain AVA property owners.

- New zoning ordinances were adopted (went into effect on September 1, 2011) in Benton County consistent with the Benton County Comprehensive Plan. The new ordinance included changes to the Bed and Breakfast definition allowing up to 5 rooms.
- Potential sites under consideration for the Wine Village development should fit the following criteria:
 - Land marginal for growing grapes – least suitable soils and cold air drainage areas. This is a threshold criteria that must be met before considering other site selection factors
 - Site topography suitable for Wine Village – flat to slight slopes
 - Centrally located - providing opportunities for a distinctive visitor experience where the Wine Village is immersed in vineyards and not located adjacent to or close to roads
 - A site that is visible while not being visually dominant
 - A site that provides views to Red Mountain, Horse Heaven and Rattlesnake Hills, the surrounding vineyards and the valley below
 - Centralized location – providing “hub” opportunities for trails, parking and shuttle transportation systems and provides a focal point for visitor activities
 - Diversity in trail experiences - river, vineyards, and different habitat type views
 - Ability to screen/hide parking and support facilities
 - Ability to provide a viable transportation hub

Actions

- The Alliance should continue discussions with KID and other interested parties regarding the location and design of a possible Wine Village.
- The Alliance should provide comments for Red Mountain draft planning documents and actions.
- The Alliance and others should be vigilant for opportunities to attract potential developers and funds for Wine Village implementation.

INTERPRETIVE CENTER AND TRAILS

The 2007 RM MSP proposed collaboration with the Washington State Parks Commission, the County and other potential, and especially local, project sponsors regarding the funding, design, construction and operation of the Interpretive Center, site interpretive elements, the AVA trail system and connections to the existing and future regional trail systems. The 2007 RM MSP also recommended that the Red Mountain AVA interpretive activities be coordinated with the proposed interpretive elements at the Walter Clore Wine and Culinary Center in Prosser, WA.

Status

- Washington State Parks continues to be interested in the Red Mountain AVA as a focal point and visitor destination for agricultural interpretation. For the Interpretive Center to be a sustainable facility, the Interpretive Center and trailheads would need to be self-supporting. Absent other revenue stream options these facilities would need to be within State Parks Discover Pass or day use fee system. At this time the Washington State Parks does not have capital funds for the project.
- Benton City has completed a paved trail through the town that will eventually connect to and be a part of the Tapteal Greenway Trail. The Tapteal Greenway Trail which follows along the Yakima River all the way to Richland (30 plus miles at completion). The Tapteal Greenway Trail will be an important regional trail connection for the Red Mountain AVA trail network.
- An organization called the “Ridges to Rivers Open Space Network (RROSN) formed in the Tri-Cities in 2008. This group is doing regional planning for the use and protection of Tri-Cities area natural and agrarian open spaces, and connectivity between and among those open spaces, including longer-distance regional trails.
- The County Planning staff has determined that a multi-modal “transportation hub” could be located in the Wine Village (Master Planned Resort) and provide a viable method of reducing the amount of automobile traffic on the AVA road system.

Actions

- The Alliance should continue their discussions with Benton County, Tapteal Greenway Association, RROSN, and Friends of Badger Mountain regarding trails within and extending beyond the AVA.
- Continue to work with Washington State Parks to reaffirm their interest in the Red Mountain AVA.

SIGNAGE

A well designed and coordinated system of directional signage and way-finding information can enhance a visitor’s experience to the Red Mountain AVA and be an integral part of the AVA’s visual character and identity. In addition, a way-finding system can simplify visitor access to and circulation within the AVA. The signage system should provide way-finding information at several levels including the regional scale where travelers on I-82 are provided AVA way-finding information. The second level is at the community scale where visitors to Benton City and West Richland are provided AVA way-finding information and finally within the AVA itself where visitors are directed to individual wineries and other points of interest. Benton County refers to this as a ‘three-tiered system’ for addressing signage on the Mountain. This does not address or suggest addressing signage that individual farms, wineries, or other property owners would choose to do on their own property, only signage that is in the public domain.

Status

- Tier 1 – Interstate 82 Level: This task has not been addressed to date.

- Tier 2 – Intercity Level: This would include major signs along state highways and major gateways. Other than the sign placed by the community at the southeast entrance to the AVA (from Benton City, along SR 224), this task has not been addressed to date.
- Tier 3 – AVA Level: Benton County has not addressed this though the Alliance has discussed it. Benton County currently does not have a signage ordinance or the staffing to regulate the aesthetics and the design of way finding signage. However, the County, through Conditional Use Permits can regulate the size and location of signage within certain districts (see GMA Ag. District BCC 11.18.070. (15)) Actions
- The County and the Alliance should work collaboratively with the Red Mountain community, the cities of Benton City and West Richland, and the Washington Department of Transportation to develop and implement informational and way-finding signage at all three tiers described herein.

VISITOR SERVING AREA (FORMERLY MIXED USE AREA)

The 2007 RM MSP recommended that the Alliance and the County begin discussions with “Mixed Use Area” property owners regarding the need and opportunity for a coordinated site planning effort including all properties within the area identified as the “Mixed Use Area” (AVA lands south of Highway 224 and east of Appaloosa Rd.) in the 2007 RM MSP report. Such an effort would assist in developing this important Red Mountain AVA “front door” area as a cohesive, coordinated development that reinforces the Red Mountain AVA vision while anticipating the pressure for interchange commercial uses associated with the future Red Mountain interchange.

Status

- Other than County Planning Review of the concept, no actions have occurred on this element. The County Planning Department has noted that the “Mixed Use Area” as proposed in the 2007 RM MSP is not consistent with provisions of the Growth Management Act, the County’s Comprehensive Plan or current zoning ordinances. Staff is researching alternative methods to allow tourist serving uses within a reduced boundary, i.e., small-scale recreational or tourist uses (SSRT’s) that **may** enable some of the mixed uses proposed for this area. The criteria for SSRT’s are similar to Master Planned Resorts as they rely on a rural setting however SSRT’s are a smaller scale development both in size and investment and usually tied to the development of individual parcels.

Actions

- “Mixed Use Area” designations should be designated as “Tourist Serving Area”. The area should be reduced in size to remove those lands within the AVA. The area should undergo further site planning to provide the designation with uses and zoning that provide assurances that this area serves the tourism needs of the Red Mountain AVA and does not promote residential or commercial sprawl.

- The Alliance should have open discussions with the County Planning Department, Planning Commission and property owners in the future regarding the opportunity for coordinated planning and development of this important area of the AVA in anticipation of development pressures related to the future Red Mountain interchange.
- If coordinated planning within the Tourist Serving cannot be carried out, the Alliance should continue to monitor development proposals and land use actions on lands adjacent to AVA lands south of highway 224.

OTHER ADJACENT LANDS

The Alliance should continue discussions with adjacent property owners and communities regarding how development on adjacent properties can benefit from the quality of proposed development for the Red Mountain AVA. Adjacent property owners and communities are encouraged to incorporate the AVA vision, proposed quality, and design guidelines into their plans and development projects.

Status

- No actions have occurred on this element.

Actions

- The Alliance should continue to monitor these properties.

8. ENDNOTES AND REFERENCES

Endnotes

¹ Alcohol and Tobacco Tax and Trade Bureau, U.S. Viticultural Areas (updated as of 4/23/2007), http://www.ttb.gov/appellation/us_by_ava.pdf.

² Code of Federal Regulations Title 27, Volume 1, Part 9, Section 22, Subpart C—Approved American Viticultural Areas, Alcohol, Tobacco Products and Firearms, http://a257.g.akamaitech.net/7/257/2422/03jul20071500/edocket.access.gpo.gov/cfr_2007/aprqttr/pdf/27cfr9.22.pdf.

³ Benton County, Washington, Office of Sustainable Development. Red Mountain Conceptual Plan: A Vision of the Future for the Red Mountain AVA. Prepared by J.T. Atkins & Company PC, March 2006.

⁴ Transportation Research Board, *Highway Capacity Manual*, 2002.

⁵ According to Doug Eldred of WSDOT, information from the traffic data office for SR 224 shows a 2% reduction in volume on the weekend.

⁶ Atkins, Tom, J.T. Atkins & Company PC.

⁷ Masberg, Dr. Barbara, Central Washington University.

⁸ The average party was comprised of 2 persons in a single vehicle. Therefore, the number of parties also equals the number of visitor vehicles entering the AVA on the High Season Weekend Day.

⁹ Slade, Roscoe, Public Works Director, City of West Richland, June 2007.

¹⁰ Mitchell, Teresa, Washington State Department of Ecology, CRO Water Resources Program, March 16, 2007.

¹¹ Mitchell, Teresa, Washington State Department of Ecology, CRO Water Resources Program, March 16, 2007.

¹² Phelps Freeborn, Washington State Department of Ecology, White Paper, 2005.

¹³ Storm, David R. (1997) *Winery Utilities: Planning, Design, and Operation*, The Chapman & Hall Enology Library, New York, New York.

¹⁴ Rotell, Kay, Environmental Health Specialist, Benton-Franklin Health District, March 28, 2007.

¹⁵ Associated Press KNBC TV Los Angeles. *Government: Gas Price Increase Likely To Slow*. Retrieved August 2007 from <http://www.knbc.com/news/11607898/detail.html?subid=10101581>

¹⁶ United States Census Bureau. Interim Projections: Percent Distribution of Projected Population and Population Change for Regions and Divisions: 2000 to 2030. Retried 2007 from <http://www.census.gov/population/www/projections/projectionsagesex.html>

¹⁷ Wine Marketing Council. *2006 Consumer Tracking Study*. Retrieved January 2007 from <http://www.winemarketcouncil.com/research.asp>.

¹⁸ Travel Industry Association (TIA) & Edge Research (2006). *Profile of culinary travelers, 2006 edition*. Retrieved May 2007 from http://www.experiencewashington.com/images/pdf/R_VisitorProfileTIA-WineCulinary2006.pdf

¹⁹ Kreag, Glen. *Impacts of Tourism*. Retrieved September 2, 2007 from <http://www.seagrant.umn.edu/tourism/pdf/impactsTourism.pdf>.

²⁰ TriCities Visitor and Convention Bureau. *Big Dollar Impact*. Retrieved August 2007 from <http://www.visittri-cities.com/FileDisplay.cfm?FileID=1826>.

²¹ County of Napa General Plan Update. *Napa County Visitor Profile Study and Napa County Economic Impact Study, A Series of Executive Reports*. Retrieved August 2007 from http://www.napacountygeneralplan.com/meetings_and_workshops/files/materials_042606-2005_napa_county_visitor_profile_study.pdf.

²² State of Washington Department of Community, Trade and Economic Development. *Washington State Statewide Travel Impacts and Visitor Volume 1991-2006*. December 2006. Retrieved August 2007 from http://www.experiencewashington.com/images/pdf/R_ImpactStatewide2006.pdf.

²³ Creative City Network of Canada. *Savouring 54 Years of Local Tradition: The Niagara Grape and Wine Festival*. Retrieved August 2007 from <http://creativecity.ca/resources/project-profiles/Niagara-Region-Niagara-Wine-Festival.html>.

²⁴ Wine Market Council, *2006 Consumer Tracking Study*. Retrieved January 2007 from <http://www.winemarketcouncil.com/research.asp>.

²⁵ Taylor, R., *Wine tourism and festivals and events: a longitudinal analysis of visitor characteristics and satisfaction measure*. Proceedings of the International Wine Tourism Conference, Margaret River, Western Australia. May 2004.

²⁶ Wine Market Council (2006). *2006 Consumer Tracking Study*. Retrieved January 2007 from <http://www.winemercouncil.com/research.asp>

²⁷ Thomas, A & G. Pickering. (2005) *X-it: Gen-X and older wine drinker comparisons in New Zealand*. *International Journal of Wine Marketing* 17 (2). pp. 30-48.

²⁸ Holmes, Jim, discussion.

²⁹ Vinewise, Washington Guide to Sustainable Viticulture. *Sustainable Viticulture*. Retrieved August 2007 from <http://www.vinewise.org/208.html>.

³⁰ Vinewise, Washington Guide to Sustainable Viticulture. *Sustainable Viticulture*. Retrieved August 2007 from <http://www.vinewise.org/208.html>.

³¹ Wine Spectator. June 30, 2007, page 67.

³² *Pest Management Strategic Plan*; Washington State Wine Grape Production Workshop March 17, 2004, Pasco, WA.

³³ Washington Wine Industry Foundation. *Sustainability*. Retrieved August 2007 from http://www.washingtonwinefoundation.org/index.php?page_id=19.

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³⁵ Link, Dr. Steve. *Integrating Native Ecosystem*. WSU-Richland Department of Botany. June 1, 2007.

³⁶ Wine Spectator. June 30, 2007, page 67.

³⁷ Washington State Grape Society Meeting, 2000. Retrieved from <http://www.grapesociety.com/2000meetingproceedings/>.

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³⁹ Washington Wine Industry Foundation. *Sustainability*. Retrieved August 2007 from http://www.washingtonwinefoundation.org/index.php?page_id=19.

⁴⁰ James, David, (2000). Washington State Grape Society. *Integrated Pest Management in Washington Viticulture: Prospects and Potential*. Retrieved August 2007 from <http://www.grapesociety.com/2000meetingproceedings/integratedpestmanagement.html>.

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Appendix H

Transportation

Appendix H-1
Road Program 2016 – 2021
(or as updated)

RESOLUTION

2015 534

BEFORE THE BOARD OF COMMISSIONERS OF BENTON COUNTY, WASHINGTON:

IN THE MATTER OF COUNTY ROADS RE: APPROVAL OF THE 2016 - 2021 SIX-YEAR ROAD PROGRAM

WHEREAS, RCW 36.81.121 requires development of perpetual advanced six-year plans for coordinated transportation; and

WHEREAS, the updated six-year plan, describing the road maintenance and improvement program for the period of 2016 through 2021 shall be adopted prior to adoption of the annual budget, after one or more public hearings; and


WHEREAS, a public hearing on said six-year plan/road program was held on July 28, 2015; and

WHEREAS, in accordance with WAC 136-14-050 and WAC 136-20-060, the priority array and bridge report prepared by the County Engineer and staff were considered as a part of the six-year plan; and

WHEREAS, the County Engineer recommends approval of the 2016 – 2021 Six Year Road Program; NOW THEREFORE,

BE IT RESOLVED that the Board of Benton County Commissioners, Benton County, Washington hereby concurs with the County Engineer's recommendation and hereby approves the 2016 – 2021 Six-Year Road Program.

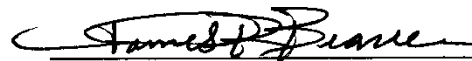
Dated this 28th day of July, 2015.



Chairman of the Board.

SHON SMALL - ABSENT

Chairman Pro-Tem.



Member.

Attest: 
Clerk of the Board

Constituting the Board of County Commissioners of Benton County, Washington.

Orig.: Public Works

M.H.Ames

BENTON COUNTY

Public Works Department



2016-2021 Road Program

Submitted to

Board of County Commissioners
Hearing date: July 28, 2015

Jerome Delvin, Chairman
Shon Small, Pro Tem
James R. Beaver

Introduction

The Benton County Six-Year Road Program is a planning tool to identify the expenditure of operational and capital funds for improvement to County roadways. Even though this is not a budget document, budgets are prepared using the information contained in this planning document. A new Six-Year Program is prepared in the spring of each year with adoption by the Board of County Commissioners anticipated prior to July 31. In the fall of each year the Board of County Commissioners will adopt a One-Year Road Program identifying the next year's road projects to be designed and constructed. After the One-Year Road program is approved the Board of County Commissioners approves the Public Works budget that is authorization for all Public Works fund expenditures.

This document is intended to provide the following information:

Financial

The Financial Projection report shows proposed revenues and expenditures for the six-year planning period. Many of the projects listed in the Six-Year Road Program are grant dependent. If grants for each project are not received the project will be delayed until funding becomes available. Remember that this is a planning document and not a budgeting document. Once funds become available projects will be prioritized by the Board of County Commissioners and then included in the One-Year Road Program and Public Works budget.

Six-Year Road Program

Each project has a brief explanation of the needed improvements, sources of funding, project cost, phasing and schedule. As needs change throughout the roadway network system and as funds become available priorities will also change. Projects listed are in relative priority based upon community needs regardless of funding. The Board establishes priorities at the time of document approval however; community involvement, available funding and safety requirements will always modify project priorities.

Road Data

Following the Six-Year Road Program is supplemental road data. The supplemental data contains information about various roadway programs and plans in the Six-Year Program. The following categories are listed in the Road Data section of this document:

- Discussions concerning potential new roads
- A list of roads benefiting from the Rural Arterial Program
- Roads paved through the County Arterial Preservation Program
- Certain paved roads that are not constructed to current standards
- Gravel roads scheduled to be paved
- Railroad crossings where new signal improvements would be beneficial
- A list of bridges in Benton County
- An inspection report for Benton County bridges
- A glossary of terms

The inventory for our roadway network as of June 9, 2015 is as follows:

<u>Roadway Surface</u>	<u>Urban</u>	<u>Rural</u>
Bituminous Surface Treatment	144.8	383.2
Asphalt Concrete Pavement	29.8	45.4
Portland Cement Concrete Pavement	0.3	0.2
Gravel	2.5	241.5
Graded & Drained	0	5.3
Unimproved	<u>0</u>	<u>5.4</u>
Total Miles	177.4	681.0

<u>Federal Functional Classifications</u>	<u>Miles</u>
Urban	
16 Minor Arterial	3.1
17 Major Collector	44.1
18 Minor Collector	5.3
19 Local Access	<u>124.9</u>
Total Urban Mileage	177.4
Rural	
07 Major Collector	87.4
08 Minor Collector	202.9
09 Local Access	<u>390.7</u>
Total Rural Mileage	681.0
Total Mileage County Wide	858.4

<u>Bridges</u>	<u>Quantity</u>
Twenty feet in length or longer	54
Greater than 6 feet but less than 20 feet in length	28

**BENTON COUNTY SIX-YEAR ROAD PROGRAM
FINANCIAL PROJECTION 2016-2021**

-REVENUES-

<u>Item</u>	<u>Revenue</u>
Carryover (January 1, 2016)	\$1,700,000
Property Taxes (Prior to Diversion)	\$39,575,754
Motor Vehicle Fuel Tax:	
Road Fund #0101-101	\$18,743,903
CRID's	\$970,000
State Grants:	
UCP-TIB (formerly TPP; TIA)	
CAPP	\$2,869,500
FMSIB	
RAP	\$4,481,000
State Grants Total:	\$7,350,500
Federal Grants:	
FHWA APP	
STP/R: Rural	\$952,000
STP/U: Urban	\$983,000
STP/H: Hazard Elimination	
STP/XP: Railroad	\$54,000
STP/E: Enhancement	
STP/BRRP: Bridge	
Federal Grants Total:	\$1,989,000
Public Works Trust Fund Loan	
Other Funds	
Operating Transfer-In	
County Road Improvement Matching Program Fund #0101-102	\$5,446,000
CRIMP Fund #0101-102 Carryover	\$1,840,000
Paths & Trails Reserve Fund #0114-101	\$360,000
Interest on Road Fund	\$150,000
TOTAL ANTICIPATED REVENUES	\$78,125,157

-EXPENSES-

<u>Item</u>	<u>Expenditures</u>
Traffic Policing (Diverted Property Taxes)	\$3,108,642
Maintenance	\$38,264,321
Administration	\$9,767,918
Operations	\$4,152,643
Construction:	
Road Fund #0101-101 (less PWTF P&I Pymt)	\$2,609,000
County Road Improvement Matching Program Fund #0101-102	\$5,446,000
Paths & Trails Reserve Fund #0114-101	\$360,000
CRID's	\$970,000
State Grants:	
UCP-TIB (formerly TPP; TIA)	
CAPP	\$2,869,500
FMSIB	
RAP	\$4,481,000
State Grants Total:	\$7,350,500
Federal Grants:	
FHWA APP	
STP/R: Rural	\$952,000
STP/U: Urban	\$983,000
STP/H: Hazard Elimination	
STP/XP: Railroad	\$54,000
STP/E: Enhancement	
STP/BRRP: Bridge	
Federal Grants Total:	\$1,989,000
Public Works Trust Fund Loan P & I Repayment	\$1,240,870
Other Funds	
Undetermined Funding Sources (less CRID)	\$18,420,000
TOTAL ANTICIPATED EXPENDITURES	\$93,678,893

Under - (Over) - Expended **(\$15,553,736)**

2016-2021 ROAD PROGRAM

PRIOR ITY	PROJECT	LENGTH (mi)	COST EST	COUNTY					STATE			FEDERAL			UNDETERMINED FUNDING SOURCE	CONSTRUCTION			
				ROAD FUND			CONTRIBUTIONS		TIB	FMSIB	CRAB	BFCOG	WSDOT	FHWA		2016	2017	2018	2019 to 2021
				PT & MVFT	P&T R	CRIMP	AMT	SOURCE	UCP		RAP	STP/R&U	STP/E&H						
POTENTIAL NEW ROADS																			
1	DAGUE RD: Terril to Game Farm	0.5	250												250			250	
2	WILLAMETTE HEIGHTS - S. 38th AVE. (W. Rich. Limits to W. Rich. Limits)	0.7	1,283	300								983				300		983	
3	WILLAMETTE HEIGHTS - MT. ADAMS VIEW (S. 38th Ave West to W. Rich. Limits)	0.1	200	200												200			
	Subtotal		1,733	500								983			250	500		983	250
RURAL ARTERIAL PROGRAM																			
4	NINE CANYON RD Phase II: Beck to Mills	2.4	1,500			150						1,350				1,500			
5	NINE CANYON RD Phase III: Coffin to Beck	3.0	3,479			348						3,131				733	2,020	726	
6	COUNTY WELL ROAD Phase I: SR221 to McBee	3.0	2,250												2,250			2,250	
7	COUNTY WELL ROAD Phase II: McBee to Clodius	2.0	1,500												1,500			1,500	
8	COUNTY WELL ROAD Phase III: Clodius to County Pit	1.8	1,350												1,350			1,350	
9	HANKS RD: 1/2 mile East of McDonald to Aller	1.5	1,800	100											1,700	100		1,700	
10	HANKS RD: Crosby to 1/2 mile East of McDonald	1.5	1,800	100											1,700	100		1,700	
11	FINLEY RD: M.P. 5.2 to End of Pavement	2.1	1,750												1,750			1,750	
12	CASE RD: OIEH to Hanks	2.3	2,000												2,000			2,000	
	Subtotal		17,429	200		498						4,481			12,250	2,433	2,020	726	12,250
PAVED ROAD UPGRADES																			
13	SELLARDS RD Phase I: SR 221 to 2 miles East of SR 221	2.0	1,100			148						952				1,100			
14	SELLARDS RD Phase II: 2 miles East of SR221 to 1/2 mile East of Tyacke	2.5	1,475	75		1,400										75	700	700	
15	SELLARDS RD Phase III: 1/2 mile East of Tyacke to Travis	2.5	1,475	75		1,400										75		700	700
16	BERT JAMES RD: Sellards to SR 221	4.0	3,100	100											3,000	50	50	3,000	
17	JOHNSON RD: CR 12 to Griffin	2.2	1,470	150											1,320		75	75	1,320
	Subtotal		8,620	400		2,948						952			4,320	1,300	825	1,475	5,020
GRAVEL ROAD UPGRADES																			
18	TYRELL RD Phase I: 2 miles West of Plymouth Road to Plymouth Road	2.0	1,000			1,000										1,000			
19	TYRELL RD Phase II: Travis Road to 2 miles West of Plymouth Road	2.0	1,000			1,000											1,000		
	Subtotal		2,000			2,000										1,000	1,000		
ENHANCEMENT & SAFETY PROJECTS																			
20	PROSSER to GRANDVIEW PEDESTRIAN & BICYCLE PATHWAY IMPROVEMENTS	0.6	20	3										17		20			
21	JOHNSON RD/GRIFFIN RD: Intersection Improvements	0.5	1,000												1,000			1,000	
22	OBSOLETE BRIDGE REMOVAL	n/a	300												300			300	
23	ROADSIDE WATERWAY PIPING AND SAFETY MITIGATION	n/a	300												300			300	
	Subtotal		1,620	3										17	1,600	20		1,600	
ANNUAL PROGRAMS & MISCELLANEOUS PROJECTS																			
24	PATHS & TRAILS		60			60										10	10	10	30
25	RAILROAD CROSSINGS		60			6								54		10	10	10	30
26	EMERGENT PROJECTS		1,500												1,500	250	250	250	750
	Subtotal		1,620					0						54		270	270	270	810
TOTALS			33,022	2,609	60	5,446	0	0	0	0	4,481	1,935	71	0	18,420	5,523	4,115	3,454	19,930

(All \$'s x 1000)

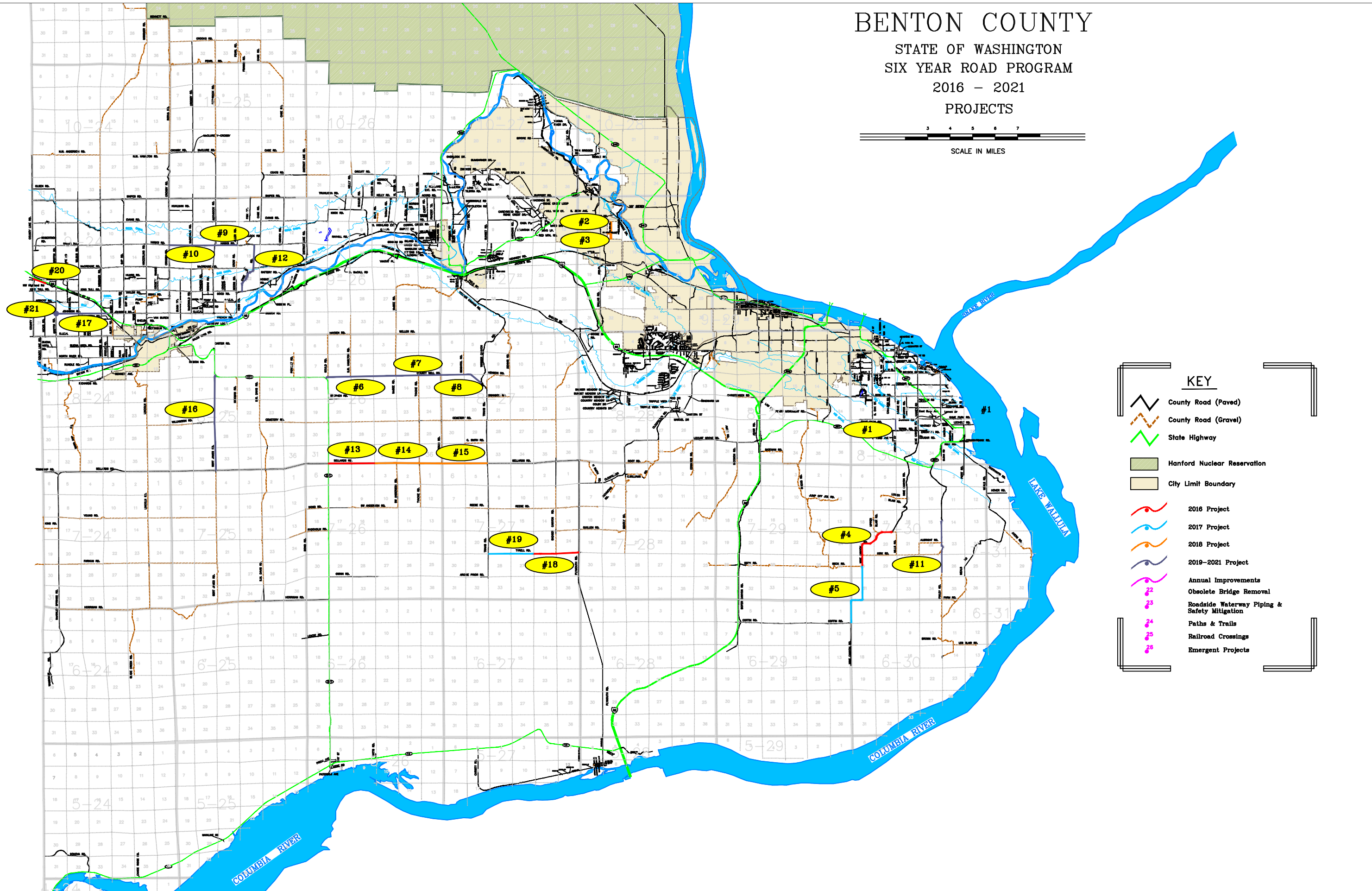
7/28/2015

BENTON COUNTY

STATE OF WASHINGTON
SIX YEAR ROAD PROGRAM

2016 - 2021

PROJECTS



KEY

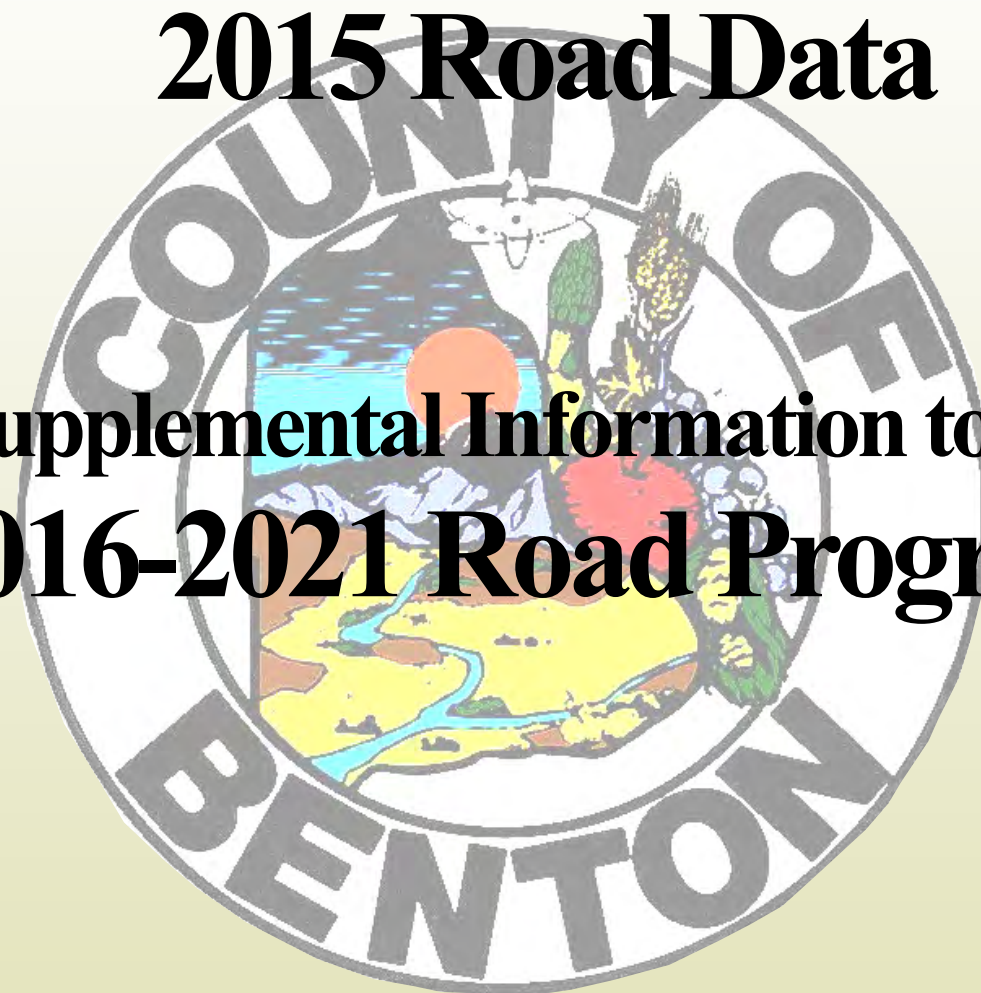
- County Road (Paved)
- County Road (Gravel)
- State Highway
- Hanford Nuclear Reservation
- City Limit Boundary
- 2016 Project
- 2017 Project
- 2018 Project
- 2019-2021 Project
- Annual Improvements
- Obsolete Bridge Removal
- Roadside Waterway Piping & Safety Mitigation
- Paths & Trails
- Railroad Crossings
- Emergent Projects

BENTON COUNTY

Public Works Department

2015 Road Data

Supplemental Information to the 2016-2021 Road Program



Submitted to:

Board of County Commissioners
Hearing date: July 28, 2015

Jerome Delvin, Chairman
Shon Small, Pro Tem
James R. Beaver

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POTENTIAL NEW ROADS

Potential New Roads

Roads owned, operated and maintained by the County are established by resolution of the Board of County Commissioners. Prior to establishment of a county road the County Engineer completes an Engineer's Report and a Survey Report. The Board then holds a public hearing on those reports and determines if the road is to be established. These reports contain at least the following information:

- a) the necessity of the road,
- b) the proper terminal points, general course and length,
- c) the proper right-of-way width,
- d) the estimated cost of construction, including all necessary bridges, culverts, clearing, grubbing, drainage and grading,
- e) such other facts as may be of importance to be considered by the Board and,
- f) a map of the road as surveyed, which shows the tracts of land over which the road passes and any field notes and profiles of such survey.

Additionally certain environmental studies may be necessary prior to design and construction of any roadway.

Benton County is considering the following potential new roadways:

S. 38th Avenue and Mt. Adams View

In conjunction with the City of West Richland, we requested these potential roads be classified as arterials. The classification was granted; the City received STP funding and is designing the road. Construction funding will be pursued in 2018. These two roads serve the residents of Willamette Heights Section 8.

Dague Road

An unopened half mile North-South right-of-way exists between Game Farm Road and Terril Road and when constructed will help the traffic patterns in the area.

RURAL ARTERIAL PROGRAM

Rural Arterial Program

The Rural Arterial Program (RAP), created in 1983 by the Washington State Legislature, was established to improve rural arterials and collectors. Motor Vehicle Fuel Tax is distributed to five regions within the state and there is competition amongst counties within each of those regions for the funds. The County Road Administration manages this program through an oversight body known as the County Road Administration Board (CRAB).

Authority for the RAP program is contained in the Revised Code of Washington (RCW) 36.79 and the administrative rules are located in the Washington Administrative Code (WAC) 136-100. These laws and codes establish the uses and limitations of the program funds and create a competitive process for each county to apply for project funding.

CRAB staff manages the competitive process that is based upon roadway conditions. After review of the application and proposed improvements, CRAB staff then establishes a priority array for the projects. As funding becomes available from successful competition, the counties then program the projects for design and construction.

The Southeast Region (Asotin, Benton, Columbia, Franklin, Garfield, Klickitat, Walla Walla and Yakima counties) has established road-rating criteria for project competition in our region. That criterion includes traffic history, roadway structure and geometry. The following page provides information about projects that have been funded and completed with financial assistance through the RAP Program, or have been funded with assistance through the RAP Program and are in the design and construction process.

Completed Rural Arterial Program (RAP) Projects									
Dollars X \$1,000									
Road Name	From	To	From	To	Length	RAP	Biennium	Cost	Completed
Snipes Rd	McDonald	Rothrock	7.73	8.84	1.11	\$118	85 - 87	\$249	7/30/1986
Grant Avenue Bridge			0.00	0.15	0.15	\$326	85 - 87	\$2,292	9/24/1986
North River Rd	Griffin	Missimer	0.96	2.68	1.72	\$250	87 - 89	\$405	8/4/1988
McKinley Springs Rd	Horrigan	Farnum	2.66	4.66	2.00	\$250	87 - 89	\$370	7/10/1989
Travis Rd	Reese	Sellards	3.07	5.09	2.02	\$285	89 - 91	\$413	6/18/1990
McKinley Springs Rd	Farnum	Young	4.65	6.76	2.11	\$285	89 - 91	\$410	6/8/1990
Plymouth Rd	SR 14	MP 5.61	1.61	5.61	4.00	\$720	91 - 93	\$1,259	6/6/1994
Plymouth Rd	MP 5.61	Tyrell	5.61	9.73	4.12	\$356	91 - 93	\$760	7/10/1995
Horrigan Rd	Davis	SR 221	9.61	12.51	2.90	\$298	93 - 95	\$840	6/30/1995
County Route 12	County Line	Prosser CL	0.00	4.67	4.67	\$418	95 - 97	\$479	10/31/1997
Webber Canyon Rd	Henson	MP 1.10	0.00	1.10	1.10	\$594	95 - 97	\$1,456	7/1/1998
Plymouth Rd	Tyrell	Sellards	9.73	13.79	4.06	\$955	95 - 97	\$1,303	6/1/2001
Travis Rd	Archie Prior	Reese	0.00	3.04	3.04	\$810	97 - 99	\$900	6/1/2002
Sellards Rd	Travis	Plymouth	19.23	23.27	4.04	\$1,125	97 - 99	\$1,250	2003
Clodfelter Rd	Plymouth	Bently	0.00	2.25	2.25	\$846	01 - 03	\$1,945	2005
Webber Canyon Rd	Dennis	Kiona	3.31	6.44	3.13	\$1,300	99 - 01	\$5,184	2009
Clodfelter Rd	Bently	C.Williams	2.35	4.90	2.55	\$1,350	03 - 05	\$1,938	2012
Locust Grove Rd	C.Williams	Edwards	0.00	1.50	1.50	\$900	05 - 07	\$1,757	2012
Nine Canyon Rd	Mills	SR 397	7.40	10.80	3.40	\$2,741	07-09	\$3,706	2015
				Total	49.87	\$13,927		\$26,916	
Funded RAP Projects									
Dollars X \$1,000									
Road Name	From	To	From	To	Length	RAP	Biennium	Cost	
Nine Canyon Rd	Beck	Mills	4.80	7.40	2.60	\$2,543	09 - 11	\$2,826	
Nine Canyon Rd	Coffin	Beck	1.90	4.80	2.90	\$3,150	13 - 15	\$3,500	
				Total	5.50	\$5,693		\$6,326	

**COUNTY
ARTERIAL
PRESERVATION
PROGRAM**

County Arterial Preservation Program

The County Arterial Preservation Program (CAPP) created in 1990 by the Washington State Legislature was established to preserve rural arterials and collectors. Motor Vehicle Fuel Tax is distributed to counties based upon each counties allocation of arterial and collector lane miles proportional to the total statewide arterial and collector lane miles. The County Road Administration manages this program through an oversight body known as the County Road Administration Board (CRAB).

Authority for the CAPP program is contained in the Revised Code of Washington (RCW) 48.68.090 and the administrative rules are located in the Washington Administrative Code (WAC) 136-300. These laws and codes establish the uses and limitations of the program and create a fund distribution process.

County staff evaluates each arterial and collector for the appropriateness of preserving and resurfacing county arterials and collectors. The preservation usually consists of some shoulder work, pre-leveling and resurfacing, including chip seals.

Completed County Arterial Preservation Program (CAPP) Projects							
Road Name	From	To	From	To	Length	Cost	Year
Finley Rd	SR 397	Donelson	12.33	14.25	1.92	\$101,593	1990
Haney Rd	Game Farm	Bowles	0.00	1.00	1.00	\$132,994	1990
Nine Canyon Rd	KID Canal	Game Farm	11.54	13.31	1.77	*	1990
Demoss Rd	SR 224	Rupert	0.00	3.97	3.97	\$244,071	1991
Reata Rd	Vaca	Leslie	2.23	3.31	1.08	*	1991
Hinzerling Rd	OIEH	King Tull	0.00	1.04	1.04	\$276,900	1992
OIEH	I-82	Whitstran	5.51	9.51	4.00	*	1992
19th Ave, W	Washington	Oak	0.00	0.98	0.98	\$281,960	1993
Finley Rd	Riek	Game Farm	11.14	12.15	1.01	*	1993
Game Farm Rd	Haney	Finley	7.04	8.05	1.01	*	1993
Highland Rd	Olympia	Washington	0.00	1.31	1.31	*	1993
Piert Rd	CID Canal	Lechelt	0.91	2.24	1.33	*	1993
Gap Rd	I-82	Hanks	0.28	3.72	3.44	\$308,653	1994
Sellards Rd	SR 221		12.14	14.14	2.00	*	1994
Clodfelter Rd	Tripple Vista	10th	6.52	10.22	3.70	\$294,500	1995
Meals Rd	Piert	Hover	7.73	10.07	2.34	*	1995
Griffin Rd	McCreadie	Snipes	0.76	3.78	3.02	\$271,927	1996
Rothrock Rd	OIEH	Hanks	0.00	2.55	2.55	*	1996
Ruppert Rd	Demoss		0.37	1.14	0.77	\$315,830	1997
Oak St	27th	Bowles	1.18	2.05	0.87	*	1997
Finley Rd	SR 397	Donelson	14.33	16.61	2.28	*	1997
Sellards Rd	Ward Gap		0.99	2.19	1.20	*	1997
Sellards Rd		Lincoln	3.24	4.04	0.80	*	1997
Webber Canyon Rd	County Well		0.00	1.10	1.10	\$124,731	1998
BST (Various Locations)						\$207,743	1998
Sellards Rd	Lincoln	SR 221	4.04	12.10	8.06	\$365,149	1999
Badger Rd	Webber Canyon	Badger Canyon	0.00	5.93	5.93	\$349,348	2000
OIEH	Rothrock	District Line	9.48	13.93	4.45	\$339,472	2001
Pioneer Rd	OIEH	King Tull	0.00	1.03	1.03	*	2001
Badger Rd	Badger Canyon	I-82	5.93	12.00	6.07	\$443,783	2002
Hanks Rd	County Line	Crosby	0.00	6.07	6.07	\$367,660	2003
BST (Various Locations)						\$327,609	2004
Johnson Rd	County Route 12	Hinzerling	3.24	5.03	1.79	\$134,310	2005
BST (Various Locations)						\$199,062	2005
BST (Various Locations)						\$272,946	2006
BST (Various Locations)						\$266,634	2007
Reata Rd	Bermuda	Leslie	1.79	3.57	1.78	\$189,941	2007
OIEH	Bunn	Pioneer	7.50	8.50	1.00	\$25,241	2007
BST (Various Locations)						\$362,600	2008
BST (Various Locations)						\$348,981	2009
BST (Various Locations)						\$306,105	2010
BST (Various Locations)						\$367,274	2011
BST (Various Locations)						\$479,033	2012
BST (Various Locations)						\$444,447	2013
BST (Various Locations)						\$471,046	2014
BST (Various Locations)**						\$478,250	2015
Total						\$9,099,793	
*Indicates cost is included in total above							
**Amount is projected to end of the Year							

RAILROAD CROSSING IMPROVEMENT PROJECTS

Unfunded Railroad Crossing Improvement Projects

There are nineteen publicly permitted railroad crossings in Benton County (listed on the following page) with passive warning devices. Benton County pursues federal/state grants to convert the remaining passive warning devices to active warning devices by applying for funding at all passive crossings each time a call for projects is requested. Passive warning devices include pavement markings and signs. Active warning devices include warning lights, bells and crossing arms in addition to the pavement markings and signs. While the existing railroad crossings with passive warning devices are safe to cross, safety can be improved with the installation of active warning devices.

Privately permitted railroad crossings are not listed on the following page. Improvements to privately permitted railroad crossings are dependent upon permit conditions between the railroad and the permittee.

The primary source of funding for publicly permitted crossing improvements is from the federal Surface Transportation Program (STP). Because of the significant expense associated with installation of active warning devices Benton County relies upon a competitive process for the use of STP funds to determine construction timing. During a competitive process for STP funds a variety of criteria is used to determine the successful applicants. Two of the most significant criteria for the competitive process are “Exposure Factor” and “Crossing Angle”. The Exposure Factor and Crossing Angle for each unfunded crossing are listed in the following table.

Unfunded Railroad Crossing Improvement Projects

Crossing	Crossing No	Railroad	Exposure Factor Veh Vol x Train Vol	Crossing Angle
Richards Rd	1 C 42.60	BNSF	3800	75
Bryson Brown Rd	6H 9.70	BNSF	3200	60
Perkins Rd	6H 8.50	BNSF	2800	60
Finley Rd	6 H 8.51	BNSF	2000	80
Ward Gap Rd	1 C 44.20	BNSF	2000	75
Haney Rd	6 H 9.70	BNSF	1700	80
Pioneer Rd	1U 37.30	BNSF	1400	85
Pioneer Rd (Simplot Spur)	6H 48.50	BNSF	1400	85
County Line Rd, S	1U 44.90	BNSF	1200	60
Griffin Rd, S	1U 43.80	BNSF	1000	65
Lechelt Rd	3AS D 26.00	BNSF	800	90
Wilgus Rd, S	1U 41.60	BNSF	440	85
Bunn Rd	1 U 37.80	BNSF	340	90
Albro Rd, N	1U 41.30	BNSF	320	90
Missimer Rd, S	1U 41.80	BNSF	250	85
Hansen Rd	1C 33.60	BNSF	200	85
McDonald Rd	1U 37.80	BNSF	150	90
Toothaker Rd	3A 220.20	BNSF	150	120

BRIDGE INVENTORY

Bridge Inventory

The National Bridge Inspection Standards (NBIS) published in the Code of Federal Regulations defines a bridge as follows:

“A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes: it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.”

The sufficiency rating (SR) is the basis for establishing eligibility and priority for replacement or rehabilitation of bridges with Federal Highway Bridge Replacement and Rehabilitation Program (HBRRP) funds. The sufficiency rating is a numeric value which indicates a bridge’s relative ability to serve its intended purpose. The value ranges from 100 (a bridge in new condition) to a 0 (a bridge not suitable for carrying traffic). The sufficiency rating is the summation of four calculated values: Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reductions.

There are two types of deficient bridges – structurally deficient (SD) and functionally obsolete (FO). A structurally deficient bridge, as defined by the Federal Highway Administration (FHWA), is one whose condition or design has impacted its ability to adequately carry its intended traffic loads. A functionally obsolete bridge is one in which the deck geometry, load carrying capacity, clearance or approach roadway alignment has reduced its ability to adequately meet the traffic needs below accepted design standards. Those bridges meeting the criteria for both SD and FO are only considered SD, the structural deficiency overrides the functional obsolescence and the bridge will be considered in the SD classification.

In general, a lower sufficiency rating results in a higher priority for repairs or replacement. To qualify for replacement with federal financial assistance, a bridge must have a sufficiency rating of less than 50 and be structurally deficient or functionally obsolete. To be eligible for rehabilitation, a bridge must have a sufficiency rating of less than 80 and be structurally deficient or functionally obsolete. Federal funding applies to bridges or structures that meet the NBIS definition and are greater than ten years old. Currently, sufficiency ratings prioritize the funding for these bridges or structures.

Benton County currently has no bridges rated as structurally deficient and the seven bridges that have been rated as functionally obsolete have been so rated because of deck geometry or roadway alignment.

BRIDGE INSPECTION REPORT

Bridge Inspection Report

The County Engineer is required to report bridge deficiencies to the Board (WAC 136.20.060) in the Six-Year Road Program. Following is the bridge inspection report through June 30, 2015.

Bridge Inspection Report for Annual Certification

Revised 7/15/2014 j.a.l.

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
137001050	B	Horrigan Rd	28	02/24/14	02/24/16	E Branch of Glade Creek	Y	1	Place rip rap at outlet end of all 3 culverts.	99.97
242100162	B	McDonald Rd	25	02/26/14	02/26/16	SVID Canal	N	0	All previous repairs have been made. No new repairs.	98.99
186500803	B	McBee Rd	52	02/21/14	02/21/16	KID Canal	Y	1	Skin patch both approaches.	98.50
242100336	B	McDonald Rd	44	02/19/14	02/19/16	Roza Canal	Y	1	Place rip rap at the Northwest and Southwest corners at roadway surface to stop erosion.	97.97
518000027	B	Twin Bridges North Crossing	200	06/24/15	06/24/17	Yakima River	N	1	All previous repairs have been made. No new repairs.	97.67
121500000	B	Grant Ave	617	06/25/15	06/25/17	Yakima River	Y	1	Clean out expansion joints and drains.	96.45
								1	Contact BCSO for graffiti abatement.	
110500253	B	Plymouth Rd	22	02/24/14	02/24/16	Four Mile Canyon	Y	1	Paint culvert crossing markings	97.30
								1	Old tires and a TV have been dumped on the East end of the culvert.	
221501725	B	OIEH	24	02/26/14	02/26/16	Knox Creek	Y	1	Remove silt from the West pipe. Enlarge the inlet eare for silt deposit.	97.26
202500732	B	Griffin Rd	44	02/19/14	02/19/16	Roza Canal	Y	1	Raise guardrail at NW corner of the bridge	97.11
221900316	B	Crosby Rd	32	02/19/14	02/19/16	Roza Canal	Y	1	The joint material between the abutment and the wingwall at the SE & SW corners that was previously replaced has failed. Replace again.	96.14
441100924	B	Clodfelter Rd	48	02/21/14	02/21/16	KID Canal	N	0	All previous repairs have been made. No new repairs.	96.09
218500071	B	Hinzerling Rd	34	02/26/14	02/26/16	SVID Canal	N	0	No repairs	95.95
218500352	B	Hinzerling Rd Roza	43	02/19/14	02/19/16	Roza Canal	N	0	Crack seal joints at both abutments	95.94
199100926	B	Badger Canyon Rd	39	02/21/14	02/21/16	KID Canal	N	0	A portion of the bridge rail at the Northeast corner of the bridge has been damaged and should be replaced.	95.74

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
518000001	B	Twin Bridges	64	02/21/14	02/21/16	CID Canal	N	0	No repairs	95.72
761000004	B	Bernath Rd CID	34	02/20/14	02/20/16	CID Canal	Y	1	Cut down the small tree under the southwest corner of the bridge.	95.56
								1	Crack seal the East approach	
								1	Skin patch the West approach	
210900436	B	Gap Rd	32	02/19/14	02/19/16	Roza Canal	Y	1	Replace joint filler material at all 4 corners on the wing walls.	94.41
								1	Clean and patch spall on SE wingwall.	
518000009	B	Twin Bridges South Crossing	450	06/24/15	06/24/17	Yakima River	Y	1	The modular block retaining walls are starting to push away from the concrete abutments on the SE corner and SW corner. The block should somehow be attached back to the abutment concrete wall. The Maintenance Superintendent should consult the County Engineer on what repair would work best in this situation. Patch approaches	97.67
515500302	B	Yakima River Dr CID	30	02/21/14	02/21/16	CID Canal	Y	1	Skin patch both approaches.	92.99
515800002	B	Bridge Rd	32	02/21/14	02/21/16	CID Canal	Y	1	Skin patch both approaches.	92.21
253000313	B	Rothrock Rd Roza	40	02/19/14	02/19/16	Roza Canal	Y	1	Clean and paint the exposed rebar at the North end of the West curb.	92.09
517000000	B	Grosscup Rd	34	02/21/14	02/21/16	CID Canal	Y	1	Skin patch Westerly approach.	91.96
204600008	B	King Tull	52	02/24/14	02/24/16	SVID Canal	N	0	No repairs	91.24
776800042	B	Erickson Rd	28	02/20/14	02/20/16	CID Canal	Y	1	No repairs	90.88
309500093	B	District Line Rd	28	02/26/14	02/26/16	BID Canal	N	0	Canal has been filled in.	89.98
189100007	B	Graham Rd	52	02/21/14	02/21/16	KID Canal	Y	1	No repairs	89.67
243100154	B	Pioneer Rd	29	02/26/14	02/26/16	SVID Canal	N	0	No repairs	88.94
315500288	B	Case Rd	29	02/19/14	02/19/14	Roza Canal	Y	1	Place riprap along South retaining wall under Unit A	87.55
								1	Crack Seal joint at S approach	
714000085	B	36th Ave, E	32	02/20/14	02/20/16	CID Canal	N	0	No repairs	87.51
489101153	B	Nine Canyon	20	02/20/14	02/20/16	KID Canal	Y	1	Crack seal both approaches	86.21

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
327100069	B	Truhlicka Rd	21	02/19/14	02/19/16	Roza Canal	Y	1	Skin patch both approaches.	85.22
253000011	B	Rothrock Spring Creek	22	02/26/14	02/26/16	Spring Creek	N	0	No repairs	84.41
205700224	B	Wilgus Rd SVID Canal	32	02/24/14	02/24/16	SVID Canal	N	0	No repairs	84.40
255500668	B	Missimer Rd	48	02/19/14	02/19/16	Roza Canal	N	0	No repairs	84.28
489101306	B	Nine Canyon	22	02/20/14	02/20/16	CID Canal	Y	1	Crack seal both approaches	84.14
255500339	B	Missimer Rd	38	02/26/14	02/26/16	SVID Canal	N	0	No repairs	83.94
221501858	B	OIEH	20	02/26/14	02/26/16	Corral Creek	Y	1	Cut down and remove the trees and brush from the upstream side of the bridge. Do not remove the root balls.	80.54
210300295	B	County Rt 12	46	02/24/14	02/24/16	SVID Canal	N	0	No repairs	79.90
204600575	B	King Tull	31	02/26/14	02/26/16	SVID Canal	N	0	No repairs	79.15
503500035	B	Valley View Rd	32	02/21/14	02/21/16	CID Canal	Y	1	Patch the Westerly approach.	79.14
								1	Crack seal both approaches.	
205700629	B	Wilgus Rd	40	02/19/14	02/19/16	Roza Canal	N	0	No repairs	76.48
202500280	B	Griffin Rd	37	02/24/14	02/24/16	SVID Canal	N	0	No repairs	75.76
221501017	B	OIEH	26	02/26/14	02/26/16	Spring Creek	Y	1	Replace missing joint material on all 4 corners.	75.69
518000171	B	Twin Bridges Rd Horn Rapids	34	02/21/14	02/21/16	Horn Rapids Corp Canal	N	0	No repairs	73.14
210900136	B	Gap Rd	34	02/26/14	02/26/16	SVID Canal	N	0	No repairs	73.12
133500073	B	McKinley Springs Rd	10	12/11/15	12/11/16	Glade Creek	Y	2	Crack seal at both ends of the bridge	71.01
301000093	B	Hess Rd	52	12/13/13	12/09/15	Chandler Canal	N	M	Monitor the crack in cap at the west abutment	69.68
253000110	B	Rothrock Rd	25	02/26/14	02/26/16	SVID Canal	Y	1	Crack Seal Both Approaches	67.17
221501107	B	OIEH	60	02/26/14	02/26/16	Snipes Creek	Y	1	Recaulk joints between abutments and wingwalls.	66.89
301000146	B	Hess Rd	71	12/10/13	12/10/15	Chandler Canal	Y	3	Remove brush from shoulder of road at NE corner	65.51
221501583	B	OIEH	50	12/10/13	12/11/15	Chandler Canal	Y	1	Remove old patches and repair curbing at NW and SW corners	58.10
								1	Patch SW corner at bottom of canal on abutment where spill is.	

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
								1	Repair spall in SW corner of diaphragm of Girder D. Paint exposed rebar.	
								1	Repair Joint at SE and SW corner of abutment	
309500042	B	District Line Rd	52	12/13/13	12/10/15	Chandler Canal	Y	2	Replace cut cross braces between Girders A & B at both abutments.	54.35
761300110	B	Oak St	36	02/16/14	02/20/16	CID Canal	Y	1	Replace missing joint material at the SW corner.	41.98
156500713	SS	Bert James Rd	14	04/08/11	04/08/16	Unnamed drainage	N	0	No repairs	85.31
343200001	SS	Davis Rd	12	03/30/11	03/30/16	BID Canal	Y	1	Structure could be removed	84.43
322200054	SS	Acord Rd	19	03/20/11	03/20/16	Corral Creek	N	0	No repairs	82.08
337100133	SS	Whan Rd	16	03/20/11	03/20/16	BID Canal	Y	1	Remove structure as it is no longer needed.	81.39
330900083	SS	Knox Rd	14	03/30/11	03/30/16	BID Canal	N	0	No repairs	77.46
226400967	SS	McCreadie Rd	18	02/19/13	08/31/15	Snipes Creek	N	M	Monitor large rip rap at SE corner for further scour	77.39
772100091	SS	Piert Rd	15	04/05/11	04/05/16	CID Canal	N	0	No repairs	74.61
330200133	SS	Highland Extension, W	18	03/30/11	03/30/16	Corral Creek	Y	3	Replace sixth & seventh post from SE corner of bridge.	74.23
								1	Place shoulder rock at Southeast and Northwest corners of Patch both roadway approaches	
								1	Patch both roadway approaches	
245000038	SS	Biggam Rd	18	07/22/11	07/22/16	Spring Creek	N	0	No repairs	73.61
330900027	SS	Knox Rd	14	03/30/11	03/30/16	Corral Creek	Y	1	Place rip rap at Southwest corner wingwall.	72.69
								1	Remove brush from outlet end of bridge	
								1	Replace delineator at Southwest corner of bridge	
720300062	SS	Gum St	18	04/05/11	04/05/16	CID Canal	N	0	No repairs	64.81
758000101	SS	27th Ave, E	12	04/05/11	04/05/16	CID Canal	N	0	No repairs	64.64
332100076	SS	Thomas Rd	19	02/26/13	08/31/15	BID Canal	Y	1	Recommend removing the structure/BID Pressurized system.	61.71
203600052	C	Apricot Rd	10	4/31/2011	4/31/2016	SVID Canal	Y	1	Small hole at SE corner of apron that needs some rip rap.	99.94
504400019	C	Brian Lane	10	02/20/08	08/31/15	Lapierre Canyon drainage	N	0	No repairs	96.98

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
110200733	C	Sellards Rd at MP 7.39	10	03/05/08	08/31/15	Unnamed drainage	Y	1	Place material in downstream scour hole.	96.96
137000978	C	Horrigan Rd MP 9.776	8	12/27/11	12/27/16	Unnamed drainage	N	0	No repairs	96.95
311700080	C	Obrien Rd	8	12/27/11	12/27/16	Roza Canal	N	0	No repairs	96.95
110200922	C	Sellards Rd at MP 9.22	10	03/05/08	08/31/15	Unnamed drainage	Y	1	Place material in downstream scour hole.	96.94
221900272	C	Crosby Rd	10	02/25/10	08/31/15	Spring Creek	N	0	No repairs	96.94
188200504	C	Jacobs Rd	8	02/26/10	08/31/15	Unnamed drainage MP 5.037	Y	2	Mark the crossing with white paint on the roadway surface.	96.93
133500379	C	McKinley Springs Rd at MP 3.79	10	03/05/08	08/31/15	Unnamed drainage	Y	1	Add more fill material to SE guardrail end treatment. Check the bolts on the guardrail.	96.89
309500218	C	District Line Rd	8	03/30/11	03/30/16	Roza Canal	N	0	No repairs	96.83
110201483	C	Sellards Rd at MP 14.83	9	03/05/08	08/31/15	Unnamed drainage	Y	1	Install end treatment on east end of south guardrail that is missing. Reshape SW end treatment.	96.81
110201382	C	Sellards Rd at MP 13.82	12	03/05/08	08/31/15	Unnamed drainage	Y	1	Place material along exposed footings.	96.79
111800008	C	Webber Canyon Rd at MP 0.078	9	04/08/11	04/08/16	Unnamed drainage	Y	1	There is a scour hole approx 10' diamter x 14" deep at the outlet end of the culvert. Maintenance should replace the rock that was washed out.	96.78
								1	Clean out the tumbleweeds from both ends of the culvert	
111800031	C	Webber Canyon Rd at MP 0.308	9	04/08/11	04/08/16	Unnamed drainage	Y	1	Clean out the tumbleweeds from both ends of the culvert	96.78
111800059	C	Webber Canyon Rd at MP 0.594	13	04/08/11	04/08/16	Unnamed drainage	Y	1	Clean out the tumbleweeds from both ends of the culvert	96.78
								1	There is a scour hole at the outlend end of the culvert approximately 1.5 Deep x 3 diameter. Replace the rock.	
111800078	C	Webber Canyon Rd at MP 0.778	12	04/08/11	04/08/16	Unnamed drainage	Y	1	Clean out the tumbleweeds from both ends of the culvert	96.78
111800102	C	Webber Canyon Rd at MP 1.020	18	04/08/11	04/08/16	Unnamed drainage	N	0	No repairs	96.78
111800112	C	Webber Canyon Rd at MP 1.116	18	04/08/11	04/08/16	Unnamed drainage	Y	1	Clean out the tumbleweeds from both ends of the culvert	96.78

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
111800120	C	Webber Canyon Rd at MP 1.203	15	04/08/11	04/08/16	Unnamed drainage	Y	1	Clean out the tumbleweeds from both ends of the culvert	96.78
110201894	C	Sellards Rd at MP 18.94	8	02/21/08	08/31/15	Carter Canyon	N	0	No repairs	96.77
111900860	C	Travis Rd	9	04/08/11	04/08/16	Unnamed drainage	Y	1	There is a scour hole approx 10' wd x 15' lg at the outlet end of the culvert. Place rip rap in scour hole.	96.74
111900401	C	Travis Rd	10	12/27/11	12/27/16	Unnamed drainage	Y	2	Add paint marks for the alignment across the road	96.64
475000239	C	Coffin Rd	15	03/04/08	08/31/15	4 Mile Canyon	N	0	No repairs	96.56
169600109	C	Chandler Rd	18	02/26/10	08/31/15	KID Canal	Y	3	Mark the crossing with white paint on the roadway surface.	94.41
222200946	C	Hanks Rd	12	12/27/11	12/27/16	Snipes Creek	N	0	No repairs	92.19
111900531	C	Travis Rd	12	02/21/08	08/31/15	Carter Canyon	Y	1	Exposed footing on south side. Fill scour hole 45" deep by 4' long at SE corner with large material.	90.39
222200644	C	Hanks Rd	12	02/25/10	08/31/15	Spring Creek	N	0	No repairs	89.96
221200412	C	Snipes Rd	14	03/31/11	03/31/16	Spring Creek	Y	2	Clean out inlet end of culvert.	88.33
502000032	C	Lorayne J Blvd	10	02/20/08	08/31/15	Lapierre Canyon	Y	1	Clean brush and debris from inlet end.	87.75
162000182	C	Gwinn Rd	8	03/04/08	08/31/15	Unnamed drainage	Y	1	Place material in scour hole caused by water running off the roadway at the top of the north headwall and down underneath the west side.	87.54
230000520	C	Evans Rd	18	03/31/11	03/31/16	Spring Creek	Y	1	Remove brush from inlet end of culvert	86.23
								1	Place rip rap at the Northeast corner	
201000101	C	County Line Rd	10	03/31/11	03/31/16	SVID Canal	Y	1	Place rip rap at the ends of the downstream wingwalls	86.21
328100137	C	Kelly Rd	9	03/30/11	03/30/16	Roza Canal	N	0	No repairs	85.63
218500398	C	Hinzerling Rd	18	03/31/11	03/31/16	Spring Creek	N	0	Replace large rip rap along footings and in stream bed- or- shotcrete or pour a floor with inlet and outlet aprons.	82.15
764000224	C	Haney Rd	16	04/05/11	04/05/16	CID Canal	N	0	No repairs	81.31
495501132	C	Finley Rd	9	08/18/11	08/31/15	CID Canal	N	0	No repairs	81.22
240100184	C	Bunn Rd	12	03/02/11	03/02/16	SVID Canal	N	0	No repairs	79.37
330900006	C	Knox Rd	9	03/30/11	03/30/16	Corral Creek	N	0	No repairs	72.69
301000143	C	Hess Rd	8	04/06/11	04/06/16	Spring Creek	N	0	No repairs	71.17

Bridge No.	B = BRIDGE SS = SHORT SPAN C = CULVERT	Bridge Name	Length (in feet)	Date Inspected	Next Inspection Date	Bridge Crossing	Repair Needed	Priority*	Repair Description	Sufficiency Rating
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*1= 1 year max
*2= 3 year max
*3= when time allows

ROAD INVENTORY

Road Inventory

This section is an inventory of roads that are operated and maintained by Benton County. This list changes yearly because annexations into adjoining cities diminish our road inventory while new developments add to our inventory.

Roads are categorized according to how they operate/function. This Federal Functional Classification (FFC) is a significant factor in determining available funding for road improvements. Following is a chart that illustrates certain funding sources and which FFC roads have access to those funds. Also, identified below, are the operational characteristics for each of the FFC's.

RURAL

Major Collector (07):

- Provides service to:
 - any county seat not on arterial;
 - larger towns not served by arterial;
 - other traffic generators of intra-county importance.
- Links these places with other nearby towns or cities with routes of higher classifications.
- Serves more important intra-county travel corridors.
- Total Length of Major Collectors is 87.394 Miles.

Minor Collector (08):

- Roads spaced to:
 - reflect population density;
 - collect traffic from local roads;
 - bring all developed areas within a reasonable distance of a collector road.
- Provide service to remaining smaller communities.
- Link locally important generators with outlying areas.
- Total Length of Minor Collectors is 202.926 Miles.

Local Access (09):

- Primarily provide access to adjacent land.
- Provide service to travel over relatively short distances.
- Encompasses all roadways not classified as collectors or arterials.
- 65 – 75% of road mileage.
- Total Length of Local Access is 390.704 Miles.

URBAN

Minor Arterial (16):

- Interconnects and augments the urban principal arterial system.
- Serves moderate length trip desires as a somewhat lower mobility than principal arterials.
- Distributes traffic to smaller geographic areas than principal arterials.
- Should not penetrate identifiable neighborhoods.
- Cumulative percentages:
 - 15 – 25% of total system road mileage
 - 65 – 80% of Vehicle Miles Traveled (VMT)
- Total Length of Urban Minor Arterials is 3.045 Miles.

Major Collector (17):

- Provides land access and traffic circulation within residential neighborhoods, commercial and industrial areas.
- May penetrate residential neighborhoods.
- Collects traffic from local streets and minor collectors and channels it to arterials.
- May include majority of Central Business District (CBD) street grid.
- Total Length of Urban Major Collectors is 44.049 Miles.

Minor Collector (18)

- Provides land access and traffic circulation within residential neighborhoods, commercial and industrial areas.
- May penetrate residential neighborhoods.
- Collects traffic from local streets and channels it to arterials.
- May include majority of Central Business District (CBD) street grid.
- Link residential traffic to a major collector.
- Total Length of Urban Minor Collectors is 5.341 Miles.

Local Access (19):

- Provides direct access to abutting land use.
- Provides access to higher orders of the system.
- Service to through traffic is usually discouraged.
- Total Length of Urban Local Access is 124.908 Miles.

FUNDING SOURCES

Road Fund

CPF - (Local)
CRID
CRIMP

(T.I.B.) UAP
(T.I.B.) UCP
(Fed.) STP/U

URBAN		RURAL	
Minor Arterial	16	Minor Arterial	07
Collector	17	Collector	08
Access	19	Access	09

RAP (C.R.A.B)

STP/R (Fed.)

CAPP (C.R.A.B)

- | | |
|--|--|
| <p>Local</p> <ul style="list-style-type: none"> Road Fund.....County Road Fund (101-101) CPF.....Capitol Project Fund (101-102) CRID.....County Road Improvement District CRIMP... County Road Improvement Matching Program <p>State - T.I.B. (Transportation Improvement Board)</p> <ul style="list-style-type: none"> UAP.....Urban Arterial Program UCP.....Urban Corridor Program <p>Federal</p> <ul style="list-style-type: none"> STP/U.....Surface Transportation Program/Urban | <p>State - C.R.A.B. (County Road Admin. Board)</p> <ul style="list-style-type: none"> RAP.....Rural Arterial Program CAPP.....County Arterial Preservation Program <p>Federal</p> <ul style="list-style-type: none"> STP/R.....Surface Transportation Program/Rural |
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GLOSSARY

GLOSSARY

COUNTY FUNDS

PROPERTY TAX (PT)

Property taxes are levied for many local purposes – schools, police & fire protection, health, roads, general government and other uses. The basic upper limits of the two senior county levies are \$1.80 per \$1,000 assessed valuation for general government (current expenses) and \$2.25 per \$1,000 assessed valuation for roads. The sum of the two senior county levies cannot exceed \$4.05 per \$1,000 assessed value. The actual amounts of the two senior levies are established annually by the Benton County Commissioners. Benton County receives revenues from property taxes in two payments during the months of April and October.

The Road Fund is defined as a ‘special revenue’ fund where certain funds earmarked for county road purposes are deposited. The two major sources of revenue for this Fund are property taxes and MVFT. Additionally, the Road Fund finances projects that are refunded by local, state and federal programs (UAP, UCP, CAPP, RAP, FMAC and STP).

MOTOR VEHICLE FUEL TAX (MVFT)

State Motor Vehicle Fuel Tax is an excise tax on the sale of motor vehicle fuel. This tax is used by the State, counties and cities for road, street, ferry and highway purposes. The County Road Administration Board (CRAB) is responsible for the biennial calculations that are furnished to the State Treasurer who makes monthly distributions to counties.

The following information will change due to the 2015 State Legislature passing a new Transportation package. At this time, the changes have not been enumerated.

Washington Gas Tax History

<u>Year Enacted</u>	<u>Tax Rate</u>
<u>1921</u>	<u>1.0¢</u>
<u>1924</u>	<u>2.0¢</u>
<u>1929</u>	<u>3.0¢</u>
<u>1931</u>	<u>4.0¢</u>
<u>1933</u>	<u>5.0¢</u>
<u>1949</u>	<u>6.5¢</u>
<u>1961</u>	<u>7.5¢</u>
<u>1967</u>	<u>9.7¢</u>
<u>1977</u>	<u>11.0¢</u>
<u>1979</u>	<u>12.0¢</u>
<u>1981</u>	<u>13.5¢</u>
<u>1983</u>	<u>16.0¢</u>
<u>1984</u>	<u>18.0¢</u>
<u>1990</u>	<u>22.0¢</u>
<u>1991</u>	<u>23.0¢</u>
<u>2003</u>	<u>28.0¢</u>

<u>2005</u>	<u>31.0¢</u>
<u>2006</u>	<u>34.0¢</u>
<u>2007</u>	<u>36.0¢</u>
<u>2008</u>	<u>37.5¢</u>

Gas Tax Distribution as of July 1, 2009

<u>State Highways</u>	<u>24.46¢</u>
<u>State Ferries</u>	<u>1.08¢</u>
<u>Cities</u>	<u>2.96¢</u>
<u>Counties</u>	<u>4.91¢</u>
<u>CRAB</u>	<u>1.05¢</u>
<u>Arterial Preservation Account</u>	<u>0.45¢</u>
<u>Rural Arterial Trust Account</u>	<u>0.60¢</u>
<u>TIB</u>	<u>3.01¢</u>
<u>Transportation Improvement Account</u>	<u>1.31¢</u>
<u>Urban Arterial Trust Account</u>	<u>1.70¢</u>
<u>Total</u>	<u>37.5¢</u>

PATHS AND TRAILS RESERVE (P&TR) FUND

The Paths and Trails Reserve (P&TR) Fund is financed from 0.5% of MVFT County Formula Distribution revenue. These funds are meant primarily for the construction of pedestrian, equestrian, or bicycle facilities or any combination of facilities, other than a sidewalk constructed as a part of a city street or county road for the exclusive use of pedestrians or non-motorized vehicles. These funds may also be used to widen a highway shoulder, street or road when the extra shoulder width is constructed to accommodate bicyclists consistent with a comprehensive plan or master plan for bicycle trails or paths adopted by a local government authority prior to such construction.

CAPITAL PROJECTS FUND (CPF)

When a county has incurred a loss or reduction of real property tax revenue due to the existence of lands and waters administered by the federal government, this ‘payment in lieu of tax’ process offsets the loss.

The Capital Projects Fund was established in 1997 as the County Road Public Works Fund, renamed the Public Works Fund, renamed the Capital Acquisition Fund and finally renamed the Capital Projects Fund. These funds, received from the U.S. Department of Energy, are designated by the Board of County Commissioners toward accomplishing public works projects that support economic development and other public purposes.

LOANS

The County may occasionally borrow money to accomplish a project and may occasionally loan money to accomplish a project. For County Road Improvement Districts, Road funds may be used to construct a new roadway with reimbursement to occur if bonds are sold or from property payments over a period of time. Some projects may be of such a scope or financial magnitude that the County will borrow funds to accomplish the project with

payment to be made over time. For construction of CR 397 (the I-82 to SR 397 Intertie Project), funds were borrowed from the Public Works Trust fund.

County Road Improvement District (CRID)

The Board of County Commissioners may form a CRID under the authority of RCW 36.88. The process is initiated by a group of landowners who request formation of the CRID and authorize their payment for the construction of county roads. A CRID is formed after the filing of a petition that meets the requirements of RCW 36.88.020 and holding a public hearing or; after the filing of a resolution by the Board of County Commissioners that meets the requirements of RCW 36.88.030 and holding a public hearing. The landowners pay for the roads over a period of years, determined by the Board, not to exceed 20 years.

County Road Improvement Matching Program (CRIMP)

The Board of County Commissioners resolved in 2010 to dedicate the Road District portion of PILT funds issued by the Department of Energy for the Hanford Site to be utilized for the purpose of securing and matching funding through the State and Federal Highway programs. These funds are to be used for the purpose of improving the County Road System. In 2014, the BOCC amended the required purpose of the funds to include any work on the improvement of the Arterial system within the county.

Public Works Board (PWB)

The Public Works Board was created by the 1985 Legislature to provide leadership in the arena of public works management. Appointed by the Governor for staggered four-year terms, the Board is comprised of: (1) local government officials from counties and cities; (2) special purpose district representatives; and (3) private sector members. The 13 members of the Public Works Board possess a wide range of experience and talent in relevant fields such as public finance, engineering, construction, and local government public works management.

The Public Works Board understands that the condition of local physical infrastructure has a significant bearing on the quality of life in Washington communities. In addition to providing stewardship of the Public Works Trust Fund, and the Drinking Water State Revolving Fund, the Board recognizes one of its chief aims is to promote good public works management strategies and techniques. The mission of the Washington State Public Works Board is to assist Washington's local governments and private water systems in meeting their public works needs that sustain livable communities.

Washington State Public Works Trust Fund (PWTF)

1. *Objective:* the Washington State Public Works Trust Fund is a low-interest revolving loan fund designed to help local governments finance critical public works projects.
2. *Eligibility:* eligible projects include repair, replacement, rehabilitation, reconstruction, or improvement of eligible public works systems to meet current standards for existing users. Growth related projects are not eligible.
3. *Selection Criteria:* each question in the application is weighted with a certain number of points. Total points possible are 100. The Public Works Board

then ranks, from highest to lowest, each application according to the number of points earned.

4. *Funding:* \$10 million is available per jurisdiction per biennium.

One-half percent (0.5%) to two percent (2%) interest, depending on local match.

Loan term is for the life of the project, or a maximum of 20 years. Projection completion time is 48 months after contract execution.

STATE FUNDS

TRANSPORTATION IMPROVEMENT BOARD (TIB)

The Transportation Improvement Board is a state agency directed by a twenty-one-member board. The composition of the board is six city members, six county members, two WSDOT officials, a governor appointee from a state agency, a private sector representative, a member representing special needs transportation, a non-motorized representative, a member representing the ports, and two representatives from transit. The local agency, private sector, port, non-motorized, special needs, and transit board members are appointed by the WSDOT Secretary to four-year staggered terms. The WSDOT Secretary also appoints the WSDOT officials. The County Road Administration Board Director is one of the county members and is an ex-officio member. The governor appointee position also has a four-year term. The TIB meets periodically throughout the state.

The primary purpose of the TIB is to administer state funding for local government transportation projects. Projects are funded by utilizing TIB revenue in combination with local matching funds and private sector contributions.

Urban Arterial Program (UAP)

1. *Objective:* this program was established in 1967 under the title Urban Arterial Trust Account (UATA). Its purpose is to fund city and urban county arterial road and street projects to reduce congestion and improve safety, geometric, and structural concerns.
2. *Eligibility:* annually, the Public Works Department proposes projects for consideration by the TIB. Road candidates must be classified as arterial and will compete with candidates statewide.
3. *Selection Criteria:* includes pavement condition, pavement and roadway width, traffic, accidents, and people carrying capacity.
4. *Funding:* until 1987, state bond sales and excess revenues funded the projects. The program is now on a pay-as-you-go basis with the majority of the fuel tax revenue currently used to make payments on the UATA bonds sold since 1967. UAP provides 80% project funds with 20% local match.

Urban Corridor Program (UCP)

1. *Objective:* this program was established in 1988 under the title Transportation Improvement Account (TIA). It provides funding for transportation projects for urban counties, cities with a population over 5,000 and Transportation Benefit Districts.
2. *Eligibility:* annually, the Public Works Department proposes projects for consideration by the TIB. Road candidates must be classified as arterial and

will compete with candidates statewide. The TIB requires multi-agency planning, coordination and public/private cooperation to further the goal of achieving a balanced transportation system.

3. *Selection Criteria:* projects must be attributable to congestion caused by economic development or growth; consistent with state, regional and local contributions (including transit and rail); and be partially funded by local contributions.
4. *Funding:* projects are eligible for reimbursement up to 80% and can receive a higher priority if their local contribution is greater than the 20% minimum and includes private sector funds.

Small City Arterial Program (SCAP)

1. *Objective:* the Small City Arterial Program was formally established by the Legislature in 1995. Before its creation, small city projects were funded with a portion of the revenue distributed to the Urban Arterial Program and Urban Corridor Program. Projects preserve and improve the arterial roadway system consistent with local needs in cities with a population less than 5,000.
2. *Eligibility:* an arterial must meet at least one of the following conditions to be eligible for TIB funding:
 - a. Serves as a logical extension of a county arterial or state highway into the corporate limits
 - b. Serves as a route connecting local generators such as schools, medical facilities, social centers, recreational areas, commercial centers or industrial sites
 - c. Acts as a bypass or truck route to relieve the central core area
3. *Selection Criteria:* project selection is based upon safety, pavement condition and local support.
4. *Funding:* funds are distributed across three regions based on small city populations

Local match requirements:

- Under 500 population – no match
- 500 and over – 5% local match

COUNTY ROAD ADMINISTRATION BOARD (CRAB)

The County Road Administration Board (CRAB) was created by the Legislature in 1965 to provide statutory oversight of Washington's thirty-nine county road departments. The agency is funded from the portion of the counties' fuel tax that is withheld for state supervision, and from a small portion of the two grant programs that it administers. The agency is governed by a nine-member board that meets quarterly and is comprised of six county commissioners/council-members and three county engineers. The Board of Directors of the Washington State Association of Counties appoints the CRAB Board. The CRAB Board establishes and maintains "Standards of Good Practice" to guide and ensure consistency and professional management of county road departments in the State of Washington. The agency is a major resource for the Washington Association of County Engineers and the Washington State Association of Counties for transportation related issues. CRAB does research, provides reports and presents testimony when appropriate. The responsibility to distribute the counties' portion of the Motor Vehicle Fuel Tax (MVFT) was given to CRAB in 1985. At that time the agency also became the custodian of the county

road log, a database of over 40,000 miles of roads. The formula for the distribution of fuel tax revenues is updated biennially to reflect statewide changes in population, costs, and mileage.

County Arterial Preservation Program (CAPP)

1. *Objective:* to preserve and improve the safety and functionality of paved arterials and collectors in the unincorporated area of each county.
2. *Eligibility:* each county shall utilize a computer-based pavement management system meeting State requirements on all county paved arterial roads in order to retain eligibility for CAPP funds.
3. *Selection Criteria:* after evaluating arterials for deficiencies, the Public Works Department, in the Six-Year Road Program, proposes projects for approval by the Benton County Commissioners.
4. *Funding:* at its first regular meeting after July 1 of each year, CRAB establishes the next calendar year's allocation percentages for the individual counties based on information contained in the most recently certified master county road log. CRAB shall compute each county's allocation percentage as its percentage of paved arterial lane miles of the total statewide paved county arterial lane miles.

Rural Arterial Program (RAP)

1. *Objective:* to improve rural arterials and collectors for safety, drivability and maintainability.
2. *Eligibility:* all rural arterials and collectors. Counties eligible to receive Rural Arterial Transportation Account (RATA) funds are:
 - a. Those in which there has been no diversion of the county road levy;
 - b. Those in which the actual expenditures for traffic law enforcement have been equal to or greater than the amount of the diverted road levy budget for the traffic law enforcement;
 - c. Those with a population of less than 8,000; and
 - d. Those expending revenues collected for road purposes only on other governmental services after authorization from the voters of that county.
3. *Selection Criteria:* project selection is based upon traffic history, roadway structure and geometrics. Proposed projects are evaluated and prioritized in each of five regions by CRAB.
4. *Funding:* RATA 90% with 10% local match.

FREIGHT MOBILITY STRATEGIC INVESTMENT BOARD (FMSIB)

Previously administered directly by the Legislative Transportation Committee, in 1998 the Legislature created the Freight Mobility Strategic Investment Board for the purpose of reviewing and recommending funding, on a prioritization basis, for freight mobility projects that are of strategic importance to the State of Washington.

Freight Mobility Advisory Committee (FMAC)

1. *Objective:* established to assist WSDOT in looking at ways of evaluating and selecting freight mobility projects for possible funding, and in developing a priority list of freight projects. The Board shall carry out the provisions of Chapter 175, Laws of 1998, as now or hereafter amended, and shall perform the duties and functions as prescribed.
2. *Eligibility:* all transportation municipalities.

3. *Selection Criteria:*
 - project must be on a strategic freight corridor
 - projects must meet one of the following conditions:
 - a. Project primarily aimed at reducing identified barriers to freight movement with only incidental benefits to general or personal mobility.
 - b. Aimed at increasing capacity of the movement of freight with only incidental benefits to general or personal mobility
 - c. It is primarily aimed at mitigating the impacts on communities of increasing freight movement, including roadway/railway conflicts; and
 - the project must have a total public benefit/total public cost ratio of equal to or greater than one
4. *Funding:* part of Legislative package that is voted on in November of each year under the Transportation Budget.

FEDERAL GRANTS

COMMUNITY ECONOMIC REVITALIZATION BOARD (CERB)

Administered by the Department of Community, Trade and Economic Development (CTED), CERB is the only state program that contracts with counties, cities, towns, port districts, special districts, and municipal corporations to finance infrastructure projects which result in increased capacity for economic development. The 19-member board provides low interest loans (and grants in some circumstances) for public infrastructure such as bridges, roads, domestic and industrial water, sanitary sewer, storm sewer, port facilities and general purpose industrial buildings. Assisted projects facilitate job creation and retention by businesses and industry, primarily in areas of high unemployment.

Rural Economic Vitality (REV) Program

1. *Objective:* the Community Economic Revitalization Board (CERB) and WSDOT, Highways and Local Programs, have partnered to implement an element of the Governor's Economic Vitality Initiative for rural areas and specified urban pockets of poverty.
2. *Eligibility:* activities such as improvements on state and federal highways, county roads and city streets.
3. *Selection Criteria:* project provides improvements to transportation systems linked to economic development; projects must be located in a designated Rural County (population less than 100 persons per square mile), *or* State Urban Community Empowerment Zone.
4. *Funding:* projects are eligible for reimbursement up to 86.5% Federal.

UNITED STATES DEPARTMENT OF COMMERCE (DOC)

The Department of Commerce promotes job creation, economic growth, sustainable development and improved living standards for all Americans by working in partnership with businesses, universities, communities and workers to:

- Build for the future and promote U.S. competitiveness in the global marketplace by strengthening and safeguarding the nation's economic infrastructure.

- Keep America competitive with cutting-edge science and technology and an unrivaled information base.
- Provide effective management and stewardship of the nation's resources and assets to ensure sustainable economic opportunities.

Economic Development Administration (EDA)

1. *Objective:* established under the Public Works and Economic Development Act of 1965 (42 U.S.C. 3121), as amended, to generate jobs, help retain existing jobs, and stimulate industrial and commercial growth in economically-distressed areas of the United States.
2. *Eligibility:* activities may include, but are not limited to, the creation/expansion of strategically targeted business development and financing programs such as construction of infrastructure improvements, organizational development and market or industry research and analysis.
3. *Selection Criteria:* projects need to be prioritized in the Comprehensive Economic Development Strategy (CEDS) assembled and administered by the Benton-Franklin Council of Governments.
4. *Funding:* no specific grant matches.

BENTON-FRANKLIN COUNCIL OF GOVERNMENTS (BFCOG)

The function of the Benton-Franklin Council of Governments is to facilitate a cooperative approach to local and regional problem solving. The basic activities of the BFCOG are:

- To provide a regional forum for multi-jurisdictional decision making,
- To serve as the Economic Development District for the region,
- To serve as a regional planning entity for the development of multi-jurisdictional programs, and
- To provide a lead agency capacity for the provisions of multi-jurisdictional programs.
- Act as the central planning agency for federal funds.

Surface Transportation Program /Rural (STP/R)

1. *Objective:* improve transportation facilities based upon regional priorities.
2. *Eligibility:* projects must be on federally functional roads classified higher than rural minor collector and local access roads. All transportation modes are eligible. Entities within Benton County that compete for these funds are the City of Prosser, City of West Richland, City of Benton City, Port of Benton, Ben Franklin Transit and Benton County.
3. *Selection Criteria:* the criteria and applications procedures are established by Tri-MATS and the BFCOG. Selection criteria include:
 - a. Supports the Growth Management Act/Regional Transportation Planning/Comprehensive Plan;
 - b. Preserves the existing transportation system;
 - c. Increases capacity and mobility;
 - d. Enhances safety;
 - e. Facilitates alternative transportation modes and intermodalism;
 - f. Eliminates seasonal road restriction and provides all weather road; and
 - g. Provides for connectivity of the existing system to the proposed project.
4. *Funding:* the basic program is 80% federal with 20% local match. However, this is modified to 86.5% federal with 13.5% local match due to adjustments

for public lands in Washington. Exceptions are pedestrian or bicycle facilities that are 80% federal with 20% local match.

Surface Transportation Program/Urban (STP/U)

1. *Objective:* develop, improve, and/or preserve an integrated transportation system that encourages multimodal choices to the public.
2. *Eligibility:* projects must be on federally functional roads classified higher than urban collectors.
3. *Selection Criteria:* funds are distributed by formula. The current formula allocates a minimum base of 5% to each of nine agencies with the remainder distributed according to each agency's share of urban population and road miles.
4. *Funding:* the basic program is 80% federal with 20% local match. However, this is modified to 86.5% federal with 13.5% local match due to adjustments for public lands in Washington. Exceptions are pedestrian or bicycle facilities that are 80% federal with 20% local match.

WSDOT HIGHWAY & LOCAL PROGRAMS (H&LP)

H&LP helps Washington's local agencies develop their local transportation projects and qualify for federal and state funding to cover some of their project costs. H&LP also provides oversight, technical support, and training to insure effective delivery of these projects. H&LP was established by the Legislature in 1935 as the State Aid Division of the (then) Department of Highways, and serves: Washington State citizens, Cities, Counties, Ports, Transit, Indian Tribes, Metropolitan Planning Organizations, Regional Transportation Planning Organizations, Benton Franklin Council of Governments, Other State and Federal Agencies and Private non-profit agencies.

Surface Transportation Program/Hazard Elimination and Safety (STP/H)

1. *Objective:* improve specific locations that constitute a danger to vehicles or pedestrians as shown by frequency of accidents.
2. *Eligibility:* projects must be located on a public road system. These projects may include (but are not limited to) intersection improvements, alignment changes, installation of railroad devices and other protective devices;
3. *Selection Criteria:* Washington State Department of Transportation (WSDOT) H&LP prioritizes proposals from local agencies and selects projects depending upon the availability of funds.
4. *Funding:* federal aid 90% with 10% local match.

Surface Transportation Program/Railroad-Highway Crossing Program (STP/R-H)

1. *Objective:* reduce fatalities, injuries, and damages through improved railway-highway crossings.
2. *Eligibility:* a crossing on any public road is eligible to receive federal funds. At least half of the available funds shall be designated for the installation of protective devices at railway-highway crossings.
3. *Selection Criteria:* projects are competitive on a statewide basis and are evaluated on:
 - a. Considerable distractions near or beyond the crossing which would compete for the driver's attention;
 - b. Traffic or parking conditions are such that the view of a post-mounted flashing light signal could be blocked;

- c. The angle of approach to the crossing is acute and post-mounted signals could go undetected;
 - d. The highway has two or more lanes in each direction; and
 - e. The highway carries high-speed and high-volume traffic.
4. *Funding:* federal aid 90% with 10% local match for the basic safety program with railroad grade crossings 99% federal and 1% Washington Utility and Transportation Commission (WUTC).

Surface Transportation Program/Transportation Enhancement Program (STP/E)

1. *Objective:* add value to transportation systems. The following activities are considered enhancements and may be eligible for funding:
- a. Provision of facilities for pedestrians and bicycles;
 - b. Provision of safety and educational activities for pedestrians and bicycles;
 - c. Acquisition of scenic easements and scenic or historic sites;
 - d. Scenic or historic highway programs (including the provision of tourist and welcome center facilities);
 - e. Landscaping and other scenic beautification;
 - f. Historic preservation;
 - g. Rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals);
 - h. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails);
 - i. Control and removal of outdoor advertising;
 - j. Archaeological planning and research;
 - k. Environmental mitigation to address water pollution due to highway runoff or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity;
 - l. Establishment of transportation museums.
2. *Eligibility:* projects must be one of the ten qualifying activities listed and must be transportation related. Environmental activities must go beyond what is customarily provided in projects.
3. *Selection Criteria:* projects are recommended and prioritized by the Benton Franklin Council of Governments and selected by a statewide advisory committee.
4. *Funding:* federal aid 80% with 20% local match.

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

Federal Highway Administration is a major agency of the U.S. Department of Transportation (DOT). FHWA is charged with the broad responsibility of ensuring that America's roads and highways continue to be the safest and most technologically up-to-date. FHWA provides financial and technical support to state and local governments for constructing, improving, and preserving America's highway system

Appropriations (APP)

Although the majority of FHWA's programs are funded through contract authority, budget authority is provided for some highway programs through appropriations acts. Though most of the Federal aid highway programs do not receive budget authority

through appropriations acts as do most other Federal programs, the appropriations act is important in the fiscal process.

For the most part, appropriations that are enacted for the highway program are contained in the annual DOT Appropriations Act, although they can be placed in other legislative acts such as a supplemental appropriations act.

BRIDGE REPLACEMENT ADVISORY COMMITTEE (BRAC)

The Highways and Local Programs Service Center of the Washington State Department of Transportation (WSDOT) and local agencies have developed a bridge replacement selection process for selecting and prioritizing bridges to be replaced with Highway Bridge Replacement and Rehabilitation Program (HBRRP) funding.

The primary committee specifically set up to facilitate selection of local agency bridges for replacement or rehabilitation is the Bridge Replacement Advisory Committee. The BRAC Technical Committee is a BRAC subcommittee, consisting of three members appointed by BRAC. WSDOT works extensively with these two committees in the selection process.

Bridge Replacement and Rehabilitation Program (BRRP):

1. *Objective:* replace or rehabilitate roadway bridges over waterways, other topographical barriers, other roadways, railroads, canals, ferry landings, etc., when those bridges have been determined deficient because of structural deficiencies, physical deterioration, or functional obsolescence.
2. *Eligibility:* bridges on public roads are eligible for funding for rehabilitation seismic retrofit, and painting.
3. *Selection Criteria:* Benton County inventories County owned structures in accordance with the National Bridge Inspection Standards and Washington State Law. BRAC prioritizes proposals from local agencies and selects projects depending upon the availability of funds.
4. *Funding:* federal aid 80% with 20% local match.

Appendix H-2

Transportation Level of Service

Table 1 shows the Level of Service (LOS) and Average Daily Traffic (ADT) for major collector roads in Benton County, along with other roads. The LOS is displayed as the speed at which Level C LOS can be maintained; Level C LOS corresponds with a stable traffic flow. ADT is provided for either 2015 or 2016 depending on when the road was surveyed. Future growth of ADT was assumed to be 3 percent per year and was calculated for 10 years from the last surveyed date (either 2015 or 2016). For each road with an established LOS, it was determined that the 10-year forecasted ADT will result in an LOS of Level C or higher, as significant capacity still exists on these roads, and will be maintained as the County increases in population.

**Table 1
Current and Future ADT for Major Collectors, Minor Arterials and Other Roads**

Road Name	LOS@mph (C/XX mph)	Current ADT (2015 or 2016) ¹	Future ADT (10 Year Forecast) ^{2,3}
19th Avenue East		471	633
25th Avenue East		1,170	1,572
27th Avenue East		5,492	7,381
Acord Road		803	1,079
Badger Canyon Road		345	464
Badger Road	C/50 mph	1,897	2,549
Bennett Avenue	C/50 mph	1,003	1,348
Bert James Road		207	278
Bofer Canyon Road		90	121
Bowles Road		1,997	2,684
Byron Road	C/50 mph	no data	N/A
Case Road		599	805
Christy Road	C/50 mph	358	481
Clodfelter Road	C/50 mph	2,508	3,371
Coffin Road		318	427
Corral Creek Road		1,030	1,384
County Line Road		337	453
County Route 12	C/50 mph	8,503	11,427
County Well Road		209	281
Crosby Road		45	60
Dallas Road		4,166	5,599
Demoss Road		732	984
Finley Road		3,484	4,682
Game Farm Road		1,085	1,458
Gap Road	C/35 mph	1,874	2,518
Grant Avenue	C/25 mph	4,447	5,976
Griffin Road		1,297	1,743
Hanks Road		3,218	4,325
Harrington Road		2,499	3,358

Road Name	LOS@mph (C/XX mph)	Current ADT (2015 or 2016)¹	Future ADT (10 Year Forecast)^{2,3}
Hinzerling Road	C/50 mph	1,614	2,169
Horrigan Road		51	69
Jacobs Road	C/50 mph	no data	N/A
Johnson Road	C/50 mph	2,893	3,888
Kennedy Road	C/50 mph	2,013	2,705
King Tull Road		977	1,313
Knox Road		360	484
Locust Grove Road		362	486
Lower County Line Road		125	168
Mccreadie Road		175	235
Mckinley Springs Road	C/50 mph	263	353
Meals Road		60	81
Nine Canyon Road		630	847
North River Road		2,409	3,237
Oak Street South		1,764	2,371
Old Inland Empire Highway	C/50 mph	13,842	18,602
Plymouth Road	C/50 mph	659	886
River Road		905	1,216
Rothrock Road		1,091	1,466
Ruppert Road		442	594
Sellards Road	C/50 mph	713	958
Snipes Road		988	1,328
Travis Road	C/50 mph	595	800
Twin Bridges Road		2,465	3,313
Ward Gap Road		26	35
Webber Canyon Road	C/25 mph	759	1,020
Wilgus Road		626	841

Notes:

1. Includes data from either 2015 or 2016 depending on when each road was sampled
2. Forecasted to either 2025 or 2026 depending on Current ADT year
3. 10-year forecast uses a 3% yearly increase in ADT

Appendix H-3
Washington State Highway Inventory
Within Benton County

Appendix H-3

Washington State Highway Inventory Within Benton County

Washington State Highway Route Mileage and Description				
SR #	Beginning	Ending	Route Miles	Description
I-82	Yakima Co. Line West of Prosser	Oregon State Line at Umatilla	57.23	I-82 is a freeway extending from I-90 near Ellensburg, Washington, to I-84 near Hermiston, Oregon
I-182	Jct. I-82 West of the Tri-Cities	Franklin Co. Line at Columbia River	6.04	I-182 is a 16-mile interstate spur route from I-82 west of the Tri-Cities to US 395, SR 397 and US 12 in Pasco
US 395	Jct. I-82 South of Kennewick	Franklin Co. Line at the Blue Bridge	5.88	US 395 is a Highway of National Significance, extending from Mexico to Canada via eastern Washington. Within the RTP, the road extends from Umatilla, Oregon to the Adams County Line.
SR 14	Klickitat Co. Line	Jct. I-82 at Plymouth	28.53	SR 14 is an east-west route along the Columbia River from Vancouver to Plymouth in Benton County south of the Tri-Cities. This route provides a two-lane alternative to I-84 on the Oregon side of the river.
SR 22	Yakima Co. Line West of Prosser	Jct. I-82 at East Prosser	6.76	SR 22 from Toppenish (SR 97) to Prosser (I-82) primarily serves local needs. Less than seven miles are in Benton County. Some truck traffic utilizes this route in lieu of I-82.
SR 24	Yakima Co. Line West of Hanford West Gate	Grant Co. Line at Vernita Bridge	12.8	SR 24 extends from Yakima to SR 26 at Othello. A primary function of this route is access to the west gate of the Hanford site at the SR 24/SR 240 Junction.
SR 221	Jct. SR 14 at Paterson	Jct. SR 22 at Prosser	25.95	SR 221 is a 26-mile local farm route from SR 22 at Prosser to SR 14 at Paterson, but attracts through traffic as well.
SR 224	Jct. I-82 at Kiona	Jct. SR 240 at Richland	10.18	SR 224 provides a 10-mile connection, from I-82 (Kiona/Benton City) through West Richland to Richland (SR 240). Traffic on this route is oriented to Richland and Hanford work sites and local freight movements.
SR 225	Jct. SR 224 at Kiona	Jct. SR 240 at Horn Rapids	11.32	SR 225 extends from Kiona (I-82) through Benton City to SR 240 at Horn Rapids. DOE Route 10 extends on into the Hanford reservation. Hanford commuters dominate peak volumes on this two-lane roadway.
SR 240	Jct. SR 24 at Hanford West Gate	Jct. US 395 at Kennewick	40.22	SR 240 extends from SR 24 at the Hanford west gate to Richland and Kennewick (to a junction with US 395), a distance of 40 miles. In conjunction with SR 24 to Yakima and SR 243 north to SR 90 at Vantage, SR 240 carries regional traffic, including freight movements. It also serves as the primary route of the daily Hanford work-commute.
SR 397	I-82/Locust Road Interchange	I-182/US 395 Interchange	22.31	SR 397 extends from I-82 at Locust Grove interchange (exit 114) to the Finley area, then to Kennewick, across the Columbia River, and through East Pasco to the I-182/US 395 interchange. This route serves as freight access to the Port of Pasco, the Port of Kennewick and other industrial sites along the river.

Appendix H-4
Washington State Highway Inventory
within Benton County and 2028 Forecast
and Level of Service Analysis

Appendix H-4

Washington State Highway Build-out of Benton County Comp Plan Land Use Assumptions - 2028 AADT

SR #	Begin MilePost	End MilePost	Functional Class	HSS	Lanes Inc.	Lanes Dec.	Legal Speed	Current AADT	Single Truck %	Double Truck %	Triple Truck %	AADT 2028	Comments
14	141.33	154.89	Rural Minor Arterial		1	1	65	1200				1512	
14	154.89	157.21	Rural Minor Arterial		1	1	65	1500	7.02	37.54	3.63	1890	
14	157.21	165.93	Rural Minor Arterial		1	1	65	1900				2394	
14	165.93	167.14	Rural Minor Arterial		1	1	65	2300	6.92	30.67	5.9	2898	
14	167.14	178.79	Rural Minor Arterial		1	1	65	3500	6.25	33.9	6.46	4410	
14	178.79	179.85	Rural Minor Arterial		1	1	65	4100	6.58	28.84	5.6	5166	
14	179.85	180.66	Rural Minor Arterial		1	1	55	4400	5.52	24.09	4.24	5544	
22	28.6	34.83	Rural Major Collector		1	1	60	1900				2394	Prosser UGA
22	34.83	35.06	Urban Minor Collector		1	1	55	2100	2.95	12.03	1.51	2646	Prosser UGA
22	35.06	35.3	Urban Minor Arterial		1	1	45	4000	3.32	15.63	4.31	5040	Prosser UGA
22	35.3	35.62	Urban Minor Arterial		1	1	45	5100				6426	Prosser UGA
22	35.62	35.72	Urban Minor Collector		1	1	45	6700				8442	Prosser UGA
22	35.72	35.84	Urban Minor Arterial		1	1	45	4200				5292	Prosser UGA
24	30.41	35.39	Rural Minor Arterial		1	1	65	3300				4158	
24	35.39	38.48	Rural Minor Arterial		1	1	65	3400				4284	
24	38.48	41.98	Rural Minor Arterial		1	1	60	4800				6048	
24	41.98	43.87	Rural Minor Arterial		1	1	60	4800	4.34	11.27	4.67	6048	
82	74.66	75.55	Rural Interstate	Y	2	2	70	19000				23940	
82	75.55	79.53	Urban Interstate	Y	2	2	70	22000				27720	
82	79.53	80.45	Urban Interstate	Y	2	2	70	15000				18900	
82	80.45	82.19	Urban Interstate	Y	2	2	70	19000				23940	
82	82.19	82.86	Urban Interstate	Y	2	2	70	16000				20160	
82	82.86	88.2	Rural Interstate	Y	2	2	70	20000				25200	
82	88.2	89	Rural Interstate	Y	2	2	70	20000				25200	
82	89	93.16	Rural Interstate	Y	2	2	70	20000				25200	
82	93.16	94.14	Rural Interstate	Y	2	2	70	20000				25200	
82	94.14	96.24	Rural Interstate	Y	2	2	70	21000				26460	
82	96.24	97.13	Rural Interstate	Y	2	2	70	18000				22680	
82	97.13	102.84	Urban Interstate	Y	2	2	70	25000				31500	
82	102.84	104.13	Urban Interstate	Y	2	2	70	12000				15120	
82	104.13	105.12	Urban Interstate	Y	2	2	70	9300				11718	
82	105.12	109.64	Urban Interstate	Y	2	2	70	12000				15120	
82	109.64	113.72	Urban Interstate	Y	2	2	70	16000				20160	
82	113.72	113.99	Urban Interstate	Y	2	2	70	21000				26460	
82	113.99	114.91	Rural Interstate	Y	2	2	70	19000				23940	
82	114.91	122.28	Rural Interstate	Y	2	2	70	20000	3.86	13.64	1.72	25200	
82	122.28	123.23	Rural Interstate	Y	2	2	70	20000				25200	
82	123.23	131.23	Rural Interstate	Y	2	2	70	20000				25200	
82	131.23	132	Rural Interstate	Y	2	2	70	18000				22680	
82	132	132.57	Rural Interstate	Y	2	2	65	22000	4.76	14.12	1.92	27720	
182	0	0.44	Urban Interstate	Y	1	1	70	11000	6.04	9.14	1.83	13860	

Appendix H-4

Washington State Highway Build-out of Benton County Comp Plan Land Use Assumptions - 2028 AADT

SR #	Begin MilePost	End MilePost	Functional Class	HSS	Lanes Inc.	Lanes Dec.	Legal Speed	Current AADT	Single Truck %	Double Truck %	Triple Truck %	AADT 2028	Comments
182	0.44	3.44	Urban Interstate	Y	2	2	70	22000	5.67	12.81	2.39	27720	Richland UGA
182	3.44	4.21	Urban Interstate	Y	2	2	70	54000				68040	Richland UGA
182	4.21	5.67	Urban Interstate	Y	2	2	70	67000				84420	Richland UGA
182	5.67	6.95	Urban Interstate	Y	3	3	70	64000				80640	Richland UGA
221	0	0.14	Rural Minor Arterial		1	1	50	2500	5.59	34.69	7.21	3150	
221	0.14	11.44	Rural Minor Arterial		1	1	65	2400				3024	
221	11.44	18.67	Rural Minor Arterial		1	1	65	2400	4.12	28.79	4.74	3024	
221	18.67	20.18	Rural Minor Arterial		1	1	65	2200	3.04	27.51	6.28	2772	
221	20.18	25.65	Rural Minor Arterial		1	1	65	2500				3150	Prosser UGA
221	25.65	25.95	Urban Minor Arterial		1	1	55	2800	3.98	22.61	4.83	3528	
224	0	0.24	Rural Major Collector		1	1	55	6500	5.45	5.39	0.72	8190	
224	0.24	0.62	Rural Major Collector		1	1	55	4000				5040	
224	0.62	3.12	Rural Major Collector		1	1	55	3600				4536	
224	3.12	4.47	Rural Major Collector		1	1	55	3200				4032	
224	4.47	6.23	Urban Minor Arterial		1	1	55	4100	3.69	1.17	0	5166	W Richland UGA
224	6.23	6.82	Urban Minor Arterial		1	1	55	4400				5544	W Richland UGA
224	6.82	7.27	Urban Minor Collector		1	1	35	5800				7308	W Richland UGA
224	7.27	7.9	Urban Minor Arterial		1	1	35	9200				11592	W Richland UGA
224	7.9	8.45	Urban Minor Arterial		2	2	35	15000				18900	W Richland UGA
224	8.45	8.96	Urban Minor Arterial		2	2	40	16000				20160	W Richland UGA
224	8.96	9.97	Urban Minor Arterial		2	2	40	17000				21420	W Richland UGA
224	9.97	10.15	Urban Minor Arterial		2	2	40	17000				21420	W Richland UGA
225	0	0.92	Rural Major Collector		1	1	35	11000	4.15	2.18	0.33	13860	Benton City UGA
225	0.92	1.12	Rural Major Collector		1	1	30	7800				9828	Benton City UGA
225	1.12	1.74	Rural Major Collector		1	1	25	7900				9954	Benton City UGA
225	1.74	1.95	Rural Major Collector		1	1	25	8000				10080	Benton City UGA
225	1.95	2.51	Rural Major Collector		1	1	35	6000				7560	Benton City UGA
225	2.51	4.02	Rural Major Collector		1	1	40	3500	4.13	1.45	0.72	4410	Benton City UGA
225	4.02	4.72	Rural Major Collector		1	1	40	1800				2268	
225	4.72	9.76	Rural Major Collector		1	1	50	1800				2268	
225	9.76	11.33	Rural Major Collector		1	1	50	1800	8.98	5.24	0.54	2268	
240	0	7.95	Rural Minor Arterial		1	1	65	2600	5.49	13.56	3.46	3276	
240	7.95	20.49	Rural Minor Arterial		1	1	65	3800	6.21	3.42	1.29	4788	
240	20.49	21.93	Rural Minor Arterial		1	1	55	4900	2.68	7.45	1.31	6174	Richland UGA
240	21.93	25.13	Urban Other		1	1	55	5100				6426	Richland UGA
240	25.13	26.93	Urban Other		1	1	55	5300				6678	Richland UGA
240	26.93	27.78	Urban Other		1	1	55	10000	4.32	4.13	0.69	12600	Richland UGA
240	27.78	28.27	Urban Other		1	1	55	12000				15120	Richland UGA
240	28.27	28.88	Urban Other		1	1	55	13000				16380	Richland UGA
240	28.88	29.66	Urban Other	Y	3	3	55	29000	3.26	3.56	0.3	36540	Richland UGA
240	29.66	30.27	Urban Other	Y	3	3	55	28000				35280	Richland UGA

Appendix H-4

Washington State Highway Build-out of Benton County Comp Plan Land Use Assumptions - 2028 AADT

SR #	Begin MilePost	End MilePost	Functional Class	HSS	Lanes Inc.	Lanes Dec.	Legal Speed	Current AADT	Single Truck %	Double Truck %	Triple Truck %	AADT 2028	Comments
240	30.27	31.25	Urban Other	Y	3	3	55	35000				44100	Richland UGA
240	31.25	32.09	Urban Other	Y	3	3	55	40000				50400	Richland UGA
240	32.09	32.81	Urban Other	Y	3	3	55	45000				56700	Richland UGA
240	32.81	32.99	Urban Other	Y	1	1	55	24000				30240	Richland UGA
240	32.99	33.1	Urban Other	Y	2	2	55	30000				37800	Richland UGA
240	34.22	34.83	Urban Other	Y	3	2	60	30000				37800	Richland UGA
240	34.83	35.74	Urban Other	Y	3	3	60	76000	2.26	0.59	0.04	95760	Richland UGA
240	35.74	36.46	Urban Other	Y	3	3	60	48000				60480	Richland UGA
240	36.46	37.44	Urban Other	Y	1	1	60	54000				68040	Richland UGA
240	37.44	38.29	Urban Other	Y	2	2	60	45000				56700	Richland UGA
240	38.29	39.1	Urban Other	Y	2	2	60	32000				40320	Richland UGA
240	39.1	40.95	Urban Other	Y	2	2	60	42000				52920	Richland UGA
240	40.95	41.24	Urban Other		1	1	60	21000				26460	Kennewick UGA
240	41.24	41.31	Urban Other	Y	2	2	60	23000				29670	Kennewick UGA
241	22.87	25.18	Rural Minor Collector		1	1	55	1600				2064	Kennewick UGA
395	13.05	13.42	Urban Other	Y	1	2	55	8600	3.95	10.45	1.8	10836	Kennewick UGA
395	13.42	13.78	Urban Other	Y	2	2	55	17000	4.1	9.59	1.76	21420	Kennewick UGA
395	13.78	14.22	Urban Other	Y	2	2	55	16000				20160	Kennewick UGA
395	14.22	14.92	Urban Other	Y	2	2	55	17000				21420	Kennewick UGA
395	14.92	15.56	Urban Other	Y	2	2	50	22000				27720	Kennewick UGA
395	15.56	16.17	Urban Other	Y	2	2	50	23000				28980	Kennewick UGA
395	16.17	16.42	Urban Other	Y	2	2	35	29000	3.47	6.32	0.89	36540	Kennewick UGA
395	16.42	16.8	Urban Other	Y	2	2	35	29000				36540	Kennewick UGA
395	16.8	16.92	Urban Other	Y	2	2	35	29000				36540	Kennewick UGA
395	16.92	17.11	Urban Other	Y	2	2	35	28000				36120	Kennewick UGA
395	17.11	17.6	Urban Other	Y	2	2	45	35000	2.47	3.43	0.37	44100	Kennewick UGA
395	17.6	18.07	Urban Other	Y	2	2	45	46000				57960	Kennewick UGA
395	18.07	18.59	Urban Other	Y	2	2	55	36000				45360	Kennewick UGA
395	18.59	19.11	Urban Other		2	2	55	64000	5.2	2.71	0.37	80640	Kennewick UGA
397	0	7.23	Urban Minor Arterial		1	1	60	1700	5.54	11.85	0.83	2142	
397	7.23	10.44	Urban Minor Arterial		1	1	60	760	8.83	20.07	0.97	957	
397	10.44	11.12	Urban Minor Arterial		1	1	45	1200	4.52	19.13	1.04	1512	
397	11.12	11.68	Urban Major Collector		1	1	50	1400	4.72	7.18	0.65	1764	
397	11.68	12.06	Urban Major Collector		1	1	50	1700				2142	
397	12.06	12.35	Urban Major Collector		1	1	50	2100	4.72	5.66	0.49	2646	
397	12.35	12.79	Urban Major Collector		1	1	50	3300	4.73	3.56	0.28	4158	
397	12.79	13.46	Urban Major Collector		1	1	50	4600				5796	
397	13.46	13.89	Urban Major Collector		1	1	50	5800	4.56	5.76	0.38	7308	
397	13.89	14.25	Urban Major Collector		1	1	50	6800	4.25	5	0.35	8568	
397	14.25	15.78	Urban Major Collector		1	1	50	8100	4.17	4.37	0.33	10206	
397	15.78	16.25	Urban Major Collector		1	1	50	11000	3.94	3.54	0.28	13860	

Appendix H-4

Washington State Highway Build-out of Benton County Comp Plan Land Use Assumptions - 2028 AADT

SR #	Begin MilePost	End MilePost	Functional Class	HSS	Lanes Inc.	Lanes Dec.	Legal Speed	Current AADT	Single Truck %	Double Truck %	Triple Truck %	AADT 2028	Comments
397	16.25	16.66	Urban Major Collector		1	1	40	10000				12600	Kennewick UGA
397	16.66	17.23	Urban Other		2	2	40	9800				12348	Kennewick UGA
397	17.23	17.48	Urban Other		2	2	35	11000				13860	Kennewick UGA
397	17.48	17.59	Urban Other		2	2	35	16000	3.41	3.2	0.09	20160	Kennewick UGA
397	17.59	18.69	Urban Other		2	2	40	17000				21420	Kennewick UGA

Appendix I
Comprehensive Parks Plan, 2014 – 2020

Benton County

Comprehensive Parks Plan

2014-2020

July 2014

*Cover: View of Wallula Gap Preserve
(photo: Virginia Lee Paul)*

Acknowledgements:

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Introduction

In 2008, creation of the Benton County Comprehensive Parks Plan marked the first major comprehensive planning effort for the County's parks system in over twenty years. The standard in Washington State is for cities and counties to update their parks plans every *six years*, even though the planning horizon is twenty years. With this 2014 update to the Plan, Benton County is getting itself onto that regular revision schedule. The Plan gives guidance to Commissioners, the Park Board, staff, and park patrons as the system continues to develop. The Plan is the result of a rigorous public process, and Benton County thanks all of the participants who provided input and direction.

This Plan addresses both the conditions and needs of the existing parks, as well as future needs and desires expressed by the community that may involve the creation of new parks or development of new facilities within existing parks in coming years. The existing parks, of which there are nine, are referred-to administratively as "park units", and are loosely-organized in two general tiers: the "Tier One" parks are the larger, more developed, and more heavily used sites; the "Tier Two" parks are smaller facilities with less use and visibility. The tiers are described in more detail later in the document.

Conditions and management philosophy make the County's parks different from the more numerous and accessible "city parks" that most of the public sees more regularly. Benton County's parks tend to be larger, less-developed sites in more rural settings. Overall, the County's parks emphasize diffuse, passive recreational uses in "natural areas" such as horse riding and wildlife observation; as opposed to more traditional uses and facilities like playgrounds and sports fields that would be found in manicured municipal parks. In general, Benton County's parks offer a transition, contrast, and balance between intensely-developed and highly-managed city parks; and remote, undeveloped public lands such as those managed by the Forest Service or Bureau of Land Management. The Plan discusses levels of service and types of parks in detail.

Finally, Benton County emphasizes teamwork and partnerships - themes that are reprised often in this document and that were a focus of the public process. The Park Board and staff have benefited from the numerous corporate, non-profit, and public sector partnerships that have been crucial to the development and management of the parks. Benton County will use this Comprehensive Parks Plan to continue to share its parks vision and partnership philosophy with the community.

Setting, Purpose, and Need

This 20-year Comprehensive Parks Plan is the guide for future decisions related to the Benton County parks system and park facilities. The Benton County Park Board uses the Plan to advise the County Commissioners on matters of policy, programs, and projects for the development and operation of Benton County's park system. The Plan must be updated at least every six years to remain eligible for Washington State Recreation and Conservation Office (RCO) grant funding. This Parks Plan is also prepared in accordance with requirements specified in RCW 36.70A (Growth Management Act) after being adopted by the Board of County Commissioners.

Benton County began developing a park system in the early 1960s. Today, the County manages nine park properties, with five owned outright, two leased from the US Army Corps of Engineers, and one that is partially owned by the County and partially leased from the Washington Department of Fish and Wildlife. Benton County park property totals over 2,300 acres with river frontage at four of the parks and significant public land adjoining some of the properties. The parks range in size from the very small (less than one acre) to the significantly larger (over 500 acres). The park facilities have many functions including lawn activities and picnicking, water and swimming, natural open space and habitat conservation, boat launches, a model airplane facility, an RV campground, an equestrian camp, developed shooting facility, and even a pioneer cemetery. Benton County subleases all or portions of two parks to non-profit entities.

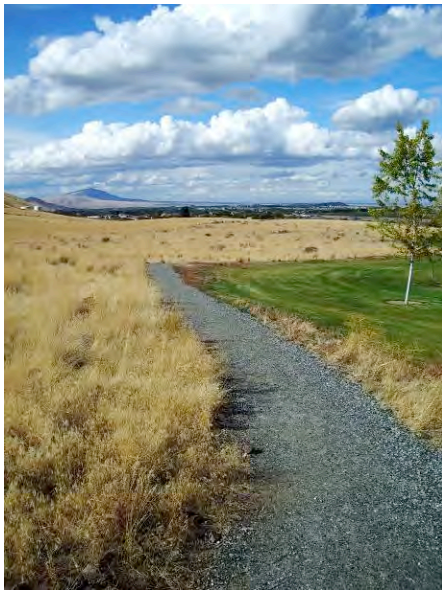


Figure 2 - The shared trail between a city park and a county park at Badger Mountain Centennial Preserve shows the potential collaboration between the various agencies and user groups. Trails at the Preserve are built and maintained by the Friends of Badger Mountain.



Figure 1 - Benton County is located in the center of the Columbia Basin

Benton County has two full-time park rangers assigned year-round with one stationed at Two Rivers Park and one based at Horn Rapids Park. The park system is administered from the County Commissioners' Office by the Sustainable Development Coordinator in collaboration with the Benton County Park Board, whose volunteer members are appointed by the Commissioners. There are also a number of user groups who advocate for and volunteer at specific parks.

Benton County Public Lands

- County Boundaries
- US Bureau of Land Management
- Washington State Department of Fish and Wildlife
- City Boundaries
- US Fish and Wildlife Service
- US Dept. of Energy
- Highways
- State
- US Department of Energy Hanford Site

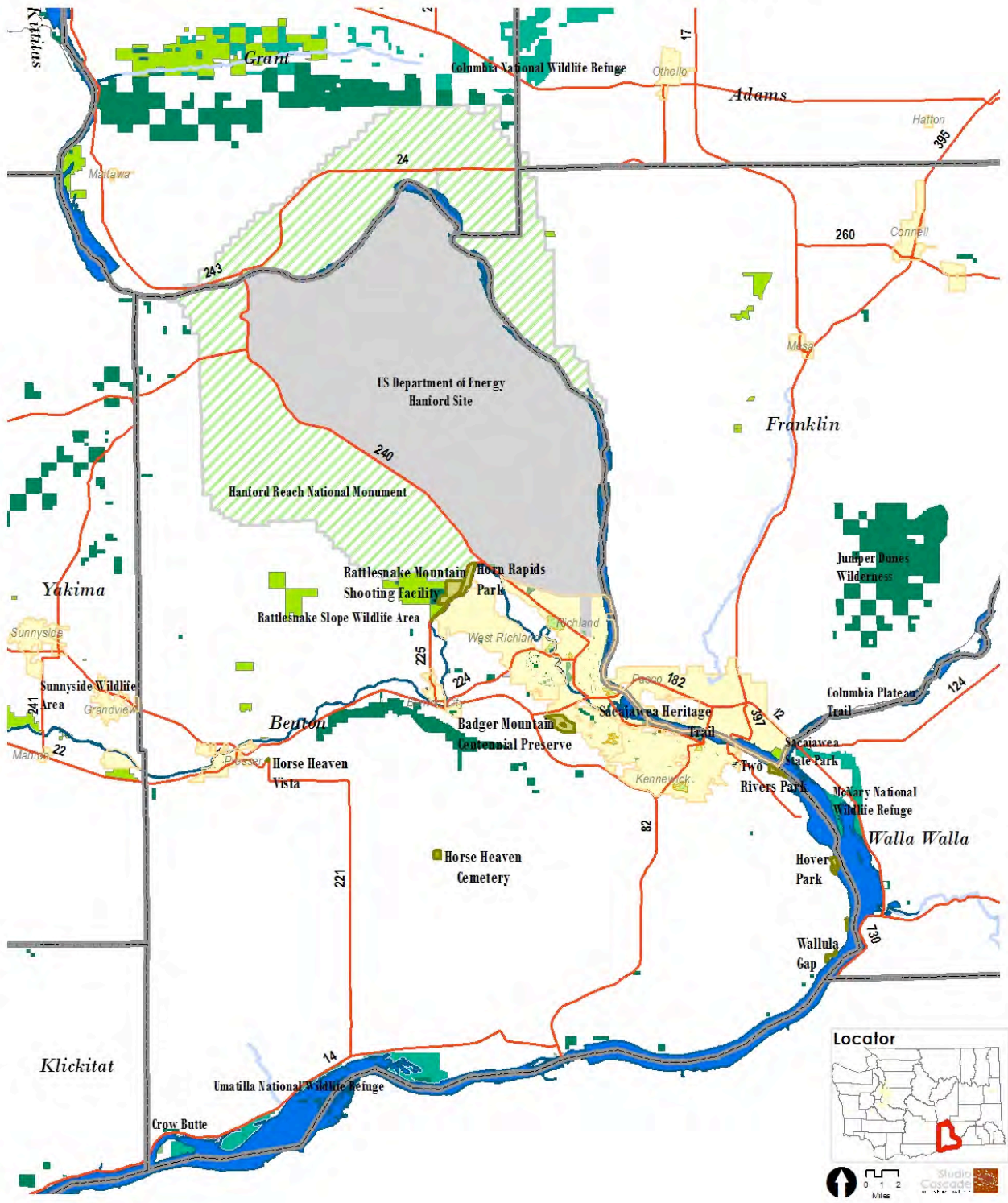


Figure 3 - The Benton County region offers several park and open space opportunities

Benton County's Parks

The current system includes nine sites as outlined in the following table and as depicted on the following map. Benton County manages a total of 2,314.5 acres of land.

Table 1 - Benton County Parks and Acreage

Site	Calculated Acres
Badger Mountain Centennial Preserve	627.1
Horn Rapids Park	564.5
Horse Heaven Cemetery	2.0
Horse Heaven Vista	6.3
Hover Park	175.0
Rattlesnake Mountain Shooting Facility	740.0
Two Rivers Park	159.0
Vista Park	0.3
Wallula Gap Preserve	110.0
TOTALS	2,384.2

**Land was calculated using a Geographic Information System (GIS) and sometimes differs from historic acreage calculations*

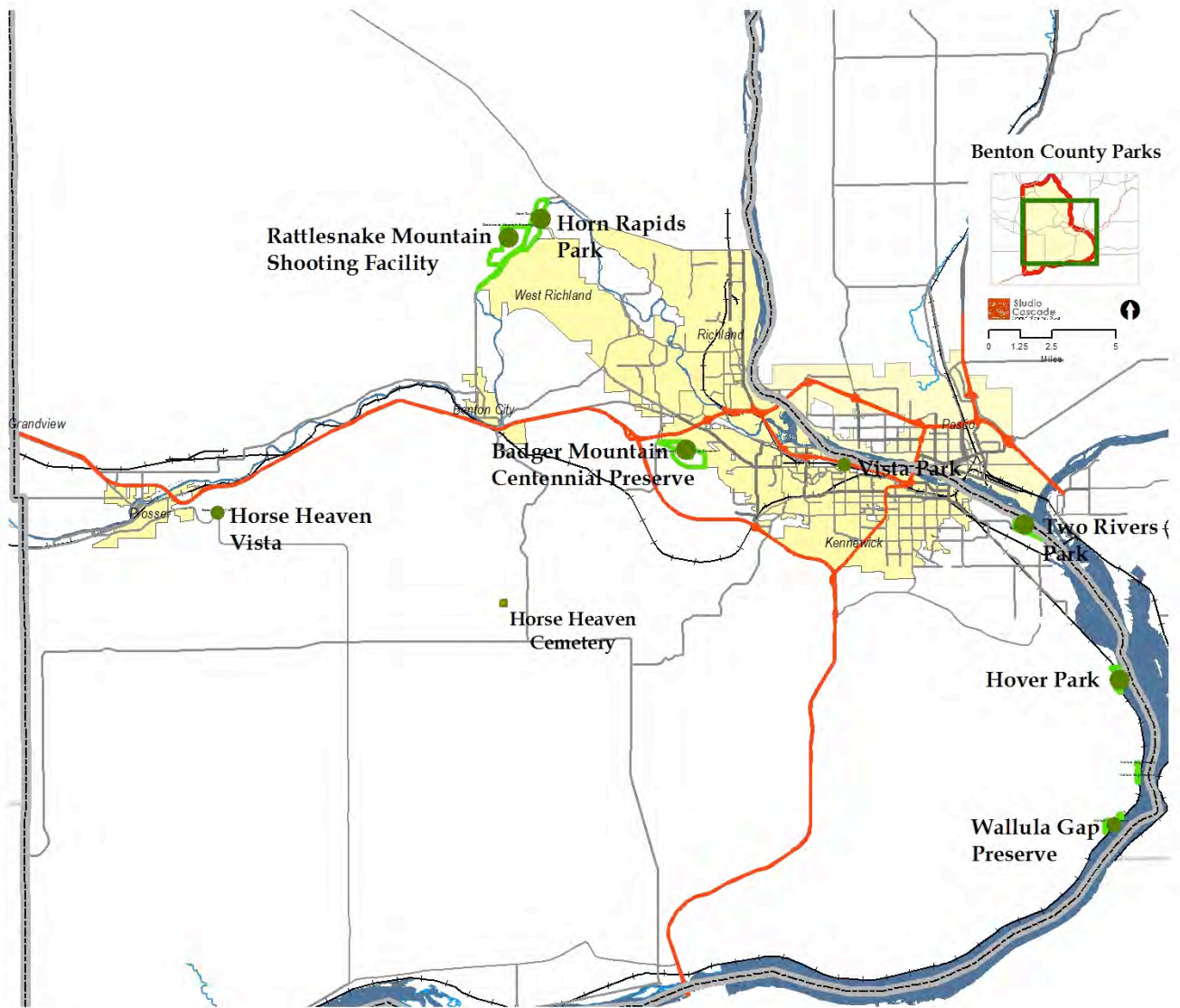


Figure 4 - Benton County park locations

Horse Heave Cemetery

The cemetery is the most recent addition to the County's parks portfolio, having been added in 2012. The two-acre site was developed south of Benton City in the Horse Heaven Hills as a private pioneer cemetery beginning in 1893. The last burials were in the 1940s, and Benton County took possession of the parcel through a property foreclosure in 1954. Recent improvements include a perimeter driveway and fence, and some sitting benches. Plans call for some interpretive signage in the future.



Figure 5 - The Shooting Facility offers target opportunities in multiple disciplines, with an emphasis on youth programs and hunter education (photo: uncredited)

Horse Heaven Vista

First developed in 1960 and substantially renovated in 2009, Horse Heaven Vista sits above Prosser along State Route 221 on the crest of the Horse Heaven Hills overlooking the Lower Yakima Valley. The site offers a sheltered view point, paved parking area, restrooms, and historical signage.

Rattlesnake Mountain Shooting Facility

Rattlesnake Mountain Shooting Facility (RMSF) is the County's largest park unit at about 740 acres. A portion of the property is owned by the State of Washington and used through an agreement with the Washington Department of Fish and Wildlife. The remainder of the property was formerly leased from the Bureau of Land Management but was purchased by the County in 20XX. Benton County subleases the entire property to its concessionaire -- the Tri-Cities Shooting Association (TCSA) - who oversees maintenance, administration, and operations of the facility. TCSA is responsible for all capital improvements, though the County occasionally assists financially with certain projects at the discretion of the Park Board. The RMSF is large enough to contain several separate shooting ranges designed and managed for different disciplines. The facility is open to the public several days per week.



Figure 6 - Horn Rapids Park offers five miles of shoreline and a hard-ramped boat launch for family fishing access to the Yakima River (photo: uncredited)

Horn Rapids Park

Horn Rapids has been owned by Benton County since 1964 and is a major natural area of the park system with about 565 acres of riparian areas and upland shrub-steppe. Previous to the County's acquisition of the park; the site was a fording location across the Yakima River for wildlife and Native Americans traveling along Rattlesnake Ridge, a campsite for the pioneering Longmire Wagon Train, an internment camp for conscientious objectors during

World War II, and a Hanford Site contractor camp and field office. Named for the shallow rapids that are now the site of Wanawish Dam, the park is located six miles north of Benton City and has over five miles of Yakima River along one side and the public lands of the Hanford Reach National Monument, Rattlesnake Mountain Shooting Facility, and Rattlesnake Slope Wildlife Area on the other. The park has an improved campground with full recreational vehicle hookups, showers, restrooms, a horse camp, a model airplane facility, a boat launch, and several miles of multi-use trails. Horn Rapids Park is used as an outdoor educational center by areas schools and scouting troops; and has evolved into a bit of an outdoor events center.

Badger Mountain Centennial Preserve

Badger Mountain Centennial Preserve has 627 acres of mostly-intact shrub-steppe landscape located on the upper ridges and slopes of Badger Mountain in south Richland. The preserve was purchased in 2005 through a partnership using County, private, and state funds with goals to preserve views, protect upland shrub-steppe habitat, and provide for hiking, biking, and horse riding opportunities. The Preserve was later expanded the addition of three more parcels on the south face of the mountain. A series of multi-use trails lace the Preserve, mostly leading to the summit where sweeping 360-degree views of the Columbia Basin are the reward. The park is designated as a natural preserve, with plans to keep it as public undeveloped open space for passive recreational use, habitat preservation, and for outdoor education and interpretive opportunities. Per Resolution 05-27 that created the Preserve in 2005, the acreage is also “banked” by Benton County for possible use as mitigation for shrub-steppe disturbances that may occur elsewhere in the County.

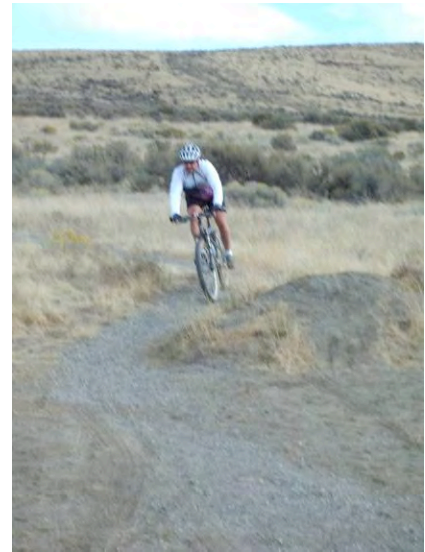


Figure 7 - Badger Mountain is not only a popular hiking, biking, and horse riding destination; it is also the scenic backdrop for the Tri-Cities

Vista Park

Vista Park is located in the Tri-City Heights neighborhood of northwest Kennewick. It is a half-acre neighborhood park with picnic tables and swing sets that was originally developed by the local Vista Junior Women’s Club in 1970. County staff maintains the park including general repair of play equipment, irrigation, and general care of the park. It is the only small park owned by the County in an urban environment.

Two Rivers Park

Two Rivers Park is leased from the U.S. Army Corps of Engineers and is located about two miles east of Kennewick near the community of Finley. The developed portion of the park is centered around two large sheltered lagoons on the west end, while the east end of the park is a 100-acre Natural Area of beaver ponds, riparian woodlands, and marshes. Two Rivers is home to the last downstream developed boat launch in the Tri-Cities which is used heavily throughout the year. The developed portion of the park features a playground, extensive picnicking areas, and a disc golf course that was added in 2009.

Hover Park

Hover Park is located about six miles downstream of Two Rivers Park on the Columbia River, and is also a Corps of Engineers property operated by Benton County under the same lease as Two Rivers. The first wagon train into the area, the Longmire Party, crossed the Columbia River on rafts in 1853 near where the park is located today. The first major ferry crossing from Wallula was also in the vicinity, and the original Hover town site -- established in 1898 -- is part of the park.

The undeveloped and open park has good potential for future use with a sandy beach area in a protected lagoon and shoreline with dense stands of trees. The open areas are crisscrossed with dirt roads and active railroad tracks bisect the property, which creates somewhat of an access and development challenge.



Figure 8 - With three lagoons sheltered from the main channel of the Columbia River, Two Rivers Park is an ideal setting for passive water activities such as swimming, fishing, and kayaking (photo: AJ Fyall)



Figure 9 - Hover Park has management issues connected to access, dumping, and vandalism; but also has many scenic, habitat, and recreation opportunities (photo: AJ Fyall)

Wallula Gap Preserve

Wallula Gap Preserve is located at the eastern end of Benton County, where the Columbia River splits Horse Heaven Hills. The park unit consists of three disconnected parcels that are approximately 110 acres which have remained unchanged since the properties were deeded over to the county in 1984 by the U.S. Department of the Interior. The parcels are remote and generally inaccessible, with one parcel not much more than the sheer basalt cliffs of Wallula Gap itself. Current legal access to the property is by water only, although the railroad corridor limits that access. In order to access the property by land an easement would have to cross about 5 miles of privately owned property.



Figure 10 - Unreachable by automobile, Wallula Gap Preserve is used mostly by birders and naturalists on foot or horseback (photo: B Lake)

The properties are managed as part of the National Natural Landmarks program of the National Park Service; and Benton County provides regular reports to the Park Service on the status and condition of the site.

Planning Area History

Lewis and Clark landed on Blalock Island near Richland during their expedition on the Columbia River in 1805. That expedition opened the region to more exploration, and fur trading was established between the Hudson's Bay Company and the Native American tribes of the area. This temporary settlement grew when the Northern Pacific Railroad started construction of its main line up the Yakima Valley in 1883. Benton County and the current county boundaries were created in 1905 from the eastern portions of Yakima and Klickitat Counties with Prosser designated as the county seat.

As is the case with much of Eastern Washington, agriculture is at the core of Benton County's social and economic history since European settlement. The climate of the region, combined with the ability to add water mostly when and where the farmer's will wants it, are key to Eastern Washington's place among the elite agricultural areas of North America. Benton County showcases a balance of dryland and irrigated farming, with wheat and ranching dominating the higher elevation areas above water conveyance infrastructure, with row crops, orchards, and vineyards prevalent in the irrigated areas.

The 1940s saw the most dramatic change to life in the Mid-Columbia region since settlement itself. As a part of the nation's World War II effort, the Hanford Site was developed across parts of four southeastern Washington counties, mostly in Benton County. Hanford Site defense-oriented missions, non-military research, and cleanup operations have fueled the Tri-Cities economy for over seventy years since the initial Manhattan Project. Hanford inexorably changed the physical, social, and economic landscape of the region.

The middle of the 20th Century was the halcyon era of dam-building throughout the American West. The completion of the John Day (1971) and McNary (1954) projects on the Columbia River impacted communities in Benton County in a number of ways, and in ways specific to the parks that the County would later manage and that this plan addresses. The pool behind McNary Dam creates the calmed, steady-elevation river level that characterizes Two Rivers and Hover Parks, and because of the dam projects, the Army Corps of Engineers expropriate properties along the rivers which later became the basis for these and other parks along the Columbia and Snake Rivers.

More recently, population growth and economic expansion have been the drivers that continue to reshape the character of the region. The 'critical mass' of the Tri-Cities metropolitan area is now such that it is able to support a diversifying spectrum of economic sectors and industries that were historically exclusively the province of larger metro areas. The Tri-Cities has become the second-largest retail hub in all of eastern Washington and Oregon behind Spokane, and has also become a more established retirement and tourism destination.

Geography and Climate

Benton County covers 1722 square miles along Washington's border with Oregon. The Columbia River defines the northern, eastern, and southern boundary; with the Yakima River bisecting the county from west to east. Rattlesnake Ridge separates the Pasco Basin and the Yakima River Valley running from the northwest to the southeast through the County to where it collides with the Horse Heaven Hills south of Finley. This ridge includes Rattlesnake, Red, Candy, and Badger Mountains. Rattlesnake Mountain is the highest point in the County (elevation of 3629 feet), and the lowest elevation (265 feet) is along the Columbia River near Plymouth.



Figure 11 - The Horse Heaven Hills plateau terminates dramatically near Hover Park and Wallula Gap Preserve

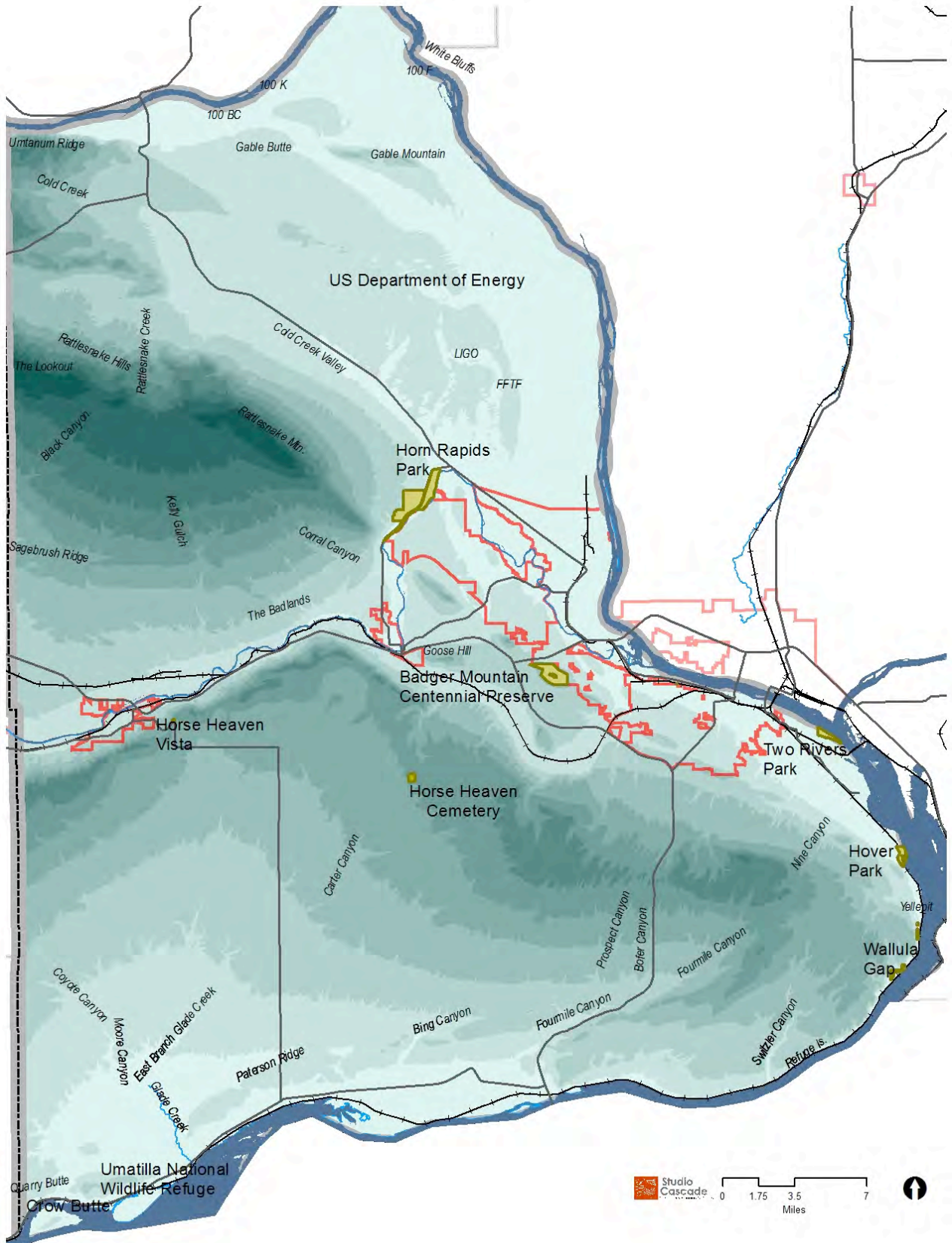


Figure 12 - There are a number of canyons and peaks in Benton County and a wide river valleys through the center of the County. The color bands in the above map depict elevation differences of about 270 feet for each gradient

The county has several basins and valleys with plateaus and ridges separating them. The Pasco Basin (mostly the Hanford Site) is fairly flat with some hills. The Yakima Valley slices through the County east-to-west, and is where most of the population, agriculture, and transportation infrastructure is located. The Horse Heaven Slope defines the plateau that makes up the southern half of the county. This monocline rises from the Columbia River along the southern edge of the County to the Horse Heaven Hills ridgeline running east to west. Jump Off Joe Butte to the south of Kennewick is the highest point on this ridge.

These mountains and ridges defined the path of the Ice Age Floods that scoured and defined the region from northern Idaho all the way to the Pacific Ocean at the mouth of the Columbia River. The valleys became inundated with only the tops of the buttes and ridges sticking out above the floods. Wallula Gap was a constriction point where the water backed up and slowly drained down-river. This back-up allowed large boulders and other debris called "erratics" to be rafted into the region and randomly scattered within the County as seen in many of the County's parks. This interesting geologic event is part of the proposed Ice Age Floods National Geologic Trail which would be a network of marked touring routes across parts of Montana, Idaho, Washington, and Oregon, with interpretive centers located across the region.

The region has a relatively arid climate because of the Cascade Range to the west and the rain shadow it creates with annual

precipitation between 5 and 15 inches depending on the area of the County. Daytime summer temperatures often exceed the 100 degrees but evenings cool down even during the hottest



Figure 13 - The proposed Ice Age Flood touring route (from the National Park Service report and the Ice Age Flood Institute includes much of Benton County

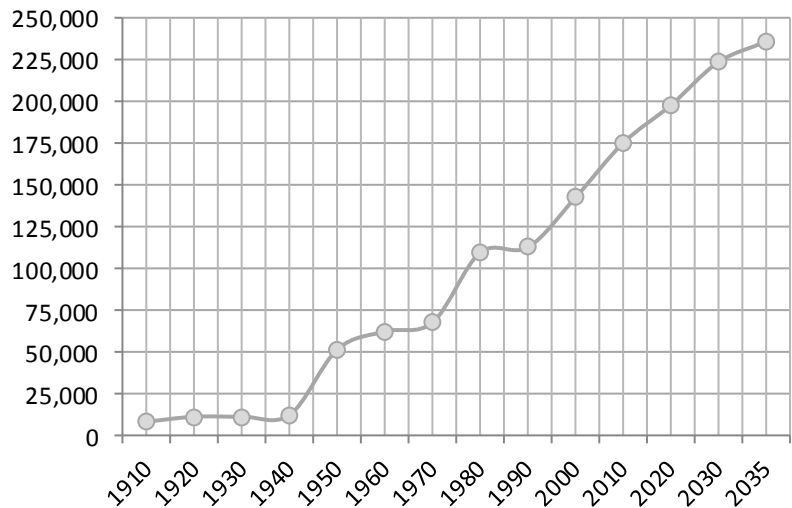


Figure 14 - OFM and the US Census Population Trends and Projections

months of July and August. Winter weather can be relatively mild although prolonged cold spells do occur. Daytime January temperatures average just above the freezing point.

Demographics and Economy

Benton County had a population of 183,400 according to the Office of Financial Management (OFM) estimates for 2013. This was an increase of about 8,000 people since the 2010 US Census. The population of the incorporated areas was 149,690 people while the population of unincorporated areas, including Paterson, Plymouth, and Whitstran, was 33,710. The projections for the County, as seen in figure 14, estimate a population of 236,007 in the County by 2035.

The primary economic engines in Benton County are Professional, Scientific, and Technical Services, Waste Management and Remediation, Health Care and Social Assistance, and Retail Trade. Other industries include accommodation and food services and educational services. The world's largest irrigated experiment station, Washington State University Irrigated Agriculture Research and Extension Center, is located in Benton County 10 miles north of Prosser. The wine industry is a rapidly growing industry with many established and new wineries opening in recent years. Columbia Crest, the state's largest winery, is located in Paterson, overlooking the Columbia River.

In 2010, there were 65,304 households in Benton County with an average household size of 2.66 people. Eighteen percent of the people living in Benton County were foreign born and 17.6 percent of people over 5 years old spoke a language other than English at home. Of those people who spoke other than English at home, 74 percent spoke Spanish and 46 percent reported that they did not speak English "very well".

Table 2 - 2007 Population Breakdown

2007 Population	
Benton City	3,240
Kennewick	76,410
Prosser	5,810
Richland	51,150
West Richland	13,080
Incorporated	149,690
Unincorporated	33,710
Total	183,400

Source: OFM

Table 3 - Benton County's 2012 Demographic Summary American Community Survey

Demographic Estimates	Estimate	Percent	U.S.
Total population	175,177		
Male	87,486	49.9	49.2%
Female	87,691	50.1	50.8%
Median age (years)	35.6	(X)	37.2
Under 5 years	13,071	7.5	6.5%
18 years and over	127,513	72.8	76%
65 years and over	20,586	11.8	13%
One race	168,955	96.4	97.1%
White	144,418	82.4	72.4%
Hispanic or Latino (of any race)	32,696	18.7	16.3%

School enrollment in Benton County was 46,349 in 2012 including nursery schools and kindergarten to 12th grade. Kindergarten enrollment was 2,319, elementary school from 1st to 8th grade was 21,482, and high school 9th to 12th grade was 11,217. College or graduate schools had 8,880 students enrolled. Eleven percent of non-institutionalized people reported a disability,

with the breakdown varying by age (4 percent of people under 18 years old, 9 percent of people 18 to 64 years old, and 33.5 percent of those 65 and older reported a disability).

Table 4 - Benton County's 2012 Social Summary American Community Survey

Social Characteristics	Estimate	Percent	U.S.
Average household size	2.69	(X)	2.64
Average family size	3.25	(X)	3.25
Population 25 years and over	112,007		
High school graduate or higher	(X)	90.9	86.4%
Bachelor's degree or higher	(X)	29.5	29.1%
Civilian veterans (civilian population 18 years and over)	14,811	11.1	8.9%
Disability status	19,721	10.90	12.2%
Foreign born	16,431	9	13%
Speak a language other than English at home (population 5 years and over)	32,303	19	21%

In 2012, Seventy-eight percent of Benton County workers over 16, drove to work alone, 13 percent carpooled, 1.3 percent took public transportation, 2.5 percent walked, 1.4 percent used other means and 3.7 percent worked at home. Commuters took an average of 21 minutes to get to work.

Table 5 - Benton County's 2010 Housing Summary American Community Survey

Housing Characteristics	Estimate	Percent	U.S.
Total housing units	68,896		
Occupied housing units	64,660	93.9	87.5%
Owner-occupied housing units	44,674	69.1	65.5%
Renter-occupied housing units	19,986	30.9	34.5%
Median value (dollars)	174,800	(X)	181,400

Also in 2012, the most common occupations included: Management, business, science, and art occupations, at 37.5 percent; Sales and office occupations at 22.2 percent; Service occupations at 16.4 percent; Natural resources, construction, and maintenance occupations at 12.8 percent ; and Production, transportation, and material moving occupations at 11.1 percent. 76.8 percent of the people employed were classified as private wage and salary workers; 17.7 percent were government workers; and 5.4 percent were self-employed or non-incorporated business workers. The median income of households in Benton County was \$60,300. The median monthly housing costs for mortgaged owners was \$1,385, non-mortgaged owners \$399, and renters \$779.

Table 6 - Benton County's 2012 Economic Summary American Community Survey

Economic Characteristics	Estimate	Percent	U.S.
In labor force (population 16 years and over)	86,457	64.8	64.7%
Mean travel time to work in minutes (workers 16 years and over)	21.3	(X)	25.4
Median household income (in 2012 inflation-adjusted dollars)	60,300	(X)	53,046
Median family income (in 2012 inflation-adjusted dollars)	74,791	(X)	73,034
Per capita income (in 2012 inflation-adjusted dollars)	28,171	(X)	28,051
Families below poverty level	(X)	9.4	10.9%
Individuals below poverty level	(X)	12.9	14.9%

Process

Framework

The Recreation and Conservation Office (RCO) is a major source of park grant funding and provides specific planning guidelines for eligibility. RCO park planning requirements differ from the Growth Management Act (GMA) but are compatible with it. This document is meant to fulfill all state requirements for parks planning.

The guidelines as specified by the RCO ask for the inclusion of several elements within a comprehensive parks plan.

- **Community goals** are broad statements of intent based on an overall vision.
- **Policies** implement goals, directing day-to-day agency behavior in a manner designed to achieve specific and measurable actions.
- An **inventory** of the planning area and community reveals its identity and strengths within the context of the County's geography, along with the current parks and conditions including facilities, lands, programs, and the policy environment impacting parks and recreation activities.
- **Public involvement** provides opportunity for input in plan development and adoption.
- **Demand and need analysis** defines priorities for acquisition, development, preservation, enhancement, management and other park system management strategies based on public input and inventory.
- Projects for acquisition, development and renovation are the basis of the **Capital Improvement Program** including a projected timeline, budget and funding sources for each over at least a six-year period.
- The final step is **adoption**, which creates the final approval of the plan and process required to apply for grants.



Figure 15 - Benton County is following the state guidelines for a parks plan allowing for potential state grants and funding.

Participation

Citizen involvement for parks planning is the backbone of this planning process. Benton County appreciates the high level of public participation that was crucial to generating a great Comprehensive Parks Plan. In particular, our "Partners in Parks" were instrumental to this planning process, as they are to so many parks projects and functions. The Partners in Parks have chosen to take-on high levels of responsibility in the parks over the years, and they make-up the heart of our volunteer corps. The Partners include:

- Backcountry Horsemen of Washington - Purple Sage Riders
- Backcountry Horsemen of Washington - Rattlesnake Ridge Riders
- Friends of Badger Mountain
- Native Plant Society – Columbia Basin Chapter
- Tapteal Greenway Association
- Tri-Cities Miniature Aircraft Association
- Tri-Cities Shooting Association

In addition to our Partners and the public at large, several representatives from other organizations and agencies participated in the plan process, including:

Benton Conservation District

Benton City Economic Development Council

Benton County Emergency Services

Benton County Fire District 1

Benton Franklin Health District

Benton-Franklin Council of Governments

Chinook Cycling Club

Desert Kayak and Canoe Club

Finley Schools

Inter-Mountain Alpine Club

Kennewick Parks and Recreation

Kennewick Schools

Kiona-Benton City Schools

Pacific NW Fjord Horse Group

Paterson Schools

Prosser Schools

Richland Parks and Recreation

Richland Rod and Gun Club

Richland Schools

Tri-City Bicycle Club

US Bureau of Land Management

US Army Corps of Engineers

West Richland City Council

West Richland Parks Board

The outline for plan development has followed a meeting schedule designed for interaction, input, and participation. The events included:

Date	Event	Location
Nov 21, 2013	Scoping Workshop	Bethel Church, Richland
Dec 12, 2013	Trails Summit	Bethel Church, Richland
May 13, 2014	Policy & Projects Workshop	Justice Center, Kennewick
Jun 10, 2014	Draft Plan Meeting	Horn Rapids Park, Benton City
Jul 08, 2014	Plan Roll-Out	Two Rivers Park, Finley
Jul 22, 2014	Plan Adoption	Benton County Courthouse, Prosser

The public participation process included first, integrating the research and information from the 2007-2008 process, which updated the community research done previously in 1982 and 1994. Next, input was gathered at two public meetings facilitated by the consultant that focused on Badger Mountain, Candy Mountain, and connecting trails systems. At this point, the Park Board took over the process and gathered additional input from the public, Partners in Parks, and users to generate the draft CPP. After two rounds of review and revision, the 2014 Comprehensive Parks Plan was adopted by the Board of County Commissioners at the recommendation of the Park Board in July.



Figure 16 - Participants had many great ideas shared during workshops and on the website

Parks and Recreation Trends

There are trends that can be seen within Benton County. Several assessments were distributed to the population to get feedback over the years.

Questions focused on the existing system, potential demand, and funding. The full text of the 2007-2008 Benton County Parks Questionnaire and a report is included in the appendix of this parks plan along with information from the previous survey/questionnaires conducted in 1982 and 1994.

2007-2008 Parks Questionnaire Findings

Benton County administered an online questionnaire to county residents in 2007 as part of the public participation program to engage the public in the parks planning process. The questionnaire was intended to reach park users and residents to learn about what they liked about Benton County Parks, what needed to be improved, what activities are most popular, and an idea of what kinds of parks should be provided in the park system. The questionnaire was a tool for input for people who did not have time or inclination to come to scheduled public meetings. In this way, the questionnaire attracted people to the process that wouldn't normally participate but whose ideas helped shape policy development and project prioritizing.

The 2007-08 questionnaire was administered and processed by an online survey distributor. The program restricted completed questionnaires to one IP address, to reduce the chance of duplicate respondents. Essentially, each computer could only complete the questionnaire one

time. The questionnaire was available to the public between November 2007 and January 2008. Links to the questionnaire were posted on the project website and made available via email through the steering committee and various stakeholders. The website was also advertised in the Tri-City Herald, on local television news programs, and on talk radio.

The results were consistent with the responses from public meetings and other opportunities for public comment. Most respondents to the questionnaire were from Richland (47 percent) and Kennewick (25 percent) and were between 45 and 59 years of age. The majority of respondents indicate they are satisfied with the parks system. The questionnaire provides some key findings including:

- **Facility Demand** - Badger Mountain Centennial Preserve and Horn Rapids Park are used by a majority of respondents and Badger Mountain has the highest percentage of weekly users. Hiking and walking were the activities the majority of respondents participated in most frequently during an “in season” month. Bicycling and nature activities were also frequent activities for respondents. The responses show a high need for facilities to support these activities and continued maintenance of the most frequently used parks.
- **Project Types** - Trails topped the list of needed parks facilities. Trails were closely followed by preserves and waterfront parks. All facility types, except athletic play fields, showed high level of support. Coupled with the activities that people do most in their free time, these questions show an increased desire for trails, preserves, and waterfront parks. These projects will take precedence in future planning efforts.
- **Project Priorities** - Collaboration and safety received the highest ratings when respondents were asked to prioritize various attributes of parks projects. Future projects will reflect the desires of residents to have parks that are safe and that were designed, funded, built and maintained through a process of collaboration.
- **Funding** - An overwhelming 90 percent of respondents said they believed land should be set aside in new developments for future parks facilities. Respondents said they would like parks to be funded through various means including but not limited to development impact fees, by a bond issue, or through a property tax increase. Knowing how residents feel parks should be funded helps the parks department make better choices about how to pay for maintenance, acquisitions and improvements.

State and National Trends

There are emerging park and recreation trends at the state and national level which relate to Benton County. These trends should be considered as part of the assessment. The following trends were highlighted by the Washington State Recreation and Conservation Office (RCO) and include both state and national surveys and research. Those trends relate to specific opportunities within the County. People are busy and have to weigh the time available for work, live, and play. Key trends to consider include:

- **Increasing population:** The County is growing rapidly with more growth in urban areas than rural areas

- **Aging population:** Older and retired populations continue to grow within the county with many expected to stay active and likely demanding more recreation opportunities
- **Ethnic diversity:** The growing population in Benton County is diverse with many non-native speaking residents that should be considered in marketing and services
- **Changing lifestyles:** Changing work patterns are creating off peak demand on facilities and less structure for activities while multi-generational demand increases demand for diverse activities
- **Physical activity:** An increased interest in physical activity has emerged as obesity rises in children and adults throughout the country
- **Infill development:** Urban areas are being filled in and higher density housing development is increasing demand for more urban facilities and connectivity to rural opportunities
- **Convenient recreation:** People are getting busier and costs for travel are increasing interest in recreating closer to the home and work
- **Recreation choices:** An increase in trail activity and winter recreation interests including indoor winter activities and an emerging interest in activities like community gardens, mountain biking, canoeing, kayaking, adventure sports and disk golf.

The RCO, in 2003, identified outdoor recreation activities and the projected change in participation levels in the next 10 and 20 years. The following table highlights those activities and the increase or decrease for each activity. At the statewide level walking and hiking are the highest interest area. Sport related activities come in at a close second.

Table 7 - Washington State's future participation in outdoor activity

Participation in Washington	10 Year	20 Year
Walking	+23%	+34%
Hiking	+10%	+20%
Outdoor team and individual sports	+6%	+12%
Nature activities	+23%	+37%
Sightseeing	+10%	+20%
Bicycle riding	+19%	+29%
Picnicking	+20%	+31%
Motor boating	+10%	No estimate
Non-pool swimming	+19%	+29%
Visiting a beach	+21%	+33%
Canoeing/kayaking	+21%	+30%
Downhill skiing	+21%	No estimate
Cross-country skiing	+23%	No estimate
Snowmobile riding	+42%	No estimate
Fishing	-5%	-10%
Camping - primitive dispersed	+5%	No estimate
Camping - backpacking	+5%	+8%
Camping - developed (RV style)	+10%	+20%
Off-road vehicle riding	+10%	+20%

Hunting-shooting	-15%	-21%
Equestrian	+5%	+8%
Air activities	No estimate	No estimate

Source: RCO 2003- Statewide data

In 2013, the RCO updated the State Comprehensive Outdoor Recreation Plan, which included an assessment of demand for outdoor recreation in Washington State, which shows that across the state, people were interested in nearby and affordable activities. Walking and hiking continue to be popular activities in Washington, but also near the top are outdoor team and individual sports (which includes fitness activities like jogging), nature activities, and picnicking and BBQing.

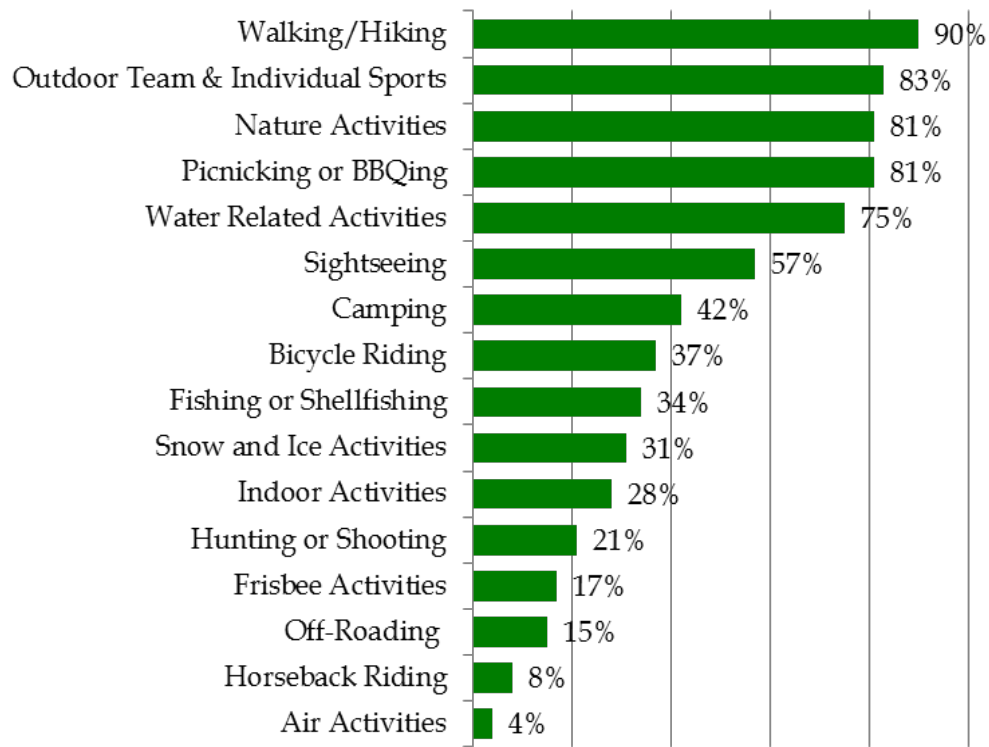


Figure 17 - Statewide participation in recreation may not reflect Benton County trends perfectly but should be considered as part of the picture as overall state demand impacts county facilities

Vision and Issues

What would the Benton County park system look like in 20 years? When asked that question, residents said that, *“Benton County provides a connected system of parks, trails, and nature preserves that balance the community’s priorities to provide environmental stewardship, public access, diverse opportunities, and healthy options.”* This vision describes that park system 20 years from now, creating a picture of what will be. The vision is supported through a policy framework that provides the steps for achieving the vision.

Issues are points of contention, missing pieces, and general concerns that focus the vision and policy framework. Some identified issues include:

- **Partnerships** - are the backbone of improvements, expansion, and recreation oriented activities
- **Connectivity** - is lacking between parks and throughout the county
- **Misuse** - could diminish access to sites and disrupt the natural areas, and damages property
- **Coordination** - is crucial to make a complete system and keep conversation alive
- **Conflicts** - between interest and users groups could disrupt partnerships and viability of the park system
- **Information** - is not available about the current park system or the amenities offered
- **Funding** - is hard to obtain for continued maintenance and for the many competing projects
- **Development** - is occurring at a fast pace within and near unique landscapes and key corridors
- **Access** - is not provided or developed for some parks within the system while other areas are to easily accessed



Figure 18 - The park vision can be broken down into component parts which guide goal and policy development

Demand and Needs Assessment

The park system is meant to provide desired and needed opportunities for Benton County residents to recreate and participate in different outdoor activities. The system should provide enough opportunities to users, and those opportunities should be in the right locations within the County. There is also an opportunity for the park system to help provide regional recreation opportunities and protect or enhance the environment.

Level of Service, Level of Management, and Park Types

The 2014 Benton County Comprehensive Plan adopted level of service standards for parks from the 1982 Comprehensive Parks Plan. Those plans specify that the standards are meant to be used as guidelines, not absolutes. The following table modifies those standards to fit with the current population and feedback during the workshop sessions and questionnaire.

Table 8 - Current Level of Service Standards

Park Type	Service area	Level of Service
Regional Parks	15 mile radius and within an hour drive	5 acres per 1000 population
Natural Park Designation	20 mile service radius	5 acres per 1000 population
Trails	NA	1.37 miles per 1000 population`
Special Use	NA	Case by Case

To better understand the types of parks within the system, the following “level of service” (LOS) descriptions were created in 2008 using the 1982 Parks Plan and the current system features and revised in 2014 based on further refinement of the organization.

Regional Parks are intended for more passive outdoor uses and serve a large region including rural county residents. These parks are meant to preserve large areas of natural space and typically include amenities like wooded areas, varied topography, water features, but can also provide campgrounds, picnic areas, nature centers, trails, waterfront access, boating, and sometimes athletic fields. These parks should not be used to relieve pressure for urban park uses. In the Benton County portfolio, Horn Rapids Park and Two Rivers Park would be considered the “regional parks”.

Natural Parks (Preserves) are undeveloped areas mostly in their natural condition that are managed for educational or recreational purposes that preserve native plant and wildlife habitat and promote passive recreation. They generally can provide non-consumptive uses including interpretive trails, historical points, viewpoints, educational centers, picnic areas, and case by case primitive camping. Benton County has two preserves – Badger Mountain and Wallula Gap.

Trails (Linear Parks) are intended to provide circulation between parks, cities and rural areas. Trails can follow roadways, waterways, wooded areas, historic or scenic routes, and should consider points of interest, scenic views and existing rights of way. Benton County does not currently own or manage any linear parks or trails within the parks system, however the County is working with other entities to promote trails between existing and possibly future (Candy Mountain) holdings.

Special Use areas include sites that are either smaller and have focused uses or are managed for specific uses and may be subleased and managed by other organizations.. At Benton County, examples include: Horse Heaven Cemetery, Horse Heaven Vista, Hover Park, Rattlesnake Mountain Shooting Facility, and Vista Park.

In addition to LOS designations, Benton County organizes its nine parks by “level of management” (LOM). This results in a two-tiered system. The Tier One parks have daily operational oversight, either by an assigned County park ranger or by concessionaires or volunteers. These four parks are by far the most heavily used in the system. The Tier Two parks are smaller, have significantly less use overall, and do not have daily active management.

Tier One	Tier Two
Badger Mountain Centennial Preserve	Horse Heaven Cemetery
Horn Rapids Park	Horse Heaven Vista
Rattlesnake Mountain Shooting Facility	Hover Park
Two Rivers Park	Vista Park
	Wallula Gap Preserve

Benton County had 183,400 residents in 2013 with a forecast population of 236,007 in the year 2035. The current level of service standards would call for a total 1,834 acres of parkland and an additional 526 acres by 2035 for a total of 2,360 acres. There are currently 1,460 acres of regional and natural park land in the system, although Hover Park is currently not developed in any way.

The current park system is not meeting the level of service standards by 374 acres, and will need a total of 900 more acres of land to meet those standards 20 years from now. This acreage analysis does not include special use parks, trail connections, or community desire for preservation of open space lands in certain sensitive and view corridors.

Table 9 - Level of Service requirements by 2035 for Benton County parks

Park Type	Current LOS (Pop. 183,400)	2035 LOS (Pop. 236,007)
Regional Parks	917 acres	1,180 acres
Natural Parks	917 acres+	1,180 acres+
Special Use	Case basis	Case basis
Total Parkland to meet LOS	1,834 acres	2,360 acres
Trails	253 miles	323 miles

*within a 20 mile service area

+within an hours drive

Table 10: Park Acreage by Park Type

Site	Calculated Acres
Regional Parks	
Horn Rapids Park	564.5
Two Rivers Park	159.0
<i>Regional Parks Total</i>	723.5
Natural Parks	
Badger Mountain Centennial Preserve	627.1

Wallula Gap Preserve	110.0
<i>Natural Parks Total</i>	737.1
<i>Subtotal of Natural and Regional</i>	1,460.6
Special Parks	
Vista Park	0.3
Horse Heaven Cemetery	2.0
Horse Heaven Vista	6.3
Hover Park	175.0
Rattlesnake Mountain Shooting Facility	740.0
<i>Special Parks Total</i>	923.6
GRAND TOTAL	2,384.2

*Land was calculated using a Geographic Information System (GIS) and sometimes differs from historic acreage calculations

Table 11 - Park system needs by 2035

Park Type	2013 Acres			2035 Acres		
	Target	Current	Desired	Target	Now	Desired
Regional	917	723.5	193.5	1,180	723.5	456.5
Natural	917	737.1	179.9	1,180	737.1	442.9
Total	1,834	1,460.6	373.4	2,360	1,460.6	899.9
Special Use	NA	923.6	NA	NA	923.6	NA

Other Facilities

Many of the cities within Benton County provide recreation opportunities and park land, including an extensive trail network provided through coordinated efforts of multiple jurisdictions. Benton County has no control over these city park facilities but recognizes they provide recreational opportunities for residents in the County.

State and Federal Lands in Benton County

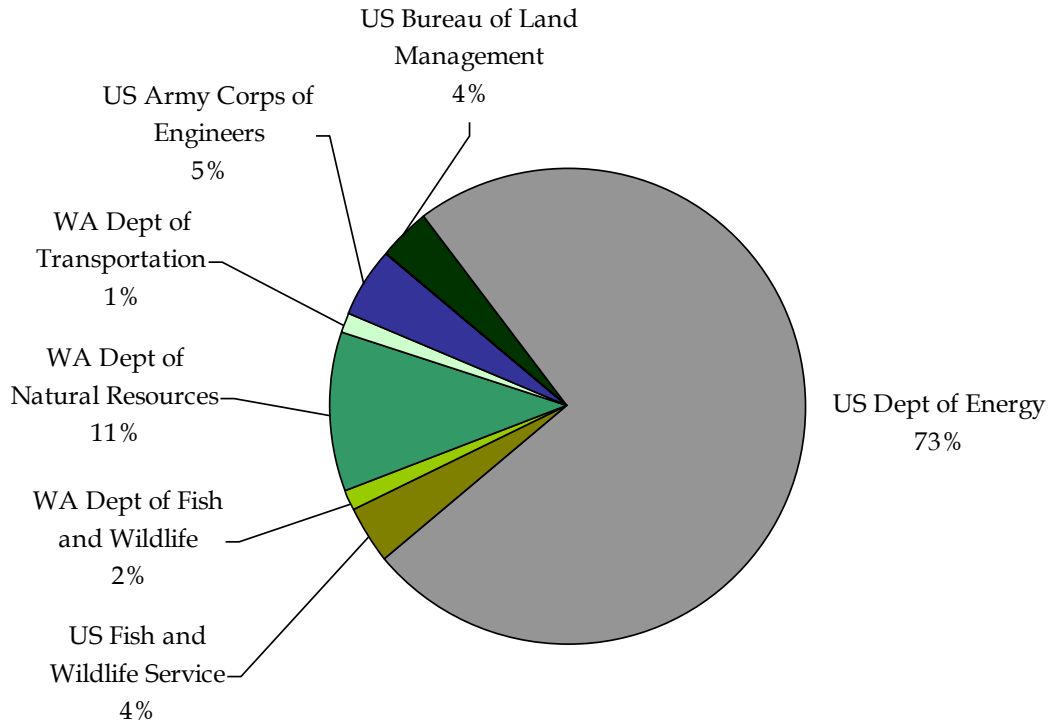


Figure 19 - Approximately 384,500 acres of public lands are managed by the state or federal government although most of this land does not provide public access (Hanford Site)

Park Land and Critical Areas

The park system provides larger tracts of open space preserves for native wildlife and plant species while still allowing passive activities. There are other lands within the County that are limited because of natural conditions (this land has been identified as critical resource lands by the County). Some of this land could have a potential use within the park system as trail corridors or as additions to open space preserves that provide natural habitat and viewshed corridors. Much of this land is already owned by public or quasi-public entities although there are privately owned lands in these areas, as well. This private land is difficult to use or develop. Land owners should be approached about easements along corridors or within identified areas while still allowing the full use of their properties. In other cases this land could be acquired or easements could be obtained within identified critical area land. Preserving some of this land (through conservation easements, with trusts, or as park land) could create needed corridors and preserve valuable environmentally sensitive areas and ecological function system-wide while providing diverse and needed recreation opportunities.

Critical area lands identified in the County's Comprehensive Plan include wetlands, critical aquifer protection areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife conservation areas. Those areas support natural and resource functions or are potential hazardous areas. Some benefits of protection include water quality, habitat, natural flood control, groundwater replenishment, natural hazard protection; historical, archaeological, and aesthetic value protection, and recreation.

The map identifies potential critical areas, and existing public and quasi-public lands. From this conceptual map, linkages and sites can be identified by connecting critical areas and public lands. These sites and corridors play a larger role for open space preserve identification, partnerships, and could provide potential locations for acquisition or easements.

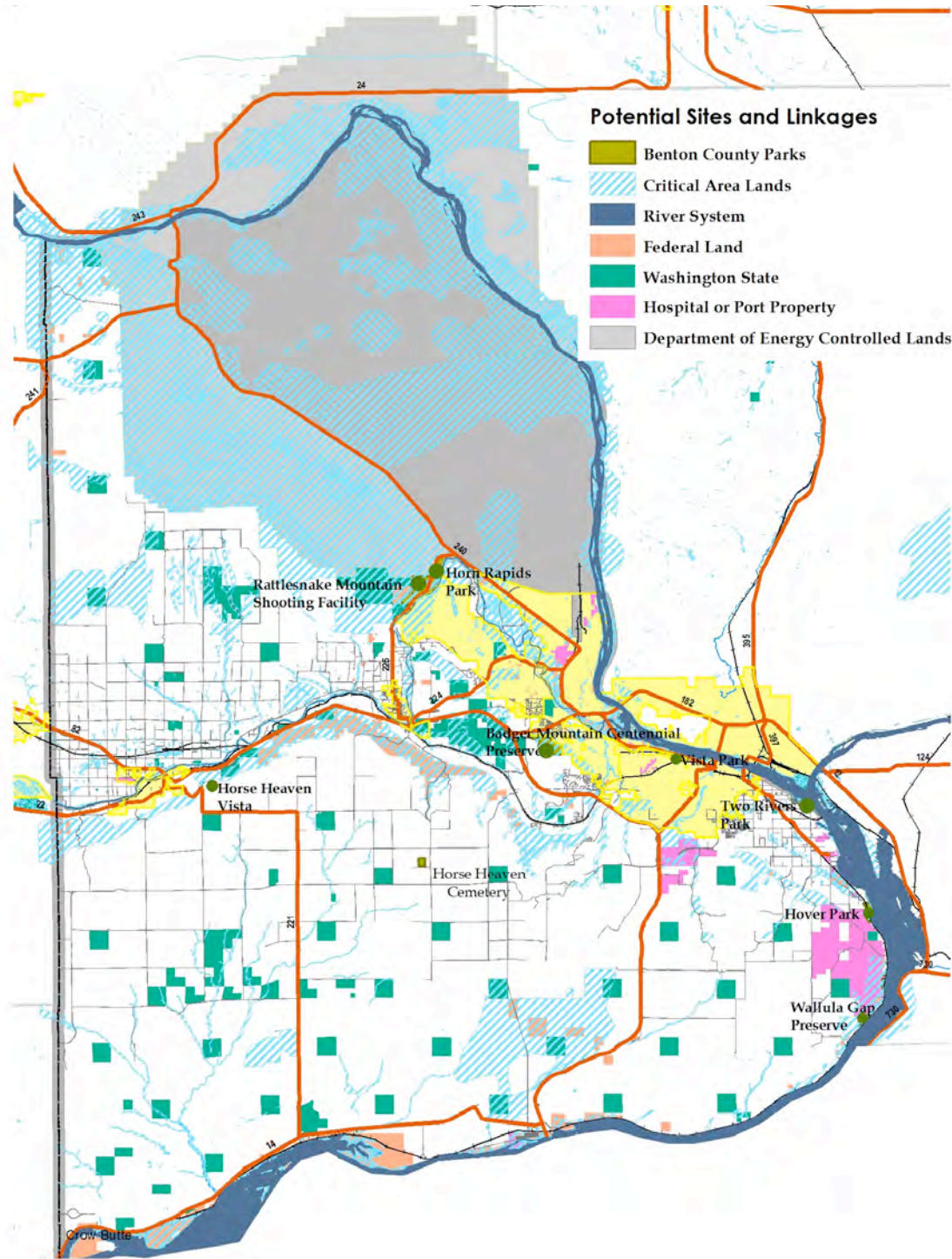


Figure 20 - A map showing approximate critical area, public, and quasi-public lands in Benton County

Workshop Participant Project Ideas

During the 2008 and 2014 planning cycles, participants identified many projects and project areas that could be beneficial as improvements or additions to the Benton County park system. There is not enough money or manpower to follow through with all of the project areas that came up during brainstorming but it is important to consider the ideas as part of the long-term plan. Final projects are identified which fit within the overall vision and goals of this plan and are included in the implementation section of the Plan. The following are paraphrased and summarized ideas generated during the planning meetings or from comments received:

Badger Mountain Centennial Preserve	Two Rivers Park
<i>Welcome sign kiosk, sign, and parking on back side,</i>	<i>Long term master plan and landscape plan</i>
<i>Pave access for parking lot and horse trailer access</i>	<i>Gazebo in open area, disc golf course, boardwalk trail along river, paved boat parking, update restrooms</i>
<i>Continued restoration of natural areas</i>	<i>Improve policing</i>
<i>Signs on major roads for directions and trail signs pointing at interesting things</i>	<i>Improved trail along shoreline</i>
<i>Another hiking trail to make a loop and more mutli-use trails</i>	<i>Multi-use trail including connectivity to Hover Park and Kennewick</i>
<i>Trail links to other ridges and trails</i>	<i>Improve/maintain ramp and dock and access for safety</i>
<i>Restroom at trailheads (Westgate)</i>	<i>Trailer parking and restrooms for boat area</i>

Horn Rapids Park & Rattlesnake Mountain Shooting Facility	Hover Park
<i>Restroom for Meacham Hall. Shade trees around facilities, remove lawn</i>	<i>Limit vehicle access, native vegetation</i>
<i>Water access trail development and improves loop trails within park</i>	<i>Day use parking and interpretive information</i>
<i>Trail connecting to BLM, DOE and WA Fish and Wildlife lands</i>	<i>Improve railroad crossing (over/under railroad)</i>
<i>Acquire property or easements to connect Benton City with Horn Rapids Park</i>	<i>Multi-use trails in and to Two Rivers and Wallula Gap</i>
<i>Abandoned RR (potential bike/pedestrian path)"</i>	<i>Camping and boat-in beach access (swimming)</i>
<i>Parking access on Horn Road (south end)</i>	<i>RV and restroom area</i>
<i>Continue and expand revegetation with native plants</i>	<i>Area patrolled, limit access points to help control illegal dumping</i>

The public input also produced a wide variety of system-wide ideas through brainstorming during the workshop process. These ideas may go beyond the scope of the Benton County Park System but the ideas are summarized below. Generally, they include:

Countywide or new park project ideas

Ridge top preservation and trail (Candy Mountain, Red Mountain, Rattlesnake Mountain)

Waterfront acquisition, trails

Horse Heaven rim trail corridor with McBee overlook

New park in Red Mountain area

Access point at end of Ayers Road (preservation and restroom etc.)

Consistent signage for hunter/other access

ADA improvements

Multi-use trails and expanded equine trails

Trails on both sides of Yakima River

Parking areas suitable for horse trailers

Non-motorized trails for Wallula Gap with trailhead parking, restroom, water

Trail system (by permit only) to top of rattlesnake-nonmotorized (monitored)

Brochure listing all of the parks, directions and equestrian route maps

Set aside land for park in Badger Road area

Continue (Keene) corridor abandoned RR for bike-ped trail extension (City of Richland)

Coordinate w USFWS and DOE for potential future uses of Hanford Reach lands and ALE

Support a county park for the Plymouth area

Creation of access point at the end of Hamilton Road (north of Benton City)

Creation of better river access point in the Twin Bridges area (near West Richland)

Park Specific Assessment and Recommendations

Each park has specific issues that should be addressed. These issues are focused on improving the parks to a level that creates a safe and sustainable park for long term use and enjoyment of the users while keeping with the mission and use philosophies of the County and the Park Board. The assessment was developed through park visits, interviews with user groups and staff, public meetings and comments received. The following improvements are incorporated into the Implementation Section of this Plan.

Badger Mountain Centennial Preserve Improvements

The existing park has multiple trails and many recreation opportunities. The primary issues in this park include abundant use on a relatively undeveloped property. The intent of the site is to preserve the natural setting but also provide for the users. Without further planning and improvements, this park's trail system has the potential for conflicts between user types and over use leading to deterioration of the natural preserve. The observed volume of users and the predicted increase in use of the park points to a need for better facilities and a defined trailhead for each entry into the park. Park improvements should include:

- A park master plan and trail plan with consideration of expansion through collaborations and partnering. *(Adoption expected in fall 2014)*
- Improved access and parking at the Westgate trailhead with a restroom facility. *(The parking area has been upgraded once.)*
- Work toward creating connections offsite - to the east onto Badger Butte (Little Badger Mountain), and to the west to Candy Mountain and Red Mountain, possibly through the creation of a new preserve on Candy Mountain.
- Investigate and begin if feasible, remediation of abandoned roads, utility trenches, scratch trails, and other scars on the mountain.

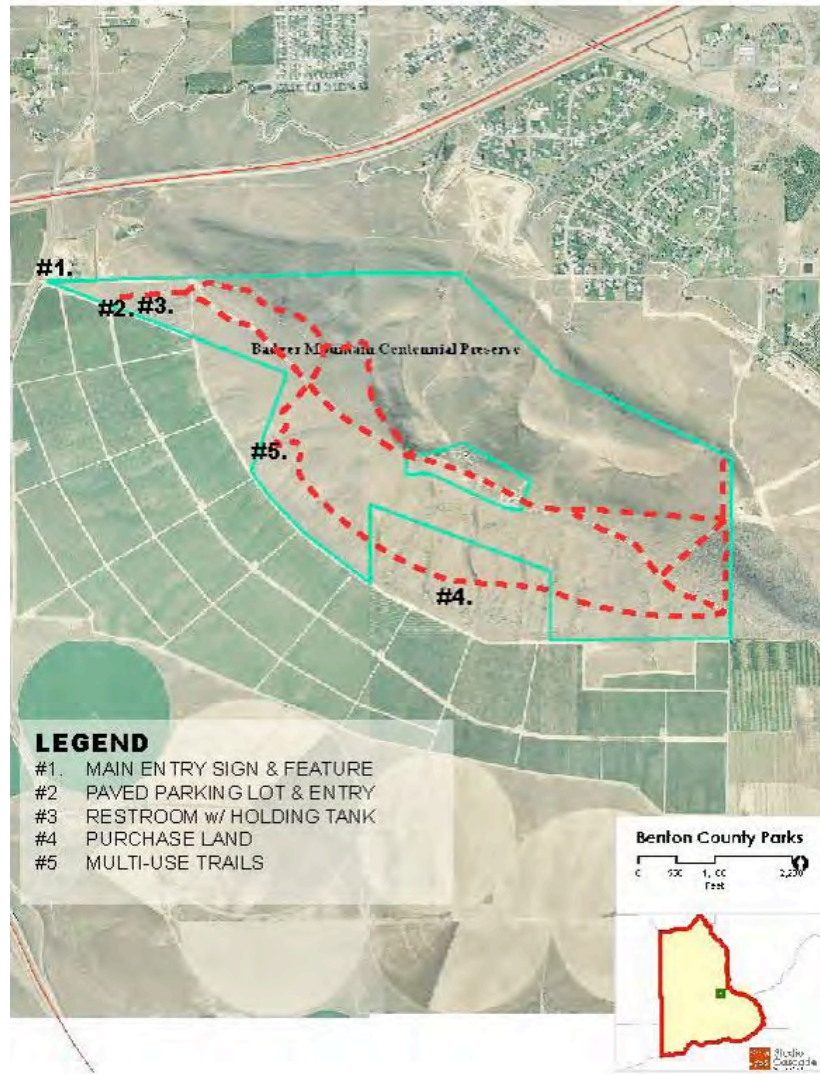


Figure 21 - Badger Mountain has a popular multi-use trail system and other opportunities that should be further explored with a master plan

Horse Heaven Cemetery

The Cemetery is a Tier Two, minimal improvement site. The biggest issue concerning the Cemetery is occasional vandalism. Minimal improvements have been proposed:

- Addition of historical interpretive signage.
- Addition of a monument to all persons known to be buried on the premises. Many original headstones have disintegrated or been destroyed. A single, headstone with names of all interrees engraved upon it has been proposed for the site.

Horn Rapids Park Improvements

Horn Rapids Park sees a lot of use but also gets abuse in the form of off-road vehicle use and dumping due to the park's isolation and the large internal network of informal roads. The park also has a lot of riverfront needing better designed access for safe and proper use of the river and shoreline.

Recommendations to resolve issues and provide solutions include:

- Park boundary clarification and reconfiguration which would afford better management by all entities involved in ownership of the proposed properties. Thus far, the park's main neighbor – the US Department of Energy, has not shown much interest in addressing this issue.
- Park and trail master plan with site survey to show preferred boundaries of the

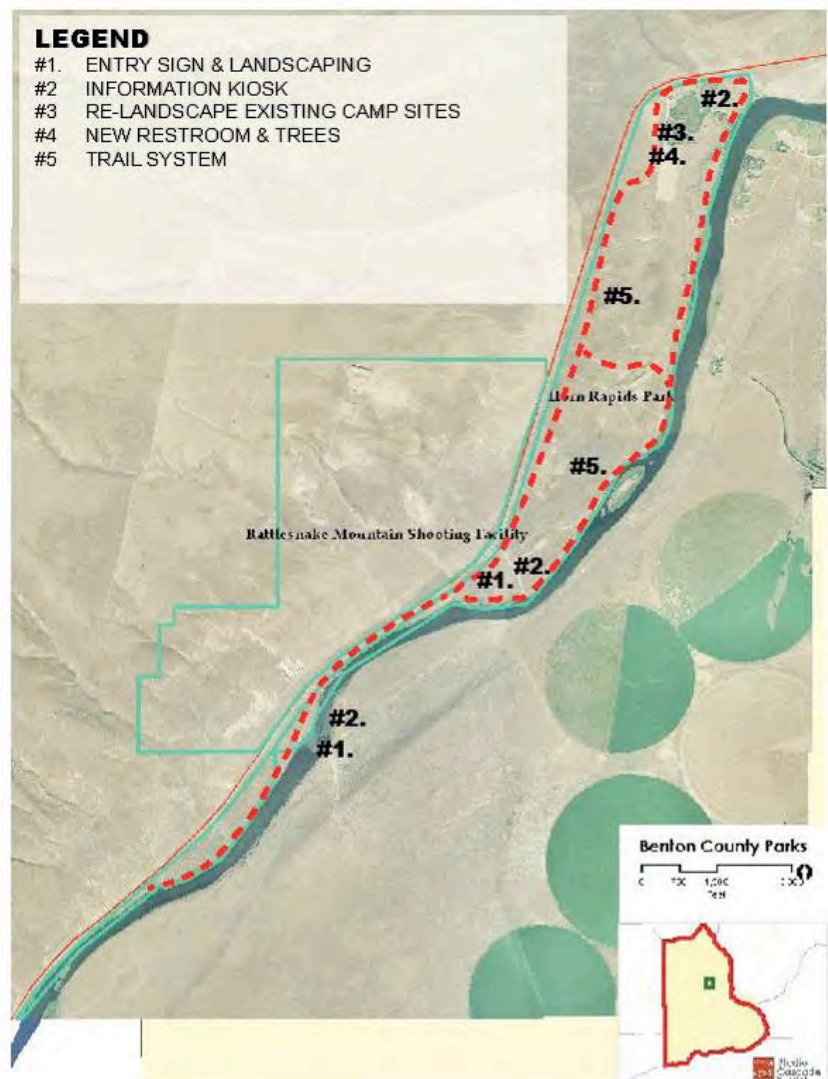


Figure 22 - Horn Rapids Park and Rattlesnake Shooting Facility are divided by Horn Road but are adjoining properties

park.

- Update road and entry signs and landscaping.
- Identify native areas for rehabilitation.

Horse Heaven Vista Improvements

Horse Heaven Vista had a major renovation that occurred after the 2008 CPP. There are some improvements proposed for the site, but no additional major projects are foreseen at this time:

- Install main entry sign.
- Install information kiosk.
- Demarcate park boundaries.
- Remove large debris pile(s) from site.
- Work to make HHV a node along the suggested "Horse Heaven Rim Trail".



Figure 23 - Landscaping could help blend improvements into the surroundings in Horn Rapids and other parks

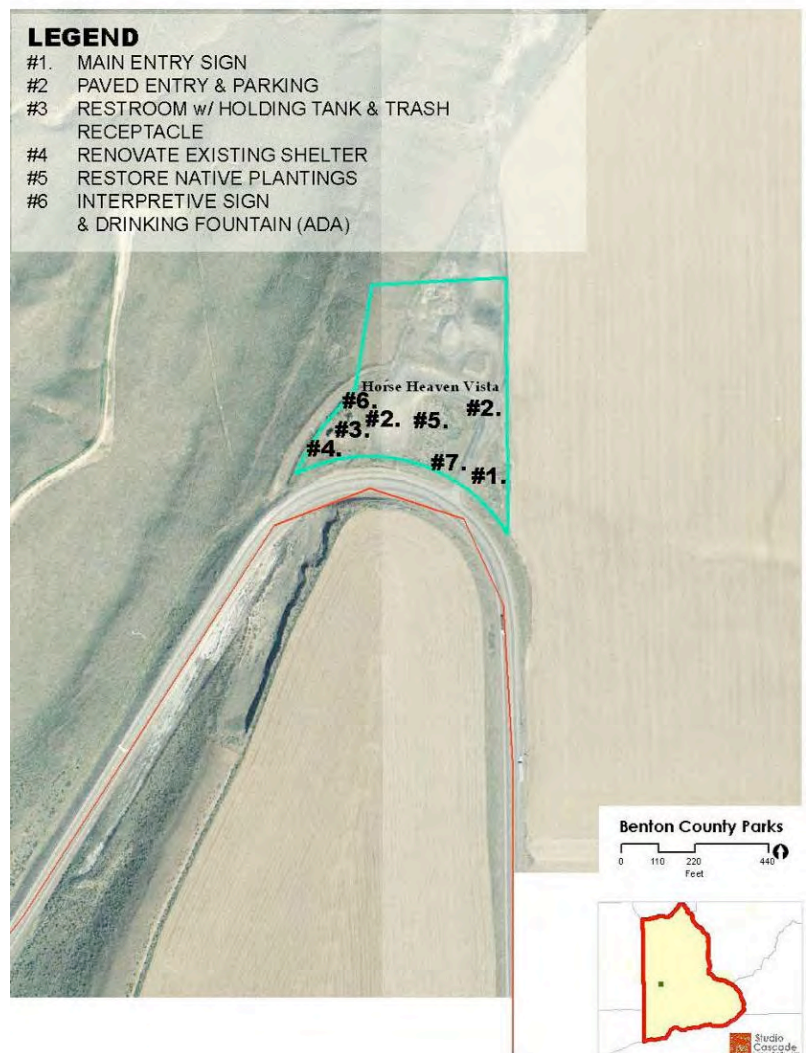


Figure 24 - Horse Heaven Vista has funding for most of the proposed improvements

Hover Park Improvements

Hover Park is located in a rural area without controlled access. The area is undeveloped and has some signs of the original town site. This property has a lot of potential but also has a lot of issues. The park currently has unauthorized and indiscriminate (often illegal) use by off-road vehicles and for dumping of junk cars and other garbage. Current users enjoy the fishing and trail opportunities but the overall perception of the park in the community is low. A strong interest was expressed for keeping the park under lease and management by the County by users who enjoy fishing, horseback riding, bicycling, and walking.

The Park Board should look into options and decide what the next step will be for this property. The following are some options that could be taken. The first step should be considered as highest priority.

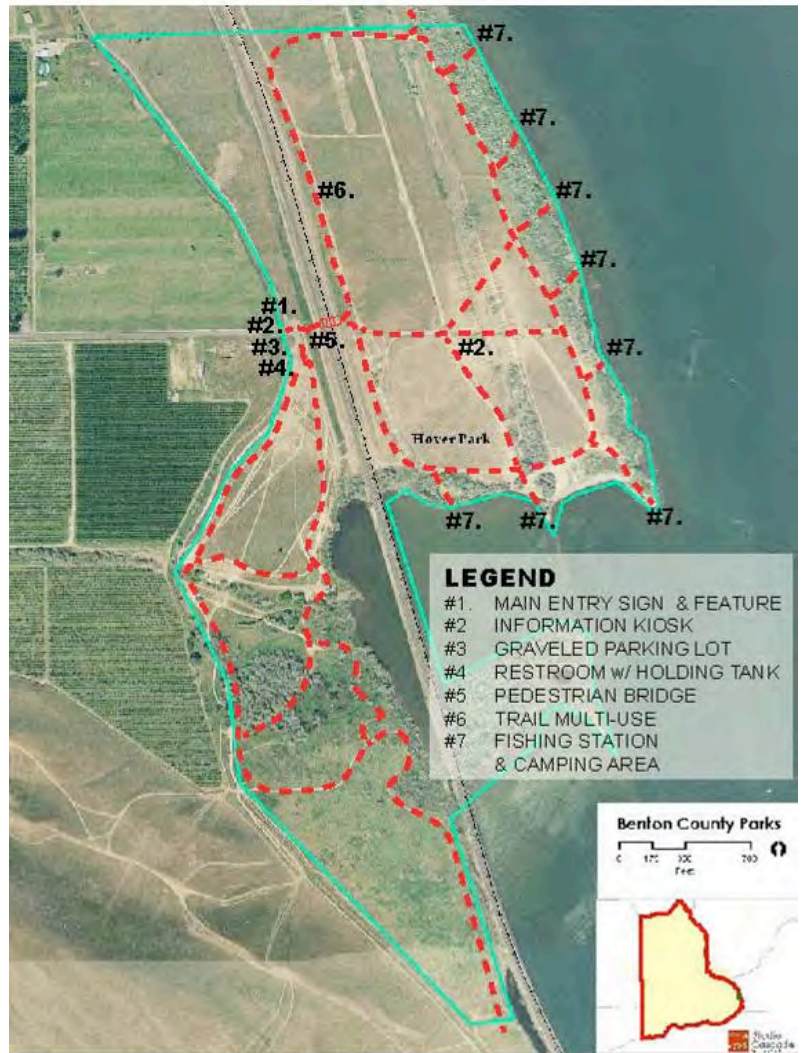


Figure 25 - Hover park has many opportunities for water sports but needs access.

- Control vehicle access into the site and parking options (Updated welcome sign and limited vehicle access)
- Railroad crossing options either on existing crossing north of property or with a new over pedestrian bridge



Figure 26 - The uncontrolled access to Hover Park is a gravel road without a railroad crossing to the main parkland

Rattlesnake Mountain Shooting Facility Improvements

Since the 2008 CPP, Benton County has purchased the property formerly owned by the Bureau of Land Management, has extended its land use agreement with the Washington Department of Fish and Wildlife, and has completed a master plan for the park in conjunction with its concessionaire partner, the Tri-Cities Shooting Association (TCSA). New projects at the site are primarily the responsibility of TCSA. The County may consider assisting financially, logistically, or otherwise on future projects on a case-by-case basis.

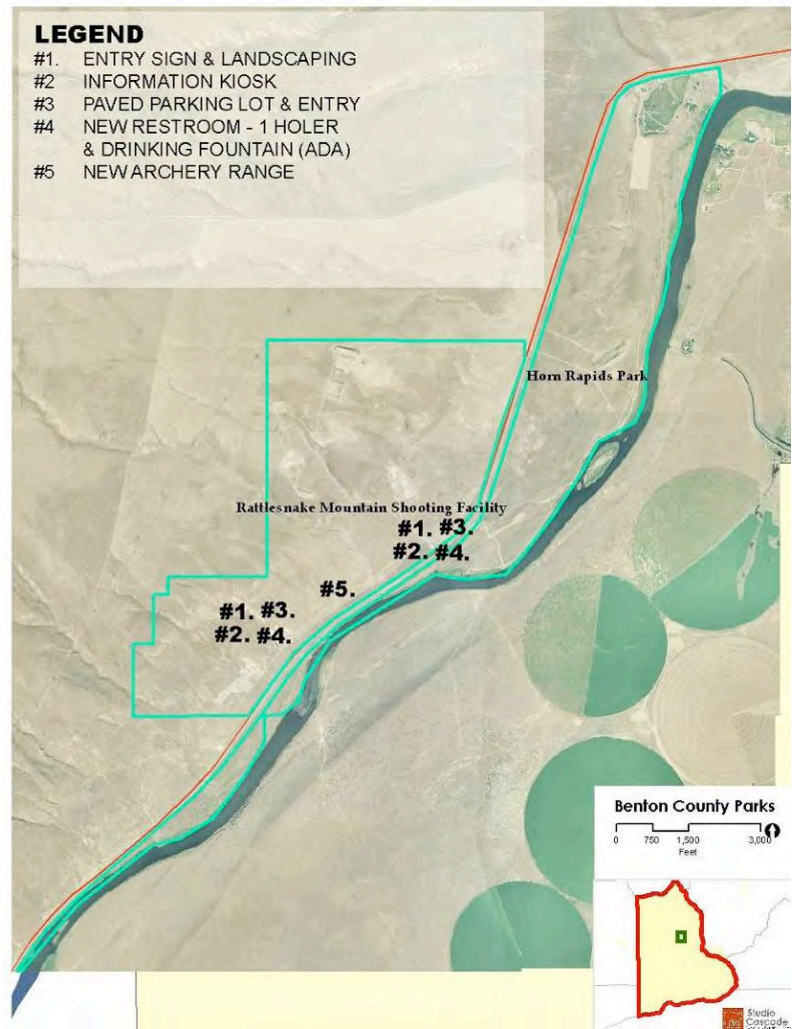


Figure 27 - Rattlesnake Shooting Facility is a subleased property with several proposed improvements and expansions

Two Rivers Park Improvements

Two Rivers Park has great opportunities for formal and passive recreation. The improved areas provide large expanses of grass for informal team sports, swimming, picnic areas, and boat launching. Unimproved areas provide for bird watching and relaxation and natural shoreline opportunities.

The disc golf course that was installed in the park in 2009 has generally been considered to be the last major improvement or use change in a park that is essentially matured and built-out. There are other smaller projects and renovations that have been proposed, however:

- Consider a native plants interpretive path through the detached quadrant on the south side of Finley Road.
- Update park and trail master plan.
- Boat Launch: address long-term strategy at the launch slips themselves, as well as restroom and parking situation.
- Boat Launch: remove old dock floats from park property.
- Consider group picnic shelters or large covered facility as part of master plan.
- Upgrade or replace restroom in main park area.
- Interpretation for trail system.
- Extension of Nature Trail out onto the rivershore of the Natural Area, including crossing of wetlands area likely in the form of a boardwalk.
- Consistent road signs.



Figure 28 - Two Rivers has many water focused areas with potential for a riverfront trail system in the natural area.



Figure 29 - Two Rivers has many recreation choices and flexible spaces

- Assess and redevelop Playground.

Vista Park Improvements

This neighborhood park is an urban area that does not fit easily into the vision of the County’s park system. The County has had discussions with the City of Kennewick about possibly transferring the property. The City has expressed willingness in taking over the park if and when the area is annexed. In the meantime, any improvements or modifications should be done in collaboration with the City. The following improvements are considered:

- Remove existing outdated play structures.
- Install new playground equipment with modern cushion and edging.
- Update and repair irrigation.
- Update retaining wall on the south side of the park.



Figure 31 - The bank between the parking areas and Vista Park is hard to traverse

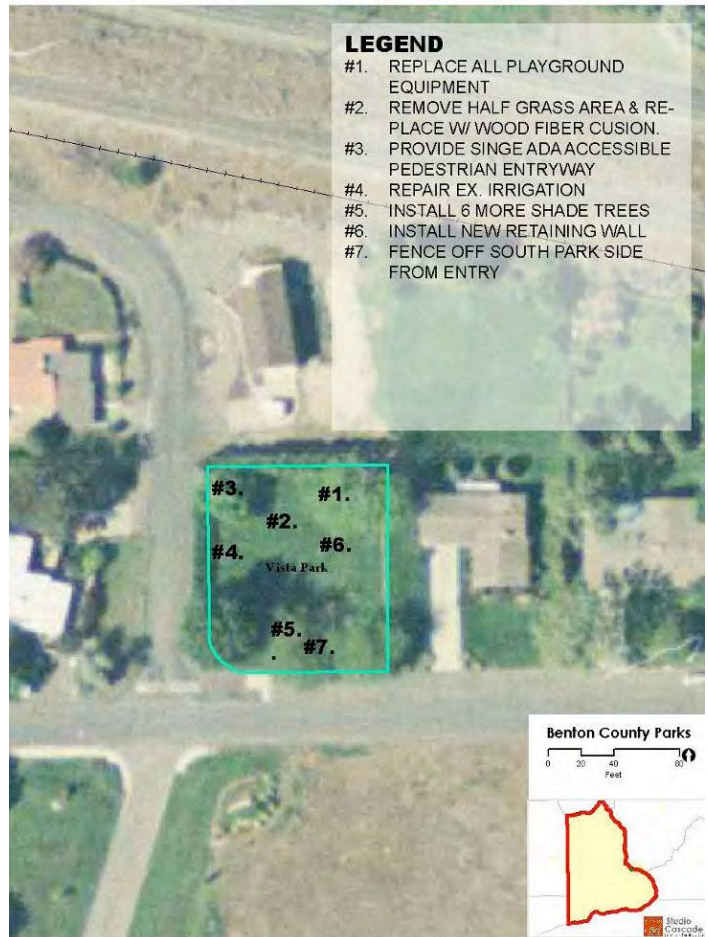


Figure 30 - Vista Park is Benton County's only small neighborhood park.

Wallula Gap Preserve Improvements

This Preserve is located in a very difficult area of the county to access. The site is primarily an aesthetic and view property from the Columbia River corridor. There is a large section of private land adjoining the properties, separating it from other accessible public lands.

- The County should continue to look at ways to access the properties through easements or other options.



Figure 32 - Wallula Gap is not accessible so any improvements would depend on gaining access through neighboring property

System-wide

Through the public process, the community has expressed an interest in some system-wide improvements. There are opportunities to better communicate the County's park-related activities to the public and for expanding park and recreation opportunities in certain parts of the County. Suggestions included:

- Improved information distribution by providing kiosks at key park access points, publishing a brochure, and utilizing the website.
- A user-friendly capital improvements summary document that showcases improvements to the park system as they are completed.
- A formal trail connection between Columbia Park (the Sacajawea Heritage Trail in Kennewick) and Two Rivers Park, at a minimum, and possibly on to Hover Park. This has been a back-burner project in Benton County's Capital Facilities Plan for several years, a project formerly known as the "Interlock".
- Support for a County-sponsored community-type park in Plymouth.

Community-wide

The process also produced ideas from the community in a number of larger, regional-scale projects that may or may not be led-by or directly involve Benton County. There may be opportunities for multiple jurisdictions to collaborate on concepts such as:

- A "Rattlesnake Ridge Trail", connecting Badger Mountain Centennial Preserve with Red Mountain via Candy Mountain.

- A “Rattlesnake Mountain Trail” connecting Horn Rapids Park to the Vernita area via the crest of Rattlesnake Mountain and through the Hanford Reach National Monument.
- A “Horse Heaven Rim Trail” along the crest of the Horse Heaven Hills.
- A trail connection between Prosser and Benton City/Red Mountain via the Yakima River corridor.
- Preservation of lands on and around Candy Mountain as a preserve in the same fashion as Badger Mountain has already been preserved, either by the County or by some other appropriate entity.
- Protections of important habitat and recreational lands either through acquisition or easement in the Jackrabbit Ridge area near Richland and areas south and east of Horn Rapids Park.
- Creation of better access point(s) along the Yakima River below Benton City for non-motorized use (floaters, kayakers, etc), particularly in the Twin Bridges area.

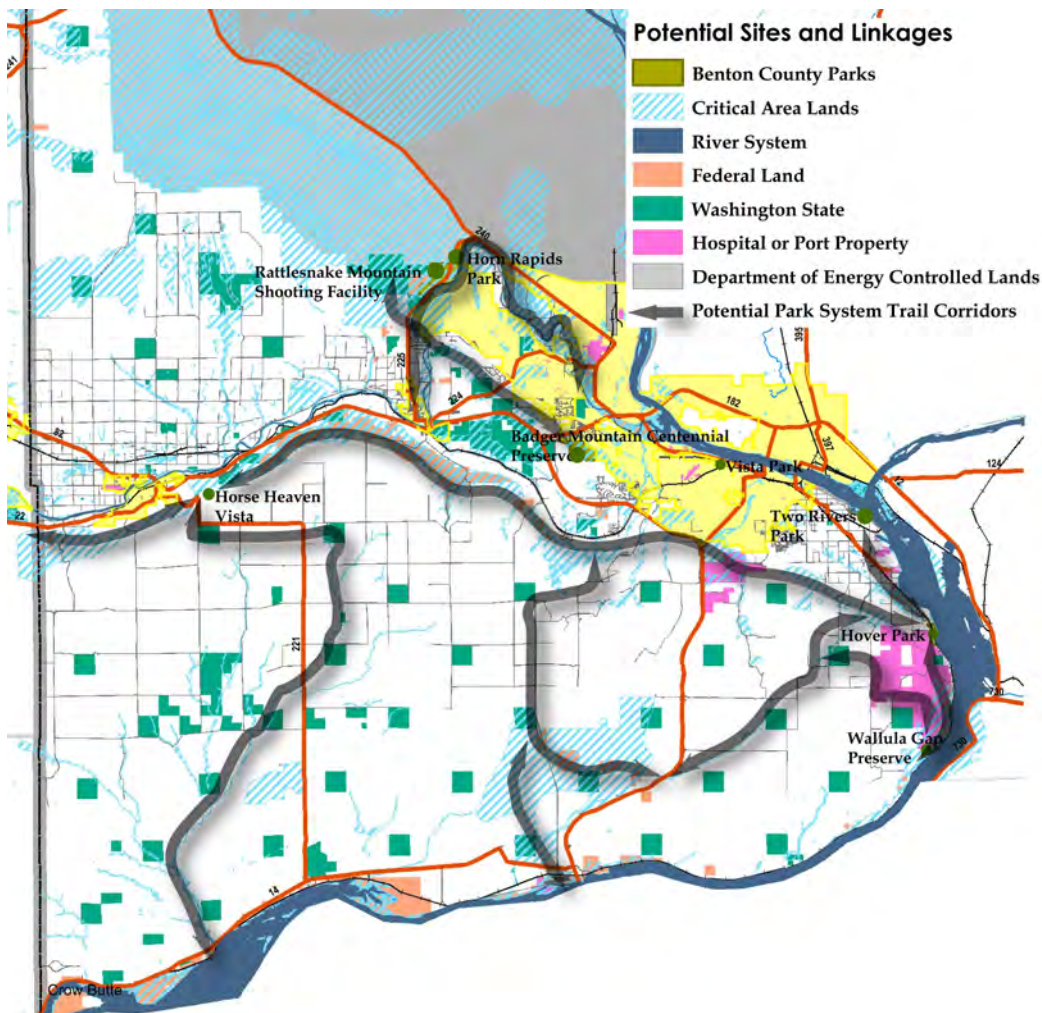


Figure 33 - Identifying potential properties and links with a trail system would allow user access to the entire system

Goals and Policies

The framework for making the vision a reality involves the development of goals and policies. A goal is an end result of which policies are directed. A policy is the means and guidelines by which one will accomplish the goals.

The goals and policies reflect public input and ideas generated throughout the plan process. The policies are meant to ensure that decisions relating to parks represent the most current ideas regarding park facilities and services within the County.

Both residents and tourists benefit from the recreational opportunities and the natural amenities offered by Benton County and other parks providers within the region. Trails create the network to better connect the regional system and also offers corridors for recreational, commute, and wildlife travel. Open space preserves are an important component of the natural environment and supports the natural system, aesthetics, recreation and the economy. The system also provides transitions from the urban landscape of the Tri-Cities to the surrounding rural landscapes.

System and Access

Goal 1-Have a connected system of parks, trails and open space

Policies	
1.	Using a collaborative system-wide perspective, consider best routes and missing links between the county’s park facilities, urban park systems, rural communities and surrounding jurisdictions.
2.	Make trails multiple-use or compatible-use for walkers, runners, bikers, and equestrians for recreating and commuting.
3.	Limit access to natural areas through signage, vehicular barriers, education and enforcement.
4.	Identify and map the trail system.
5.	Approach specific owners to consider trail corridors along existing and proposed canal right of ways and for access to remote areas.
6.	Assist in the development of a Yakima and Columbia River water trail system with pullouts and stopping points within riverfront parks.
7.	Work with the Army Corps of Engineers and municipalities in expanding the levee trail network as part of the trail system.
8.	Identify property that would better connect the County park system and request access to and through those properties (i.e. Kennewick Public Hospital District).
9.	Work with jurisdictions and advocate to identify and create a regional trail system.

-
10. Continue to support the efforts of the Tapteal Greenway Association to complete the Tapteal Greenway Trail, five miles of which go through the Horn Rapids Park.
-
11. Update or create master plans for the larger parks within the system.
-
12. Evaluate access options for Wallula Gap.
-

Use and Expansion

Goal 2-Provide access and opportunities for a broad spectrum of recreational pursuits

Policies

1. Ensure that the park system remains affordable and available to all potential users.
-
2. Consider ADA design guidelines for access in all improvements, maintenance and acquisition to the extent possible.
-
3. Develop horse mounting platforms for individuals with physical limitations.
-
4. Maintain and expand water oriented opportunities for day-use, camping, fishing, and motorized and non-motorized boating.
-
5. Identify and preserve historic resources with interested partners.
-
6. Provide sufficient facilities for all residents and visitors without overuse using adopted levels of service.
-
7. Identify future sites that will provide diverse opportunities for recreation users and serve all areas of the county.
-
8. Plan for park system acquisitions and development in cooperation with regional and local entities.
-
9. Consider donations of property for the Badger Mountain Centennial Preserve.
-
10. Work with the City of Kennewick to develop a trail that connects Columbia Park to Two Rivers Park and on to Hover Park.
-
11. Consider water rights in the acquisition or development of future park land.
-

Ecology, Aesthetics, Education, and Health

Goal 3-Promote environmental stewardship

Policies	
1.	Identify and consider acquisition of natural open space preserves – such as Candy Mountain, for example – for current and future benefits.
2.	Coordinate efforts with other jurisdictions and organizations to protect ecological diversity and systems.
3.	Identify, protect, and include critical areas in the park system as natural preserves and corridors (examples include wetlands, shorelines, habitat as defined in state law).
4.	Consider identified wildlife corridors (Washington Department of Natural Resources) when looking at new property acquisition.
5.	Low-impact uses should have a priority in existing parks and new park designs but higher impact use areas should be accommodated as appropriate.
6.	Develop a fire and medical response plan as a part of each master plan. Develop fire control policies for the park system in cooperation with the fire districts considering impacts (fire lines, retardants, motorized vehicle use, heavy equipment, aircraft, medical response, and rehabilitation planning).
7.	Consider view corridors including ridgelines and peaks if a conservation easement program is developed
8.	Protect shoreline and water access points within the park system.
9.	Provide social spaces for gatherings (i.e. group picnic areas, plazas, and amphitheaters).
10.	Support partners who provide environmental and natural education programs in the parks.
11.	Educate the public on the benefits of protecting fragile ecosystems and critical areas through signage and publications.
12.	Consider dedicated sites and facilities for outdoor classrooms within the park system, where suitable, for interested group activities.
13.	Encourage frequent use of the park system for improved health, well-being and outdoor activity by hosting special events.

Management, Maintenance, and Funding

Goal 4-Maintain and improve park facilities

Policies

1. Determine accurate park boundaries and maintain that data for mapping and site planning, especially for Horn Rapids Park.

2. Create efficient park maintenance standards and programs that are sustainable over the long term.

3. Upgrade and standardize sites improvements for ease of maintenance.

4. Use consistent, quality building construction and low impact lighting in remodels and new building within the park system (i.e. green building, dark sky, water efficiency).

5. Use an Integrated Pesticide Management program to minimize, or eliminate where possible, pesticide application and use.

6. Use native species, where possible, in park plantings for lower maintenance and cost.

7. Develop criteria for prioritizing improvements for parks.

8. Pursue a variety of funding strategies including new revenue generating ideas for the acquisition, development and maintenance of the park system.

9. Update capital improvement plans annually.

10. Measure community needs and update the Comprehensive Parks Plan at least every six years.

11. Include ADA accessibility, where possible, when upgrading or renovating park components.

12. Continue to build volunteers into the parks program.

13. Continue to build on the "Partners in Parks".

14. Continue to build the relationship with the Sheriffs' Work Crew.

15. Improve and integrate a system to combat and reverse the spread of invasive and noxious weeds.

Goal 5-Support the department's needs and priorities

Policies

1. Promote and market the park system and raise awareness of available facilities using outreach (special events, user groups, area websites, public places, kiosks).

2. Create outreach materials, brochures, and maps promoting the parks and their benefits.

3. Develop and implement a consistent map, signage and wayfinding program for the park system with thematic interpretive signing.

4. Develop signage for water access points within the county.

5. Develop public involvement strategies for planning and development projects.

6. Provide leadership, management and expert advice on planning, design, acquisition and implementation of park and open space projects.

7. Continue to develop a good work environment for staff and volunteers.

8. Provide adequate staffing for maintenance, safety, and security and evaluate the organizational model for necessary changes.

9. Provide program training and development opportunities for staff to ensure best practices.

10. Develop a department policy manual in collaboration with the Park Board to address issues including but not limited to: parks and facilities naming standards, vehicle access and control standards, signage standards, construction and lighting standards, trail etiquette, use of domestic animals in the parks, and donation acceptance protocols.

11. Evaluate established partnerships for viability and identify areas needing improvement.

12. Coordinate parks planning with other agencies, jurisdictions, and user groups.

13. Assist the Rattlesnake Mountain Shooting Facility and the Miniature Aircraft Association in identifying improvements to their subleased areas. Master plan each facility.

14. Maintain and recruit volunteers for outreach, education, preservation, maintenance, trail improvements, and plantings programs.

15. Consider private partners for services, vending, amenities, and specific events.

16. Consider alternate funding options for the park system.

Implementation

There are many exciting ideas and projects in Benton County being developed and implemented by various groups. It became apparent during the park planning process that residents wanted many parks and recreation opportunities in the County. Some of these ideas focused on urban areas of the County while others focused on areas that are in the transition zone between the urban and rural landscape. Other project ideas specifically related to the rural county.

The County maintains the park system and also considers expansions on a case by case basis. These actions have created a strong regional parks system but have not created priorities or direction for decisions pertaining to the future park system. The vision sets a clear role to provide a connected system of parks through collaboration while protecting and providing access to Benton County’s natural areas.

Fiscal Portrait

In order to maintain and support a parks system for a growing population, funding is needed. This funding will make the implementation of Benton County’s parks plan a reality. Revenue can be obtained from a combination of taxes, licenses and permit fees, state and federal grants, user service charges, fines and forfeits, miscellaneous interest earnings and sales, and pass-through federal revenue sharing monies. Major funding sources for park and recreation facilities could include property taxes, general obligation bonds, real estate excise taxes, grants and pass-through monies, and park mitigation fees. Benton County has not relied much upon grant funding in recent years, but has been the recipient of substantial donations of cash, land, and volunteer labor.

Some funding options could be implemented by the County, while others would require partnerships. Some sources have specific application and qualification requirements that the County will need to meet prior to receiving available grants or loans.

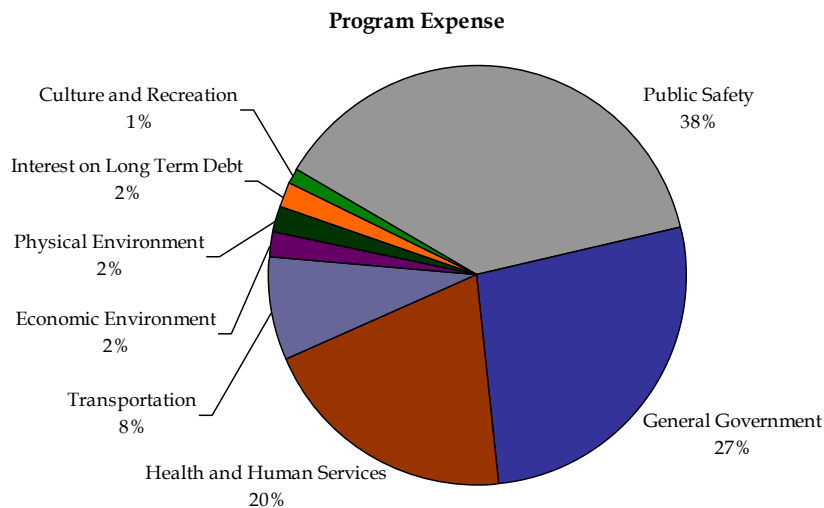


Figure 34 - Benton County spent less than 1% of funds on culture and recreation in 2006

Revenue

The services and programs within Benton County are supported through various revenue sources which are then placed into specific funds. The primary fund that revenue is placed in is the Current Expense Fund. This fund’s revenue is one-third from property tax, one-third from intergovernmental revenue, and one-seventh from sales tax. The Park Development Fund, which comes from the general fund, is used for capital improvements within the Benton County Park System which totals about one percent of the County’s spending per year.

The County had total expense revenues of \$113,560,428 in the 2013-2014 biennial budget and total expense expenditures of \$113,636,766. The total fund ending balance of \$76,338.

The Current Expense budget for the Park Department supports two full-time employees, a part-time director, and part-time office staff. The County does not have plans to expand the budget in the next 6 years for increased staffing.

Table 12 - Current expenses and planned expenses through 2018

Current Expense-Parks	2013-2014 Budget
Salaries & Wages	\$180,488
Benefits	75,900
Supplies	\$44,552
Other	\$77,770
Total	\$378,710

Summary of Capital Projects from Park Fund

	2013-2014		2015-2016		2017-2018	
Estimated Beginning Balance (Jan 1 st)	206,000	155,000	56,500	60,500	(26,500)	(274,000)
Revenue	20,000	20,000	20,000	20,000	20,000	20,000
CIP Projects	(71,000)	(118,500)	(16,000)	(107,000)	(276,500)	(157,000)
Other Expenditures	-	-	-	-	-	-
Estimated Ending Balance	155,000	56,500	60,500	(26,500)	(274,000)	(411,000)

Table 13: Park Development Fund 2008 Budget Breakdown

Account-Park Development	2013-2014 Budget Breakdown
Supplies	\$25,000
Other Services and Charges	\$62,400
Capital Outlay	\$275,000
Total	\$362,400

The path and trail fund accounts for the county’s share of the motor vehicle fuel tax distributed by the state and can be used for pedestrian, equestrian, and bicycle paths and trails. This fund may continue to decrease if fuel prices continue to rise.

Table 14 - Paths and Trails Fund

Paths/Trails Reserve			2011-2012	2013-2014
Beginning Balance			70,139	63,750
Revenues			100,889	93,881

The current staffing for the park system is enough to maintain the current system with support of many volunteer hours and a volunteer Park Board. Even with this small staff, the department was able to move beyond maintaining the status quo. The Park Department orchestrated the acquisition of the Badger Mountain Preserve property, and is now looking at adding another major preserve at nearby Candy Mountain. Many more options for improving the park system have been identified in this plan, in jurisdictional planning, and from partners; but the current staff level makes little time for any other projects or administrative capacity. This means that grant identification and applications, and other funding sources would have to be obtained through volunteer efforts or come from another department within the County unless the staffing budget was increased.

Debt

Benton County had bonded debt of \$37,400,000 as of December of 2006 which was an increase of approximately \$5,500,000 since 2005. There was a remaining capacity for non-voted debt (1.5 percent of assessed valuation) of approximately \$116,000,000. There is about \$100,000,000 more in voted debt capacity (2.5 percent of assessed valuation) for a total capacity of over \$200 million for voted and non-voted bonds. The best option for increasing funding for park acquisition and maintenance would be to consider the conservation futures program as detailed in the funding sources table below.

Funding Sources

The following is a list of potential funding sources.

Funding Sources
Capital Improvement Fund - Money allocated from the County’s General Fund to finance major capital projects.
Certificates of Participation - A lease-purchase approach in which the County sells Certificates of Participation (COPs) to a lending institution. The County then pays the loan off from revenue produced by the facility or from its general operating budget. The lending institution holds title to the property until the COPs are repaid. This procedure does not require a vote of the public.
Conservation Futures Levy - The County can levy, by resolution, up to \$.0625 per \$1,000 assessed valuation for the acquisition of open space land, farm and agricultural land, and timber land (RCW 84.34). This money may only be used for acquiring rights and interests (easements) in real property with a portion used for maintenance. As of the summer of 2014, the County is examining this option very closely and has been working with citizen advocates and the Trust for Public Land on a possible Conservation Futures strategy.
Fee in Lieu of Parks and Open Space - A voluntary option for developers (RCW 82.02.020)
General Fund --General funds allocated to the Park and Recreation Budget.

General Obligation Bond - Property tax for the sale of construction bonds.

- ❑ Unlimited - The tax assessment can be levied up to 30 years with a bound counsel hired. Requires a 60% majority approval of 40% of the voters who voted at the last election.
- ❑ Limited Tax (Councilmanic) Bonds - Bonds that can be issued by the County Commissioners. Does not require a vote of the people but must be paid out of the annual operating budget.

Park Impact Fees - The County does not currently have impact fees for open space and parks. The fees could be imposed on new development based on a set share of the impact but can not be used for maintenance and must be for projects in the capital facilities plan and has restrictions as identified in the Growth Management Act. RCW 82.02.050

Park and Recreation Districts or Service Areas - With citizen interest, the County could explore the possibility of creating Parks and Recreation Districts/Service Areas for park needs. Districts are independently managed and could meet some of the need for facilities in defined areas. RCW 36.69 and 36.68. Citizens have raised the specter of a possible Tri-Cities area "metropolitan park district" on multiple occasions over the years.

Park Revenue - Revenue from park operations used to pay for capital improvements.

Payment in Lieu of Tax - Federal government payments substitute for property taxes on the land base of federal land managing agencies (e.g., Bureau of Land Management, Army Corps of Engineers, U.S. Fish and Wildlife Service).

Real Estate Excise Tax (REET) RCW 82.46--Levied on all real estate sales measured by the full selling price, including the amount of any liens, mortgages, and other debts given to secure the purchase.

- ❑ First 0.25 percent projects identified in the capital facilities element and housing relocation assistance which would include parks improvements. RCW 82.46.010
- ❑ Second 0.25 percent REET 2 - An additional excise tax on each sale of real property at a rate not exceeding 0.25 percent of the selling price restricted to projects in a capital facilities plan and could be used for "planning, construction, reconstruction, repair, rehabilitation, or improvements to parks" (requires an ordinance and approval of the voters). RCW 82.46.035(2)
- ❑ 0.50 Percent Affordable Housing REET *in lieu* of Optional Sales Tax - the County can not use this option because of timing and it also does not apply to parks unincorporated areas. RCW 82.46.075
- ❑ 1.0 percent Conservation Area REET-The County may submit a ballot proposition to the voters for an added REET on each sale of real property at a rate not to exceed 1 percent of the selling price for acquisition and maintenance of Conservation Areas. RCW 82.46.070

Revenue Bonds- Revenue from the operation of the facility pays for the capital cost and debt service. Does not require a vote of people unless required by local ordinance.

Special Levy - A property tax for construction and/or operation levied for a set number of years. It is usually short term, 1-3 years. A special levy requires a 60% voter approval.

Another source for funding comes through grants. The best funding source is through Washington State (Recreation and Conservation Office). The County has not utilized a grant through the state since the development of Horn Rapids Park in 1998, but as of the summer of 2014 is applying for an RCO grant to assist with the purchase of available private properties on Candy Mountain that would be used to create a new preserve. The State offers several programs that would fit with improvements and acquisitions the County is interested in pursuing.

State Recreation and Conservation Funding Board Grants

Aquatic Land Enhancement Fund (ALEA) - This program, funded by the State Department of Natural

Resources, can finance acquisition, restoration, or improvement of aquatic lands for public purposes, and to provide interpretation and access to those lands and waters with 50 percent in matching resources required.

Boating Facilities Program (BFP) - Grants to acquire, develop, and renovate boating facilities like boat ramps, guest moorage, and support facilities

Boating Infrastructure Grant (BIG) - Grants to help with guest boating facilities for 26 feet and larger boats (25 percent match).

Firearm and Archery Range Recreation (FARR) - Aiming at acquiring, developing, and renovating firearm ranges and archery training and practice facilities with a 33-50 percent match required.

Land and Water Conservation Fund (LWCF) - Grants to buy land and develop outdoor facilities for parks, trails, and wildlife lands. Grants require a 50percent match

National Recreational Trails Program (NRTP) - Federal funding through the RFCB to maintain backcountry trails and facilities with a required 20 percent match. Examples of eligible projects include maintenance and rerouting of trails, trailside and trailhead facilities, environmental education, and trail safety programs.

Nonhighway and Off-Road Vehicle Activities (NOVA) - To develop and manage opportunities for backcountry trails and non-highway roads, grants can be used for planning, capital improvements, maintenance, operation, land acquisition, education, and law enforcement.

Washington Wildlife and Recreation Program (WWRP) - Acquisition and development parks, water access, trails. Funding is also available for critical wildlife habitat, natural areas, urban wildlife habitat, farmland preservation and protection of riparian areas, with at least a 50 percent match.

Youth Athletic Facilities (YAF) - Grants to acquire, develop, maintain, and improve youth and community athletic facilities with a 50 percent match required.

The last option for funding is actually not monetary in nature. Benton County currently has strong working relationships with volunteer groups and partners. This teamwork could be promoted as an option for many types of improvements within the system. The following are some options for non-monetary choices for development including:

Non-Monetary Options

Density Bonus and Clustering - Consider density bonuses for open space and critical areas preservation or affordable housing. Clustering could focus on conserving resource lands and promoting larger open space areas consistent with rural character.

Dedication Requirement - A typical requirement of subdivisions.

Development Agreements - SEPA mitigation agreements including deferral of improvements or future dedication of land not subject to the five-year limitation in RCW 82.02.020.

Conservation Easements - a legal agreement between a landowner and a land trust or government agency that permanently limits uses of the land in order to protect its conservation values. Conservation easements can use a purchase or transfer of development rights program or donations.

Current Use Assessment - The Washington Open Space Taxation Act allows property owners to have their open space, farm and agricultural, and timber lands valued at their current use helping to preserve private land in open space, farm and timber use. RCW 84.34

Partnerships - Cooperative partnerships with agencies and citizen groups could be pursued by the county. The state and federal governments including the state Department of Natural Resources (DNR). DNR seeks better managed land through consolidation of land holdings using trades or sales. The

county should continue to work with DNR and other state and federal agencies to identify opportunities to meet county open space needs.

Purchase of Development Rights -A process where the development rights of a specific parcel of desired open space land is purchased. A funding source, such as a bond, would need to be identified for a purchase of development rights program.

Transfer of Development Rights - A process where development rights of a specified parcel is transferred to a second parcel of land more suitable for development. The second parcel is then permitted a higher level of development. If the two parcels are owned by two different landowners, the increased value of the second parcel is given to the owner of the first parcel.

Volunteer Efforts - Strengthening volunteer efforts could help with contributions of cash, materials or labor. Playgrounds, community gardens, and farmers markets have been developed through volunteer efforts. Adopt-A-Trail and Adopt-A-Greenway programs are examples of volunteer programs successfully implemented in other areas. Volunteer hours can also count toward in-kind funding for some grants and funding applications.

Prioritizing Criteria

Overarching criteria are based on input during meetings, stakeholder interviews, questionnaire responses, and other input received during the completion of projects since the 2008 Plan. Priorities also considered trends of users within the park system.

Through questionnaire responses, the most important focus areas for new projects include in order of importance:

1. Trails for pedestrian, bicycle and equestrian use
2. Preserves
3. Waterfront parks
4. Overnight camping

This list provides general preference for types of projects to develop in the park system. Specific projects should then be evaluated using the following criteria. This set of criteria was also derived from questionnaire responses and responses obtained during the meetings. The individual projects can then be placed in the capital improvement program with relative priority determining the timeframe for implementation.

General Priorities for Project Funding		Weight
Safety - project will create a safer environment for users on an appropriate site		4
Collaboration - project involves the community and has partners in developing and maintaining the site		4
Quality - project is viable, well-designed, and enhances or protects the environment long-term		3
Access -project provides better or new public access incorporated into the surroundings		3
Affordability - project will squeeze the most value and provide opportunity for all users		3
Multi-Use - project serve more than one function with an educational component included		2
Funding - project is timely and has funding from sources such as grants or other resources		2

Seasonality – project will create opportunities for programs throughout the year

1

Project Scoring Guide: <i>Projects are scored from 0 to 5 with 0 not meeting criterion and five exceeding criterion.</i>	Safety	Collaboration	Quality	Access	Affordability	Multi-Use	Funding	Seasonality	Raw Score	Weighted Score	Priority
Relative Importance (Weight)	4	4	3	3	3	2	2	1			
Badger Mountain Master Planning and Improvements	4	5	4	4	4	4	2	3	30	64	1
Horn Rapids Master Plan Update and Improvements	3	5	4	4	4	4	3	4	31	63	1
Hover Park Controlled Access	5	2	5	2	3	2	5	1	25	51	3
Hover Park Master Plan and Improvements	4	2	4	4	4	4	5	1	28	56	2
Rattlesnake Shooting Range Expansion	5	4	1	1	3	2	5	3	24	49	3
Two-Rivers Park and Trail design	3	2	3	4	5	4	5	3	29	55	2
Vista Park Improvement	4	2	1	1	2	1	1	1	13	30	3
Columbia River Trail (Kennewick, Two-Rivers Park, Hover Park)	1	3	4	4	4	3	2	3	24	47	3

20-Year Capital Improvement Program

Biennium	Project	Funding	Category	Facility	Cost
2015-16	Establishment of Candy Mountain Preserve	D, M	A	OS, TP, TB, I, EQ	\$1,500,000
2015-16	Two Rivers Park Nature Trail Boardwalk	L	D	WF, P, F, I, SB, B	\$75,000
2017-18	Horn Rapids Park Compound Expansion	L	D	WF, OS, TP, TB, EQ, F	\$75,000
2017-18	Vista Park Remodel	L	R	PE	\$50,000
2019-20	Two Rivers Park Playground Remodel	L	R	WF, P, F, I, SB, B	\$80,000

2019-20	Two Rivers Park Restroom Replacement	L	R	WF, P, F, I, SB, B	\$200,000
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*Category Acquisition, Renovation, Development, Restoration

**Funding: Local, General Obligation Bond, Unknown, Donation, Revenue Bonds, Matching Grant, Other Bonds

The CIP includes all facility types that apply for each project with the primary use listed first. Facility types specify what funding options can be considered use the following categories:

Facility Type	Symbol	Facility Type	Symbol
Aquarium	A	Open Space, Greenway	OS
Administration, Maintenance	AM	ORV Facility, Trail	ORV
Boating Facilities	B	Picnic, Day Use	P
Basketball, Other Courts	BB	Play Equipment	PE
Botanical Garden	BG	Open Play Field	PF
Baseball, Softball Fields	BS	Swimming Beach	SB
Camping Facility	C	Swimming, Indoor Pool	SI
Community, Senior Center	CC	Swimming, Outdoor	SO
Equestrian Facility/Trail	EQ	Tennis Court	T
Fishing Area	F	Trail, Bicycle	TB
Football/Soccer Fields	FS	Trail, Pedestrian	TP
Golf Course	G	Winter Sports Facility	W
Interpretive/Nature Study	I	Waterfront/Beach Access	WF
Neighborhood Park	NPK	Zoo	Z

Appendices

Appendix A - Recommended Department Policies and Development Criteria

Appendix B - Cost Estimates for Park Improvements

Appendix C - 2007-2008 Parks Questionnaire and previous Park Surveys

Appendix D - Comments



The Burrowing Owl (Athene cunicularia), with its laser-focused gaze and peculiar habits, is an iconic summer visitor to the Columbia Basin and an unofficial mascot of Benton County Parks. The Parks System's missions of recreation, conservation, and education are represented and facilitated by the Burrowing Owl. Habitat restoration projects, such as those targeting these charismatic birds, promote wildlife tourism, volunteer participation, and inter-agency cooperation in our community (photo: Don Baccus, <http://donb.furfly.net>).

Appendix J
Capital Improvement Plan, 2017 – 2022

CAPITAL IMPROVEMENT PLAN 2017-2022

Benton County

PO Box 190
620 Market Street
Prosser, WA 99350
(509) 786-5600
www.co.benton.wa.us





CAPITAL IMPROVEMENT PLAN NAVIGATION TIPS

There are a number of ways to navigate through the Capital Improvement Plan. Listed below are the two easiest options:

1. The **Table of Contents** contains links to all sections of the book. To go directly to the section you would like to see, simply click on the section name or page number directly in the table of contents.

If at any time you would like to return to the table of contents, click on **Return to TOC** located at the bottom of each page and it will take you back to the CIP table of contents.

2. Click on **Bookmarks** tab to the left of the window to view all of the bookmarked pages; the format is similar to the table of contents. To expand a subsection, click the "+". To go to a section you would like to see, simply click on the section name.
3. At the bottom of the window the "◀" and "▶" buttons take you back and forward one page at a time. The "◀" and "▶" take you to the first and last page of the document, respectively.



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RESOLUTION 2016 855

BEFORE THE BOARD OF COMMISSIONERS OF BENTON COUNTY, WASHINGTON:
IN THE MATTER OF ADOPTING THE 2017-2022 BENTON COUNTY CAPITAL IMPROVEMENT PLAN.

WHEREAS, the Board of County Commissioners desires to update the Benton County Capital Improvement Plan in conjunction with the biennial Benton County Budget; and

WHEREAS, the Capital Improvement Plan is a planning document to be used in setting policy and establishing priorities for capital projects; and

WHEREAS, the 2017-2022 Capital Improvement Plan shall be adopted as part of the County's budget process and will be amended into the Capital Facilities Element of the Benton County Comprehensive Plan as allowed under RCW 36.70A.130(2)(a)iv; **NOW, THEREFORE,**

BE IT RESOLVED, that the Board of Benton County Commissioners hereby adopts the attached 2017-2022 Benton County Capital Improvement Plan.

Dated this 1 day of Nov., 2016



Chairman of the Board



Chairman Pro Tem



Member

Constituting the Board of County
Commissioners of Benton County,
Washington

Attest: 
Clerk of the Board

P. Schut



BOARD OF BENTON COUNTY COMMISSIONERS



[District 1 Benton County Commissioner Jerome Delvin](#) is serving his first term as commissioner from the 1st District, which includes Richland and West Richland in Benton County. He previously served two and one-half terms in the state Senate and five terms in the state House of Representatives. He was a former military policeman and officer in the Hanford Patrol. [See more...](#)



[District 2 Benton County Commissioner Shon R. Small](#) was elected to start his first term on January 1, 2011. Commissioner Small attended Walla Walla Community College and majored in Criminal Justice, preparing him for a future career as a Police Officer. He served Benton County for 22 years during his career in Law Enforcement with 20 of those years working for the Benton County Sheriff's Office. [See more...](#)



[District 3 Benton County Commissioner James R. Beaver](#) was elected to start his first term on January 1, 2009. Commissioner Beaver earned his degree in Economics from Washington State University. He joins the County bringing 18 years of government experience with him. In 1990, he was elected to the Kennewick City Council and was appointed by the Council to serve as Mayor from 1996 to 2008 making him the longest consecutive mayor in over 100 years. [See more...](#)



BENTON COUNTY DEPARTMENTS

The departments listed below pertain to the projects that are listed in the Capital Improvement Plan and do not include all Benton County departments. Each department listed below was involved in preparing their section of this document. Click on the department name for additional information regarding the services they provide.

[Benton County Commissioners Office](#)

The County Commissioners adopt ordinances, resolutions, motions, levy taxes, appropriate revenue, and adopt the final budget for the County. The legislative body generally confirms appointments to County boards and commissions. The County Commissioners generally appoint the members of the boundary review board and planning commission in counties that have created this board and commission. The County Commissioners can also sit as the board of equalization (the County board of property tax appeals) to review disputed assessments.

Mission

The Commissioners' department is accessible to its constituents, with responsible elected officials who offer a broad, balanced prospective and services to the community.

[Benton County Corrections Department](#)

The Benton County Sheriff's Office Bureau of Corrections provides incarceration and alternative program services to all law enforcement jurisdictions within Benton County. In addition, the jail provides contract services to other agencies throughout the State. The Benton County jail provides local user agencies several alternative programs to meet community needs; an electronic home monitoring program (EHM), work release program and work crew program. The operation of the alternative programs save user agencies several hundreds of thousands of dollars each year, based on the cost of full incarceration.

Mission

The mission of the Benton County Sheriff's Office is to consistently earn the public's trust and contribute to safety and security in our community by providing the highest quality law enforcement, corrections and support services possible within the resources entrusted to us. We achieve our mission through investing in available resources in highly-motivated, professionally trained, ethical team members who are committed to working in partnership with the community, steadily improving interagency cooperation, and exhibiting the highest degree of personal and professional integrity.



Benton County District Court

Benton County's five full time judges process Sheriff, State Patrol, Cities of Benton City, Kennewick, Prosser, Richland, and West Richland misdemeanors and infractions as well as small claims and civil suits involving amounts under \$50,000. District Court also handles traffic citations, name changes and protection orders.

Mission

To provide fair and equal access to our Court for all members of the public. To resolve civil and criminal cases while maintaining the respect and dignity of the individuals.

Benton County Facilities Department

The Facilities Department is responsible for the physical environment of all Benton County Facilities. The facilities include a 700-bed jail in Kennewick, the Courthouse at the County Seat in Prosser, the Kennewick Justice Center, the Health District Building in Kennewick, the Kennewick Annex on Canal Blvd., Benton County Animal Control Facility, and other smaller satellite offices. This department also acts as the construction contracting office for Benton County administrative services.

Mission

It is the mission of the Benton County Facilities Department to provide a safe, secure, productive, and comfortable work area for Benton County employees and the users of Benton County Facilities.

Benton County Fairgrounds

The Benton County Fairgrounds is a multipurpose, county owned facility which is perfect for meetings, trade shows, livestock events, RV rallies, concerts, sporting events, day camps and weddings. The location and layout of the Benton County Fairgrounds offers an affordable choice for almost any type of event. It is handicap accessible, fully fenced and can be accessed by three major street entrances with parking for over 2000 vehicles. The employees are well trained and help guide event holders through all phases of an event.

Mission

The mission of the Benton County Fairgrounds is to make it our challenge to meet your every event need; priding ourselves on uncompromising services.



[Benton County Information Technology](#)

Information Technology is an internal services department that provides information technology and telecommunications support for Benton County departments. Information Technology also processes outgoing mail for departments in Prosser.

Mission

The mission for Benton County Information Technology is to improve the stability, functionality and performance of the Benton County information technology environment and support all departments in using information technology to meet their goals and objectives.

[Benton County Parks Department](#)

Benton County supports a small parks system to provide recreational and educational venues for the health, enjoyment, and enrichment of the community. The Park Department works for the County Commissioners at the advisement of the Benton County Park Board, and oversees eight separate park properties within the County. Benton County maintains park facilities only, and conducts no recreational programming.

Mission

To provide safe and meaningful educational and recreational experiences for both our residents and visiting public that showcases the natural resources and landscapes of Benton County.

[Benton County Public Works Department](#)

Benton County, Washington has a total area of 1,760 square miles. The Hanford Site, under Federal control encompasses 586 square miles. Fifty-seven square miles of the County is covered with water. Benton County Public Works is staffed with engineers, survey, construction and solid waste specialists, road maintenance crews and professional support staff responsible for the planning, engineering, design, construction, operation and maintenance of approximately 850 miles of County roads (600 miles paved and 250 miles gravel) and 80 bridges within the 1,174 square land miles not under Federal control.

Mission

Provide solution-oriented, cost effective, quality public works services and a safe, efficient county road system in accordance with applicable laws, resolutions, and regulations.

Introduction



INTRODUCTION
to this Capital Improvement Plan (CIP), which is a multiyear plan, will provide information on the plan and programmed approach to utilizing the County's



INTRODUCTION

What are Capital Improvements?

The Capital Improvement Plan (CIP) is a six-year roadmap for creating, maintaining and paying for Benton County's present and future infrastructure needs. The CIP outlines project costs, funding sources and estimated future operating costs associated with each capital improvement. The plan is designed to ensure that capital improvements will be made when and where they are needed, and that the County will have the funds to pay for and maintain them.

Capital improvement projects are non-routine capital expenditures requiring a significant amount of money usually consisting of the purchase of equipment, acquisition of land, design and construction of new assets, or the renovation, rehabilitation or expansion of existing capital assets. Capital projects usually have an expected useful life of at least five years.

Capital improvements make up the bricks and mortar, or infrastructure that all Counties must have in place to provide essential services to current residents and support new growth and development. They also are designed to prevent the deterioration of the County's existing infrastructure, and respond to and anticipate the future growth of the County. A wide range of projects comprise capital improvements as illustrated by the examples below:

- court facilities and office buildings;
- parks, trails open space, and other related facilities;
- roads, bridges, traffic signals and other traffic control devices including fiber optic infrastructure needed for the operation of intelligent transportation systems;
- landscape beautification projects;
- computer software and hardware systems other than personal computers and printers;
- flood control drainage channels, storm drains and retention basins;
- major equipment purchases.



Growing Counties such as Benton County face a special set of complex problems. These Counties need to build new roads, add public amenities such as parks and expand public safety services to maintain, replace, rehabilitate and/or upgrade existing capital assets such as roads, parks, and buildings.

Benton County has kept pace with the rapid growth through many new public assets. Benton County also has completed many capital projects that involved renovating, rehabilitating or expanding existing infrastructure or buildings. Notable projects completed since 2009 include the following:

- 2016 Metasys System*
- 2016 Property Tax and Assessment System*
- 2016 Kennewick Annex & Juvenile Justice Center Parking Lot Reconfiguration*
- 2016 Jail West Wing Shower Stalls Remodel*
- 2016 Fairgrounds Building 16 HVAC*
- 2016 Inmate Management Hardware and Operating System*
- 2016 Vista Park Overhaul
- 2016 Tyrell Road- Phase I*
- 2016 Sellards Road- Phase I*
- 2016 Nine Canyon Road- Phase II*
- 2015 Nine Canyon Road- Phase I
- 2015 Fairgrounds Irrigation Infrastructure
- 2015 Network Firewall, Load Balancing, Break Fix Monitoring
- 2015 Kennewick Road Maintenance Shop
- 2015 Benton County Courthouse Renovation
- 2015 Benton County Courthouse HVAC Replacement
- 2014 Justice Center Carpet
- 2014 Courtroom Sound System Upgrades (Courtroom A, D, 5, 6, and Prosser)
- 2014 Benton County Fairground's Bathroom
- 2014 Benton County Courthouse Shuffle
- 2014 Video Conferencing System
- 2014 Voice Network Upgrade
- 2013 Port of Benton (Walter Clore Center)
- 2013 District Court Remodel



Completed Projects Continued

- 2013 Travis Road (Seller Road to Henson Road)
- 2013 Benton County Clerk Remodel
- 2012 Jail Kitchen Dishwasher
- 2012 OPTO22 Control System
- 2012 Storage Area Network (SAN) Expansion
- 2012 Voice System Transition
- 2012 Network Switches
- 2011 Benton County Health District Tenant Improvement – for Human Services
- 2011 Benton County Animal Control Facility
- 2010 Fairgrounds Mainline Replacement
- 2010 Wiser Parkway
- 2009 Remodel Master Control at Benton County Jail
- 2009 800 MHZ – Benton County Emergency Services
- 2009 Justice Center District Court Remodel

* Scheduled to be completed by the end 2016

Paying for Capital Improvements

In many respects, the County planning process for selecting, scheduling and financing capital improvements parallels the way an individual might plan for buying a new house or car. This process entails an assessment of many valid competing needs, a determination of priorities, an evaluation of costs and financing options and an establishment of realistic completion timeframes.



Guidelines and Policies Used in Developing the CIP

The Benton County Commissioners' strategic goals and key objectives and the County's financial policies provide the broad parameters for development of the annual capital plan. Additional considerations include the following:

- Does a project support the County Commissioners' strategic goals?
- Does a project qualify as a capital project as defined in the County Budget Policy and have an expected useful life of at least five years?
- Does a project satisfactorily address all federal, state and county legal and financial requirements?
- Does a project support the County's favorable investment ratings and financial integrity?
- Does a project support the County's goal of ensuring all geographic areas of the County have comparable quality in the types of services that are defined in the Capital Improvement Plan?
- Does a project prevent the deterioration of the County's existing infrastructure, and respond to and anticipate future growth in the County?
- Does a project encourage and sustain quality economic development?
- Is a project responsive to the needs of residents and businesses within the constraints of reasonable taxes and fees?
- Does a project leverage funds provided by other units of government where appropriate?

Master plans also help determine which projects should be included in the CIP and the timeframes in which the projects should be completed. For example, the County's master plan for its parks system, called the "Parks Comprehensive Plan", was completed in 2009. Through a public process, the Parks Comprehensive Plan inventoried the community's existing recreational assets and forecasted future demand; then looked at what additions or improvements could be made to existing park lands to meet those needs, and what opportunities may exist for the addition of new park lands to the system.

Economic forecasts also are a critical source of information and guidance throughout the capital planning process. The forecasts assess external factors such as whether the local economy is growing or contracting, population growth, inflation for construction materials, the value of land, and other variables that may affect the County's ability to finance needed services and capital projects.



Benton County's Biennial CIP Development Process

In conjunction with the biennial budgeting process, the Commissioners Office coordinates the countywide process of revising and updating the County's capital plan. County staff members from all departments participate in the extensive review of projects in the existing plan and the identification of new projects for inclusion in the CIP. The County Commissioners' commitment to the needs and desires of Benton County citizens is a critical factor considered during the capital planning process, as well as compliance with legal limits and financial resources.

The Commissioners appropriate the first two years of the plan. The remaining four years are for planning purposes and funding is not guaranteed to occur in the year planned. County Commissioners make the final decision about whether and when to fund a project.

Once projects are selected for inclusion in the capital plan, decisions must be made about which projects should be recommended for inclusion in the first two years of the plan. Determining how and when to schedule projects is a complicated process. It must take into account the County Commissioners' strategic goals as well as all of the variables that affect the County's ability to generate the funds to pay for these projects without jeopardizing its ability to provide routine, ongoing services and one-time or emergency services when needed.

Prior to County Commissioners' consideration of the proposed CIP, the capital projects are reviewed and evaluated to ensure there is a revenue source for all of the estimated expenditures. In recent years, some of the capital project revenue sources have been obligated to pay down outstanding debt issuance therefore in-depth discussions assist the County Commissioners in making the best current and future business decisions.

The County Commissioners review the recommended CIP during a special scheduled workshop. Commissioners also consider the recommendations of staff before making the final decision about which projects should be included in which years of the CIP.



IMPACT OF THE CIP ON THE OPERATING BUDGET

Benton County's operating budget is directly affected by the CIP. Almost every new capital improvement entails ongoing expenses for routine operation, repair and maintenance upon completion or acquisition. Also, many new capital facilities require the addition of new positions. Existing County facilities and equipment that were once considered state-of-the art will require rehabilitation, renovation or upgrades to accommodate new uses and/or address safety and structural improvements. Older facilities usually involve higher maintenance and repair costs as well. Pay-as-you-go capital projects, grant-matching funds and lease/purchase capital expenses also come directly from the operating budget.

The costs of future operations and maintenance for new CIP projects are estimated based on the current cost of similar buildings and/or departments. Various departments have experts on different types of operating costs are consulted in order to provide the most accurate estimates. Operating costs are carefully considered in deciding which projects move forward in the CIP because it is not possible for the County to fund concurrently several large-scale projects that have significant operating budget impacts. Therefore, implementation timetables are established that stagger projects over time.

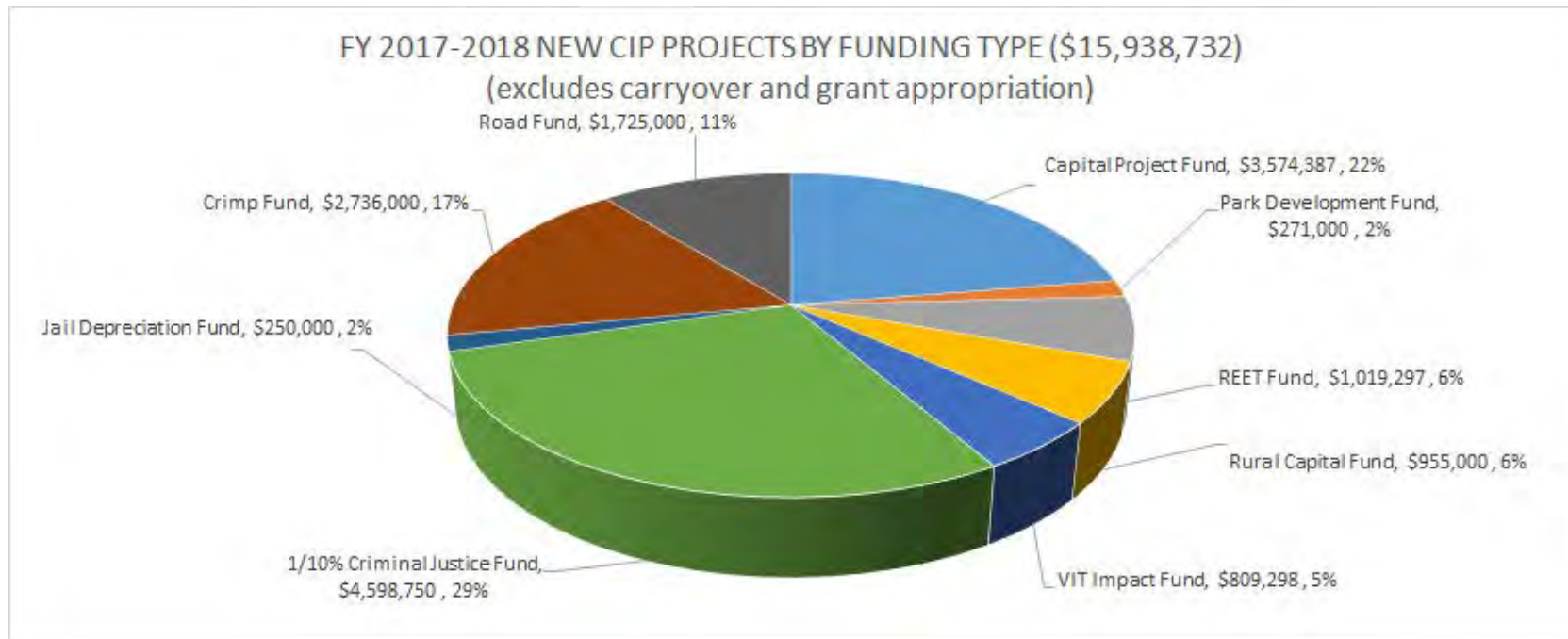
County Commissioners review operating and maintenance costs associated with capital projects scheduled to come on-line in the upcoming fiscal year during the budget workshops. If operating and maintenance costs have been identified in a project the departments are required to either absorb the additional costs or submit a supplemental request to receive funding. Supplemental requests for CIP operating and maintenance costs are balanced against other requests for additional funding.



SUMMARY BY FUNDING TYPE

Benton County’s CIP contains a wide range of projects that make up a well-rounded, long-range program for County improvements.

The graph below shows new FY 2017-2018 CIP projects by funding type, excluding grant appropriation and carryover. The following section includes a summary of all capital projects by fund. A narrative description of the major CIP categories precedes the project detail sheets for each project. Each detail sheet contains a project identification name, a short project description, the anticipated funding source, projected costs for each of the six years, and the operating impact, if any. The operating impact section remains expanded to show approximately how much will be spent on personnel, supplies, utilities, insurance, etc. along with a description of the operating impact.



FY 2017-2022 Capital Improvement Plan
Summary of All Capital Projects by Funding Type

FUND 0305-101		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECT FUND							
Estimated Beginning Balance (Jan 1st)	\$ 21,381,901	\$ 15,717,391	\$ 14,497,878	\$ 12,978,365	\$ 11,688,156	\$ 10,483,643	
REVENUE	171,212	171,212	171,212	171,212	171,212	171,212	171,212
CIP PROJECTS	(4,622,722)	(177,725)	(477,725)	(248,421)	(162,725)	(162,725)	(162,725)
OTHER EXPENDITURES	(1,213,000)	(1,213,000)	(1,213,000)	(1,213,000)	(1,213,000)	(1,213,000)	(1,213,000)
Estimated Ending Fund Balance (Dec 31st)	\$ 15,717,391	\$ 14,497,878	\$ 12,978,365	\$ 11,688,156	\$ 10,483,643	\$ 9,279,130	

FUND 0110-102		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND							
Estimated Beginning Balance (Jan 1st)	\$ 512,214	\$ 317,899	\$ 238,585	\$ 27,270	\$ 10,956	\$ 9,641	
REVENUE	21,253	21,253	21,253	21,253	21,253	21,253	21,253
CIP PROJECTS	(193,000)	(78,000)	(210,000)	(15,000)	-	-	-
OTHER EXPENDITURES	(22,568)	(22,568)	(22,568)	(22,568)	(22,568)	(22,568)	(22,568)
Estimated Ending Fund Balance (Dec 31st)	\$ 317,899	\$ 238,585	\$ 27,270	\$ 10,956	\$ 9,641	\$ 8,327	

FUND 0130-101		2017-2018		2019-2020		2021-2022	
REET FUND							
Estimated Beginning Balance (Jan 1st)	\$ 1,565,384	\$ 700,470	\$ 854,853	\$ 1,009,236	\$ 1,163,619	\$ 1,318,003	
REVENUE	315,302	315,302	315,302	315,302	315,302	315,302	315,302
CIP PROJECTS	(1,019,297)	-	-	-	-	-	-
OTHER EXPENDITURES	(160,919)	(160,919)	(160,919)	(160,919)	(160,919)	(160,919)	(160,919)
Estimated Ending Fund Balance (Dec 31st)	\$ 700,470	\$ 854,853	\$ 1,009,236	\$ 1,163,619	\$ 1,318,003	\$ 1,472,386	

FUND 0144-101		2017-2018		2019-2020		2021-2022	
RURAL CAPITAL FUND							
Estimated Beginning Balance (Jan 1st)	\$ 1,708,271	\$ 1,982,228	\$ 1,451,186	\$ 955,143	\$ 1,304,100	\$ 1,653,058	
REVENUE	3,189,739	3,189,739	3,189,739	3,189,739	3,189,739	3,189,739	3,189,739
CIP PROJECTS	(75,000)	(880,000)	(845,000)	-	-	-	-
OTHER EXPENDITURES	(2,840,782)	(2,840,782)	(2,840,782)	(2,840,782)	(2,840,782)	(2,840,782)	(2,840,782)
Estimated Ending Fund Balance (Dec 31st)	\$ 1,982,228	\$ 1,451,186	\$ 955,143	\$ 1,304,100	\$ 1,653,058	\$ 2,002,015	

FUND 0153-101		2017-2018		2019-2020		2021-2022	
VIT IMPACT FUND							
Estimated Beginning Balance (Jan 1st)	\$ 4,794,708	\$ 4,753,571	\$ 5,521,731	\$ 6,289,892	\$ 7,058,053	\$ 7,826,214	
REVENUE	768,161	768,161	768,161	768,161	768,161	768,161	768,161
CIP PROJECTS	(809,298)	-	-	-	-	-	-
OTHER EXPENDITURES	-	-	-	-	-	-	-
Estimated Ending Fund Balance (Dec 31st)	\$ 4,753,571	\$ 5,521,731	\$ 6,289,892	\$ 7,058,053	\$ 7,826,214	\$ 8,594,374	

FY 2017-2022 Capital Improvement Plan
Summary of All Capital Projects by Funding Type

FUND 0133-101		2017-2018		2019-2020		2021-2022	
1/10% CRIMINAL JUSTICE FUND							
Estimated Beginning Balance (Jan 1st)	\$ 8,294,137	\$ 2,455,702	\$ 4,386,756	\$ 6,317,811	\$ 8,248,865	\$ 10,179,920	
REVENUE	3,531,055	3,531,055	3,531,055	3,531,055	3,531,055	3,531,055	3,531,055
CIP PROJECTS	(7,769,490)	-	-	-	-	-	-
OTHER EXPENDITURES	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)	(1,600,000)
Estimated Ending Fund Balance (Dec 31st)	\$ 2,455,702	\$ 4,386,756	\$ 6,317,811	\$ 8,248,865	\$ 10,179,920	\$ 12,110,975	
FUND 0142-101		2017-2018		2019-2020		2021-2022	
JAIL DEPRECIATION RESERVE							
Estimated Beginning Balance (Jan 1st)	\$ 756,852	\$ 546,020	\$ 585,187	\$ 624,354	\$ 663,521	\$ 702,689	
REVENUE	180,156	180,156	180,156	180,156	180,156	180,156	180,156
CIP PROJECTS	(250,000)	-	-	-	-	-	-
OTHER EXPENDITURES	(140,989)	(140,989)	(140,989)	(140,989)	(140,989)	(140,989)	(140,989)
Estimated Ending Fund Balance (Dec 31st)	\$ 546,020	\$ 585,187	\$ 624,354	\$ 663,521	\$ 702,689	\$ 741,856	
FUND 0101-102		2017-2018		2019-2020		2021-2022	
CRIMP FUND							
Estimated Beginning Balance (Jan 1st)	\$ 3,677,477	\$ 1,727,626	\$ 2,513,775	\$ 1,899,924	\$ 2,686,073	\$ 3,472,222	
REVENUE	786,149	786,149	786,149	786,149	786,149	786,149	786,149
CIP PROJECTS	(2,736,000)	-	(1,400,000)	-	-	-	-
OTHER EXPENDITURES	-	-	-	-	-	-	-
Estimated Ending Fund Balance (Dec 31st)	\$ 1,727,626	\$ 2,513,775	\$ 1,899,924	\$ 2,686,073	\$ 3,472,222	\$ 4,258,372	
FUND TO BE DETERMINED PROJECTS		2017-2018		2019-2020		2021-2022	
Estimated Beginning Balance (Jan 1st)	\$ -	\$ (10,684,420)	\$ (11,184,420)	\$ (11,659,420)	\$ (12,319,420)	\$ (12,989,420)	
REVENUE	-	-	-	-	-	-	-
CIP PROJECTS	(10,684,420)	(500,000)	(475,000)	(660,000)	(670,000)	(10,790,000)	
OTHER EXPENDITURES	-	-	-	-	-	-	-
Estimated Ending Fund Balance (Dec 31st)	\$ (10,684,420)	\$ (11,184,420)	\$ (11,659,420)	\$ (12,319,420)	\$ (12,989,420)	\$ (23,779,420)	

Capital Project Fund



CAPITAL PROJECT FUND

is for routine capital outlay purchases and projects by the county including but not limited to office furniture, major building maintenance, real property acquisition, building remodeling projects, road projects and water projects. Said funds shall be invested by the Benton County Treasurer with interest accruing to the Current Expense fund.

Public Wireless Internet Improvement Countywide

Description and Scope

The County's secure public wireless internet (BenCoGuest) usage continues to increase. The importance of making the internet available to both County employees and the general public has created an environment that promotes transparency, innovation, and efficient government. Currently, public wireless users share the same internet bandwidth as County employees.

Purpose and Need

In an effort to improve wireless security, provide the best internet experience possible to guests, and to make County internet services more reliable, it is recommended to isolate public wireless traffic to its own internet service. Separating public wireless internet usage will reduce any impact the public may impose on day to day County internet services. In addition to separating the public wireless service, the County will purchase a dedicated firewall that will integrate the new internet service with the County's existing wireless infrastructure.

History and Current Status

Monitoring the internet traffic on BenCoGuest has raised some security and traffic logging questions. Keeping Benton County's data safe and secure is a top priority. Protecting County internet services regardless of whether provided by the County Network or wirelessly has become as equally important.

Operating and Maintenance Impact

The ongoing costs for this project are associated with a three (3) year maintenance/support agreement and yearly increases in bandwidth. There will be an investment in a physical device to carry out the Public Wireless Internet Improvement. All hardware purchased will be enrolled into the Central Services Replacement Fund Policy.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 94,698	\$ 49,087	\$ 3,475	\$ 3,475	\$ 31,711	\$ 3,475	\$ 3,475
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 94,698	\$ 49,087	\$ 3,475	\$ 3,475	\$ 31,711	\$ 3,475	\$ 3,475

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	17,376	17,376	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	77,323	31,711	3,475	3,475	31,711	3,475	3,475
	-	-	-	-	-	-	-
TOTAL	\$ 94,698	\$ 49,087	\$ 3,475	\$ 3,475	\$ 31,711	\$ 3,475	\$ 3,475

Identification Protection

Countywide

Description and Scope

The growing number of County owned mobile devices (laptops, tablets, smart phones) and remote users has sparked a new workforce that needs to stay connected to County network resources at all times, regardless of location. One of the many problems with a mobile workforce is keeping mobile devices updated with the latest security patches. With this project, the County will be able to control which County resources are available to a mobile device based on device and user security policies.

Purpose and Need

Protecting County data, resources, and services from unauthorized mobile devices and users is critical in today's fight against cyber threats. The installation of an identity services engine can help make certain that all devices connected to the County network are secure. In addition to inspecting mobile devices, this security tool can analyze users. By confirming mobile devices and users meet minimal security measures, the County network will continue to deliver top quality services to its constituents.

History and Current Status

Information Technology Department (IT) is finishing the installation of new firewalls that will complete one of the County's Capital Improvement Plan Projects: Network Firewall, Load Balancing, and Break Fix Monitoring. Once the firewall installation is finished, IT will have strengthened its initial defense mechanism against cyber threats. An identity services engine will complement the firewalls, and provide IT with a second layer of security to protect County data.

Operating and Maintenance Impact

The ongoing costs for this project are associated with annual maintenance and support. There will be an investment in a physical device to carry out identity engine services. All hardware purchased will be enrolled into the Central Services Replacement Fund Policy.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 270,415	\$ 84,165	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 270,415	\$ 84,165	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	46,915	46,915	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	223,499	37,250	37,250	37,250	37,250	37,250	37,250
	-	-	-	-	-	-	-
TOTAL	\$ 270,415	\$ 84,165	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250	\$ 37,250

Microsoft Office 365 Migration (Cloud)

Countywide

Description and Scope

Microsoft Office 365 is a cloud technology that can provide the County access to applications including Microsoft Office, OneDrive, SharePoint, and Email. Office 365 focuses on sharing, collaboration, and storage which provides enterprise ready tools to help businesses achieve greater efficiencies. Besides offering higher quality tools for County business, Office 365 reduces the amount of infrastructure needed to support these applications.

Purpose and Need

Utilizing Microsoft Government Cloud environment will provide the County cloud space designed around Government security requirements. Engaging professional services to assist in the development of a strategic plan to move County data/services to the cloud can ensure a quality end result. Once complete, an internet connection is all that will be needed to take advantage of Office 365 applications.

History and Current Status

Many State and local agencies are already using Office 365. The costs associated to procuring, installing, upgrading, and maintaining these services has become too costly to keep in-house. One County department has already signed a contract with a vendor who provides SharePoint support specific to law enforcement. IT is continually training on and testing Office 365 tools.

Operating and Maintenance Impact

The ongoing costs for this project are associated to professional services needed to migrate County data to Office 365. The County Microsoft Enterprise Agreement already covers Office 365 licensing, and since we are already paying for Microsoft Premier Support, we also receive Office 365 support at no extra cost.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 185,000	\$ 140,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 185,000	\$ 140,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	185,000	140,000	15,000	15,000	15,000	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 185,000	\$ 140,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -

Virtualization Specific Storage Countywide

Description and Scope

Since starting the virtualization environment in 2014, the County's use of virtualization has grown to include faxing, printing, intranet, financial, and testing services that the entire County benefits from. To help manage the future growth of virtual machines, this project is aimed at taking advantage of new virtual storage technology, making it easier to manage and control the County's virtual environment.

Purpose and Need

In seeing the County's virtual usage increase, purchasing a storage area network strictly for virtualization is desirable. In addition to addressing specific virtualization storage demands, extra tools are now available to monitor, maintain, and setup virtual machines. The new virtual storage will also have faster 10GB network connections. The extra network bandwidth will provide greater server availability, decrease latency, improve backups, and enhance our disaster recovery times.

History and Current Status

In 2013 the County engaged in a significant storage area network upgrade, addressing present and future County data needs. Additional storage for County data and additional storage for the County's new virtualization space was added. Our virtual production environment was in infancy. Since then, the environment has grown partly because of how affordable, reliable, and innovative virtual spaces have become to County services.

Operating and Maintenance Impact

The ongoing costs for this project are associated with a three (3) year maintenance/support agreement. There will be an investment in a two virtual storage devices. One device for the Kennewick Justice Center and one device for the Prosser Courthouse. All hardware purchased will be enrolled into the Central Services Replacement Fund Policy.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 167,620	\$ 125,160	\$ -	\$ -	\$ 42,460	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 167,620	\$ 125,160	\$ -	\$ -	\$ 42,460	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	82,700	82,700	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	84,920	42,460	-	-	42,460	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 167,620	\$ 125,160	\$ -	\$ -	\$ 42,460	\$ -	\$ -

County Website Redesign

Countywide

Description and Scope

As a communication platform for Benton County citizens, the County website must be able to provide innovative e-government services to the community, including fully functional mobile device formatting. MunicipalCMS provides Benton County a cost efficient solution but it is time to reassess our needs and requirements, exploring alternative solutions to make sure the County can keep up with future public needs.

Purpose and Need

MunicipalCMS has hosted the Benton County website for a decade. Many County departments have expressed a need for increased functionality that MunicipalCMS does not provide. The County website plays a vital role in economic development and public relations and is a reflection of Benton County.

History and Current Status

MunicipalCMS / Tower Innovations has provided Benton County with content management tools and web hosting services since the early 2000s. Early in the website inception and design process, a color scheme and standardized font was selected to provide a uniformity to the overall site.

Operating and Maintenance Impact

The ongoing costs for this project are associated to professional services needed to redesign and construct the County's website. Yearly support costs have been added to help make sure the County has adequate website support.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 332,000	\$ 222,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 332,000	\$ 222,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	200,000	200,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	132,000	22,000	22,000	22,000	22,000	22,000	22,000
	-	-	-	-	-	-	-
TOTAL	\$ 332,000	\$ 222,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000

Justice Center Renovation, 1st and 2nd Floors

7122 W Okanogan Pl. Bldg. A, Kennewick, WA 99336

Description and Scope

This project involves renovating the offices of the Prosecuting Attorney, OPD, Mental Health Court, Administration, Executive Conference Room, and Information Technology. Located on the 1st and 2nd floors of the Kennewick Justice Center.

Purpose and Need

Due to increased staffing in recent years these departments have out grown their existing spaces, requiring expansion and relocation of these departments' office areas. Further increases in staff may prove to be in the best interests of the county, thus requiring expansion of office space. The renovation would significantly improve the offices' current effectiveness and efficiency, and would permit further growth.

History and Current Status

With the passage of the 3/10th of 1% Public Safety Sales Tax, some departments have increased staffing and created programs to accommodate the growing need of criminal justice and public safety departments. This increase puts department office spaces over capacity, thus requiring expansion and relocation of these departments.

Operating and Maintenance Impact

Since a number of the offices already exist with a minimal amount of expansion into the unfinished space located on the 2nd floor of the Justice Center this, project may result in a marginal increase in utility usage (power and HVAC more specifically). Operating and maintenance costs would be minimal.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -
3/10TH OF 1% CRIMINAL JUSTICE TAX	800,000	800,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 1,800,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 20,000	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	1,780,000	1,780,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 1,800,000	\$ -	\$ -	\$ -	\$ -	\$ -

Restroom Remodel

Justice Center and Annex in Kennewick

Description and Scope

There are several restrooms in our facilities that need to be upgraded. These include: at the Justice Center, the Men's and Women's Public Restrooms for Superior Court, the Men's and Women's Employee Restrooms for Superior Court Clerks; and at the Annex, the Men's and Women's Restroom. The Annex restrooms are used by both the public and employees.

Purpose and Need

These restrooms have served the public and employees well, but are past their prime. They are no longer attractive and reflect a poor image of the County and how we take care of our facilities. This remodel goes beyond a coat of paint. It will include handicap accessibility, as well as new fixtures, floor and wall tile, divider walls, lights, paint, mirrors and dispensers. The estimated cost includes demolition and rework, along with taxes and permits.

History and Current Status

The restrooms in the Justice Center have been very well used since being built in 1984. There have been no improvements done to these since then, aside from routine maintenance. The restrooms at the Annex appear to have been remodeled during the late 1970's, but are in need again. The remodel will bring these up to current standards while making them more attractive and functional.

Operating and Maintenance Impact

There will not be an impact to the operating budget on an ongoing basis. Paper supplies and cleaning services are provided by our Janitorial contractor. The construction estimate is \$50,000 per restroom.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 300,000	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 300,000	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	300,000	-	-	300,000	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 300,000	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -

Old Engineering Building

Prosser Ave., Prosser WA

Description and Scope

This project consists of the complete restoration of the Old Engineering Building. The building is approximately (5,000) sq. ft. Restored into usable office space for the Planning Department as it once shared this space with the Engineering Department. This building is currently vacated due to heavy rain water damage from the roof and is no longer in service.

Purpose and Need

Once restored, the Planning Department can be relocated into the new office space, and the existing Planning Building can be sold, thus allowing funds to be used for reimbursement of the restoration. This would also allow for the Planning Department to be located at the Courthouse for easy access to the public and other County Departments.

History and Current Status

This building was built back in the late 1940's and was called the "Engineering Building" as the Benton County Public Works Department and Planning utilized this building until the late 1980's, when the Benton County Courthouse was remodeled.

Operating and Maintenance Impact

Operation and Maintenance should stay about the same. Due to the costs would shift from the existing Planning building to the newly restored Engineering building.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 1,326,000	\$ 1,326,000	\$ -	\$ -	\$ -	\$ -	\$ -
PLANNING BUILDING SALE	224,000	-	224,000	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,550,000	\$ 1,326,000	\$ 224,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 110,000	\$ 110,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	1,440,000	1,440,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,550,000	\$ 1,550,000	\$ -	\$ -	\$ -	\$ -	\$ -

Benton County Facilities Carpet Replacement Countywide

Description and Scope

The project consists of removing and installing approximately 160,000 Sq. Ft. of carpet within all Benton County Facilities. The dismantling, moving and reinstallation of employee workstations will also be included in the scope of work. The carpet would be replaced in phases over the next six years. This would also allow the Facilities Department repaint the office space while it is unoccupied.

Purpose and Need

A portion of the carpet within the county facilities has been in place for over thirty five years and has surpassed its life expectancy. It has been re-glued and repaired several times over the years. It has reached the point of needing to be replaced. With the recent completion of three remodeling projects there are several offices with portions of new and old carpet.

History and Current Status

There is still carpet in the Benton County Courthouse that has been in place since in 1986. Every time the carpet is cleaned it lifts in several areas thus creating a tripping Hazard. These areas have been re-glued several times over the years. Some areas have reached the point of not being repairable. Recently some of the office space has been remodeled received new carpet.

Operating and Maintenance Impact

Replacing the carpet will remove several possible tripping hazards thus avoiding the possibility of incident claims and also save time on carpet repairs. The new carpet will be more maintenance friendly as it will be in the form of 20in x 20in squares. Damaged areas will be able to be pulled up and replaced as needed without the need of professional services from an outside vendor.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 600,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 600,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT COSTS	REVENUES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	600,000	100,000	100,000	100,000	100,000	100,000	100,000
	-	-	-	-	-	-	-
TOTAL	\$ 600,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000

Justice Center Parking Lots Repair

Justice Center in Kennewick

Description and Scope

The parking lots at the Benton County Justice Center in Kennewick vary in age between 8 and 32 years old. They have plenty of life left in them before needing to be replaced. To prolong this life, the parking lots need some maintenance provided. This will include sealing of cracks in the pavements, seal coating of the surface, and repainting of all of the lines, marking and crosswalks.

Purpose and Need

The parking lots at the Justice Center are made of asphalt, which is a petroleum based product. Over time, this can deteriorate due to weather, water, freezing temperature and oil or gas leaked onto it. The deterioration can be minimized by sealing the cracks and seal coating the asphalt. Part of the parking lot is 32 years old and in desperate need of help. All of the areas need cracks sealing and seal coating to extend the life of the lot.

History and Current Status

In 2002 and 2003, the Justice was expanded and a large area of parking was added. In 2008, the Health District building added another significant area. This, along with some original parking lots from 1984, reflect the need of this upkeep. This project will encompass the entire Justice Center complex including the Coroner's Office, Maintenance Shop, Health building and all the Courts and Jail parking areas.

Operating and Maintenance Impact

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 150,000	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 150,000	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT COSTS	REVENUES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	150,000	150,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 150,000	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -

Park Development Fund



PARK DEVELOPMENT FUND is a cumulative reserve fund for the purpose of accumulating and expending said moneys for capital improvements within Benton County parks

Badger Mountain Centennial Preserve

5305 East 210 Private Road, Richland

Description and Scope

One major project is anticipated for Badger Mountain Centennial Preserve (BMP) during the planning period -- improvements to the **Summit Road** that connects Dallas Road to the summit area along the west ridgeline. This road follows a utility easement and is used numerous times daily by vendors who need access to the summit, as well as for park business. Improvements would include choosing a formal route, grading in some areas, removal of large cobbles, and placement of suitable course gravel.

Purpose and Need

The existing track was never properly built as a road. It bifurcates in several places, contributes to erosion, and is an eyesore. There are several areas in the middle section that are nearly impassable for passenger vehicles, and in several places the cant of the track is less than ideal for vehicle travel of any kind.

History and Current Status

Existing track continues to degrade. Has been in place for many decades.

Operating and Maintenance Impact

The Department does not foresee any further maintenance for several years.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND	\$ 35,000	\$ -	\$ -	\$ 35,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 35,000	\$ -	\$ -	\$ 35,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 2,000	\$ -	\$ -	\$ 2,000	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	30,000	-	-	30,000	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	3,000	-	-	3,000	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 35,000	\$ -	\$ -	\$ 35,000	\$ -	\$ -	\$ -

Candy Mountain Preserve

70804 East 669 Private Road Northeast, West Richland

Description and Scope

The project calls for placement of a new **parking lot** at the base of Candy Mountain on property recently acquired by Benton County known as the "Candy Mountain Preserve" (CMP). Exact location and dimensions have not yet been scoped. Will be a gravel lot, ringed by railroad tie type barriers in the style the County uses elsewhere in the park system. Tentative plans call for a lot with a capacity of around fifty (50) vehicles, plus space for a portable toilet.

Purpose and Need

With over two hundred thousand (200,000) visits per year to Badger Mountain, CMP is created to fulfill a public recreation need. The centerpiece of the park will be a trail from the Dallas Road area to the summit (about 2 miles). There may be subsequent trails also. The parking lot will be the jump-off point onto that trail and the primary staging area for whatever happens on the property.

History and Current Status

CMP was created Spring 2016 after a long-term effort to purchase nearly two hundred (200) acres of property on Candy Mountain for the public park. The purpose of the Preserve is to conserve habitat and open space, and to provide another venue for non-motorized recreation in Benton County (hike-bike-horse). The parking lot and subsequent trail will be the first improvements to the new park.

Operating and Maintenance Impact

The County will need to refurbish the parking lot on about a 2-3-year cycle, based on conditions and need. This will include reworking the gravel, likely including a top-coat. This work should be expected to cost \$3-10k depending on extent... County will spray for weeds several times per season... County will maintain signs and traffic barriers as needed.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ -	\$ -	\$ -
CURRENT EXPENSE (PARKS)	1,250	-	250	250	250	250	250
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 76,250	\$ 75,000	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 2,000	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	70,000	70,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	3,000	3,000	-	-	-	-	-
OPERATIONS AND MAINTENANCE	1,250	-	250	250	250	250	250
	-	-	-	-	-	-	-
TOTAL	\$ 76,250	\$ 75,000	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250

Horse Heaven Vista
100806 West Carter Road, Prosser

Description and Scope

Placement of a large **entrance sign**, and placement of two standard alert signs (one each direction) along the highway.

Purpose and Need

There is no welcoming sign identifying the park, and no signs along the highway noticing that the park is upcoming.

History and Current Status

There is not and has never been any such signage of either type.

Operating and Maintenance Impact

Benton County would pay for the creation and installation of the highway signs, but after that they become the responsibility of the State. The County would have to clean and refurbish the entrance sign as needed.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND	\$ 6,000	\$ 3,000	\$ 3,000	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 6,000	\$ 3,000	\$ 3,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	6,000	3,000	3,000	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 6,000	\$ 3,000	\$ 3,000	\$ -	\$ -	\$ -	\$ -

Horn Rapids Park

115803 North State Route 225, Benton City

Description and Scope

There are three distinct projects for Horn Rapids Park: 1) Addition of a new **shop**; 2) Paving of the **driveway** to the office/maintenance area; and 3) Development of a new **master plan** for the park.

Purpose and Need

Shop: The current shop is undersized and inadequate to meet both workspace and storage needs. The new shop would double the usable space and upgrade electrical systems. **Driveway:** Paving the driveway will assist with maintenance (erosion) and dust control. **Master Plan:** The park has not been master planned since the 1980s and needs a fresh, comprehensive look.

History and Current Status

The park has existed since the 1960s, but serious development didn't begin until 1999. Much of the park's facilities and infrastructure were undersized from the start, and the past fifteen (15) years have been spent addressing those deficiencies. The secured lay-down around the Shop has been renovated in recent years, but not the Shop itself, which is the next priority.

Operating and Maintenance Impact

Maintaining the expanded shop will fall into the park caretaker's existing regular duties, as will keeping care of the driveway. The paved driveway is expected to require less maintenance than the existing gravel, though it may need to be resealed and patched in places about every five (5) years or so, which will be a substantive capital costs when those renovations do occur.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND	\$ 140,000	\$ -	\$ 75,000	\$ 50,000	\$ 15,000	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 140,000	\$ -	\$ 75,000	\$ 50,000	\$ 15,000	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 22,000	\$ -	\$ 5,000	\$ 2,000	\$ 15,000	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	105,000	-	60,000	45,000	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	13,000	-	10,000	3,000	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 140,000	\$ -	\$ 75,000	\$ 50,000	\$ 15,000	\$ -	\$ -

Hover Park

252305 East Hover Road, Kennewick

Description and Scope

One major improvement is planned for Hover Park: a dedicated, purpose-built **parking area** at the end of Hover Road, lined with barriers, and able to easily accommodate multiple horse trailers. The gravel lot will measure approximately two hundred (200) feet by fifty (50) feet and will include appropriate vehicle access controls.

Purpose and Need

The parking situation at Hover is poor, with uneven ground, insufficient turning space, and no designated parking area. A secondary consequence of this is that without parking and access control, people are left to drive all over the place, which degrades the park, and creates safety concerns with a railroad crossing and people getting automobiles into areas where automobiles shouldn't be.

History and Current Status

There has never been formal parking at Hover Park. It has been of interest to the County for many years, and the County's landlord -- the Army Corps of Engineers, who must approve any such action -- is aware of the County's ideas in this area.

Operating and Maintenance Impact

The parking lot would have to be treated for weeds a couple of times each year, have the gravel base retreated every 3-5 years based on use/impacts, and signage and barriers would need to be maintained.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 50,000	\$ -	\$ -	\$ -	\$ 50,000	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 50,000	\$ -	\$ -	\$ -	\$ 50,000	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 1,000	\$ -	\$ -	\$ -	\$ 1,000	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	45,000	-	-	-	45,000	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	4,000	-	-	-	4,000	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 50,000	\$ -	\$ -	\$ -	\$ 50,000	\$ -	\$ -

Two Rivers Park

213316 East Finley Road, Kennewick

Description and Scope

There are two major capital projects for Two Rivers Park: Remodel of the **Boat Launch**, including replacement of all floating docks and elimination of unused piles... Complete replacement of the **main restroom** at the central part of the park.

Purpose and Need

The Boat Launch is an aging facility at a location that presents a lot of environmental impacts. Its deterioration is continual and the facility will not be viable in its current state for much longer. The restroom will be fifty (50) years old in 2019. It is minimally functional but could use serious modernization for the next half-century.

History and Current Status

The Boat Launch was constructed in the late 1980s and has been substantively renovated several times. While still functional, the floating docks are deteriorating and will become a safety concern in the near future. The restroom was constructed in 1969, as was its septic tank and drain field. All remain functional, but are essentially at the end of or even past their expected life.

Operating and Maintenance Impact

Restrooms require daily service that is part of the park caretaker's normal duties. Modern public restrooms are robustly constructed, but there will continue to be maintenance for broken pipes, vandalism and other such things. The Boat Launch will require regular safety inspections and occasional clearing of debris that gathers on the up current side.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
PARK DEVELOPMENT FUND	\$ 240,000	\$ 115,000	\$ -	\$ 125,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 240,000	\$ 115,000	\$ -	\$ 125,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 10,000	\$ 5,000	\$ -	\$ 5,000	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICIS COSTS	210,000	100,000	-	110,000	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	20,000	10,000	-	10,000	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 240,000	\$ 115,000	\$ -	\$ 125,000	\$ -	\$ -	\$ -

Real Estate Excise Tax (R.E.E.T) Fund



1/4 PERCENT REAL ESTATE EXCISE TAX is a fund to account for the revenues generated by a special 1/4 of 1 percent excise tax levied on the sale of real property within the County. All projects must be included in the annual Benton County Comprehensive Land Use Plan before any spending is approved.

HVAC Infrastructure

Fairgrounds: 1500 S. Oak Street, Kennewick, WA 99337

Description and Scope

Buildings one (1) and four (4) will receive brand new commercial air conditioning systems that will replace the antiquated swamp coolers. The new systems will be ducted, which will allow air to be distributed around the building in a more efficient manner, thus cooling the room to the desired temperature. The new systems will also have a programmable thermostat.

Purpose and Need

The swamp coolers that are located in Buildings one (1) and four (4) are in need of replacement as they are antiquated, parts are hard to find, and the service technology is virtually non-existent. In the heat of the summer, with temperatures reaching as high as hundred and ten (110) degrees Fahrenheit, the swamp coolers have a difficult time keeping the buildings cool, especially if the building has a lot of people in it.

History and Current Status

Buildings one (1) and four (4) were constructed in the 1970's and minimal remodeling and updating have been done. Swamp coolers were installed because they were considered more efficient than air conditioning units and well suited for climates where the air is hot and the humidity is low. However, these particular units have reached the end of their life cycle as parts are extremely hard to find as well as a technician that is willing to work on them.

Operating and Maintenance Impact

Buildings one (1) and four (4) will see a reduction in their electricity bill because of the more efficient commercial air conditioning system that will be installed. Also, since the new system will have a programmable thermostat, staff will be able to control the temperature for the specific dates and times of the event. No more worrying about clients leaving the air conditioning on in an unoccupied Building.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
REET	\$ 75,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	75,000	100,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -

Buildings 1 and 4 Improvement

Fairgrounds: 1500 S. Oak Street, Kennewick, WA 99337

Description and Scope

Building one (1) requires interior walls, finished and painted, and upgraded lighting and electrical systems. Building four (4) requires interior walls, finished and painted, and upgraded lighting and electrical systems. This will make both buildings more marketable for private and public events of all types.

Purpose and Need

These changes will make Buildings one (1) and four (4) much more marketable as there will be a finished interior for small weddings and quinceañeras. During 2011 both buildings had two (2) twelve (12) foot doors and two (2) eight (8) foot garage style doors replaced which has decreased utility costs, secured the buildings and are much easier to open and close. Building four (4) has had the permanent stages removed and the double kitchen ceiling replaced.

History and Current Status

Buildings one (1) and four (4) were constructed in the 1970's and minimal remodeling and updating done. There have been continuous complaints from our clients about the buildings' conditions. Due to this it has been difficult to charge our clients the fair market value to use these buildings. Building one (1) is 80' x 100' = 8,000 square feet with a capacity of five-hundred (500) people and Building four (4) is 50' x 140' = 7,000 square feet with a capacity of four-hundred and sixty (460) people.

Operating and Maintenance Impact

The proposed projects for Building one (1) and Building four (4) deal with the buildings functionality (upgraded lighting and electrical) and aesthetics (finishing and painting the interior walls), which have very little operating and maintenance impact. However, the remodel should make the buildings more marketable increasing revenue for Benton County.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
REET	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	50,000	50,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -

Remodel Of Buildings 2 and 3

Fairgrounds: 1500 S. Oak Street, Kennewick, WA 99337

Description and Scope

The project consists of remodeling Buildings two (2) and three (3) into more modern event facilities complete with heat and A/C upgrades, upgraded wall coverings, lighting and flooring. These buildings could be used both by Benton County for training meetings and the Benton Franklin Fair as well as be more attractive rental facility for other meetings, wedding receptions, conventions and company parties.

Purpose and Need

The buildings in their current state are aging and more resemble a warehouse than an event facility. Benton County also has need of a training and meeting facility as the current facilities have inadequate space. With no hvac system, the current cooling system leaves the fairgrounds buildings hot and humid when temperatures are on the rise. The remodel of Buildings two (2) and three (3) would not only allow the Fairgrounds to become more attractive in the rental market but would regularly be used for Benton County training and other meetings saving the county travel and facility rental expenses as well.

History and Current Status

Buildings two (2) and three (3) are aging, unfinished metal buildings which are time consuming to maintain as well as being in need of upgraded heating and air. More attractive interiors and upgraded systems would not only serve the fair but create a comfortable, attractive meeting space for a variety of events throughout the year and allow for an increase in revenue for Benton County.

Operating and Maintenance Impact

The maintenance impact for the remodeled buildings would be very low for the first five years. Modern and more efficient plumbing and electrical fixtures and better insulation would help keep operating costs lower than the other existing buildings. Fairgrounds staff would be responsible for general maintenance and the facility would be cleaned by a Benton County Inmate Work Crew that is currently assigned to the fairgrounds.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
REET	\$ 809,297	\$ 809,297	\$ -	\$ -	\$ -	\$ -	\$ -
VIT	809,298	809,298	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,618,595	\$ 1,618,595	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 182,603	\$ 182,603	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	1,435,992	1,435,992	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,618,595	\$ 1,618,595	\$ -	\$ -	\$ -	\$ -	\$ -

Irrigation Infrastructure

Fairgrounds: 1500 S. Oak Street, Kennewick, WA 99337

Description and Scope

The project will consist of installation of a pump system and underground sprinkler system in areas currently without water or vegetation. Trees and grass will then be planted for dust control and additional camping areas which could create additional revenue for the Fairgrounds.

Purpose and Need

Currently the Fairgrounds Horse Facility is largely undeveloped. Strong winds stir up dust clouds that are a hazard to patrons of the Fairgrounds and a nuisance to surrounding neighborhoods. The installation of an irrigation system will help control dust and create a more esthetically pleasing area.

History and Current Status

The Fairgrounds Horse Facility is an aging portion of the Fairgrounds that has remained largely undeveloped. As the Tri-City area continues to grow, the Fairgrounds is finding a need for additional areas for camping and parking. Currently the Fairgrounds is at maximum capacity for camping areas even with the addition of the new campground created in 2015-2016.

Operating and Maintenance Impact

The maintenance impact will be low due to automated irrigation systems and will require only mowing and minor landscape maintenance. Additional revenues will be possible due to the creation of a park like area suitable for camping, family reunions and RV rallies as well as serving existing events such as Horse Racing, Creation Northwest and the Benton Franklin Fair and Rodeo.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
REET	\$ 60,000	\$ 60,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 60,000	\$ 60,000	\$ -	\$ -	\$ -	\$ -	\$ -

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	60,000	60,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 60,000	\$ 60,000	\$ -	\$ -	\$ -	\$ -	\$ -

Fairgrounds Restroom- South of the Rail

Fairgrounds: 1500 S. Oak Street, Kennewick, WA 99337

Description and Scope

Development would consist of constructing a new restroom at the southern end of the Fairgrounds near the horse arena and horse barns. The new restrooms would be approximately sixteen-hundred (1,600) square feet (40x40) and would contain both water closets and showers. This project would also consist of connecting the new restroom to the City of Kennewick sewer line as well as the demolition of the existing restroom. This new restroom could possibly be used during the annual fair as well as by horsemen and those using the nearby RV rental throughout the year.

Purpose and Need

The existing horse arena restroom building is old and in considerable need of repair or replacement. Negative comments and complaints are frequent from those who use the facility on a regular basis. The Fairgrounds is in need of a restroom facility that can adequately serve those who use the southern portion of the grounds. A larger and more updated restroom would accommodate bigger crowds and would be an excellent selling point for those groups and individuals who are looking to use the Fairgrounds. A newer restroom would also cut down considerably on maintenance costs.

History and Current Status

The current restrooms were constructed at an unknown time and are currently connected to a local septic/drain field system. It is currently not using the City's sewer for service. The restrooms contain two water closets and urinals and two showers on men's side with comparable facilities for the women.

Operating and Maintenance Impact

The maintenance impact for this structure would be quite low for the first handful of years. Modern and more efficient plumbing and electrical fixtures as well as better insulation would help reduce the operating costs compared to the existing restrooms, per square foot. Fairgrounds staff would be responsible for general maintained and the facility would be cleaned by the Benton County Imamate Work Crew that is currently assigned to the Fairgrounds.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 475,000		\$ -	\$ 475,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 475,000	\$ -	\$ -	\$ 475,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 32,000		\$ -	\$ 32,000	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	438,000		-	438,000	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	5,000		-	5,000	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 475,000	\$ -	\$ -	\$ 475,000	\$ -	\$ -	\$ -

Rural Capital Fund



RURAL CAPITAL FUND: is a fund setup to hold the .09 sales tax refund from State of Washington (RCW 82.14.370) for Economic Development Purposes. The funds are to be divided up between the Ports, Cities, and County.

Adair Road

End of County Road to Christensen (1.1 Miles)

Description and Scope

Adair Road is a proposed new 1.1-mile, paved road segment This segment of roadway would connect the existing Adair Road to Christensen Road south of Kennewick, Washington.

Purpose and Need

This new road segment will create a throughway for industrial development along the west side of the freeway (I-82). Similar development has already occurred on the east side of I-82. Development is consistent with local planning and zoning in the area. Industrial development in this area would significantly increase assessed value of the property which leads to higher revenues for the County. Industrial development will also create numerous new jobs in the area.

History and Current Status

The property along the proposed roadway is currently undeveloped. On the east side of the freeway, industrial development has already occurred. This project is in the preliminary planning phase.

Operating and Maintenance Impact

Once completed, this segment of Adair Road will add 1.1 miles of paved road to the Benton County road system. Maintenance will occur on the regularly scheduled interval of that maintenance district.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL CAPITAL FUND	\$ 850,000	\$ 75,000	\$ 775,000	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 850,000	\$ 75,000	\$ 775,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -
RIGHT OF WAY	25,000	25,000	-	-	-	-	-
CONSTRUCTION/SERVICE COST	775,000	-	775,000	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 850,000	\$ 75,000	\$ 775,000	\$ -	\$ -	\$ -	\$ -

Belmont Road

City Limits to Kennedy (1.2 Miles)

Description and Scope

Belmont Road is a proposed new 1.2-mile, paved road segment. This segment of roadway would connect the existing Belmont Road to Kennedy Road near the city limits of West Richland Washington.

Purpose and Need

This new road segment will create a throughway for commercial development between Keene and Kennedy Road. Development is consistent with local planning and zoning in the area and is anticipated to rapidly increase with the construction of the Red Mountain interchange.

History and Current Status

Development has occurred around the area of this proposal, but not in the immediate vicinity. It is expected that more development will occur once the road is in place, especially with the construction of the Red Mountain interchange. This project is in the preliminary planning phase.

Operating and Maintenance Impact

Once completed, this segment of Belmont Road will add 1.2 miles of paved, all-weather road to the Benton County road system. Maintenance will occur on the regularly scheduled interval of that maintenance district.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL CAPITAL FUND	\$ 950,000	\$ -	\$ 105,000	\$ 845,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 950,000	\$ -	\$ 105,000	\$ 845,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 60,000	\$ -	\$ 60,000	\$ -	\$ -	\$ -	\$ -
RIGHT OF WAY	45,000	-	45,000	-	-	-	-
CONSTRUCTION/SERVICE COST	845,000	-	-	845,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 950,000	\$ -	\$ 105,000	\$ 845,000	\$ -	\$ -	\$ -

Solid Waste Fund



**SOLID WASTE
FUND** - is established
to provide waste
disposal information
and assistance to the
residents of Benton
County

Moderate Risk Waste Facility

1709 S Ely Street, Kennewick

Description and Scope

This project is for the design and construction of a retrofit to an existing building in order to provide moderate risk waste (MRW) service for the residents of Benton County. The retrofitted area will be approximately one thousand nine hundred (1,900) square feet and will be used to store collected wastes currently dropped off by residents at household hazardous waste events.

Purpose and Need

Benton County has been without a MRW facility since the previous one at the Horn Rapids landfill site was lost to a fire in 2010. Currently, the County meets its MRW needs through household hazardous waste events. However, in order to provide more regular service, the County requires a facility to meet residents' needs. This is also a goal of the Benton County Solid Waste and Moderate Risk Waste Plan.

History and Current Status

The original MRW facility at the Horn Rapids landfill was lost to fire in 2010. Benton County residents have been able to discard their MRW at household hazardous waste events. In 2015, the Benton County Road Department had a feasibility study completed exploring the viability of using an existing County maintenance shop building as a MRW facility. The project is currently in the design stage.

Operating and Maintenance Impact

This facility will be operated and maintained through a combination of the Benton County solid waste fund and Washington State coordinated prevention grants. The fund draws revenue from existing solid waste taxes and waste handler fees.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
COORDINATED PREVENTION GRANT '15-'17	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
BENTON COUNTY SOLID WASTE FUND	660,000	410,000	50,000	50,000	50,000	50,000	50,000
COORDINATED PREVENTION GRANT '17-'23	1,740,000	150,000	150,000	150,000	150,000	150,000	150,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,660,000	\$ 660,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 18,000	\$ 18,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	442,000	442,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	1,200,000	200,000	200,000	200,000	200,000	200,000	200,000
	-	-	-	-	-	-	-
TOTAL	\$ 1,660,000	\$ 660,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000

1/10% Criminal Justice Fund

1/10% CRIMINAL JUSTICE FUND – is a fund established by sales tax revenue for the purpose of construction, maintenance, and operation of the adult and juvenile Benton County jails.



Benton County Mental Health Wing

Benton County Jail: 7122 W. Okanogan Pl. Bldg. B, Kennewick, WA 99336

Description and Scope

Design and construct a detention area to properly house inmates with mental health needs. This may be either an addition to the current jail or a remodel of a current housing area within the detention facility. The area must be designed to allow for continuous observation while meeting the National Institute of Corrections (NIC) Standards.

Purpose and Need

The current jail was not designed to house the volume of mental health inmates that currently occupy the facility. Failure to be able to properly house these inmates proposes a direct danger to both the corrections staff and inmate. The benefits of having the proper housing would allow the inmate to be closely monitored and to provide the support to their special needs.

History and Current Status

Currently, the Benton County Jail does not have an adequate area to house inmates that require continuous watch due to mental illness and there is fear of those individuals potentially harming themselves or others. Therefore, these individuals are held in the booking section so they can be closely watched. This arrangement puts additional stress on staff and detainees due to the lack of proper requirements needed to house such inmates.

Operating and Maintenance Impact

With an adequate facility, operation and maintenance costs would be reduced due to constant observation and less damage to the facility. It will allow officers to concentrate on specific tasks leading to a smoother operation with less interruptions. Most of the infrastructure within the facility can support an addition or a remodel.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
1/10th CRIMINAL JUSTICE FUND	\$ 5,700,000	\$ 5,700,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 5,700,000	\$ 5,700,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	5,550,000	5,550,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 5,700,000	\$ 5,700,000	\$ -	\$ -	\$ -	\$ -	\$ -

Benton County Jail Booking Remodel and Upgrade

Benton County Jail: 7122 W. Okanogan Pl. Bldg. B, Kennewick, WA 99336

Description and Scope

This booking area remodel will allow for a complete rebuild of booking workstations, interview room, and medical area, which will improve overall efficiency of the inmate booking process and the safety of staff members assigned to this area of the jail. The project includes elevated workstations with built-in counter space for electronics, renovating a restroom into an interview room, and installing a safety door on the medical exam room within the booking area.

Purpose and Need

The remodel focus is to remove the current broken furniture and design the booking area with efficiency and safety in mind. The current configuration lacks optimal safety and functioning equipment. By elevating and partially isolating the booking workstations, it will add a degree of safety to the staff members assigned to these locations.

History and Current Status

The current configuration and furniture has been in place since the facility opened in April 2003. The area is occupied and used on a 24/7 basis and furniture is now needing to be replaced. The addition of an interview room and more secure medical area is identified as a significant need, along with the re-design of the booking workstations.

Operating and Maintenance Impact

The booking area currently requires very little (if any) maintenance and repair. The operations impact will be controlled during construction and once completed will provide a streamlined booking process that is designed with employee safety in mind. After the project is complete, it will require virtually no "upkeep" or scheduled maintenance to maintain.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
1/10th CRIMINAL JUSTICE FUND	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	100,000	100,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -

Security Control System Replacement

Benton County Jail: 7122 W. Okanogan Pl. Bldg. B, Kennewick, WA 99336

Description and Scope

Replace the existing OPTO22 Control System with a new Programmable Logic Controller (PLC); add four (4) new touch screens; replace all intercom head-end with new digital intercom system; replace existing Access Control System; replace all eighty-three (83) existing cameras and adding sixty-seven (67) new HD IP 1080p cameras for a total of one-hundred and fifty (150) cameras for video management and recording; replace SpectraLink wireless phone system with ten (10) new hand-held controllers.

Purpose and Need

The existing system functionality and operation does not meet today's industry standards. The operations of a modern detention facility requires functionality, flexibility and reliability that will support 24/7 operations. Functionality supports movement and monitoring for security, flexibility allows efficient use of staff, and reliability minimizes the impact of system failures.

History and Current Status

Users of the existing electronic security system are experiencing system failures and delays. The opening of a door or responding to an alarm input from field devices sometimes takes several seconds (5s-10s), with the industry standard being (0.5s). There are numerous reports of the system failure due to "server freezing" with such system failures compromising safety and security of the staff, inmates, and the public that uses the facility.

Operating and Maintenance Impact

The overall operating and maintenance should reduce dramatically from the current issues the jail is experiencing with the OPTO22 Control System. The security control system must meet high reliable levels with minimum maintenance requirements. Replacing all of the systems mentioned above will minimize future system failures and provide a safe and secure facility.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECTS FUND	\$ 1,202,310	\$ 1,202,310	\$ -	\$ -	\$ -	\$ -	\$ -
1/10th CRIMINAL JUSTICE FUND	1,469,490	1,469,490	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,671,800	\$ 2,671,800	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICIS COSTS	2,646,800	2,646,800	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,671,800	\$ 2,671,800	\$ -	\$ -	\$ -	\$ -	\$ -

Superior Court Inmate Elevators

7122 W Okanogan Pl. Bldg. A, Kennewick, WA 99336

Description and Scope

There are two elevators in the Superior Court section of the building that transport inmates and officers to and from the Jail that are in need of replacement. These elevators have been used on a daily basis by Court Officer staff and inmates since 1984. The proposal is to replacing the hydraulic lifting system, all elevator shaft wiring and cables, and a new door operator motor assembly and a new Main Car Operating Panel.

Purpose and Need

The reason behind this upgrade is that these two elevators have exceeded their life expectancy and replacement parts are no longer available. On several occasions, a component has failed, and new parts were not available. Elevator technicians were able to obtain parts from two abandoned elevators on site. Depending on which part fails next, the elevator will be taken out of service. This will greatly impact operation of the Courts.

History and Current Status

These elevators were installed in 1984 when the Benton County Justice Center was constructed. The elevators are used multiple times a day, every week day. Overall they have been very good elevators with minimal trouble. Since they were discontinued by the manufacturer, all available parts have been used. In recent years, failures have taken the elevators out of service for several days while replacement parts were researched.

Operating and Maintenance Impact

Once upgraded, there will be little change to the operating budget and maintenance budget. There are continued, required inspections by the State inspector and regular preventative maintenance service performed by the elevator service contractor. Estimate provide by KONE Elevator is for equipment purchase and installation. Additional funds are required for work outside of their scope and any code improvements that must be made.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
1/10th CRIMINAL JUSTICE FUND	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICIS COSTS	500,000	500,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -

Juvenile Detention - Administration Building

5606 W. Canal Drive, Suite 106, Kennewick, WA 99336

Description and Scope

This project will demolish the entire existing Administrative / Courts wing and construct a new 38,000 sf. 2-story replacement wing. Temporary space will be required during construction. Once completed, the building will have more space for support staff/services, administration, classrooms, courtrooms, and judicial support services as well as updated security, communications, and lighting.

Purpose and Need

The current building's operation and functionality does not meet the needs of Juvenile Justice Staff and clients. Juvenile Justice Center is in need of upgrades to the site, lighting, communications, and security.

History and Current Status

The original Benton-Franklin Counties Juvenile Justice Center (BFJJC) was constructed in 1979 on its current six-acre site, and included an Administration Wing with one courtroom as well as a Detention Wing with a multi-purpose gymnasium, detention cells, visitation rooms, classrooms and associated support spaces. The Administration portion of the building is in need of updating to meet the needs of staff and visitors to BFJJC.

Operating and Maintenance Impact

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 10,184,420	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,184,420
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 10,184,420	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,184,420

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ 520,451	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 520,451
CONSTRUCTION/SERVICES COSTS	8,854,969	-	-	-	-	-	8,854,969
OTHER (FFE, LAND, CONTINGENCY, ETC.)	809,000	-	-	-	-	-	809,000
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 10,184,420	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,184,420

Jail Depreciation Reserve Fund

JAIL DEPRECIATION RESERVE

In 1988, Benton County established a Jail Depreciation Fund for the purpose of holding monies collected from the cities and county for depreciation factors on the Benton County Jail. By establishing and funding the Jail Depreciation Fund through the prisoner bed day rate, Benton County hopes to limit the financial impact to the General Fund should a catastrophic failure occur in the jail. Jail Depreciation fund shall also be used to replace equipment vital to jail operations, which usually are expensive in nature.



Jail Plumbing I-CON System Installation

Benton County Jail: 7122 W. Okanogan Pl. Bldg. B, Kennewick, WA 99336

Description and Scope

The Benton County Jail has approximately two-hundred and fifty-three (253) toilets and sinks and sixty-four (64) showers. Facilities would like to install the I-CON electronic plumbing control system. This will improve maintenance needs, lower costs and decrease the amount of water that is wasted. The I-CON system also allows for remote flushing capabilities and has less moving parts than traditional controls. This system would be installed by I-CON to maximize the warranty.

Purpose and Need

The I-CON system consists of timers, valves and actuators that will control showers, sinks and toilets. Valves can be placed up to sixty (60) feet away, making maintenance easier. I-CON can control the number of times a toilet is flushed. I-Con uses touch sensors instead of push-button to operate. This will also allow remote flush buttons to be placed in plumbing chases to allow officers to flush a toilet without entering a cell.

History and Current Status

An inmate can flush a blanket or other object down the toilet by repeatedly flushing over a long period of time. I-CON will allow us to control the amount of flushes per time period. This will also decrease the time spent on maintenance and the number of parts that are replaced. Officers must enter a cell to flush a toilet if the inmate refuses to do so. This system will allow officers to flush the toilet from inside the plumbing chase, increasing officer safety.

Operating and Maintenance Impact

The Facilities Department purchases approximately \$10,000 per year in replacement plumbing parts. This will be drastically reduced as the I-CON system uses it's own special valves. These valves will not have the wear and tear that the current valves do. Also, there will be a great savings in water, which will save money. This will save many hours of labor, as there have been at least 274 work orders for sinks in the last 12 months.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
JAIL DEPRECIATION RESERVE FUND	\$ 250,000	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 250,000	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	250,000	250,000	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 250,000	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -

West Wing Jail Plumbing Overhaul

Benton County Jail: 7122 W. Okanogan Pl. Bldg. B, Kennewick, WA 99336

Description and Scope

In 1984, Benton County built the Justice Center which included the Jail. The new Jail was built in 2003 and the old Jail is now referred to as the West Wing. This West Wing has not had any major plumbing enhancements made in thirty-two (32) years. This plan would upgrade, replace or refurbish as much of the plumbing components as possible. This will prolong the life of the West Wing and help prevent water damage to the Sheriff's Office below.

Purpose and Need

The purpose of this project is to prolong the life of the West Wing and help eliminate water damage to the first floor offices. There have been many water leaks over the years that have damaged walls, ceiling, equipment and carpeting. These leaks have also created a feeling of poor environmental quality and cleanliness. This project will help to minimize any water from reaching the first floor offices and will help create a more pleasant work area.

History and Current Status

Since 1984, there have been no major upgrades to the West Wing plumbing systems. This includes hot water, hot water returns, cold water, roof and floor drains, trap primers, sewer drains and vents. This project will upgrade as much of this plumbing system as feasible. This will also include work to stop water that has leaked or flooded from penetrating the floor and reaching the first floor where the Sheriff's Office is located.

Operating and Maintenance Impact

Performing this upgrade will save time and money. The Facilities Department has spent many hours cleaning up and repairing damaged walls, ceilings, floors, furniture and other equipment. Money will be saved due to overtime callouts and cleanup costs. This will also create a healthier, more conducive work environment for the Sheriff's Office staff and visitors.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,000,000	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,000,000	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	1,000,000	500,000	500,000	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,000,000	\$ 500,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -

County Road Fund



County Road Fund is created in each County of the State per the RCW 36.82.010. County Road Funds may be used for the construction, alteration, repair, improvement, or maintenance of county roads and bridges, as well as acquiring, operating, and maintaining of machinery, equipment, quarries, and for the cost of establishing county roads, acquiring rights - of- way therefore, and expenses for the operation of the county engineering office.

Road Department Kennewick Administrative Office

102808 Wiser Parkway, Kennewick

Description and Scope

This project is for the design and construction of a new, five thousand five hundred (5,500) square foot administrative office for the Benton County Road Department. Additional office space may be added for other departments or agencies, as needed. The office would be located on existing Benton County Road Department property.

Purpose and Need

In order to provide more accessible and convenient service to the majority of residents in Benton County, and in order to be more proximate to the primary location of development in Benton County, an administrative building is needed. Currently, the administration of the Department is located completely separate of either maintenance division. Locating the new facility on the existing road maintenance site in Kennewick would provide for greater oversight of that portion of the road departments operations.

History and Current Status

The Benton County Road Department is currently located in the courthouse in Prosser, Washington. This places obstacles for residents and developers who wish to visit the office, as it is distant from the main population and development center in Benton County. It also increases staff time expended to inspect development, much of which is in the same area, due to lengthy travel times. The department would maintain some presence in the courthouse when the primary office is relocated.

Operating and Maintenance Impact

The new facility is proposed to be built on the property that currently serves the Benton County Kennewick road shop. Therefore, the increase in maintenance would be only for the new structure itself. Operating costs are anticipated to decrease as staff travel time is reduced. Operating costs will be from the Benton County road fund.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
ROAD FUND	\$ 800,000	\$ 100,000	\$ 700,000	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 800,000	\$ 100,000	\$ 700,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	700,000	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 800,000	\$ 100,000	\$ 700,000	\$ -	\$ -	\$ -	\$ -

Nine Canyon Road (Phase III) - CE 1960

Coffin Road to Beck Road (3.0 miles)

Description and Scope

Nine Canyon Road is a major farm-to-market route connecting the southeast portion of Benton County to State Route 397. This is the final phase of a project to replace eight (8) miles of winding, narrow, gravel road with a modern transportation facility. Safety is improved by bringing the horizontal and vertical alignments up to current standards and widening and paving the road surface. Modern signing, striping and other safety features will be added along with designated access points for adjoining property.

Purpose and Need

Nine Canyon Road is a winding, hilly, gravel road. It is designated a T-3 freight corridor moving up to four (4) million tons of freight annually. During inclement weather the road can be difficult to travel or be shut down completely. This is the final phase in a three-phase project to improve eight (8) miles of this freight corridor to an all-weather road standard allowing for unrestricted travel all year around.

History and Current Status

Completion of the Nine Canyon Road project is a top priority for Benton County. The project is predominately funded by a grant from the County Road Administration Board (CRAB) through their Rural Arterial Program. The remaining funds come from the County's County Road Improvement Matching Program (CRIMP). Survey and design for the project began in January 2016 and should be complete by the end of summer 2016. Preliminary right of way discussions have occurred with land owners and all seem to be agreeable to the proposed alignment. Phase One (1) & Two (2) were completed in 2015 & 2016 for one million seven hundred thousand dollars (\$1,700,000.00).

Operating and Maintenance Impact

This portion of Nine Canyon Road is a gravel road and is a high-maintenance road during harvest season and is in exceptionally poor condition. Existing maintenance costs are also exceptionally high. The seasonal damage experienced on this road is unacceptable and rebuilding the road will resolve the high maintenance cost. The improvement will also increase the safety of the roadway.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL ARTERIAL PROGRAM (CRAB)	\$ 3,020,000	\$ 397,000	\$ 2,623,000	\$ -	\$ -	\$ -	\$ -
CRIMP FUND	336,000	336,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 3,356,000	\$ 733,000	\$ 2,623,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	3,356,000	733,000	2,623,000	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 3,356,000	\$ 733,000	\$ 2,623,000	\$ -	\$ -	\$ -	\$ -

Tyrell Road - Phase II

Travis Road to End of Pavement (2 miles)

Description and Scope

Tyrell Road is a four (4) mile gravel farm-to-market route connecting Travis Road to Plymouth Road. Classified as a rural minor collector, the road sees significant truck traffic during the farming season as adjoining farms use it to access Plymouth Road. This project is the final phase of a two-phase project to improve the substandard gravel road to an all weather paved road.

Purpose and Need

The existing road has a substandard vertical alignment which creates poor sight distances in some areas. The gravel surface is not sufficient for the large truck volumes seen during the farming season and requires constant maintenance. Improving the road to an all-weather paved roadway will improve safety, ensure there are no travel restrictions during inclement weather, and reduce overall maintenance costs.

History and Current Status

Tyrell Road is designated a T-3 freight route, moving up to four million (4,000,000) tons of freight annually. In recent years, irrigation water was added to the surrounding farmland, which has resulted in a significant increase in crop production and the weight of the vehicles using the roadway. The first phase of this project was completed in spring of 2016. Surveying work and design of the roadway was completed in summer of 2016. Phase one (1) was completed in 2016 for one million dollars (\$1,000,000)

Operating and Maintenance Impact

Tyrell road has high maintenance costs compared to other gravel roads in the area due to the large volume of trucks using it during the farming season. Improving the roadway will reduce overall maintenance costs and provide a better operating experience for the road users and surrounding land owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CRIMP FUNDS	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,000,000	1,000,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -

Sellards Road - Phase II

2 Miles East of SR 221 to 1/2 mile east of Tyacke Road (2.5 miles)

Description and Scope

Sellards Road is a farm-to-market road running over twenty-three (23) miles through Benton County. Classified as a rural major collector, Sellards Road experiences extensive farm traffic, including a large number of trucks during harvest season. This project is the second of three projects that will improve seven (7) miles of extensively used roadway in order to reduce maintenance costs and improve utility for traffic.

Purpose and Need

A seven (7) mile section of Sellards Road from SR 221 to Travis Road is disintegrating and requires increasing annual maintenance in order to maintain it in serviceable condition. The three phases that are being completed aim at reducing maintenance costs and closures for this road via reconstruction. This project will complete the second phase two and one half (2.5) miles.

History and Current Status

Sellards Road is a T-3 truck route, which sees up to four million (4,000,000) tons of freight moved on it annually, making it a vital shipping route in Benton County. The first phase of Sellards Road improvement was completed in 2016 (SR 221 to the BPA Power Lines). A topographical survey has been completed, though it needs to be updated. Upon completion of the update, right-of-way needs, if any, can be determined. Construction for the second phase is anticipated to be started in 2017 or 2018. Upon completion, the final phase can be initiated (tentatively planned for 2019). Phase one (1) was completed in 2016 for one million four hundred eighty thousand dollars (\$1,480,000).

Operating and Maintenance Impact

The improvement of Sellards Road will reduce operating and maintenance costs by reducing the routine patching and other remedial efforts that are currently undertaken several times a year. It will also reduce the likelihood of road closures, thus reducing maintenance on detour routes, improving user benefit, and reducing the impact on adjacent property owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CRIMP FUND	\$ 1,400,000	\$ 1,400,000	\$ -	\$ -	\$ -	\$ -	\$ -
ROAD FUND	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,400,000	\$ 1,400,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,400,000	1,400,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,400,000	\$ 1,400,000	\$ -	\$ -	\$ -	\$ -	\$ -

Sellards Road - Phases III

1/2 mile East of Tyacke to Travis (2.5 miles)

Description and Scope

Sellards Road is a farm-to-market road running over twenty-three (23) miles through Benton County. Classified as a rural major collector, Sellards Road experiences extensive farm traffic, including a large number of trucks during harvest season. This project is the third of three projects that will improve seven (7) miles of extensively used roadway in order to reduce maintenance costs and improve utility for traffic.

Purpose and Need

A seven (7) mile section of Sellards Road from SR 221 to Travis Road is disintegrating and requires increasing annual maintenance in order to maintain it in serviceable condition. The three phases that are being completed aim at reducing maintenance costs and closures for this road via reconstruction. This project will complete the third and final phase two and one half (2.5) miles.

History and Current Status

Sellards Road is a T-3 truck route, which sees up to four million (4,000,000) tons of freight moved on it annually, making it a vital shipping route in Benton County. The first phase of Sellards Road improvements was completed in 2016 and the second is anticipated to be completed in 2017-2018. A topographical survey has been completed, though it needs to be updated. Upon completion of the update, right-of-way needs, if any, can be determined. Construction for this final phase is tentatively planned for 2019.

Operating and Maintenance Impact

The improvement of Sellards Road will reduce operating and maintenance costs by reducing the routine patching and other remedial efforts that are currently undertaken several times a year. It will also reduce the likelihood of road closures, thus reducing maintenance on detour routes, improving user benefit, and reducing the impact on adjacent property owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CRIMP FUND	\$ 1,400,000	\$ -	\$ -	\$ 1,400,000	\$ -	\$ -	\$ -
ROAD FUND	75,000	75,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,475,000	\$ 75,000	\$ -	\$ 1,400,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,400,000	-	-	1,400,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,475,000	\$ 75,000	\$ -	\$ 1,400,000	\$ -	\$ -	\$ -

Bert James Road - CE 1774

Williamson to SR 221 (2.0 miles)

Description and Scope

Bert James Road is a rural minor collector running for over ten miles in Benton County. Providing a freight shortcut to SR 221, Bert James Road experiences extensive truck traffic during harvest season. The proposed project would reconstruct two (2) miles of the existing roadway in order to improve its width and vertical alignments so that it might better function in this capacity.

Purpose and Need

The existing segment of Bert James Road has substandard width and vertical alignment, which can make it difficult to navigate for trucks hauling freight. It also experiences occasional flooding. Reconstruction will see this road section rebuilt with adequate drainage, an all-weather driving surface, and widths and alignments in keeping with its usage as a freight route.

History and Current Status

Bert James Road is a T-3 route, seeing up to four million tons of freight per year. Anticipating the need for reconstruction, the County has already surveyed the corridor, procured much of the right-of-way needed for construction, and designed plans. A small amount of right-of-way still needs to be procured.

Operating and Maintenance Impact

Completion of this project will reduce the frequency of which it must be maintained, including the frequency of which it will be chip sealed. Maintenance and operating costs will thus be reduced. Road closures will also be reduced, allowing better realization of the route for users and adjacent property owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL ARTERIAL PROGRAM (CRAB)	\$ 3,528,000	\$ -	\$ -	\$ -	\$ 1,764,000	\$ -	\$ 1,764,000
ROAD FUND	292,000	50,000	50,000	-	96,000	-	96,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 3,820,000	\$ 50,000	\$ 50,000	\$ -	\$ 1,860,000	\$ -	\$ 1,860,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 100,000	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,860,000	-	-	-	1,860,000	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,960,000	\$ 50,000	\$ 50,000	\$ -	\$ 1,860,000	\$ -	\$ -

Bert James Road - CE 1774

Sellards Road to Williamson (2.0 miles)

Description and Scope

Bert James Road is a rural minor collector running for over ten miles in Benton County. Providing a freight shortcut to SR 221, Bert James Road experiences extensive truck traffic during harvest season. The proposed project would reconstruct two (2) miles of the existing roadway in order to improve its width and vertical alignments so that it might better function in this capacity.

Purpose and Need

The existing segment of Bert James Road has substandard width and vertical alignment, which can make it difficult to navigate for trucks hauling freight. It also experiences occasional flooding. Reconstruction will see this road section rebuilt with adequate drainage, an all-weather driving surface, and widths and alignments in keeping with its usage as a freight route.

History and Current Status

Bert James Road is a T-3 route, seeing up to four million tons of freight per year. Anticipating the need for reconstruction, the County has already surveyed the corridor, procured much of the right-of-way needed for construction, and designed plans. A small amount of right-of-way still needs to be procured.

Operating and Maintenance Impact

Completion of this project will reduce the frequency of which it must be maintained, including the frequency of which it will be chip sealed. Maintenance and operating costs will thus be reduced. Road closures will also be reduced, allowing better realization of the route for users and adjacent property owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL ARTERIAL PROGRAM (CRAB)	\$ 1,890,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,890,000
ROAD FUND	210,000	50,000	-	-	-	-	160,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,100,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ 2,050,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	2,050,000	-	-	-	-	-	2,050,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,100,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ 2,050,000

Rachel Road

Leslie to Klye (0.6 Miles)

Description and Scope

Rachel Road is an urban local access road that runs about one and a half (1.5) miles in Benton County, but which is heavily used due to the surrounding urbanized area. This segment of Rachel Road is failing, and the proposed project would provide a hot-mix asphalt overlay for point six (0.6) miles of roadway.

Purpose and Need

Rachel Road sees extensive use due to its proximity to urban development. The road has deteriorated at a rate faster than would be expected for its maintenance regime. As such, the Road Department has removed Rachel Road from the bituminous surface treatment (BST, or "chip seal") maintenance schedule and recommended the proposed overlay.

History and Current Status

Rachel Road has historically received BST on the typical seven-year cycle. This maintenance, which is the prescribed lifespan of BST, has proven ineffective for the roadway. It is believed that a hot-mix asphalt overlay will correct the surface issues seen by this road.

Operating and Maintenance Impact

Rachel Road will not be given BST maintenance this cycle, saving the cost of what is estimated to be an inadequate treatment. Hot-mix asphalt overlays typically can be given subsequent BST as maintenance, with the standard being fifteen (15) years after initial overlay Rachel Road would be returned to the BST schedule.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
ROAD FUND	\$ 200,000	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 200,000	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	200,000	200,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 200,000	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -

Rachel Road

Klye to end of County Road (0.8 Miles)

Description and Scope

Rachel Road is an urban local access road that runs about one and one half (1.5) miles in Benton County, but which is heavily used due to the surrounding urbanized area. This segment of Rachel Road is failing, and the proposed project would provide a hot-mix asphalt overlay for eight tenths (0.8) miles of roadway.

Purpose and Need

Rachel Road sees extensive use due to its proximity to urban development. The road has deteriorated at a rate faster than would be expected for its maintenance regime. As such, the Road Department has removed Rachel Road from the bituminous surface treatment (BST, or "chip seal") maintenance schedule and recommended the proposed overlay.

History and Current Status

Rachel Road has historically received BST on the typical seven (7) year cycle. This maintenance, which is the prescribed lifespan of BST, has proven ineffective for the roadway. It is believed that a hot-mix asphalt overlay will correct the surface issues seen by this road.

Operating and Maintenance Impact

Rachel Road will not be given BST maintenance this cycle, saving the cost of what is estimated to be an inadequate treatment. Hot-mix asphalt overlays typically can be given subsequent BST as maintenance, with the standard being 15 years after initial overlay Rachel Road would be returned to the BST schedule.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
ROAD FUND	\$ 225,000	\$ -	\$ 225,000	\$ -	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 225,000	\$ -	\$ 225,000	\$ -	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	225,000	-	225,000	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 225,000	\$ -	\$ 225,000	\$ -	\$ -	\$ -	\$ -

Willamette Heights - CE 1982

S 38th Ave (West Richland City Limits to West Richland City Limits) (0.7 Miles)

Description and Scope

South 38th Avenue is a private gravel road in the Willamette Heights area. The area around this roadway has been heavily developed and is now bordered on the north and south by the city limits of the City of West Richland. This project would see construction of the roadway to an urban arterial standard.

Purpose and Need

South 38th Avenue serves as the primary ingress/egress for other private roads in the Willamette Heights area, and sees a substantial amount of public traffic as a route through West Richland. Construction of this road to urban arterial standards will satisfy a public need – namely, a public route for the Willamette Heights area – that has been identified by the Benton County Board of Commissioners, as well as provide easier access through the City of West Richland.

History and Current Status

The Willamette Heights area was created by the federal government, which established a sixty six (66) foot roadway easement for access to subdivided property. The route is currently a private gravel road. Design standards for the urban arterial roadway will be per Benton County, the agency that, at this time, will adopt the established roadway. The City of West Richland, the lead agency on this project, is seeking federal financing for construction.

Operating and Maintenance Impact

Once South 38th Avenue is constructed and adopted as a County Road, Benton County will assume maintenance of the roadway.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
FEDERAL STPR INDIRECT GRANT FUNDS	983,000	\$ -	\$ -	\$ 983,000	\$ -	\$ -	\$ -
ROAD FUND	300,000	-	-	300,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,283,000	\$ -	\$ -	\$ 1,283,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,283,000	-	-	1,283,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,283,000	\$ -	\$ -	\$ 1,283,000	\$ -	\$ -	\$ -

Willamette Heights - CE 1982

Mt. Adams View (S 38th Ave West to West Richland Limits) (0.1 Miles)

Description and Scope

Mt Adams View is a private gravel road in the Willamette Heights area. The area around this roadway has been heavily developed and is now bordered on the north, south, and west by the city limits of the City of West Richland. This project would see construction of the roadway to an urban arterial standard.

Purpose and Need

Mt Adams View serves as a major east-west ingress/egress for other private roads in the Willamette Heights area, and sees a substantial amount of public traffic as a route through West Richland. Construction of this road to urban arterial standards will satisfy a public need – namely, a public route for the Willamette Heights area – that has been identified by the Benton County Board of Commissioners, as well as provide easier access through the City of West Richland.

History and Current Status

The Willamette Heights area was created by the federal government, which established a sixty six (66) foot roadway easement for access to subdivided property. The route is currently a private gravel road. Design standards for the urban arterial roadway will be per Benton County, the agency that, at this time, will adopt the established roadway. The City of West Richland, the lead agency on this project, is financing the construction.

Operating and Maintenance Impact

Once Mt Adams View is constructed and adopted as a County Road, Benton County will assume maintenance of the roadway.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CITY OF WEST RICHLAND	\$ 200,000	\$ -	\$ -	\$ 200,000	\$ -	\$ -	\$ -
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 200,000	\$ -	\$ -	\$ 200,000	\$ -	\$ -	\$ -

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	200,000	-	-	200,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 200,000	\$ -	\$ -	\$ 200,000	\$ -	\$ -	\$ -

Hanks Road

Crosby to 1/2 mile East of McDonald (1.5 miles)

Description and Scope

Hanks Road runs just over twelve (12) miles in Benton County. A rural minor collector, Hanks Road sees extensive farming freight traffic, particularly during harvest. The proposed project would improve one and one half (1.5) miles of Hanks Road via reconstruction to an all-weather standard and correcting horizontal and vertical alignment deficiencies.

Purpose and Need

The existing road is substandard for the traffic it serves with vertical and horizontal sight obstructions and relatively narrow lanes providing challenges for freight. Additionally, inclement weather can lead to weight restrictions and closures. The improvement of this roadway section through reconstruction will address these issues.

History and Current Status

Hanks Road is a T-3 freight route conveying up to four million (4,000,000) tons of goods annually. This proposal is part of a larger series of projects aimed at improving farm-to-market freight routes in rural Benton County.

Operating and Maintenance Impact

The high volume of truck traffic increases the maintenance costs of Hanks Road compared to other roads of similar use and condition in Benton County. Improving the road to an all-weather status and correcting the existing deficiencies should reduce those costs. Upon completion of the project, Hanks Road will return to the normal maintenance regime.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
RURAL ARTERIAL PROGRAM (CRAB)	\$ 1,620,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,620,000
ROAD FUND	180,000	100,000	-	-	-	-	80,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 1,700,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,700,000	-	-	-	-	-	1,700,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 1,700,000

Hanks Road

1/2 mile East of McDonald to Aller (1.5 miles)

Description and Scope

Hanks Road runs just over twelve (12) miles in Benton County. A rural minor collector, Hanks Road sees extensive farming freight traffic, particularly during harvest. The proposed project would improve one and one half (1.5) miles of Hanks Road via reconstruction to an all-weather standard and correcting horizontal and vertical alignment deficiencies.

Purpose and Need

The existing road is substandard for the traffic it serves with vertical and horizontal sight obstructions and relatively narrow lanes providing challenges for freight. Additionally, inclement weather can lead to weight restrictions and closures. The improvement of this roadway section through reconstruction will address these issues.

History and Current Status

Hanks Road is a T-3 freight route conveying up to four million (4,000,000) tons of goods annually. This proposal is part of a larger series of projects aimed at improving farm-to-market freight routes in rural Benton County.

Operating and Maintenance Impact

The high volume of truck traffic increases the maintenance costs of Hanks Road compared to other roads of similar use and condition in Benton County. Improving the road to an all-weather status and correcting the existing deficiencies should reduce those costs. Upon completion of the project, Hanks Road will return to the normal maintenance regime.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,700,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,700,000
ROAD FUND	100,000	100,000	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 1,700,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,700,000	-	-	-	-	-	1,700,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,800,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 1,700,000

Case Road

OIEH to Hanks (2.3 Miles)

Description and Scope

Case Road runs just over thirteen (13) miles in Benton County. A rural minor collector, Case Road sees extensive farming freight traffic, particularly during harvest. The proposed project would improve two and three tenths (2.3) miles of Hanks Road via reconstruction to an all-weather standard and correcting horizontal and vertical alignment deficiencies.

Purpose and Need

The existing road is substandard for the traffic it sees, with vertical and horizontal sight obstructions and substandard lanes providing challenges for freight. Additionally, inclement weather can lead to weight restrictions and closures. The improvement of this roadway section through reconstruction will address these issues.

History and Current Status

Case Road is a T-3 freight route conveying up to four million (4,000,000) tons of goods annually. This proposal is part of a larger series of projects aimed at improving farm-to-market freight routes in rural Benton County.

Operating and Maintenance Impact

The high volume of truck traffic increases the maintenance costs of Case Road compared to other roads of similar use and condition in Benton County. Improving the road to an all-weather status and correcting the existing deficiencies should reduce those costs. Upon completion of the project, Case Road will return to the normal maintenance regime.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 660,000	\$ 670,000	\$ 670,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 660,000	\$ 670,000	\$ 670,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
CONSTRUCTION/SERVICE COST	2,000,000	-	-	-	-	-	2,000,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000

County Well RD Phase I

SR 221 to McBee (3.0 Miles)

Description and Scope

County Well Road runs over seven miles in Benton County. Classified as a rural minor collector, the road sees significant truck traffic during the farming season. This project is the first phase of a three-part series that will reconstruct six and eight tenths (6.8) miles of the road to an all-weather standard and work to improve safety and drainage.

Purpose and Need

The existing road has poor drainage and profile. There are also segments that would benefit from the application of guardrail. Improving the road to an all-weather paved roadway will improve safety, ensure there are no travel restrictions during inclement weather, and reduce overall maintenance costs.

History and Current Status

County Well Road is designated a T-5 freight route, moving up to twenty-thousand (20,000) tons of freight over sixty (60) days. This is the first phase of this series aiming at improving roadway conditions and safety. The project is currently in the preliminary planning phase.

Operating and Maintenance Impact

County Well Road has high maintenance costs compared to other gravel roads in the area due to the large volume of trucks using it during the farming season. Improving the roadway will reduce overall maintenance costs and provide a better operating experience for the road users and surrounding land owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 2,250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,250,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,250,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	2,250,000	-	-	-	-	-	2,250,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 2,250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,250,000

County Well RD Phase II

McBee to Clodius (2.0 Miles)

Description and Scope

County Well Road runs over seven (7) miles in Benton County. Classified as a rural minor collector, the road sees significant truck traffic during the farming season. This project is the second phase of a three-part series, that will reconstruct sixty and eight tenths (6.8) miles of the road to an all-weather standard, and work to improve safety and drainage.

Purpose and Need

The existing road has poor drainage and profile. There are also segments that would benefit from the application of guardrail. Improving the road to an all-weather paved roadway will improve safety, ensure there are no travel restrictions during inclement weather, and reduce overall maintenance costs.

History and Current Status

County Well Road is designated a T-5 freight route, moving up to twenty-thousand (20,000) tons of freight over sixty days. This is the second phase of this series aiming at improving roadway conditions and safety. The project is currently in the preliminary planning phase.

Operating and Maintenance Impact

County Well Road has high maintenance costs compared to other gravel roads in the area due to the large volume of trucks using it during the farming season. Improving the roadway will reduce overall maintenance costs and provide a better operating experience for the road users and surrounding land owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,500,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,500,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,500,000	-	-	-	-	-	1,500,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,500,000

County Well RD Phase III

Clodius to County Pit (1.8 Miles)

Description and Scope

County Well Road runs over seven (7) miles in Benton County. Classified as a rural minor collector, the road sees significant truck traffic during the farming season. This project is the final phase of a three-part series, that will reconstruct six and eight tenths (6.8) miles of the road to an all-weather standard, and work to improve safety and drainage.

Purpose and Need

The existing road has poor drainage and profile. There are also segments that would benefit from the application of guardrail. Improving the road to an all-weather paved roadway will improve safety, ensure there are no travel restrictions during inclement weather, and reduce overall maintenance costs.

History and Current Status

County Well Road is designated a T-5 freight route, moving up to twenty-thousand (20,000) tons of freight over sixty days. This is the third phase of this series aiming at improving roadway conditions and safety. The project is currently in the preliminary planning phase.

Operating and Maintenance Impact

County Well Road has high maintenance costs compared to other gravel roads in the area due to the large volume of trucks using it during the farming season. Improving the roadway will reduce overall maintenance costs and provide a better operating experience for the road users and surrounding land owners.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,350,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,350,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,350,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,350,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
CONSTRUCTION/SERVICE COST	1,350,000	-	-	-	-	-	1,350,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,350,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,350,000

Finley Road

M.P. 5.2 to End of Pavement (2.1 Miles)

Description and Scope

Finley Road runs over fifteen (15) miles in Benton County. A rural minor collector, Finley Road sees extensive farming freight traffic, particularly during harvest. The proposed project would improve two and one tenths (2.1) miles of gravel road, to a paved all-weather standard, and establish proper widths.

Purpose and Need

The existing road is a gravel road with substandard lanes that provide challenges for freight. Due to it being a gravel road, inclement weather can lead to weight restrictions and closures. The improvement of this roadway section through paving will address these issues.

History and Current Status

Finley Road is a T-4 freight route conveying up to three-hundred thousand (300,000) tons of goods annually. This proposal is part of a larger series of projects aimed at improving farm-to-market freight routes in rural Benton County.

Operating and Maintenance Impact

The relatively high volume of truck traffic increases the maintenance costs of Finley Road compared to other roads of similar use and condition in Benton County. Improving the road to a paved, all-weather status and correcting the existing width deficiencies should reduce those costs. Upon completion of the project, Finley Road will return to the normal maintenance regime for similar roads.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,750,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,750,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,750,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,750,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,750,000	-	-	-	-	-	1,750,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,750,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,750,000

Dague Road

Terril to Game Farm (0.5 Miles)

Description and Scope

Dague Road is a proposed one half (0.5) mile paved all-weather road that would connect E Game Farm Road to E Terril Road in Benton County, southeast of Kennewick, Washington.

Purpose and Need

East Game Farm Road currently terminates at its east approximately one half (0.5) mile north of the intersection of Fremont Road and Terril Road. Currently, residents at the end of Game Farm Road have to back-track several miles to access the nearby state highway system. Residents on Fremont Road and Terril Road also have to back-track several miles to access the City of Kennewick. Connection of these two roads would establish a route that ultimately connects the residents to the state highway system and the more urban areas.

History and Current Status

While there has been some residential development in the general vicinity of these two roads, the surrounding land is still heavily agrarian. Providing this through route would allow for more readily dissemination of produce. It would also provide access for those residences that have been constructed in the area.

Operating and Maintenance Impact

Currently, this portion of Dague Road does not exist. Its construction would add one half (0.5) miles of paved, all-weather roadway to the County's maintenance schedule.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 250,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 250,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	250,000	-	-	-	-	-	250,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 250,000

Johnson Road

CR 12 to Griffin (2.2 Miles)

Description and Scope

Johnson Road runs over five (5) miles in Benton County. A rural local access road, Johnson Road is narrower than prescribed standards. The proposed project would improve two and two tenths (2.2) miles of Johnson Road to establish proper widths.

Purpose and Need

The existing road is a narrow road with substandard lanes that provide challenges for safety. The improvement of this roadway section through widening aims to address this issue.

History and Current Status

Johnson Road has experienced three (3) recorded accidents on this segment since 2008. This proposal aims at improving safety along this segment.

Operating and Maintenance Impact

Johnson Road is already maintained on a regular basis by the Benton County Road Department. The increased lane widths would likely only increase material costs, as labor would be geared towards standard road widths.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
UNDETERMINED FUNDING SOURCE	\$ 1,320,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,320,000
ROAD FUND	150,000	-	75,000	75,000	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,470,000	\$ -	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ 1,320,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
PRELIMINARY ENGINEERING	\$ 150,000	\$ -	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICE COST	1,320,000	-	-	-	-	-	1,320,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,470,000	\$ -	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ 1,320,000

Addendum: Ongoing Maintenance

Addendum: Ongoing Maintenance - Previously completed projects that have ongoing maintenance that is funded out of Capital Projects Fund.



Video Conferencing Upgrade & Infrastructure Countywide

Description and Scope

This \$297K project was completed in 2014. It involved upgrading the existing video conferencing equipment in the Commissioner conference rooms and installing a Tandberg network-wide video conferencing management infrastructure to facilitate future expansion of video conferencing locations and use. The system will now manage everything from full room video environments to laptops with mobile video cameras. This is on going maintenance for the system

Purpose and Need

“Face time” meetings using video conferencing have become a proven and widely used tool for the more effective use of time and resources. This project puts the infrastructure in place to expand and manage video conferencing within the county wide area network and via the internet. It includes the ability to broadcast Board meetings inside the county network.

History and Current Status

The existing video conferencing equipment (with the exception of the monitors) was acquired in 2004. Since then the use of video conferencing technologies to save travel expense and time has expanded significantly. Much of this is due to the increased availability of broadband networks, the quality of high definition imaging, and the desire to reduce the expenses and time associated with travel.

Operating and Maintenance Impact

The ongoing costs for this project are associated with replacement assessments for the equipment over a typical five year life cycle and annual software maintenance. Video conferencing equipment in addition to the existing Commissioner conference rooms is not included. The project just builds the infrastructure necessary to support video conferencing of various types added in the future.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECT FUND	222,000	37,000	37,000	37,000	37,000	37,000	37,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 222,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	222,000	37,000	37,000	37,000	37,000	37,000	37,000
	-	-	-	-	-	-	-
TOTAL	\$ 222,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000

Microsoft Enterprise Agreement

Countywide

Description and Scope

This project began in 2012 and involved a commitment by the County to a Microsoft Enterprise Agreement (MS EA). MS EA's are for a minimum of three years with the most cost benefits gained by extending to six years. The MS EA includes the licensing necessary for migrating to Microsoft Exchange email and current Office Pro software for all county workstations. It also includes licensing for future implementations of System Center, SharePoint, and Lync.

Purpose and Need

As noted in the Information Technology Strategic Plan, "most users consider Microsoft Exchange the standard for large organizations." The same is true of the Microsoft Office software. The project would migrate the county to current versions of the software noted above and keep all the software versions current. The System Center capabilities include what was previously a separate project for acquiring a Computer Asset Management System.

History and Current Status

Upgrading the current user base would cost around \$250,000. A comparable expense would need to be repeated every two or three years to keep the versions current. In the Information Technology Strategic Plan, PTI estimated a minimum cost of about \$103,000 to migrate from GroupWise to Exchange with ongoing costs averaging about \$15,000.

Operating and Maintenance Impact

The Enterprise Agreement involves fixed annual payments for the duration of the agreement. One time costs in this estimate have been expended for software and professional services to assist with the migration from Novell eDirectory and GroupWise to Microsoft Active Directory and Exchange. The increase in the annual payment for the optional second three years reflects an estimate for additional users and licenses added during the first three years.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECT FUND	\$ 1,500,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 1,500,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	1,500,000	250,000	250,000	250,000	250,000	250,000	250,000
	-	-	-	-	-	-	-
TOTAL	\$ 1,500,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000

Server Virtualization

Countywide

Description and Scope

Virtualizing the county servers involves moving away from many independent servers running specific applications or functions and combining them into a few high capacity devices that will run multiple virtual servers. This area is just now being investigated by Central Services staff. The cost estimate is developed from the Information Technology Strategic Plan report.

Purpose and Need

The primary goal of virtualization is to reduce the number of physical devices in order to reduce the maintenance requirements of physical devices both in staff time and power usage. Virtualization also provides opportunities for improving up-time by clustering servers and adding fail-over technologies that automatically switch applications from a failed server to an active one.

History and Current Status

The county data centers now house nearly forty servers supporting the general infrastructure and applications used by county departments. While virtualization has been around for many years, it has now matured to the level of being considered a best practice in the industry. This is an area identified by the Information Technology Strategic Plan as a component of a "robust technical infrastructure" (p. 11).

Operating and Maintenance Impact

The ongoing costs for this project are associated with replacement assessments for the data center equipment over a typical five year life and annual maintenance of virtualization software. These expenses could vary considerably depending on the level of virtualization that is adopted by the county and the products that are selected for managing the virtualized environment.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECT FUND	\$ 414,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 414,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	414,000	69,000	69,000	69,000	69,000	69,000	69,000
	-	-	-	-	-	-	-
TOTAL	\$ 414,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000	\$ 69,000

Voice System Upgrade

Countywide

Description and Scope

This project involves a continuation of the migration from the existing Nortel platform to the current Avaya voice technology. With the acquisition of Nortel's telephony assets in 2009, Avaya committed to Nortel's long standing practice of reusing existing hardware while enhancing and expanding features and functionality. The project will begin with a review and updated design.

Purpose and Need

As with other aspects of information technology, the county voice systems are constantly expanding in both capacity and functionality. The leases on the existing equipment will be ending in 2014 and will need to be replaced with new leases or purchases in order to continue the migration of the voice systems from Nortel to the supported Avaya platforms.

History and Current Status

Every five to six years, the county voice systems have been upgraded to newer technology and increased capacity. In the last couple of cycles, these upgrades have including leasing most of the equipment which has become less advantageous as the technology changes. Purchasing and incorporating into the Replacement Fund is what is proposed here.

Operating and Maintenance Impact

The ongoing costs for this project are associated with replacement assessments or leases for the equipment over a typical five year life cycle. They also include software maintenance and technical support contracts for the systems. No doubt the upgrade will reflect the continuing trend of convergence in voice and data systems into what is broadly described as unified communications.

PARTICIPATING FUNDS	TOTAL ESTIMATED PROJECT REVENUE	REVENUES					
		2017-2018		2019-2020		2021-2022	
CAPITAL PROJECT FUND	\$ 312,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
TOTAL	\$ 312,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000

PROJECT BUDGET	TOTAL ESTIMATED PROJECT COSTS	EXPENDITURES					
		2017-2018		2019-2020		2021-2022	
ARCHITECT / ENGINEERING FEES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CONSTRUCTION/SERVICES COSTS	-	-	-	-	-	-	-
OTHER (FFE, LAND, CONTINGENCY, ETC.)	-	-	-	-	-	-	-
OPERATIONS AND MAINTENANCE	312,000	52,000	52,000	52,000	52,000	52,000	52,000
	-	-	-	-	-	-	-
TOTAL	\$ 312,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000	\$ 52,000

Glossary



GLOSSARY - includes terms that will help you understand the technical language often used in the capital improvement plan. Glossary terms are listed alphabetically under each alphabet letter and include a brief description and an acronym, as applicable.



CAPITAL IMPROVEMENT PLAN DOCUMENT GLOSSARY

The glossary includes terms that will help you understand the technical language often used in the capital improvement plan. Glossary terms are listed alphabetically under each alphabet letter and include a brief description and an acronym, as applicable.

A

ACQUISITION: Acquiring land, existing buildings, or equipment and vehicles. The Public Works Department uses the following definition: Right-of-Way/Acquisitions consist of right-of-way cost for capital projects, including appraisal, survey services, and research, as well as purchase transactions and any associated assistance.

ADA COMPLIANCE: A Federal law providing for a wide range of protection to individuals with disabilities ranging from prohibitions against discrimination in employment specific requirements for modifications of public facilities and transportation systems.

ADOPTION: A formal action taken by the Board of Benton County Commissioners which sets the spending limits for the fiscal year.

ARCHITECT/ENGINEERING FEES: Fees associated with the art/science and technology concerned with designing and building structures.

B

BALANCED BUDGET: Consists of each funds' estimated beginning fund balance plus revenues to equal total funds available, minus total expenditures, which equals the ending fund balance. These ending fund balances must either equate to zero dollars or have a reserve balance remaining.

BEGINNING BALANCE: Comprised of residual funds brought forward from the previous year (ending balance).

BOND: A debt security, in which the authorized issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay interest (the coupon) to use and/or to repay the principal at a later date, termed maturity.

C

CAPITAL FUND: Routine capital outlay purchases and projects by the county including but not limited to office furniture, major building maintenance, real property acquisition, building remodeling projects, road projects, and water projects. Said funds shall be invested by the Benton County Treasurer with interest accruing to the Current Expense fund.



CAPITAL IMPROVEMENT PROJECT: Non-routine capital expenditures that generally cost more than \$5,000 resulting in the purchase of equipment, construction, renovation or acquisition of land, infrastructure and/or buildings with an expected useful life of at least five years.

COLLECTOR (Urban): The collector street system provides both land access service and traffic circulation within residential and neighborhoods and commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to their ultimate destinations. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. In the central business district, and in other areas of similar development and traffic density, the collector system may include the entire street grid. The collector street system may also carry local bus routes.

CORRIDOR: A major transportation route which can consist of one or more highways, arterial streets, transit lines, rail lines and/or bikeways.

D

DEBT CAPACITY: Ability to borrow money. The County's legal non-voted debt capacity is 1.5% of the assessed valuation, less outstanding limited tax general obligation bond debt, plus available assets. The County's legal voted debt capacity is 2.5% of the assessed valuation, less outstanding limited tax general obligation bond debt, plus available assets.

DEMOLITION: The destruction and removal of some or all of an existing structure.

DEPRECIATION: The periodic cost assigned for the reduction in usefulness and value of a long-term tangible asset.

E

EASEMENT: A right to use the real property of another without possessing it.

ECONOMIC DEVELOPMENT: Investment of resources to create financial self-sufficiency and prosperity in a community, including the industrial, commercial, and service sectors.



F

FAIRGROUNDS O & M FUND: A fund established for the purpose of operations and maintenance of the Benton County Fairgrounds; however, the project cost allocated in this report is for the capital projects located at the fairgrounds.

FURNITURE, FIXTURES & EQUIPMENT (FF&E): Moveable furniture, fixtures or other equipment that have no permanent connection to the structure of a building or utilities.

FMSIB: Freight Mobility Strategic Investment Board (state indirect grant funds).

G

GOAL: A general and timeless statement created with a purpose based on the needs of the community.

H

HEATING, VENTILATION, AND AIR CONDITIONING (HVAC): Refers to technology of indoor environmental comfort.

I

INFRASTRUCTURE: Facilities that support the continuance and growth of a community. Examples include roads, water lines, sewers, public buildings, & parks.

J

JAIL DEPRECIATION FUND: In 1998, Benton County established a Jail Depreciation Fund for the purpose of holding monies collected from the cities and county for depreciation factors on the Benton County Jail. By establishing and funding the Jail Depreciation Fund thru the prisoner bed day rate, Benton County hopes to limit the financial impact to the General Fund should a catastrophic failure occur in the jail. Jail Depreciation funds shall also be used to replace equipment vital to jail operations, which usually are expensive in nature.

K

There are no items at this time.

L

LEGAL DESCRIPTIONS: A method of describing a particular parcel of land in such a way that it uniquely describes the particular parcel and no other.



M

MAJOR COLLECTOR (Rural): These routes have several definitions. 1) serve county seats not on arterials routes, larger towns not directly served by the higher systems, and other traffic generator of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, and important agricultural areas; 2) link these places with nearby larger towns or cities, or with routes of higher classifications; and 3) serve the more important intracounty travel corridors.

MASTER PLAN: A plan prepared to specify and coordinate the provision of one or more infrastructure systems and related services.

MILESTONE: A tangible point in time that tells how far along a project is in the process.

MINOR COLLECTOR (Rural): These routes should 1) be spaced at intervals consistent with population density to accumulate traffic from local roads and bring all developed areas within reasonable distances of collector roads; 2) provide service to the remaining smaller communities; and 3) link the local important traffic generators with their rural vicinity.

N

There are no items at this time.

O

OTHER EXPENDITURES: Expenditures not related to CIP projects for a specific fund. Examples include operating transfers, minimum fund balances, and etc.

P

PARK DEVELOPMENT FUND: is a cumulative reserve fund for the purpose of accumulating and expending said moneys for capital improvements within Benton County parks.

Q

There are no items at this time.



R

R.E.E.T. FUND: 1/4 PERCENT REAL ESTATE EXCISE TAX is a fund to account for the revenues generated by a special 1/4 of 1 percent excise tax levied on the sale of real property within the County. All projects must be included in the annual Benton County Comprehensive Land Use Plan before any spending is approved.

R.E.E.T TECHNOLOGY FUND: is a fund established per State of Washington Legislature SSHB 1240, section 2 to increase excise fees on Real Estate Excise Tax to provide for the development and implementation of an automated system for the electronic processing of the real estate excise tax compatible with the system developed by the Washington State Department of Revenue.

REVENUE: Total amounts available for appropriation including estimated revenues, fund transfers and beginning fund balances. Financial resources are received from taxes, user charges and other levels of government.

RIGHT-OF-WAY: The right given by one landowner to another to pass over the land actually transferring ownership. ROW is granted by deed or easement, for construction and maintenance according to a designated use.

ROAD FUND: is created in each County of the State per the RCW 36.82.010. County Road Funds may be used for the construction, alteration, repair, improvement, or maintenance of county roads and bridges, as well as acquiring, operating, and maintaining of machinery, equipment, quarries, and for the cost of establishing county roads, acquiring rights-of-way therefor, and expenses for the operation of the county engineering office.

S

STPR: Surface Transportation Program Rural (Competitive Federal indirect grant fund)

SUSTAINABLE DEVELOPMENT: Development with the goal of preserving environmental quality, natural resources and livability for present and future generations.

T

TBD: To Be Determined are projects that are requested, however, the funding has not been determined.

TIB: Transportation Improvement Board (Competitive State indirect grant funds)



U

There are no items at this time.

V

There are no items at this time.

W

There are no items at this time.

X

There are no items at this time.

Y

There are no items at this time.

Z

There are no items at this time.

Appendix K
Benton County Comprehensive Solid
Waste Management and Moderate Risk
Waste Management Plan, 2013

FINAL DRAFT

2013 Update Benton County Solid Waste and Moderate Risk Waste Plan

'A "roadmap" to managing the comprehensive solid waste and moderate risk waste management systems in Benton County.'



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Chapter 1

Introduction



1.0 Introduction

The 2013 Benton County Comprehensive Solid Waste Management and Moderate Risk Waste Management Plan (2013 Plan) provides background and guidance for a long-term approach to solid waste and moderate risk waste (MRW) management in the region. This 2013 Plan comprises the combined comprehensive solid waste management plan (CSWMP) and Local Hazardous Waste/Moderate Risk Waste (MRW) Plan for the incorporated and unincorporated areas of Benton County (combined Plan).

1.1 Purpose and Organization of Plan

The purpose of this 2013 Plan is to serve as a “roadmap” to managing the comprehensive solid waste and MRW management systems in Benton County. The 2013 Plan was developed as a joint effort of Benton County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland. It is intended to provide citizens and decision makers in Benton County with a guide to implement, monitor, and evaluate future activities in the planning area for a 20-year period. The recommendations for the 2013 Plan not only guide local decision makers, but substantiate the need for local funds and state grants to underwrite solid waste and MRW projects.

The 2013 Plan conforms to the requirements of the State Solid Waste Management “Reduction and Recycling Act” (RCW 70.95, and follows suggested protocol as outlined in “Guidelines for the Development of Local Comprehensive Solid Waste Management Plans and Plan Revisions” (Waste 2 Resource Program, February 2010, Publication No. 10-07-005).

The MRW Plan has been prepared to meet the planning requirements prescribed in the Local Hazardous Waste Planning Guidelines, RCW 70.105.220 and RCW 70.951.020, and follows the suggested protocol as outlined in Guidelines for Developing and Updating Local Hazardous Waste Plans (Waste 2 Resources Program, October 2009, Publication No. 09-07-073). The purpose of the MRW Plan is to establish the goals and objectives for the safe handling and management of moderate risk waste, which is composed of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste generated in the County. The Plan will direct and guide the management of these wastes over a twenty year planning period, from 2010 to 2030. The recommendations included in the MRW Plan are based on existing conditions and forecasts of future conditions in the County.

The Plan is organized as follows:

Chapter 1	Introduction and Background of the Planning Area
Chapter 2	Waste Stream Analysis
Chapter 3	Education and Outreach, Waste Reduction, Recycling, and Organics
Chapter 4	Collection Systems

Chapter 5	Transfer and Disposal
Chapter 6	Miscellaneous Wastes
Chapter 7	Moderate Risk Waste
Chapter 8	Administration and Enforcement
Chapter 9	Implementation

1.2 2013 Plan Goals and Objectives

The intent of this Plan is to establish the foundation for the proper management of solid waste and MRW in Benton County. This Plan update incorporates the following goals and objectives:

Goal #1: Emphasize public outreach and educational programs.

Objectives:

- Expand methods of outreach, including use of social media.
- Host and advertise events to increase participation.
- Coordinate events regionally.
- Link regional websites.
- Provide all types of information, including financial.

Goal #2: Continue developing solid waste programs and projects that promote and maintain a high level of public health and safety which protects the human and natural environment of Benton County.

Objectives:

- Address the management of all types of solid waste.
- Lead by example in environmental protection and in meeting environmental regulations.
- Provide consistency among resource, land use, and waste management plans.
- Address illegal accumulation of waste at residences and other locations.

Goal #3: Manage solid wastes in a manner that promotes, in order of priority: waste reduction, reuse, and recycling, with source separation of recyclables as the preferred method.

Objectives:

- Work toward reaching a diversion rate of 50% by 2020.
- Emphasize programs for commercial waste diversion.
- Establish consistent methodologies to measure the baseline and future progress in achieving waste diversion.
- Obtain accurate data on waste diversion activities.
- Support statewide product stewardship policies.

Goal #4: Encourage and expand coordination and communication regarding solid waste issues among all jurisdictions, agencies, and private firms in Benton County.

Objectives:

- Encourage consistent policies across jurisdictions.
- Encourage public involvement in the planning and implementation process.
- Emphasize local responsibility for solving solid waste management issues.

Goal #5: Provide for efficient collection, transfer, and disposal of MSW and recyclables.

Objectives:

- Ensure access to collection or drop-off services for residences, businesses, and industry.
- Locate recycling and solid waste transfer, processing, and disposal facilities to optimize service levels and transportation efficiencies.
- Ensure adequate disposal capacity.

Goal #6: Establish guidelines and strategies for management of specific waste streams.

Objectives:

- Develop a plan to prepare for management of disaster debris.
- Develop Best Management Practices for agricultural waste reuse and recycling.
- Develop a plan for managing tires.
- Develop a plan for managing universal waste.
- Continue and expand the use of litter work crews.

Goal #7: Promote and reduce obstacles to the development of new solid waste technologies and facilities.

Objectives:

- Identify specific waste streams appropriate for technology or facility development.
- Identify regionally beneficial opportunities.

Planning Authorities

1.2.1. Solid Waste Advisory Committee

According to Chapter 70.95 RCW, each county shall establish a local solid waste advisory committee (SWAC) to assist in the development of programs and policies for solid waste

handling and disposal, and to review and comment upon proposed rules, policies, or ordinances prior to their adoption. Two primary responsibilities of the SWAC are to advise on the 2013 Plan development and to assist in the plan adoption process. This Plan Update was prepared under the direction and guidance of the SWAC. The SWAC has participated in the 2013 Plan development by reviewing the previous plan and draft versions of the 2013 plan, providing input and comment on all issues covered by the 2013 Plan, acting as a liaison to their constituencies, and assisting in public involvement. The committee also reviewed the complete draft and final plans, and will be asked to recommend the 2013 Plan for adoption by the county and municipalities. After the 2013 Plan is adopted, the SWAC will routinely evaluate implementation of recommended programs, and will help to promote waste reduction and recycling throughout the region. SWAC members will also participate in amending the 2013 Plan, if necessary.

Members of the SWAC are included in **Exhibit 1-1**. Meetings are whenever action by the SWAC is needed, or at least quarterly. Minutes of the meetings are on file in the County Public Works office.

Exhibit 1-1. Solid Waste Advisory Committee Members, 2013

Name	Affiliation	Name	Affiliation
Darrick Dietrich, Chair	Basin/Ed's Disposal, Inc.	Khris Olsen	Public Citizen
Shon Small	Benton County	Patrick Puntney	Clayton-Ward
Lloyd Carnahan	City of Benton City	Pete Rogalsky	City of Richland
John Deskins	City of Kennewick	Roscoe Slade	City of West Richland
Bob Elder	City of Prosser	Jeff Wheatley	Waste Management
Mike Jewett	Sanitary Disposal		

1.2.2. Role of Local Governments

The cities of Benton County have chosen to fulfill their solid waste management planning responsibilities by participating with the county in preparing a joint city-county plan for solid waste management.

The 2013 Plan has been developed with Benton County as the lead agency and participation and cooperation defined in an inter-local agreement among the County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland, with only the Hanford area excluded.

1.3 Solid Waste Planning History in Benton County

This 2013 Plan is the most recent plan and supersedes all previous Benton County solid and hazardous waste plans, including the *1977 Comprehensive Solid Waste Management Plan for Benton and Franklin Counties*, the *1994 Benton-Franklin Counties Comprehensive Solid Waste Plan*, and the *2006 Solid Waste Management Plan Update* (the 2006 Plan).

Exhibit 1-2. lists key recommendations from the 2006 Plan and their current implementation status.

Exhibit 1-2. Status of Previous Solid Waste Management Plan Recommendations

Recommendations	Status
Public Education and Outreach	
1. Develop and distribute bilingual outreach materials.	Ongoing
2. Develop and distribute direct mailing newsletter.	Ongoing in City of Richland
3. Develop phone book section insert with information on solid waste and recycling.	Not implemented
4. Increase use of social media and web sites for information dispersion.	Ongoing
5. Provide technical assistance to schools and businesses.	Ongoing
Waste Reduction	
1. County to procure recycled content products.	Ongoing
2. Develop environmentally preferable purchasing criteria for computers and electronics.	Ongoing
3. Implement City/County waste reduction policies.	Ongoing
4. Develop and implement methods to measure waste reduction results.	Ongoing
5. Provide reuse or swap shops, or both, at landfill or drop-off sites for used residential materials	Implemented
Recycling	
1. Implement internal recycling program for County operations.	Implemented
2. Implement special event recycling.	Ongoing
3. Expand recycling drop-box program.	Ongoing
4. Implement rewards program for residential recyclers.	Ongoing
5. Implement recognition program for commercial waste reduction and recycling successes.	Ongoing
6. Provide education to businesses on recycling.	Ongoing
7. Provide commercial waste audit assistance.	Not implemented
Organics	

Recommendations	Status
1. Expand yard waste chipping program.	Ongoing
2. Encourage food waste management at restaurants and other establishments, such as donations to food banks, processing for animal waste, or rendering.	Not implemented
3. Investigate opportunities for biomass processing.	Ongoing
4. Assess feasibility of in- or out-of-county composting facility.	Implemented
Collection Systems	
1. Change service levels to capture more households for recycling.	Ongoing
Transfer and Disposal	
1. Expand Horn Rapids Landfill to ensure in-county disposal capacity.	Not Implemented
2. Assess long-haul of MSW out of City of Richland.	Ongoing
3. Expand local transfer station capacity.	Not Implemented
Construction and Demolition Debris	
1. Provide education programs for contractors.	Not Implemented
2. Establish construction, demolition, and inert waste diversion specifications for public projects.	Not Implemented
3. Use recycled content building specifications for public projects.	Not Implemented
4. Develop disaster management plan.	Ongoing
5. Establish locations for staging and temporary storage of disaster debris.	Ongoing
6. Assess development of regional C&D facility.	Not implemented
Wood Waste	
1. Support diversion at transfer stations and landfills.	Ongoing
2. Provide public education on facilities to divert wood waste.	Ongoing
Industrial Wastes	
1. Continue to monitor and regulate industrial waste disposal; provide assistance as necessary.	Ongoing
Agricultural Wastes	
1. Form committee to discuss potential opportunities for alternative energy industries using agricultural waste.	Ongoing
Tires	
1. Implement City/County purchasing programs for recycled tire products.	Ongoing
2. Reduce City/County tire waste through maintenance and repair program.	Ongoing
3. Provide tire waste public education programs.	Ongoing
Biomedical Wastes	

Recommendations	Status
1. Provide education materials for correct management of residential medical waste.	Ongoing
2. Collect sharps and outdated pharmaceuticals at MRW collection sites.	Ongoing
Asbestos	
1. Educate homeowners on proper handling methods.	Ongoing
Moderate Risk Wastes	
1. Expand public education program.	Ongoing
2. Provide information on alternative products.	Ongoing
3. Use mobile collection center to target rural areas.	Not implemented
4. Expand household hazardous waste collection to include biomedical waste generated by households.	Ongoing
5. Implement recognition program for businesses.	Ongoing
6. Provide business collection assistance.	Ongoing
7. Continue enforcement efforts.	Ongoing
Tank Pumping	
1. Continue private sector management of septage.	Ongoing
2. Assess feasibility of developing facility if disposal becomes limited for oil/waste separator sludge.	Ongoing
3. Continue private sector management of fats/oil grease tank pumping.	Ongoing
Electronic Wastes	
1. Inventory available opportunities for e-waste collection and recycling.	Ongoing
2. Establish relationships with recyclers and programs to recycle e-waste.	Ongoing
Administration	
1. Facilitate interagency cooperation.	Ongoing
Enforcement	
1. Coordinate enforcement activities among responsible agencies.	Ongoing
2. Improve coordination among County agencies, cities, and other relevant public agencies responsible for illegal dumping cleanup, education, and prevention programs.	Ongoing
3. Develop coordinated public outreach and education program.	Ongoing

1.3.1. City of Richland 2011 Solid Waste Management Plan

The 2011 City of Richland Solid Waste Management Plan documents existing waste management policies and current programs established and operated by the City. The City's plan is incorporated by reference into the County plan, and is not intended to replace the City's

commitment to the Benton County Comprehensive Solid Waste Management Plan and Interlocal Agreement. Copies of Richland's Solid Waste Management Plan may be obtained by contacting the City's Public Works Department.

The City's plan serves as a guide to Richland's solid waste management approach in the years ahead. Highlights of the plan's recommendations include the following:

- Enhance existing waste and recycling programs for commercial customers.
- Continue curbside collection of food waste by the commercial sector.
- Expand Horn Rapids Landfill.
- Expand diversion of construction and demolition materials at Horn Rapids Landfill as markets allow.
- Support diversion of wood waste at transfer station and landfill.
- Encourage and support research and development of alternative energy industries and development of new recycling technologies.
- Promote programs and provide incentives that encourage and support waste reduction, reuse, and recycling.

1.4 Relationship to Other Plans

The solid waste management plan must be viewed in the context of the overall planning process within all jurisdictions. As such, it must function in conjunction with various other plans, planning policy documents, and studies which deal with related matters. Included among these are the County Comprehensive Plan and Zoning Code, Shoreline Management Master Plan, capital facility plans, emergency management plans, watershed plans, and floodplain management plans.

1.4.1. Benton County Comprehensive Plan

The planning guidelines require that the solid waste management plan reference comprehensive land use plans for all participating jurisdictions to ensure that the solid waste management plan is consistent with policies set forth in the other documents. This includes the Benton County Comprehensive Land Use Plan 2006 Update (with revisions).

Benton County's Comprehensive Plan is the official statement adopted by the Benton County Board of Commissioners (Board) setting forth goals and policies to protect the health, welfare, safety, and quality of life of Benton County's residents. The fundamental purpose of the plan is to manage growth and land use in order to sustain and enhance the quality of life for county residents, as that quality is defined by the residents themselves via the public process. The plan expresses a long-range vision of how citizens want their rural community to look and function in the future. The plan helps to focus, coordinate, and direct the many diverse activities of County departments by providing a comprehensive and common vision.

1.4.2. Shoreline Management Plans

Shoreline management plans establish policies and regulations for development along shorelines. Shorelines include all waters of the state, including reservoirs, floodplains, and their associated wetlands. While the area is recognized as arid and semi-arid, there are a number of hydrological features meeting the definitions for protection under the Washington Shoreline Management Act of 1972. Benton County contains Mound Pond and Yellepit Pond. The shorelines of the Columbia and Yakima Rivers are also regulated by the Shoreline Management Act. The Benton County Shoreline Management Master Plan prohibits development of sanitary landfills along shorelines.

1.5 Background of the Planning Area

The planning area includes Benton County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland, with only the Hanford area excluded. The county is bordered on the west by Klickitat and Yakima counties, on the north by Grant county, on the east by Franklin and Walla Walla counties, and on the south by Umatilla county, Oregon.

1.5.1 Population

Between 1990 and 2010, the County's population increased from 112,560 to 188,931, a 68% increase. Exhibit 1-3 contains population data for 1990 -2010.

Exhibit 1-3. Benton County Population 1990-2010

Area	1990	2000	2005	2010
Benton County	112,560	142,475	159,286	188,931
Unincorporated	27,849	33,169	34,979	43,453
Incorporated	84,711	109,306	124,307	145,478

Source: 2011 update to the Benton County Comprehensive Plan

There are five population centers in Benton County: Benton City, Kennewick, Prosser, Richland, and West Richland. Between 2005 and 2010, the County's population increased nearly 19%. The population growth for Benton County between 2005 and 2010 is summarized in

Exhibit 1-4. As indicated, the City of Benton City experienced the highest rate of growth during the period, while the City of Richland experienced the greatest increase in population.

Exhibit 1-4. Benton County Population, 2005-2010

	2005 Population	2010 Population	Rate of Population Growth	Change in Population
County Total	159,286	188,931	18.6%	29,645

Unincorporated	34,979	43,453	24.2%	8,474
Incorporated	124,307	145,478	17.0%	21,171
Benton City	2,901	3,779	30.3%	878
Kennewick	62,715	71,794	14.5%	9,079
Prosser	5,331	5,668	6.3%	337
Richland	43,309	52,901	22.1%	9,592
West Richland	10,051	11,336	12.8%	1,285

Source: 2011 update to the Benton County Comprehensive Plan

The land area of the County is 1,782 square miles. In 2011, a little over 50% of the county was in some form of agricultural use. Exhibit 1-5 indicates the distribution of land use in the County.

Exhibit 1-5. Benton County Land Use

Land Use Type	Acres	Square Miles	Percent
Cities and Urban Growth Area	71,235	111	6%
Hanford Site	266,220	416	24%
Unincorporated Area			
Irrigated Agriculture	251,406	393	23%
Dryland Agriculture	309,373	484	28%
Rangeland & Undeveloped	183,973	288	16%
Residential (rural)	22,342	35	2%
Public	5,945	9	1%
Commercial	3,035	0.5	0
Industrial	1,526	2.3	0
Aggregate	367	0.57	0
Unbuildable	251	0.39	0
Total Unincorporated Area	778,218	1,235	70%
Total County Area	1,115,673	1,782	100%

Source: 2006 Benton County Comprehensive Plan, updated 2011

The Hanford Reservation accounts for over 24% of the County's area, or about 416 square miles. The land use trend on the Hanford Site can be broadly described as the gradual reintegration of major portions of Hanford's resources (land, water, and infrastructure) into the economy, custom, and culture and regulatory authority of local jurisdictions within which the Site lies. The Site is presently being cleaned up for future uses that, in addition to federal missions, will likely include non-defense related private and public sector uses. Local jurisdictions are preparing land

use plans for the portions of the Hanford Site within their boundaries. The Hanford Site is not included in the county's solid waste management plan.

1.5.2 Economy

During the current decade, all of eastern Washington is experiencing significant population and economic growth for reasons beyond local influence. It is anticipated that the current regional growth trend will continue into the near and mid-term future (5 to 10 years).

The region's economy is anchored in agriculture, bio and high-technology, manufacturing, service industry, and government. Businesses range from a U.S. Department of Energy (DOE) national laboratory, high-tech firms, environmental and engineering companies, to food growers and processors, wineries, and manufacturers. Three major sectors have been the principal driving forces of the economy in the Benton County since the early 1970s:

- DOE and its contractors operating the Hanford Site;
- Supply System in its construction and operation of nuclear power plants; and
- The agricultural community, including a substantial food-processing component.

Except for a minor amount of agricultural commodities sold to local-area consumers, the goods and services produced by these sectors are exported outside the County. In addition to the direct employment and payrolls, these major sectors also support a sizable number of jobs in the local economy through their procurement of equipment, supplies, and business services. A summary of the non-agricultural employment is provided in **Exhibit 1-6**.

In addition to these three major employment sectors, three other components can be readily identified as contributors to the economic base of the county. The first of these, loosely termed "other major employers," include the five major non-Hanford employers in the region. A summary of the major employers of the region (Benton and Franklin counties) is provided in **Exhibit 1-7**.

**Exhibit 1-6. Tri-Cities MSA Non-Agricultural Employment
February 2011**

Category	Employees
Total Nonfarm	98,500
Goods Producing	12,700
Construction	5,700
Manufacturing	7,000
Services Providing	85,800
Private Services	67,700
Trade, Transportation, Utilities	15,200
Financial Services	3,700
Government	18,100

Source: Tri-City Development Council, accessed January 2013.

http://www.tridec.org/site_selection/tri-cities_demographics/labor_forceemployment/

Exhibit 1-7. Major Employers in the Tri-Cities Region

#	Company	Industry	Employees
1	Battelle/Pacific Northwest National Laboratory	Research and Development	4,485
2	URS	Government	3,500
3	CH2M Hill	Government	3,260
4	ConAgra	Value Added Agriculture Products	3,057
5	Bechtel National	Government	2,850
6	Kadlec Medical Center	Health Services	2,175
7	Washington River Protection	Government	1,686
8	Mission Support Alliance	Government	1,478
9	Washington Closure Hanford	Government	1,370
10	Tyson Foods	Value Added Agriculture Products	1,300
11	Energy Northwest	Research and Development/Manufacturing	1,222
12	Kennewick General Hospital	Health Services	1,072
13	Broetje Orchards	Value Added Agriculture Products	1,000
14	Lourdes Health Network	Health Services	807
15	AREVA	Manufacturing	662
16	Apollo Inc.	Manufacturing	625
17	Lockheed Martin	Technology/Government	600
18	Boise Cascade	Manufacturing	571
19	Fluor Federal Services	Government	541
20	Department of Energy (DOE)	Government	414

Source: Tri-City Development Council, accessed January 2013. [http://www.tridec.org/site_selection/tri-cities_demographics/major_industry_employers/#Top 25 Employers](http://www.tridec.org/site_selection/tri-cities_demographics/major_industry_employers/#Top_25_Employers)

1.6 Evaluation of Potential Landfill Sites

A preliminary siting review assessment was performed in 1994, with the intent of providing an initial assessment of the feasibility of siting a new landfill in Benton County (copy of feasibility on file with Benton County). Some of the locational standards are not appropriate for evaluating an entire county at once. These criteria are site specific and should be used when evaluating a single candidate site or a limited number of potential sites. The Solid Waste Management Plan should not be used for detailed site analysis, but rather to identify areas that can be examined in detail in other studies.

Areas addressed in the study included the following, all other factors determined by the Benton-Franklin Health District.

- Geology
- Surface water
- Climatic factors
- Groundwater
- Slope
- Land use
- Soil
- Cover material
- Toxic air emissions
- Flooding
- Capacity



Chapter 2

Waste Stream Analysis

2.0 Waste Stream Analysis

An accurate analysis of the types and quantities of waste generated provides the necessary data for identifying existing and future solid waste system needs, and the policies and programs to be implemented to meet those needs. This chapter analyzes Benton County's waste generation trends, and utilizes historical and projected population data to produce a 20-year (2012 to 2032) waste generation forecast. The chapter also includes waste composition data for the disposed waste stream, in order to identify potential opportunities for recycling, composting or other diversion activities.

For the purposes of this analysis, waste generation is defined as tons of solid waste disposed and diverted in Benton County. Most types of solid waste are disposed of in landfills; however, some wastes are incinerated, used as soil amendment, or disposed in sites designated for a specific type of waste. The largest component of the waste stream is mixed municipal solid waste (MSW) and consists of waste typically generated by residences, offices, and other businesses and institutions, excluding special wastes. Special wastes include industrial waste, wood waste, demolition debris, biomedical wastes, sludge and septic tank pumpings, tires, and other types of wastes. Each category of special waste has its own characteristics and handling needs. Special waste and hazardous wastes produced by households, and by businesses in small quantities, are addressed separately in Chapters 6 and 7 of this Plan.

Data used in this Plan reflect a key difference between disposed and diverted quantities of waste. As used in this Plan, disposed solid waste is considered to be all solid waste placed in landfills within, or outside of the county. Diverted waste includes waste that is recycled, composted, or otherwise diverted from disposal.

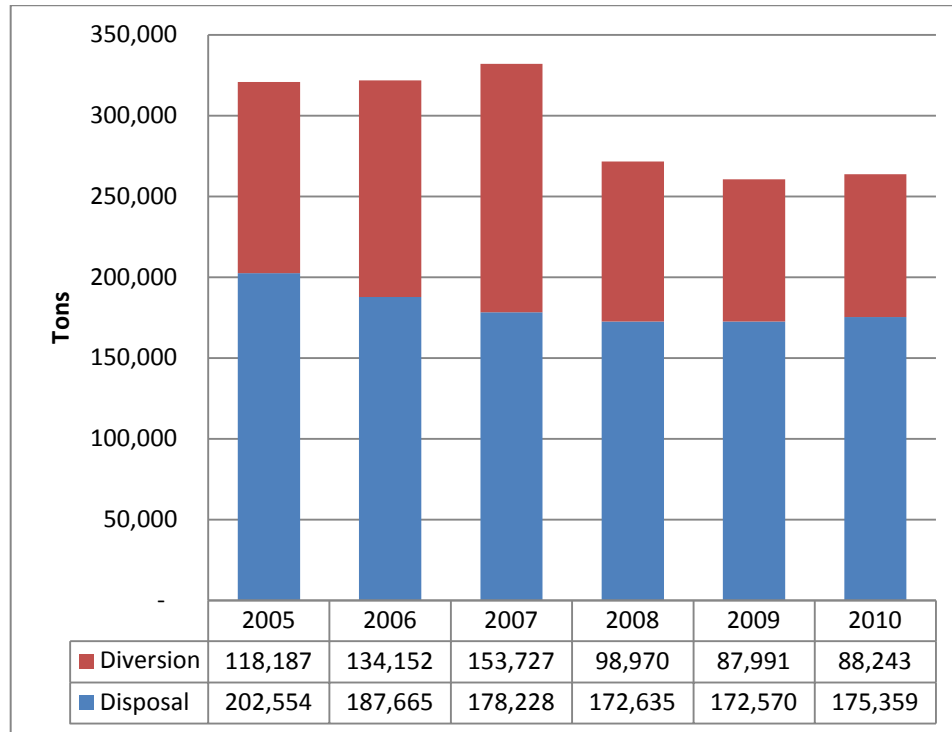
2.1 Waste Generation

According to data from Ecology, the total amount of waste generated in Benton County in 2010 was approximately 263,000 tons, including 175,000 tons disposed and 88,000 tons diverted.

Exhibit 2-1 depicts the amount of solid waste generated in the County between 2005 and 2010. The overall decline in generation beginning in 2008 is indicative of the economic slowdown and similar to other regions across the state and country.

The disposal data includes municipal solid waste that is disposed in landfills, as well as other types of disposed waste, such as construction, demolition, and inert debris and petroleum contaminated soil. The diversion data incorporates recycled materials as well as materials that are diverted, such as asphalt and concrete, and wood waste diverted for energy recovery.

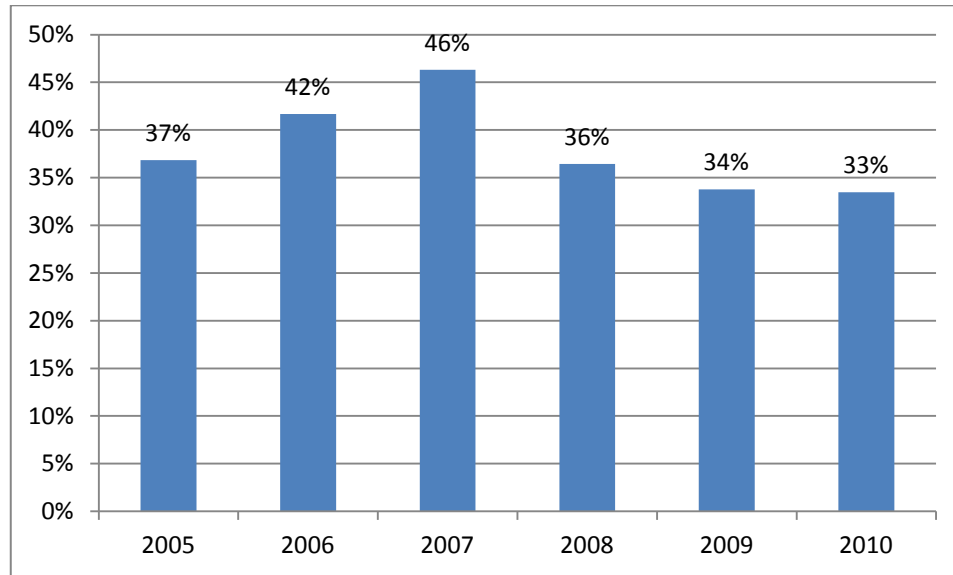
Exhibit 2-1. County-wide Waste Generation, 2005 - 2010



2.2 Diversion Rate

The County’s overall diversion rates for the years 2005 through 2010 are shown in **Exhibit 2-2**. The decline in the diversion rate can be attributed to the decline in the economy, and most notably decline in building construction, which contributed significantly to the quantity of waste diverted, specifically inert, asphalt and concrete, etc. The County has established a goal of 50% diversion by 2020. Policies and programs will be recommended in the Plan to enable the County to reach the diversion goal.

Exhibit 2-2. County-wide Diversion Rate, 2005 to 2010



2.3 Waste Generation Projections

2.3.1. Per Capita Waste Generation

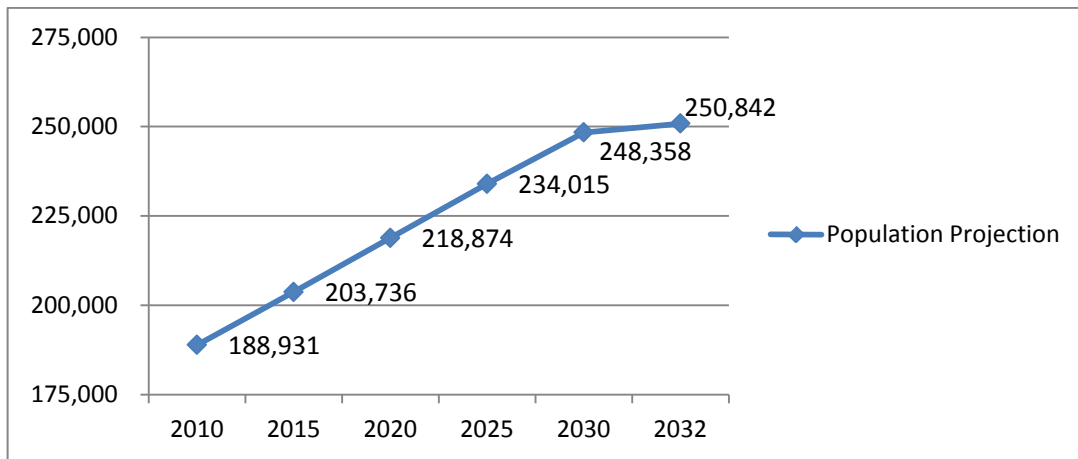
The methodology used to estimate solid waste generation rates for the next 20 years consists of using the per capita generation rate and multiplying this rate by population projections. The per capita waste generation rate for the State of Washington in 2009 was 12.37 lbs/person/day (disposed amounts include all waste that was disposed in MSW, limited purpose, and inert landfills and incinerators, both in-state and exported). Utilizing this number and Benton County population data, the 2010 waste generation in Benton County would be calculated to be over 426,000 tons, which is more than the 263,600 tons reported for the County in 2010. Therefore, this study calculates the County’s per capita generation rate using the known data from 2010. That calculation is:

$$\text{2010 Per Capita Waste Generation Rate} = \frac{\text{Total Waste Generation (tons)}}{\text{Population (pp)}} = \frac{263,603 \text{ (tons)}}{188,931 \text{ (pp)}} \times \frac{2,000 \text{ lb}}{\text{ton}} \times \frac{365 \text{ days}}{\text{year}} = \mathbf{7.65 \text{ lb/pp/day}}$$

2.3.2. Population Projections

The population projections for the Solid Waste Management Plan planning period 2010 to 2032 utilizes the 2011 County Comprehensive Plan. Based on this data, it is estimated that the County’s population will reach 250,842 by the year 2032. In **Exhibit 2-3**, the population projections are shown in 5 year increments through 2030, and then extrapolated to 2032 for the purposes of waste generation planning. The population of the County is anticipated to continue growing over the next 20 years, by approximately 7-8 % every 5 years. This is based on the Washington State Office of Financial Management High Series population projections.

Exhibit 2-3. Benton County Population Projections 2010-2032



Source: Washington State Office of Financial Management.

Utilizing the population projections from the County Comprehensive Plan and the per capita waste generation rate above, the estimated waste generation over the 20-year planning period is calculated, as shown in **Exhibit 2-4**.

Exhibit 2-4. Benton County Solid Waste Projections 2010-2032

	2010	2015	2020	2025	2030	2032
Projected Waste Generation (tons)	263,603	284,259	305,380	326,505	346,517	350,206

Waste generation is influenced by various demographic and economic factors, including changes in levels of employment and personal income, the value of recyclable materials, the price of disposal services, changes in product design and packaging, and changes in behavior affecting waste reduction and recycling activities. Some of these factors are difficult to measure over time, while others are so interrelated that using them in a statistical analysis lowers the accuracy of the forecast. For these reasons, a forecast was developed based on the historical waste generation and using population to indicate the upper limit of potential increase in solid waste

generation within the county. However, it is important to realize that any of these related factors may change within the forecast period. To maintain accuracy, the generation rate should be monitored and projections should be routinely updated.

2.3.3. Level of Service

The population projections for Benton County predict a growth of approximately 62,000 people between 2010 and 2032. In order to maintain an adequate level of service, Benton County will need to provide waste management programs for an additional 86,500 tons estimated to be generated in 2032.

2.4 Waste Composition

In addition to the amount of waste being generated, it is important to evaluate the components of disposed waste in order to identify potentially recyclable and compostable materials. This information is valuable in planning effective recycling and waste minimization programs.

Several factors affect waste composition, including opportunities available for recycling or composting materials, types of business and industry, the area climate, occurrence of natural disasters, mix of urban versus rural designations, the density of single and multi-family dwellings, and technological advances.

No detailed waste composition study has been performed to date for Benton County. Waste composition studies from other jurisdictions are summarized by Waste Generation Area in the 2009 Washington Statewide Waste Characterization Study (Ecology, 2010). In order to estimate the types and quantities of materials that comprise Benton County's disposed waste stream, the categorical percentages from the Central Waste Generation Area, where Yakima and Grant Counties were sampled, were multiplied with the 2010 disposed tonnage for Benton County.

The results of the composition analysis are summarized in **Exhibit 2-5**; the complete analysis is included in **Appendix A**. As indicated, the top 5 material types include: organics (food, leaves and grass); construction and demolition materials (carpet, soil, rocks, sand, asphalt roofing, and insulation); paper packaging (cardboard, kraft paper, mixed/low grade paper packaging); wood debris (painted wood, pallets and crates, wood waste and treated wood); and consumer products (textiles, furniture, televisions).

The information presented in **Exhibit 2-5** and **Appendix A** is important for identifying the types and quantities of materials that could potentially be targeted for recycling, composting or other diversion programs.

Exhibit 2-5. Waste Disposal Composition Summary for Benton County

Material	Percent	Estimated Benton County Tons
Paper Packaging	10.4%	19,649
Paper Products	8.2%	15,492
Plastic Packaging	6.7%	12,658
Plastic Products	4.8%	9,069
Glass	3.5%	6,613
Metal	6.2%	11,714
Organics	26.2%	49,500
Wood Debris	9.9%	18,704
Construction Materials	11.1%	20,971
Consumer Products	8.5%	16,059
Hazardous/Special Wastes	3.2%	6,046
Residues	1.2%	2,267
TOTAL	100%	188,742

Source: Washington 2009 Statewide Waste Characterization Study, Central Waste Generation Area



Chapter 3

Education and Outreach, Waste Reduction, Recycling, and Organics



3.1 Education and Outreach, Waste Reduction, Recycling, and Organics

This chapter describes existing programs and potential options for reducing the amount of waste being generated and disposed in Benton County. The programs discussed in this chapter are organized as follows:

- Education and Outreach
- Waste Reduction
- Recycling
- Organics

The first section describes education and outreach, which is key to successful waste education/recycling programs and a required element of the plan (**RCW 70.95.090(7)(b)(iv)**). Programs recommended for implementation will educate and promote concepts of waste reduction and recycling throughout the County. The next section, waste reduction, discusses programs that reduce the amount of waste generated, while the final two sections discuss programs that reduce the amount of waste requiring disposal (recycling and organics management).

3.1 Education and Outreach

The County's solid waste planning goals and objectives in the area of public education and outreach are:

Goal #1: Emphasize public outreach and educational programs.

Objectives:

- Expand methods of outreach, including use of social media
- Host and advertise events to increase participation
- Coordinate events regionally
- Link regional websites
- Provide all types of information, including financial

Goal #2: Encourage and expand coordination and communication regarding solid waste issues among all jurisdictions, agencies, and private firms in Benton County.

Objectives:

- Encourage consistent policies across jurisdictions.
- Encourage public involvement in the planning and implementation process.
- Emphasize local responsibility for solving solid waste management issues.

3.1.1 Existing Programs

Public education and outreach programs supporting waste reduction, recycling and organics management activities have been ongoing. Local governments have developed programs on a variety of topics. Education efforts include the following:

- Display booth
- Speakers bureau
- Solid waste videos
- Mailings and advertisements
- Promotional materials
- Composting workshops
- Compost bin sales
- Environmental workshops
- Classroom outreach
- Website
- Social Media

Examples of outreach and education programs developed within the county are described below.

Benton County--

The County provides information on its website and on its Facebook page about the location of drop-off and buy-back sites for recyclables, as well as ways to reduce and reuse materials, the proper disposal of household hazardous waste, the Washington E-Cycle Program, used motor oil collection sites, and disposal of medical waste. The County purchases and maintains recycling containers that are available to public events for free upon request. The County also provides outreach on all its programs at a booth at the County Fair, and information to high schools on paper recycling, as well as provides support to the City of Richland's Green Living Office, and the Benton-Franklin Cooperative Extension office's composting seminars.

City of Richland--

The City has a part time "Environmental Education Coordinator" who provides information to the public about various environmental issues effecting the City or community. Information is regularly sent out to the public in newsletters, utility bill inserts, press releases to radio and television, e-newsletters and other printed publications (including the local newspaper). The Green Living Office also has a number of environmental resources available to the public, including books, curriculum, handouts, and videos. Programs and presentations relating to the environment also are made available to service organizations, businesses, non-profit organizations, and students/schools.

The City's website and social media outlets include information on how to recycle in Richland and the materials that are accepted through various programs. The City of Richland has a 24-

hour government access channel (CityView, Channel 13) which regularly plays environmentally related videos during the “Eye on our Earth” segment, and runs public service announcements. The City has an Electronic Reader Board with waste reduction and recycling information uploaded for motorists to see. The City also encourages homeowners to compost in their own backyard, and hosts backyard composting programs each year where free bins and books are provided to each trained participant. The City has implemented a Green Recognition Program for businesses, schools, and organizations to showcase their knowledge and apply for recognition awards.

City of Kennewick--

Each new resident and business is mailed a brochure outlining the City’s existing programs. The City provides curbside and drop box recycling information on its website, and also offers backyard composting workshops.

3.1.2 Options

The following are options for public outreach and education programs.

1. Website and Social Media

Benton County’s website concerning solid waste and recycling program activities has expanded since the 2006 SWMP, but could be further expanded to include additional outreach materials including bilingual materials, description of how the County is leading by example in waste reduction, and regionally coordinated links and messages, including social media links. Benton County should regularly update its website to be a successful component of a waste reduction and recycling education campaign. As with any promotional medium, the website must be user-friendly, accurate, and interesting. The website should be professionally designed, if possible.

2. Technical Assistance to Schools and Businesses

This option recognizes the need to reach schools and businesses regarding their handling of waste. Outreach to schools and businesses would offer free technical assistance and waste audits to identify opportunities to implement waste reduction, recycling and composting activities. A functional waste reduction and recycling program in a school yields daily reminders to the students of their direct impacts on the environment. The benefits of this alternative are that commercial sources produce a significant portion of solid waste in Washington. This alternative is inline with the State’s Beyond Waste Plan (Initiative 1).

3. Landfill/Facility Tours/Interactive Education

The County, City of Richland, and private companies could offer tours of the landfill and other facilities that engage students and the community with presentations on waste reduction, recycling, and other solid waste management issues.

3.1.3 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

1. Website and Social Media

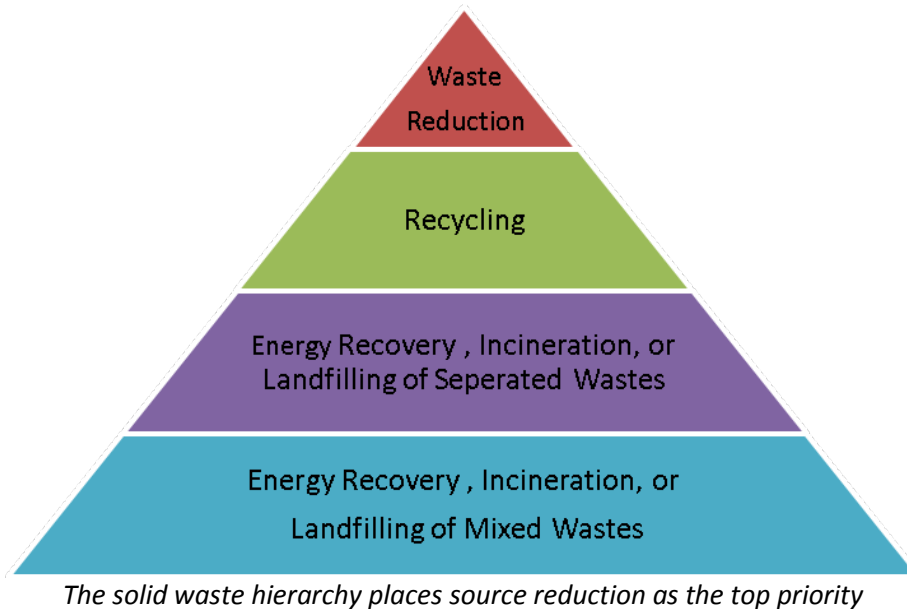
The County will strive to make its website more user friendly, and make sure it is updated as often as possible. It will include more bilingual material in order to reach out to additional residents. More information will be posted on our Facebook page to reach additional residents.

2. Technical Assistance to Schools and Businesses

The County will try additional outreach to schools and businesses and offer assistance to their staff with waste reduction, recycling and composting activities.

3.2 Waste Reduction

Waste reduction is defined as a reduction in the amount and/or toxicity of waste entering the waste stream. While all components of an Integrated Solid Waste Management System are important, reduction of waste at its source should be applied prior to implementation of other techniques, creating less waste to be recycled, reused, composted, incinerated, or landfilled.



Waste reduction is the most environmentally significant and cost-effective way to impact waste generation. Reducing waste is achieved by reducing consumption, reusing durable products, retrieving materials from disposal, reducing the toxicity of the waste stream, or a combination of these options. Unlike recycling or diversion, most waste reduction methods require no material processing. A key component of both volume and toxicity reduction involves moving “upstream” to encourage manufacturers to make less wasteful, less hazardous products.

The County’s planning goal and objectives in the area of waste reduction are as follows:

Goal #3: Manage solid wastes in a manner that promotes, in order of priority: waste reduction, reuse, and recycling, with source separation of recyclables as the preferred method.

Objectives:

- Support and maintain a solid waste system that protects human health and safety
- Work towards reaching a diversion rate of 50% by 2020.
- Emphasize programs for commercial waste diversion.
- Establish consistent methodologies to measure the baseline and future progress in achieving waste diversion.
- Obtain accurate data on waste diversion activities.
- Support statewide product stewardship policies

The following sections present a discussion of existing waste reduction programs and options for expanded or new residential and commercial waste reduction programs.

3.2.1 Existing Programs

Area jurisdictions are involved in several internal activities. The county and cities are working to instill waste reduction and recycling as a work ethic among employees, and to set an example for the community.

Washington State offers a statewide, online materials exchange, www.2good2toss.com, for municipalities. This website provides a free, online bulletin board for residents to sell or give away used, but useable items, instead of sending them to the landfill. The City of Richland lists www.2good2toss.com as well as other outlets, and they provide a handout with community reuse ideas for material exchange and reuse, such as second-hand stores, Goodwill, New Beginnings Thrift Store, and antique stores. Habitat for Humanity operates a ReStore in Richland where used and surplus building materials are sold.

The City of Kennewick is currently updating its website, and department managers are evaluating how to include the solid waste program, which will likely highlight information on waste reduction, reuse, and recycling. There are several second hand or thrift stores in the City, including Goodwill, St. Vincent de Paul, Value Village, Second Hand Haven, and Plato's Closet.

3.2.2 Options

Following are potential programs and policies for waste reduction:

1. Support Product Stewardship and Extended Producer Responsibility Policies

Product Stewardship is the act of minimizing health, safety, environmental and social impacts, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The producer of the product has responsibility to minimize adverse impacts, along with other stakeholders, such as suppliers, retailers, and consumers, who also play a role. Stewardship can be either voluntary or required by law.

Extended Producer Responsibility (EPR) is a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations into the design of their products and packaging.

Benton County could initially support Product Stewardship programs for those items that are hazardous or toxic, and cannot be collected and handled safely via existing collection systems. Product Stewardship programs should not be for commodities that already pay their own way to

be recycled. Traditional recyclables should be left to the open market to be recycled; and the community should encourage greater market development. Policy decisions regarding end of life management of materials are the responsibility of the local policy decisions of Benton County and the local jurisdictions.

The County and cities can also become Associate Members of the Northwest Product Stewardship Council (NWPSC). Associate members are local, state, regional and federal government agencies, businesses, and non-profit organizations that support the NWPSC mission and product stewardship principles. Associate Members are required to sign on to the program on behalf of their entire agency or organization. Associate Members agree to support product stewardship programs and legislation as their agency or organization allows.

The next step is to work closely with local businesses to promote producer responsibility through voluntary initiatives and take-back programs and to work with communities regionally and statewide on more comprehensive measures. Some of the next measures the County can also consider undertaking include:

- Adopt a procurement policy that includes Extended Producer Responsibility (EPR).
- Consider partnerships with local businesses to take-back products they sell that are hazardous.
- Publish articles in newsletters highlighting the program to the general public.
- Identify businesses, especially manufacturers, and meet with them to explain the program.

2. Environmentally Preferable Products Guidelines

Environmentally preferable products (EPP) typically are defined as products that have a lesser or reduced effect on human health and the environment when compared with competing products that serve the same purpose. They include products that have recycled content, reduce waste, use less energy, are less toxic, and are more durable.

Some of the benefits of EPP include:

- Improved ability to meet existing environmental goals.
- Improved worker safety and health.
- Reduced liabilities.
- Reduced health and disposal costs.

The County and cities would consider giving preference to the purchase of environmentally preferable products, and promote vendors/contractors to meet these requirements as well.

3. County/City Waste Reduction Policies

In addition to educating consumers and businesses, it is important for local governments to “practice what they preach.” Through numerous, small choices employees make each day, large amounts of waste can be prevented. Employees should be encouraged to learn more about waste reduction practices and work toward implementing and promoting such practices. Such practices by county/city employees should be implemented whenever practicable and cost-effective.

4. Promote Use of Existing Waste Exchanges

The County and other cities could promote the use of existing online materials exchange websites.

5. Promote Use of Reuse Stores and Organizations

The County and cities could promote the use of existing reuse stores and organizations in the County for residents and businesses to donate used clothing, household goods, and other items. Promotions could be implemented through the County’s website, at clean up events, and other regional events.

6. Waste Reduction Requirements for New Developments

The County and cities could require new residential and commercial development projects to incorporate measures to reduce the amount of waste generated during construction and operation. Examples include incorporating green building guidelines such as recycled content building materials, material reuse and recycling requirements, landscaping specifications, construction waste diversion, and other measures.

7. Methods to Measure Waste Management and Reduction Results

Waste reduction can be an elusive concept to measure. Even when an organization does show a reduction in their waste stream over time, without a full characterization of the waste generated before and after changes are implemented, it is difficult to prove which initiatives are successful and how successful they are. However, it continues to be a vitally important concept because it is much easier and less expensive to simply never generate waste than it is to find a way to recycle it. For that reason, the County must continue to promote waste reduction methods and set an example for other establishments by adopting waste reduction strategies.

3.2.3 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

1. Support Product Stewardship and Extended Producer Responsibility Policies

Benton County supports Product Stewardship programs for those items that are hazardous or toxic, and cannot be collected and handled safely via existing collection systems.

2. Environmentally Preferable Products Guidelines

The County and cities will research ways to give preference to the purchase of environmentally preferable products, and promote vendors/contractors to meet these requirements as well.

3. County/City Waste Reduction Policies

The County and cities will research ways to teach their employees to learn more about waste reduction and recycling, and work toward implementing and promoting such practices in the workplace.

4. Promote Use of Existing Waste Exchanges

The County and other cities will explore ways to promote the use of existing online materials exchange websites.

5. Promote Use of Reuse Stores and Organizations

The County and cities will explore ways to promote the use of existing reuse stores and organizations in the County.

6. Waste Reduction Requirements for New Developments

The County and cities will explore ways to encourage new residential and commercial development projects to incorporate measures to reduce the amount of waste generated during construction and operation.

Recycling

Recycling is the second tier in the hierarchy of solid waste management in the State. Although Washington State's goal to achieve a statewide recycling rate of 50 percent has not been met, recycling has continued to increase. The County's goal and objectives for recycling are established in the following:

Goal #3: Manage solid wastes in a manner that promotes, in order of priority: waste reduction, reuse, and recycling, with source separation of recyclables as the preferred method.

Objectives:

- Work towards reaching a diversion rate of 50% by 2020.
- Emphasize programs for commercial waste diversion.
- Establish consistent methodologies to measure the baseline and future progress in achieving waste diversion.
- Obtain accurate data on waste diversion activities.

3.2.4 Benton County Recycling/Diversion Rate

There are numerous methodologies for calculating a recycling or diversion rate, as described below.

MSW Recycling Rate: To determine a recycling rate that is consistent and comparable to past years, the Washington State Department of Ecology (Ecology) has measured a very specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as municipal solid waste by the Environmental Protection Agency. It includes durable good, nondurable good, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils or construction, demolition and landclearing debris recycled or disposed of at municipal solid waste landfills and incinerators.

Diversion Rate: Since the mid-1990s, Ecology has noted very large increases of material recovery in "non-MSW" waste streams; most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and land clearing debris. The recovery of these materials for uses other than landfill disposal is termed "diversion." The diversion rate is an overall measure which includes materials that fall under the "MSW Recycling Rate" and also "diverted" materials.

It has been estimated that in 2010, the residents and businesses in the county generated approximately 263,000 tons of waste, and approximately 88,000 tons of this waste was diverted

from disposal, for a diversion rate of 33%. The 2010 diversion rate is calculated using the following formula:

$$\text{Diversion Rate (\%)} = \frac{\text{Diversion (tons)}}{\text{Waste Generation (tons)}} = \frac{88,243}{263,603} = 33.48 \%$$

A summary of the types and quantities of materials diverted in Benton County in 2010 is shown in **Exhibit 3-1**.

Exhibit 3-1. Benton County Diversion – 2010

Material	Total (tons)	Material	Total (tons)
Paper		Batteries	
Corrugated cardboard	9,134	Batteries - Auto Lead Acid	119
High grade	258	Batteries - Household Dry Cell (alkaline/carbon)	5
Mixed	837	Batteries - NiCad/NiMH/Lithium	4
Newspaper	2,093	Special Wastes	
Plastic		Antifreeze	125
HDPE	59	Asphalt and/or Concrete	10,076
LDPE	117	Asphaltic Materials (excluding roofing)	10,088
PET	42	Concrete	17,686
Plastic - other	27	Electronics	162
Photographic films	4	Electronics - computers/other	63
Container Glass	803	Electronics - CRT/TVs	57
Metals		Fluorescent Lamps (4 foot)	6
Ferrous metals	25,545	Fluorescent Lamps (8 foot)	1
Non-ferrous metals	1,964	Fluorescent Lamps (Other)	9
Aluminum cans	195	Reuse - Clothing & Household items	28
Tin cans	48	Reuse - general	64
Appliances/White Goods	3,102	Tires (burned for energy)	51
Organics		Tires (retreaded)	4
Food Processing Waste	1,058	Tires (reused/resold)	54
Rendering - meat scraps	329	Oil Filters	35
Rendering - used cooking oil	84	Textiles (rags, clothing, other)	487
Wood (burned for energy)	450	Tires (recycled)	169
Wood - recycled	12	Used oil	1,907
Yard Debris	883		
		Total	88,243

Source: Washington State Department of Ecology Recycling Data for Benton County

3.2.5 Oregon State Requirements

Oregon statute (ORS 459.305) requires landfills that accept out-of-state garbage to certify that the local governments, which export more than 75,000 tons annually into Oregon for landfill disposal, provide the opportunity to recycle and implement recycling education programs.

Currently, the Cities of Kennewick, Benton City, Prosser and West Richland contract with private haulers for garbage service. These private haulers export a portion of that waste to Oregon landfills.

Waste Management, Inc. serves the City of Kennewick, with a population of nearly 74,000 (based on 2020 Census figures). Waste Management submitted a Waste Reduction Certification plan, and it is approved by the Oregon Department of Environmental Quality for the City of Kennewick. This Waste Reduction Plan has been approved without the requirement of a curbside program; however there is a curbside recycling program in place.

Basin Disposal, Inc./Ed's Disposal has the contract for the Cities of Benton City, Prosser, and West Richland. Basin Disposal has an exemption from ODEQ from the requirements of ORS 459.305.

As the Richland landfill nears capacity, and as requirements for use of other available landfill opportunities change and become more restrictive, Benton County, their partner Cities and Refuse Haulers will need to change and adapt to the in order to meet the needs of their citizens.

3.2.6 County and City Internal Recycling Programs--

Benton County collects cardboard, paper, plastics and metals from many County buildings, which is recycled by local haulers, including Clayton-Ward Recycling. Some County maintenance projects reuse materials, such as recycled asphalt, however there is no requirement for this practice.

City of Benton City has a paper recycling program. Ed's Disposal collects the office paper from City facilities, and the City returns its ink cartridges

City of Kennewick employees collect their office paper and aluminum cans in boxes located in all major departments. Cardboard is also separated for recycling. A local recycler picks up the materials and transports it to their main collection center for recycling.

City of Richland collects and recycles office paper, phone books, cardboard, toner cartridges, cell phones and rechargeable batteries. In addition, many of the buildings collect aluminum, plastic, and tin. Cardboard is also separated for recycling. Materials are collected by staff and transported to a local recycler. The City has also adopted a procurement policy for recycled content materials (Richland Municipal Code (RMC) Title 3.04.140). The City's intent is to

promote the use of recycled products and recyclable products by the City departments, and stimulate demand for recycled products and help develop markets for recyclable and reusable materials. City departments are to use recycled and recyclable products whenever practical and reasonable. The contracts office maintains a list of recycled and recyclable products available to the City departments.

City of West Richland has an office paper recycling program. The materials are collected by Ed’s Disposal.

City of Prosser has no formal program. City staff recycles office paper and cardboard using containers placed in various office spaces. Roadside tree trimming is chipped and used for landscaping and/or playground fall zones. Some City road projects have used asphalt road grindings for alleyways, however there is no requirement for this practice.

The development and implementation of these programs help encourage local government employees to take the recycling habit home with them, promoting recycling both at home and in the workplace.

Residential and Commercial Recycling Programs–

Benton County--The principal method for collecting recyclables from residents and businesses in Benton County is through a system of conveniently located drop boxes. In addition, a number of private and non-profit recycling centers provide opportunities to recycle a wide variety of materials, such as paper, aluminum, glass, auto batteries, scrap metal, used motor oil, and white goods. Materials may be dropped off for free or sold, depending on the item and the recipient. Most of the buyback centers and drop-off sites are conveniently located. Some facilities specialize in collecting only certain types of materials. For example, one company only accepts batteries. Other facilities provide comprehensive collection of such items as glass, aluminum, tin, paper, plastic, used oil, scrap metal, cardboard, and car batteries. Usually these facilities pay for some materials and accept other materials at no charge. The County maintains a list of available recycling opportunities on its website. The locations of drop boxes and buy-back centers are provided in **Exhibit 3-2**.

Exhibit 3-2. Location of Recycling Drop Boxes and Buy-Back Centers

Facility Location/Type of Facility	Owner/Operator
<p>Benton City Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • 7th Street and Dale Avenue • 920 Horne Drive 	<p>Ed's Disposal</p>

Facility Location/Type of Facility	Owner/Operator
<p>Kennewick Kennewick Transfer Station 2627 Ely Street Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • 4602 West Clearwater Avenue (Winco parking lot) • 2721 West Kennewick Avenue and Highway 395 (McDonalds parking lot) • West 7th Avenue and South Washington Street • 7011 West Canal Drive (Wok King parking lot) • 7704 South Bermuda Road (Bermuda Fire Station) 	<p>Waste Management</p> <p>Waste Management</p>
<ul style="list-style-type: none"> • Chevron, Corner of Keene & Queensgate Village N • 119 East Albany Street 	<p>Clayton Ward Company</p>
<p>Prosser Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • 1006 Dudley Avenue • Sherman Avenue City Yard 	<p>Basin Disposal</p>
<p>Richland Horn Rapids Landfill/HHW/MRW 3120 Twin Bridges Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • West 7th Avenue and 'W' Avenue, Battelle complex • 2411 George Washington Way, near the 7-Eleven • 2400 Stevens Drive, near the Hanford Bus Lot • 1300 Block of Jadwin Avenue, Uptown Shopping Center behind the Texaco Station • 1378 Lee Boulevard, west of Fran Rish Stadium • 103 Keene Road, south of ACE Hardware • 2801 Duportail in the Walmart Parking Lot • Corner of Queensgate Drive and Keene Road 	<p>City of Richland</p>
<p>Richland (con) Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • 1936 Saint Street 	<p>Clayton Ward Company</p>
<p>West Richland Recycling Drop Box Sites</p> <ul style="list-style-type: none"> • 460 South 40th Avenue • 4300 Block of Mt. Adams View 	<p>Ed's Disposal</p>

The City of Kennewick has a curbside collection program for recycling of glass tin, aluminum, PETE and HDPE containers; newspaper, cardboard, mixed paper, and magazines, and used motor oil.

The City of Richland City Council authorized a pilot program for curbside recycling in 2009, and service began in May 2009. The duration of the pilot program was from May through December 2009. A contract was let to a local vendor to process recycled materials. The program included an aggressive communications effort with the residents in the targeted areas, including residential utility bills, messages on the City's website, an established phone line, messaging on the municipal reader board and information available through additional means. The pilot program was a complete success with 922 tons of recyclable items were processed and diverted from the landfill. The program was then rolled out to all residents in 2010 as a voluntary program, resulting in a 27% participation rate.

3.2.7 Designation of Recyclable Materials--

The Washington Administrative Code (WAC 173-350-100) defines Recyclable Materials to mean, "those solid wastes that are separated for recycling or reuse, including, but not limited to, papers, metals, and glass that are identified as recyclable material pursuant to a local comprehensive solid waste plan." In order for any material to be considered a recyclable material under Chapter 173-350, it must be identified as such in the local comprehensive solid waste management plan. If a materials is not identified in the plan as recyclable, then the ability of the person/company wanting to recycle this material and be able to benefit from some of the exemptions granted under Section 350 does not exist. If materials are not designated as recyclables, they remain regulated as solid wastes.

The following materials are designated as recyclable materials in the County:

- Paper (newspapers, magazines, mixed paper, and corrugated cardboard).
- Glass bottles (clear, brown, and green).
- Plastic bottles (PETE and HDPE).
- Steel and aluminum cans.
- Other ferrous and non-ferrous metals
- Electronics
- Used motor oil
- Antifreeze
- Household batteries
- Automobile batteries.
- Organic Waste
- Construction Wood Waste
- Concrete
- Brick

- Asphalt

The addition or deletion of materials accepted for recycling will require ongoing evaluation and will be based on several factors, such as market stability and collection and processing costs. As required by the planning guidelines, criteria have been developed for adding or removing materials from the above list of materials. The following will be considered for adding new materials:

- Local markets and/or brokers expand their list of acceptable items based on new uses for materials or technologies that increase demand.
- New local or regional processing or demand for a given material occurs.
- Sufficient quantity of the material is available in the waste stream.
- The material can be collected efficiently and has minimal processing requirements.
- Other conditions not anticipated at this time.

Removing materials from the list requires:

- The market price becomes so low that it is not longer feasible to collect, process, and/or ship to markets.
- No market can be found for an existing recyclable material, causing the material to be stockpiled with no apparent solution in the near future.
- Other conditions not anticipated at this time.

Although it is unlikely that any existing recyclables would be removed from the current collection program barring a sudden shift in market conditions, it is likely that additional markets might become available for materials not currently recycled.

A proposal to add or delete a designated recyclable material will be brought to the SWAC, who will vote for or against the proposal. Following approval or non-approval of the proposal, all parties in the County will be notified of the addition or deletion of the material.

3.2.7 Options

Benton County and the cities have established an objective of working towards reaching a diversion rate of 50% by 2020. One method to reach this rate is to increase recycling. This section presents programs and policies to increase recycling, including county and city internal recycling programs, and residential and commercial recycling programs.

1. Expanded Recycling Drop-Box Program

Benton County and the cities could consider expanding the current drop-box program by either adding additional materials for collection or adding additional sites located in the county:

- At a minimum, the County and cities should periodically evaluate the range of recyclables accepted at the current drop boxes and determine whether new materials

should be added.

- The County and cities also should monitor growth patterns within the county and provide drop boxes to areas that are showing increased growth.

2. *Rewards Program for Residential Recyclers*

Recycle Bank is a program that rewards customers for recycling by providing incentives for recycling higher weights of materials. The program works by implanting or attaching a radio frequency identification (RFID) tag to the recycling cart, this RFID corresponds to an account number with Recycle Bank. Customers must activate their own Recycle Bank accounts to participate. The collection vehicles are equipped with weight sensing collection arms and RFID readers. When the recycling is collected the RFID tag is read and a computer stores recycled material weight collected by account. This information is then downloaded into the Recycle Bank program and the amount of materials recycled earns the account holder points. These points can be redeemed at many major retailers for goods or services. This type of program could be implemented in Kennewick and Richland, which have residential curbside recycling service.

3. *Commercial Waste Assistance*

Many industry associations have taken on the role of promoting recycling within their industries. This is particularly true for large businesses where waste reduction and recycling provide opportunities to reduce overhead costs and where disposal costs have risen substantially. It is often the smaller businesses that may lack information about opportunities and the role recycling may play in reducing disposal costs.

The City of Richland offers businesses information on its website on how to conduct a waste audit. Benton County and the other cities could work with the certificated haulers to provide its businesses with free technical assistance, by providing waste assessments. A waste assessment should address:

- The amount, nature, and composition of the waste generated in all functional areas of an establishment.
- How the waste is produced, including relevant management policies and practices.
- How the waste is managed.

The information from the waste assessment is the basis for identifying and developing the waste reduction and recycling options for the business.

4. *Recycling Opportunities Related to the Wine Industry*

During an informal survey, several of the wineries identified the need for recycling drop boxes closer to their facilities such as the Prosser Wine Village and Red Mountain. Such drop boxes are available for hire, and some wineries have chosen to recycle their glass through this option. The following options for assistance to the wine production industry could include: (1)

additional recycling drop boxes for cardboard and bottles (should accept all colors of glass commonly used in wine industry); (2) connecting wineries to artists who repurpose corks and/or wine bottles; (3) bringing in wine industry experts to hold workshops presenting newest technology and ideas for processing of post-production organics; and (4) serving as a conduit between wineries and other markets interested in purchasing post-production organics.

3.2.8 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

1. Expanded Recycling Drop-Box Program

Benton County will study the feasibility of adding additional sites located in the county.

2. Rewards Program for Residential Recyclers

Benton County will partner with Cities who provide curbside recycling to explore the feasibility of a program similar to the Recycle Bank Rewards Program.

3. Commercial Waste Assistance

Benton County and the other cities will consider the feasibility of working with the certificated haulers to provide their businesses with technical assistance to perform waste assessments.

4. Recycling Opportunities Related to the Wine Industry

Benton County will study the options to assist the wine industry in their recycling/reuse efforts.

3.3 Organics

One of the initiatives of the State's Beyond Waste Plan is to increase recycling for organic materials. Yard waste collection programs are required where there are "adequate markets or capacity for composted yard waste within or near the service area to consume the majority of the material collected." For Benton County, the following goal and objective is related to the management of organics:

Goal #6: Establish guidelines and strategies for management of specific waste streams.

Objective:

- Develop Best Management Practices for agricultural waste reuse and recycling.

3.3.1 Existing Programs

The County and cities actively promote backyard composting as a waste reduction method by providing backyard composting workshops. The County supports the efforts of the Cities of Prosser, Benton City and West Richland in their chipping programs, as well as the composting seminars held by WSU Cooperative Extension.

The City of Richland has added seasonal collection of organic yard trimmings at the curb to its basic residential garbage services. Households, except apartments and condos, are provided one green yard waste can. Additional cans are available for a monthly fee of two dollars. Materials that can be placed in the green can include loose grass, leaves, plant trimmings, garden debris like inedible fruits and vegetables, non-treated wood and branches less than 12” in diameter. The material is collected separately from garbage, every other week on the regular collection day. The program operates between the first week of March and the last week of November. In addition, during the spring and fall, drop boxes are placed in Richland neighborhoods for the collection of bulky and excess yard debris. The City also encourages residents to use a mulching lawn mower, backyard composter, and other methods to manage their organic waste.

The organic material collected in the City’s residential yard waste collection program is processed at the Horn Rapids Composting Facility. The compost facility opened in 2010 and accepts residential yard waste with no charge to the resident. Biosolids from the City’s Wastewater Treatment Plant is composted with the green waste. The composting program will save landfill space, help meet the State’s recycling goal and provide compost materials to the public. The program processed approximately 800 dry tons of biosolids, 1,500 tons of wood waste and 1,200 tons of curbside yard waste in 2011. Compost produced from the first few years of operation will be used as cover material for the area of the landfill that is being closed.

3.3.1.1 Organic Waste Inventory for Benton County

The Port of Benton, in cooperation with the Benton County Solid Waste Advisory Committee, conducted a study in 2009 to evaluate organic wastes in Benton County that may be useful for generating renewable energy. This work was funded by a grant from the Washington State Department of Ecology (Ecology). Completion of the study is consistent with Port of Benton and Benton County goals to promote local economic development, along with public health and safety, social services, and environmental quality.

The results of the study showed that, in general, the top categories of available waste materials are food processing wastes, wheat straw from irrigated wheat fields, various solid wastes (such

as wastepaper, yard waste, etc.), corn stover, grape pomace, mint slug, and turf grass straw. The October 2009 Draft Report is on file in the Benton County Public Works Department.

3.3.2 Options

1. Expand Yard Waste Chipping Program

A semi-annual program providing a chipper at designated drop-off sites throughout the area would divert additional materials from the landfill, and provide additional capacity to handle yard waste in the County. This option would only be implemented when appropriate end use markets are available for the chipped material, which may include public use for parks, medians or other landscaped areas, or in private operations.

2. Implement Curbside Green Waste Collection for Commercial Customers

This option incorporates a voluntary curbside green waste collection service for commercial customers. The service would be provided at the appropriate service frequency. The materials collected would be processed for mulch, composting, or other uses at designated and permitted compost facilities.

3. Diversion of Organic Waste from Wine Industry

The growing wine industry within Benton County is a waste producing sector that has not been previously addressed within the County's Plan. This industry produces very specific waste streams including organics that are by-products of the wine making process. An informal survey of several of the larger wine producers within Benton County identified a few common disposal methods of organics processing, including on-site land application, burial in pits, and selling to cattle ranchers for feed. The pit burial method can create hazardous conditions depending on the size and depth of the pit and whether or not access is limited in order to prevent accidental encounters. The County should work with wine industry representatives to identify opportunities to divert materials for beneficial use that are environmentally sound and protect public health.

3.3.3 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

The County will support the efforts of the cities to provide yard waste chipping, and continue to study ways in which to use the resultant material in environmentally appropriate ways. It will also research ways to expand the city-only program into the non-incorporated areas. It will support the agricultural and wine industry in finding uses for organic wastes produced in Benton County.



Chapter 4

Collection Systems

4.0 Collection Systems

This chapter provides a discussion of refuse collection in Benton County, including background information on how refuse collection is regulated, the legal authority that counties and municipalities have in managing collection services for solid waste and recyclables, and existing conditions for these activities. The chapter concludes with a discussion of the potential options for meeting existing and future collection needs in the county.

For the purposes of this plan, Benton County has established the following goal and objectives in relation to collection of solid waste:

Goal #5: Provide for efficient collection, transfer, and disposal of MSW and recyclables.

Objectives:

- Ensure access to collection or drop-off services for residences, businesses, and industry.
- Locate recycling and solid waste transfer, processing, and disposal facilities to optimize service levels and transportation efficiencies.
- Ensure adequate disposal capacity.
- Support the current WUTC authority as the appropriate framework to achieve safe and environmentally sound solid waste collection systems, allow for universal access to solid waste collection at just and reasonable rates.

4.1 Background

The Washington Utilities and Transportation Commission (WUTC), the county, and the municipalities regulate refuse collection in Benton County. The regulatory authority and jurisdiction of each of these entities is described below.

4.1.1 WUTC Authority

The WUTC supervises and regulates solid waste collection companies. WUTC authority (Chapter 81.77 RCW and Chapter 480-70 WAC) is limited to private collection companies and does not extend to municipal collection operated by municipalities or their contractors. The Commission requires reports, establishes rates, and regulates service areas and safety practices.

A private solid waste collection company must apply to the WUTC for a certificate of public convenience and necessity to operate in the unincorporated areas of the county or in incorporated areas which choose not to regulate refuse collection. The WUTC grants certificates within a designated service area to an applicant based on cost data, documented need for the service, and, if the district is already served by a certificate holder, the ability or inability of the existing certificate holder to provide service to the satisfaction of the WUTC. The Commission requires annual reports showing the refuse collection company's gross operating revenue. Certificates

may have terms and conditions attached and may be revoked or amended after a hearing held by the WUTC.

Commission regulation of solid waste collection companies does not include collecting or transporting of recyclable materials from a drop box or recycling buy-back center. It also does not include collecting or transporting recyclable materials by or on behalf of a commercial or industrial generator of recyclable materials to a recycler for use or reclamation (Chapter 81.77.010(8) RCW). Transportation of these materials is regulated under Chapter 81.80 RCW which governs the regulation of motor freight carriers. These carriers require a WUTC permit and proof of insurance to operate in the state. If the commercial recycling hauler also possess a certificate to operate as a solid waste company, WUTC is responsible for ensuring compliance with safety practices. For other commercial recycle haulers, the Washington State Patrol oversees hauler traffic safety practices.

4.1.2 County Authority

The rights of the counties in terms of solid waste collection include the establishment of solid waste collection districts for the mandatory collection of solid waste (Chapter 36.58.100 RCW). However, solid waste collection districts cannot include incorporated areas without the consent of the legislative authority of the city or town.

To form a solid waste collection district, public hearings must be held and the county legislative authority must determine that mandatory collection is in the public interest. County provision of collection services can be implemented only if the WUTC notifies the county that no qualified haulers are available for a district. Under mandatory collection, a hauler may request that the county collect fees from delinquent customers.

In Benton County, all unincorporated areas are covered by WUTC certificate holders; there are no solid waste collection districts. Although county authority to collect refuse in the unincorporated areas is limited, counties have the legal authority to assess fees on collection services provided in those areas. Presently, Benton County includes a surcharge tax on garbage collected in the unincorporated portions of the County. RCW 36.58.045 authorizes counties to assess such fees to fund administration and planning expenses associated with solid waste management.

4.1.3 Municipality Authority

Cities and towns have several options for managing solid waste collection under state law, including:

The city may choose not to manage or regulate its own refuse collection services. Collection services may then be provided by the certificate hauler(s) with authority for that area under the regulation of WUTC.

- The city may require a private company to obtain a refuse collection license from the city and to conform to all city collection guidelines.
- The city may award contracts to private companies for refuse collection in all or part of the city. The contract hauler does not need to hold a WUTC certificate for that area. Usually contracts are awarded based on selection criteria as determined by the city. The city may decide to manage and maintain its own municipal collection system for all or part of its jurisdiction.

The WUTC would not have jurisdiction over the last two options (Chapter 81.77.020 RCW). State law also allows municipalities to require residents and businesses to subscribe to designated refuse collection services.

The City of Richland is the only municipality in the region that provides collection services through a city solid waste utility.

4.2 Existing Refuse Collection Services

Refuse collection services in Benton County are provided through a number of different mechanisms, including municipal, WUTC certificates, and municipal contracts. The existing collection services and arrangements for each entity are described below.

4.2.1 Unincorporated Benton County

Refuse collection in unincorporated Benton County is provided under certificates granted by the WUTC. Four haulers are certified to collect waste in Benton County, as indicated in **Exhibit 4-1**. Maps of the service areas for each certificate holder are provided in **Exhibits 4-2 through 4-5**.

Basin Disposal, Inc.: Serves primarily the eastern area of Benton County, and the Hanford site. Waste collected by BDI trucks is brought to the BDI transfer station located in Pasco (1721 Dietrich Road) and is long-hauled to the Finley Buttes landfill for disposal.

Ed's Disposal, Inc.: Ed's Disposal, Inc., primarily serves central Benton County. Waste is transported to the BDI transfer station in Pasco and long-hauled to the Finley Buttes landfill for disposal.

Sanitary Disposal, Inc.: Sanitary Disposal, Inc. collects waste from the southwestern corner of Benton. Waste collected in the County is transported to a transfer station in Umatilla County, Oregon, between the Cities of Hermiston and Umatilla, and is long-hauled to the Finley Buttes landfill for disposal.

Waste Management of Kennewick: Serves areas throughout unincorporated Benton County for the collection and disposal of solid waste. Waste collected by Waste Management is

transported to its transfer station in Kennewick, and hauled to the Columbia Ridge landfill for disposal.

Exhibit 4-1. Benton County Certificated Haulers

<p>Certificate G-118 Basin Disposal, Inc. PO Box 3850 Pasco, WA 99302-3850 (509) 547-2476</p>	<p>Certificate G-173 Sanitary Disposal, Inc. Box 316 Hermiston, OR 97838 (541) 567-8842</p>
<p>Certificate G-110 Ed's Disposal, Inc. PO Box 3850 Pasco, WA 99302-3850 (509) 547-2476</p>	<p>Certificate G-237 Waste Management of Kennewick PO Box 6088 Kennewick, WA 99336-0088</p>

4.1.2 Benton City

The City of Benton City contracts with Ed’s Disposal, Inc. for residential and commercial solid waste collection. Residents are provided with either a 64-or 96-gallon wheeled cart, which is collected weekly using an automated truck. Additional residentially generated garbage is allowed at no extra charge, as long as it is no more than 65 pounds per item. Commercial customers are serviced by Ed’s Disposal, and businesses can contract for waste and recycling (cardboard only) collection.

4.1.3 City of Kennewick

The City of Kennewick contracts with Waste Management to provide collection services to residences and businesses within the city. Residential refuse is collected using automated curbside collection vehicles. Residents can choose either a 35-gallon or a 96-gallon cart for refuse. The rates vary by size of the cart, and are lower for the smaller cart, which encourages residents to recycle more, and discard less refuse. There is an additional charge for refuse that does not fit in the cart.

Recycling service is provided at no additional charge. Residents are provided bins for curbside collection of recyclables. One bin is used for the collection of glass bottles and jars. The second bin is used for the collection of comingled recyclables, including aluminum cans, tin cans, paperboard milk cartons, P.E.T. plastic soda and H.D.P.E. plastic milk bottles, newspaper, and magazines. Residents are instructed to place cardboard and used oil next to the bins. There is no limit on the amount of clean recyclables residents can place at the curb.

Exhibit 4-2. Certificate G-118, Basin Disposal, Inc.

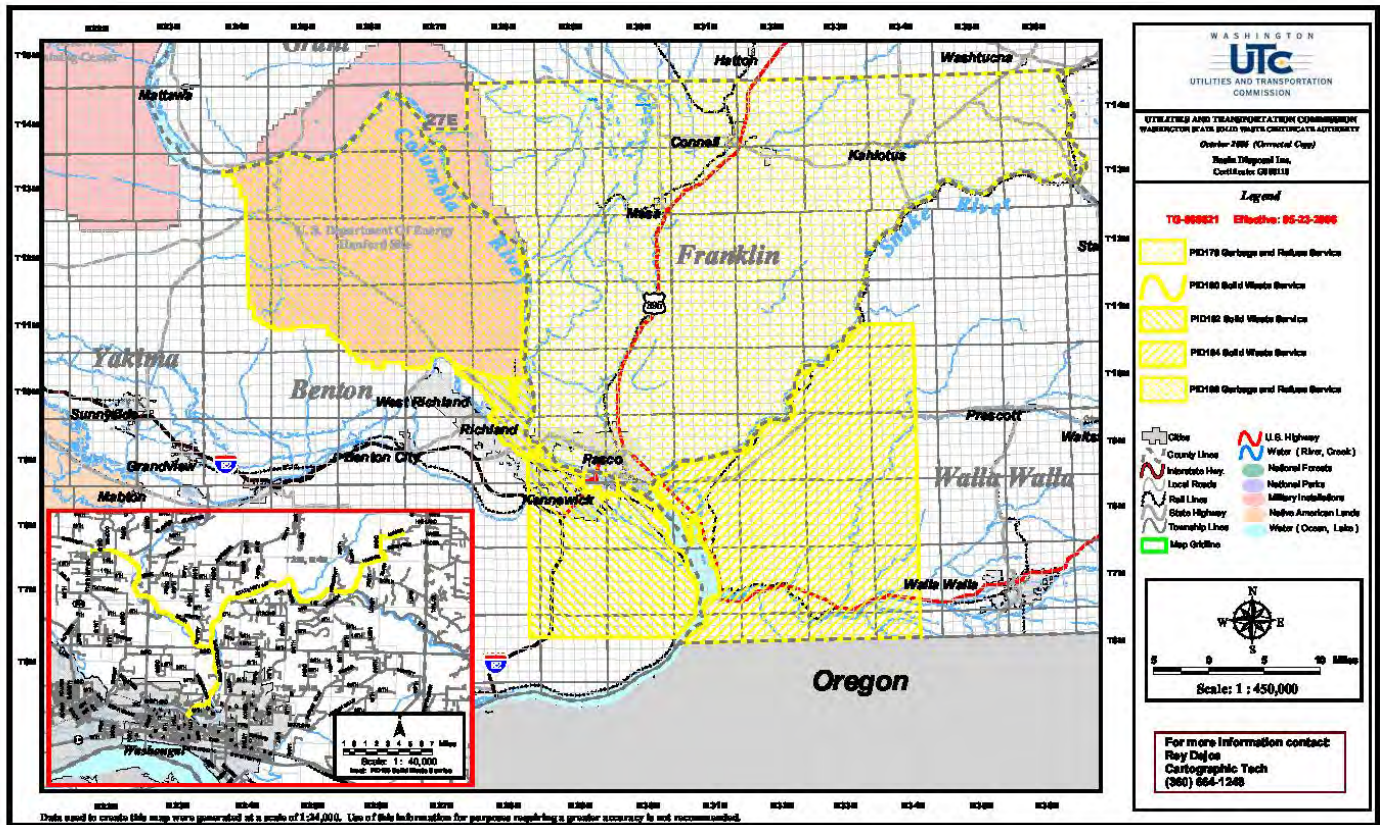


Exhibit 4-3. Certificate G-110, Ed's Disposal, Inc.

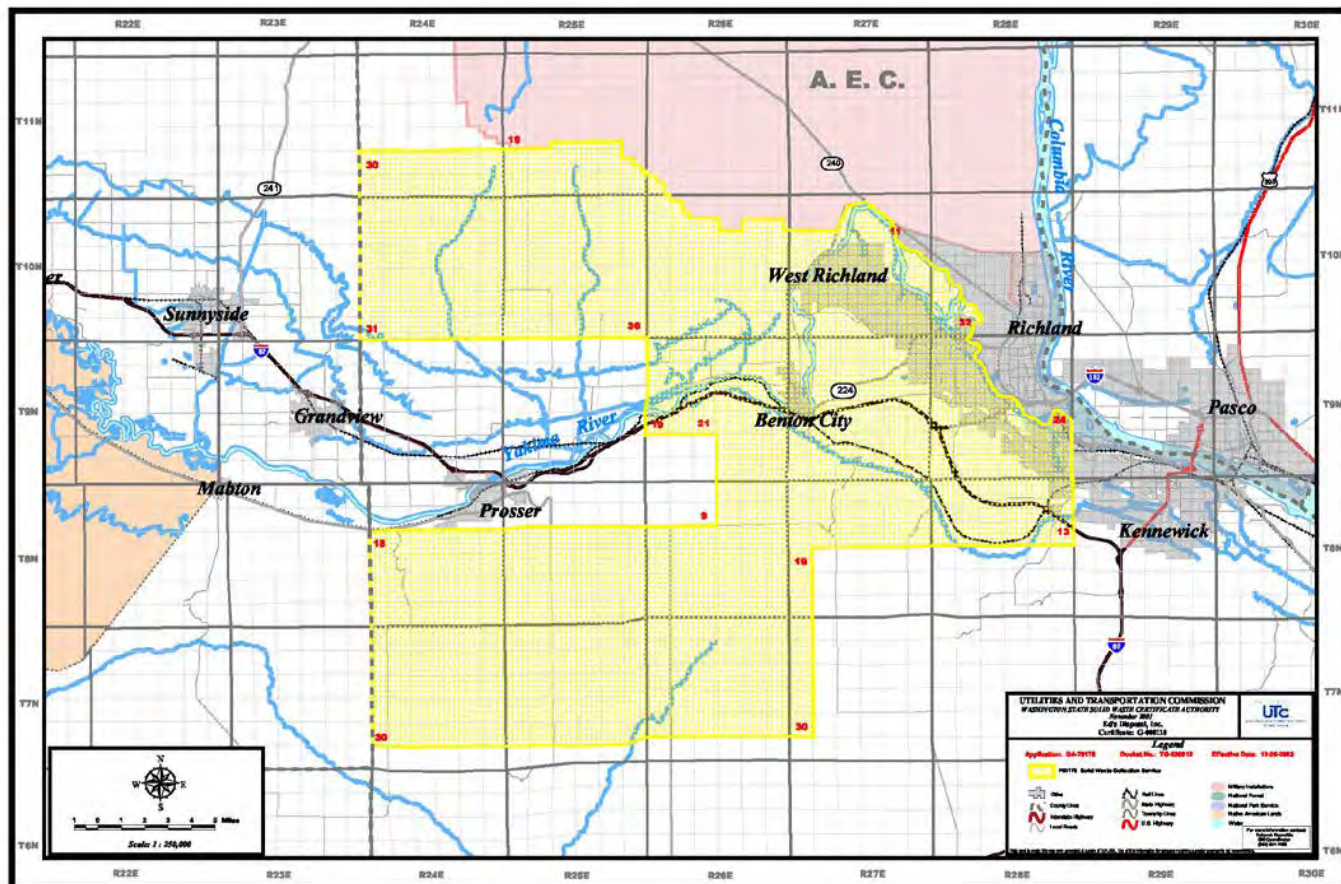


Exhibit 4-4. Certificate G-173, Sanitary Disposal, Inc.

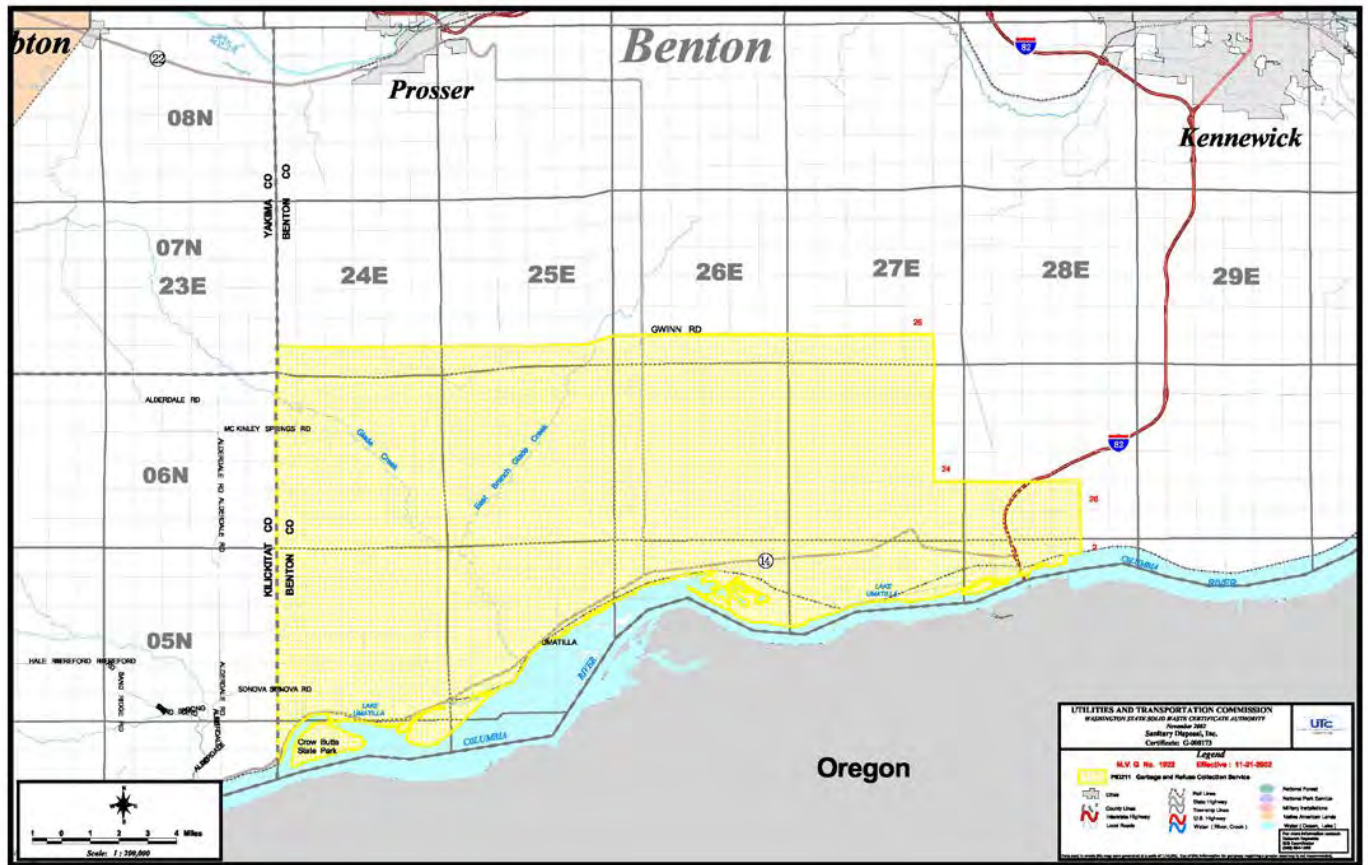
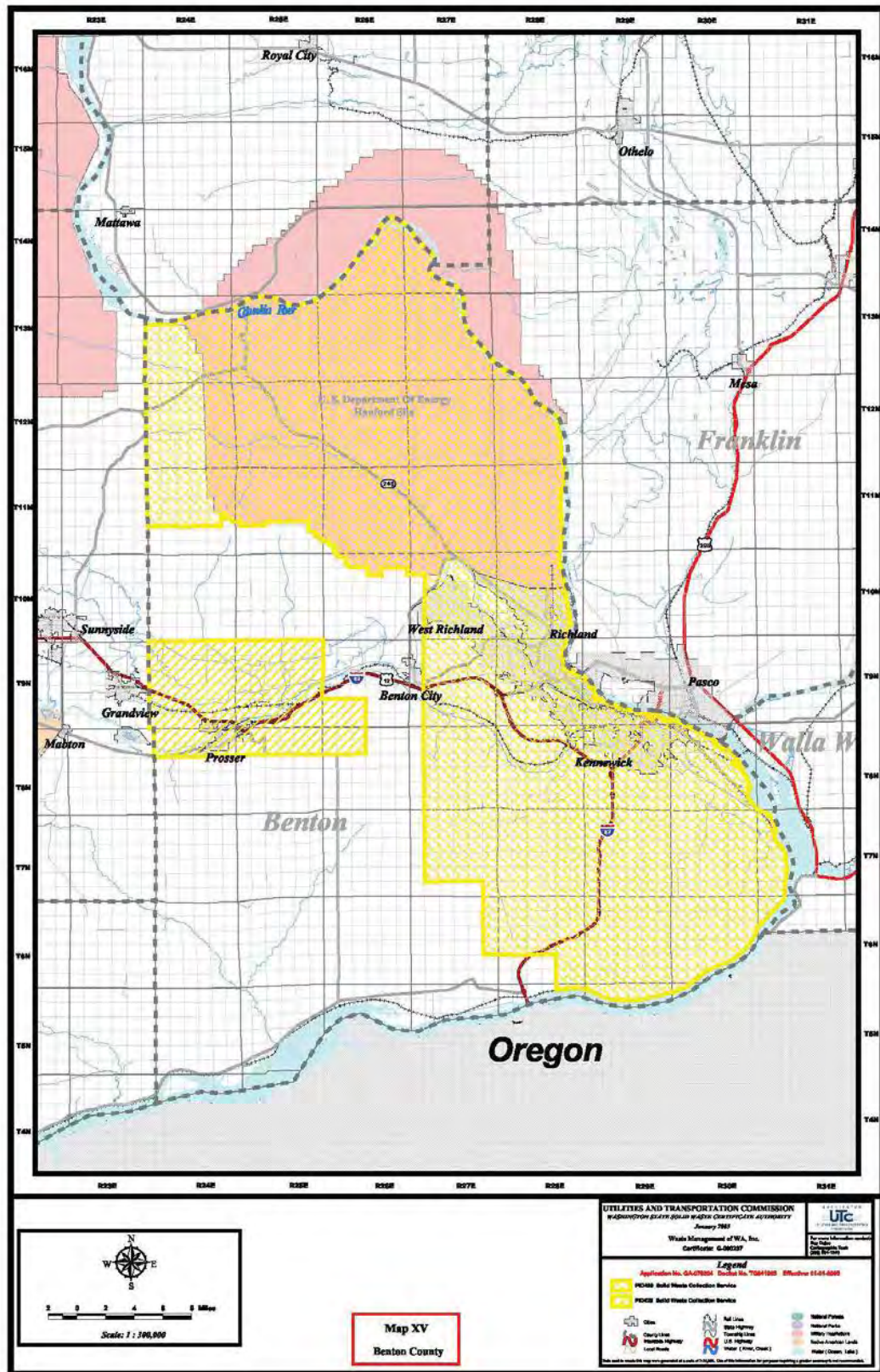


Exhibit 4-5. Certificate G-237, Waste Management of Kennewick



City residents also are provided coupons that allow them the opportunity to self-haul waste to the transfer station free of charge up to 12 times per year, replacing Spring and Fall Cleanup Events. Waste Management also offers scheduled holiday clean-ups.

4.1.4 City of Prosser

The City of Prosser contracts with Basin Disposal, Inc. (BDI) for residential and commercial solid waste collection. Residents are provided with either a 64-or 96-gallon wheeled cart, which is collected weekly using an automated truck. Additional residentially generated garbage is allowed at no extra charge, as long as it is no more than 65 pounds per item. Additionally, Prosser sponsors a spring cleanup event for all waste except household hazardous waste, and a fall clean up event for vegetative waste only. Commercial customers are serviced by BDI, and businesses can contract for waste and recycling (cardboard only) collection.

4.1.5 City of Richland

The City of Richland's Public Works Department, Solid Waste Division provides residential, commercial and roll-off box collection services in the City. Residential customers comprise approximately 47% of the collection (by weight), and commercial and roll-off customers each contribute about 28% and 24%, respectively. All waste is hauled directly to the Horn Rapids Landfill.

Richland city crews collect residential waste five days per week from approximately 16,000 residential accounts. Participation in the curbside recycling program is voluntary, and an additional monthly fee applies to that service.

The City of Richland has added seasonal collection of organic yard trimmings at the curb to its basic residential garbage services. Households, except apartments and condos, are provided one green yard waste can. Additional cans are available for a monthly fee of two dollars. Materials that can be placed in the green can include loose grass, leaves, plant trimmings, garden debris like inedible fruits and vegetables, non-treated wood and branches less than 12" in diameter. The material is collected separately from garbage, every other week on the regular collection day. The program operates between the first week of March and the last week of November. In addition, during the spring and fall, drop boxes are placed in Richland neighborhoods for the collection of bulky and excess yard debris. The City also encourages residents to use a mulching lawn mower, backyard composter, and other methods to manage their organic waste.

The City provides commercial collection services to approximately 845 accounts. Private haulers provide recycling services to some City businesses.

4.1.6 West Richland

The City of West Richland contracts with Ed’s Disposal, Inc. for residential and commercial solid waste collection. Residents are provided with either a 64-or 96-gallon wheeled cart, which is collected weekly using an automated truck. Additional residentially generated personal garbage is allowed at no extra charge, as long as it is no more than 65 pounds per item. Commercial customers are serviced by Ed’s Disposal, and businesses can contract for waste and recycling (cardboard only) collection.

4.2 Existing Programs for Self-Hauled Waste

Several options are available in the County for residents that choose to self-haul their waste.

4.2.1 Drop Box Facilities

There is a Drop Box Facility located in Prosser for city residents that choose to self haul. This drop box is operated by BDI. The drop box is open for 16 hours per week on Wednesdays, Fridays, and Saturdays. In addition, non-commercial motor oil is accepted at the facility.

Ed’s Disposal, Inc., operates a Drop Box Facility in Benton City. This drop box is also open 16 hours per week, on Thursdays and Saturdays. In addition, non-commercial motor oil is accepted at the facility.

The Drop Box facilities consist of an elevated receiving floor and a stationary compactor unit. The receiving floor is generally 20 feet by 30 feet in size and is constructed of asphalt. The facility operator uses a tollbooth on-site to conduct transactions.

Once waste is compacted into the container, the loaded container is transported to the BDI Transfer Station located in Pasco, prior to shipment to Finely Buttes landfill for disposal.

Exhibit 4-6 provides a summary of waste tonnages collected at the two drop boxes.

Exhibit 4-6. Tons of Self-Hauled Waste at Benton City and Prosser Drop Boxes

Drop Box Facility	Year					
	2006	2007	2008	2009	2010	2011
Benton City	230+	230+	120+	130+	80+	105+
Prosser	230+	220+	210+	210+	80+	80+

Source: BDI, Inc.

4.3 Collection Requirements

4.3.1 Urban and Rural Designation

The 1989 legislation allows counties to contract for the collection of source-separated recyclable materials from residences within unincorporated areas. Under this provision, counties can manage, regulate and establish the price of curbside recycling collection services. However, this does not mean the counties are authorized to operate their own solid waste collection systems as municipalities may. If the counties do not elect to contract for the collection of source separated recyclable materials from residences, the WUTC must be notified in writing no later than ninety days following the approval of the solid waste management plan's waste reduction and recycling element. Upon notification, the WUTC would have the responsibility for implementing any mandated curbside recycling or yard waste programs and determining their service levels, as addressed in the waste reduction and recycling element of the solid waste management plan.

Municipalities have the authority to provide or contract for residential curbside recycling services within their boundaries (Chapter 35.21.120 RCW). Additionally, they have the authority to manage, regulate, and fix the price of these services. Municipalities designated as urban are required to provide curbside collection of recyclables, or an equivalent program [70.95.090(7)(b)(i)]. Municipalities designated as rural may choose to meet minimum service level requirements either independently or in cooperation with the county.

The 2010 Guidelines for solid waste management plans issued by the Department of Ecology require local governments to develop clear criteria to determine the designations for urban and rural areas for disposal and waste reduction and recycling (RCW 70.95.092). Criteria to be considered include:

- Anticipated population growth.
- The presence of other urban services.
- Density of developed commercial and industrial properties.
- Geographic boundaries and transportation corridors.

The Cities of Kennewick and Richland have been designated as “urban” (population of 12,000 or more) and the remainder of the cities and unincorporated Benton County is designated “rural.” The planning guidelines recognize that there are differences in the services that can be offered to urban versus rural areas for solid waste services. Estimated 2010 population and housing densities are provided in **Exhibit 4-7**. The rural nature of Benton County limits the economic feasibility of certain methods of recyclables collection. For example, curbside collection may only be economically feasible in the two communities which have a population base to support this type of system.

Exhibit 4-7. 2010 Estimated Population and Housing Densities

Jurisdiction	2010 Population	Land Area (sq. mi.)	Estimated Population Density (pop/sq.mi.)	Number of Housing Units	Average Estimated Housing Density (houses/sq. mi.)
Unincorporated County Area	43,453	1,235	35	12,214	10
Benton City	3,779	2.56	1,476	1,185	463
Kennewick	71,794	25.9	2,772	27,205	1,050
Prosser	5,668	4.08	1,389	1,907	467
Richland	52,901	39.34	1,345	20,426	519
West Richland	11,336	20.43	555	4,398	215

Source: Washington State Office of Financial Management April 1 2011 Population (High Series), Population Density, and Housing

As required in RCW 70.95.090(5)(d), solid waste collection needs must be projected for the next six years. Requirements for future collection services will depend on population growth. Forecasted growth in population for Benton County for the years 2012 through 2018 are provided in **Exhibit 4-8**. As indicated, the population of unincorporated Benton County is estimated to reach 48,979 in 2018 and incorporated Benton County will reach 163,975. This level of growth will most likely require additional collection routes. In addition, the City of West Richland is expected to exceed 12,000 residents by 2014, and will be required to provide curbside recycling, or an equivalent program, under the current “urban” designation.

Exhibit 4-8. Forecasted Population, 2012-2018

Area	Year						
	2012	2013	2014	2015	2016	2017	2018
Unincorporated	44,826	45,528	46,242	46,859	47,555	48,262	48,979
Incorporated	150,074	152,426	154,815	156,877	159,208	161,574	163,975
Benton City	3,898	3,959	4,022	4,075	4,136	4,197	4,259
Kennewick	74,062	75,223	76,402	77,420	78,570	79,738	80,923
Prosser	5,847	5,939	6,032	6,112	6,203	6,295	6,389
Richland	54,572	55,427	56,296	57,046	57,894	58,754	59,627
West Richland	11,694	11,877	12,064	12,224	12,406	12,590	12,777

Source: Benton County Comprehensive Plan, 2011 Update

4.3.2 Options

At this time, solid waste collection appears adequate for the residents of Benton County. However, continued population growth will likely require additional collection routes in the future. The following options have been submitted to the Solid Waste Advisory Committee for their consideration:

1. *Mandatory Collection in Unincorporated Areas.*

Currently, collection services in the unincorporated county are voluntary. Residents and businesses may choose to self-haul their waste to drop boxes, transfer stations, or to the Horn Rapids landfill. The County could consider making collection services mandatory. Mandatory collection requires that all residents within a defined area sign up and pay for a minimum level of service. The primary reasons for taking this step are to minimize illegal dumping and to distribute the costs of recycling and solid waste management equitably among all residents.

To require mandatory collection in an unincorporated area or county-wide, the County would be required to form a collection district as described in RCW 36.58A.030. The statute requires the County to hold public hearings on the issue and get approval by the County Commissioners. The Commissioners could approve a mandatory collection district in all or part of the County if it was deemed in the public interest and necessary for the protection of public health.

The County has traditionally maintained a voluntary system based on the rural nature of much of the County unincorporated areas, and the preference of the community to give residents the option to subscribe to service or self-haul their waste to a permitted facility.

2. *Further Evaluation of Recycling Service Level Changes for County Unincorporated Area*

In the 2006 Plan update, the option to change recycling service levels was recommended for implementation. The County has evaluated the option, but has not made any changes to the existing service level, which is established as a population of 12,000. Since the 2006 Plan adoption, the City of Richland has implemented curbside recycling for single-family residents.

The County could consider changing the population requirement as a means to offer more convenient recycling in certain County area by using housing density rather than population. The WUTC haulers would be required to provide the recycling services specified in the Plan. Working with the haulers, the County could define a new minimum service level that expands recycling and encourages haulers to invest in additional equipment for the service.

4.3.3 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

Benton County will continue to monitor the current garbage collection practices, and make changes if deemed necessary and prudent.



Chapter 5

Transfer and Disposal

5.0 Transfer and Disposal

This chapter includes a discussion of solid waste handling systems that includes transfer stations, landfills, and export of waste outside of Benton County and the laws governing these activities.

The County has adopted the following goals and objectives for landfilling and transfer:

Goal #5: Provide for efficient collection, transfer, and disposal of MSW and recyclables.

Objectives:

- Ensure access to collection or drop-off services for residences, businesses, and industry.
- Locate recycling and solid waste transfer, processing, and disposal facilities to optimize service levels and transportation efficiencies.
- Ensure adequate disposal capacity.

5.1 Transfer Stations

Waste transfer stations play an important role in a waste management system, serving as a link between local waste collection programs and the final disposal facility. The primary reason for using a transfer station is to reduce the cost of transporting waste to disposal facilities.

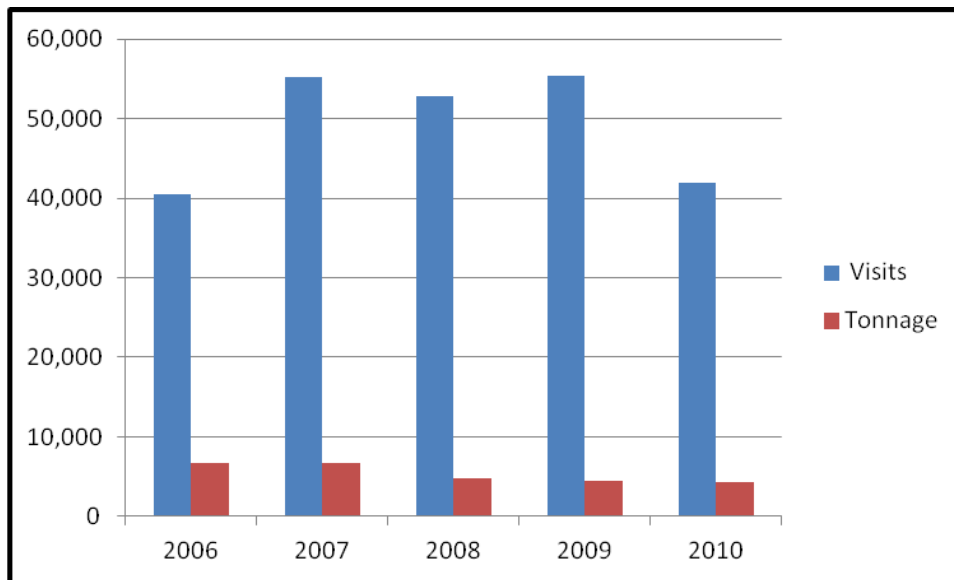
Consolidating smaller loads from collection vehicles into larger transfer vehicles enables collection crews to spend less time traveling to and from distant disposal sites and more time collecting waste. Transfer stations reduce overall transportation costs, air emissions, energy use, truck traffic, and road wear and tear. The Horn Rapids Transfer Station is used to eliminate the needs for customers to access the landfill, reducing the risks associated with self-haul vehicles interacting with commercial collection vehicles.

There are four transfer stations that are used for management of waste generated in Benton County. The transfer stations are described in the following sections.

5.1.1 Horn Rapids Landfill Transfer Station

The City of Richland operates a transfer station at the Horn Rapids Landfill. The transfer station is utilized by self-haulers for the disposal of waste, and eliminates the need for these customers to access the operation area of the landfill.

Data on the use of the transfer station from 2006-2010, including number of visits and tonnage, is included in **Exhibit 5-1**. The number of visits has averaged over 40,000 per year over the past five years, and tonnage has averaged 5,400 tons per year.

Exhibit 5-1. Horn Rapids Landfill Transfer Station Annual Visits and Tonnage

5.1.2 Waste Management Transfer Station

Waste Management operates a transfer station in Kennewick which is available for use by collection vehicles and the general public. The facility also includes a public recyclable materials and limited-purpose moderate risk waste drop-off area that accepts used oil and used antifreeze. The facility is open Monday through Saturday.

5.1.3 BDI Transfer Station

Columbia Basin LLC, d.b.a. BDI Transfer, operates a transfer station in Franklin County, at 1721 Dietrich Road in Pasco, which is available for use by commercial haulers and the general public. The facility accepts municipal solid waste, recyclable materials, and moderate risk waste (moderate risk waste is accepted from Franklin County residents only).

5.1.4 Hermiston Transfer Station

Waste collected in the County unincorporated area by Sanitary Disposal is taken to the company's Transfer Station in Hermiston, Oregon. The facility is permitted to accept municipal solid waste.

5.2 Landfills

Solid waste landfills in the State of Washington are regulated by local health departments and the Department of Ecology through the Criteria for Municipal Solid Waste Landfills Chapter 173-351 WAC. This section will provide information on Benton County landfill goals, local facilities, and an inventory of present capacity.

5.2.1 Existing Landfills

Over the past 10 years, nine landfills have been used to dispose of waste generated in Benton County. They include:

- City of Kennewick Inert Landfill, Washington.
- City of Prosser Inert Landfill, Prosser, Washington.
- Columbia Ridge Landfill, Arlington, Oregon.
- Finley Buttes Regional Landfill, Morrow County, Oregon.
- Graham Road, Spokane County, Washington.
- Greater Wenatchee Landfill, Douglas County, Washington.
- Horn Rapids Landfill, Richland, Washington.
- Roosevelt Regional Landfill, Klickitat County, Washington.
- Sudbury Road Landfill, Walla Walla, Washington.

The majority of waste disposed from Benton County is taken to the Columbia Ridge Landfill in Arlington, Oregon. Other major landfills used for disposal of waste from Benton County include the Horn Rapids Landfill in the City of Richland, and the Finley Buttes Regional Landfill in Morrow County, Oregon. In 2007, 5,000 tons of soil, rock, gravel and asphalt were taken to Drollinger Park as part of the City of Richland's closure of this park in 2008.

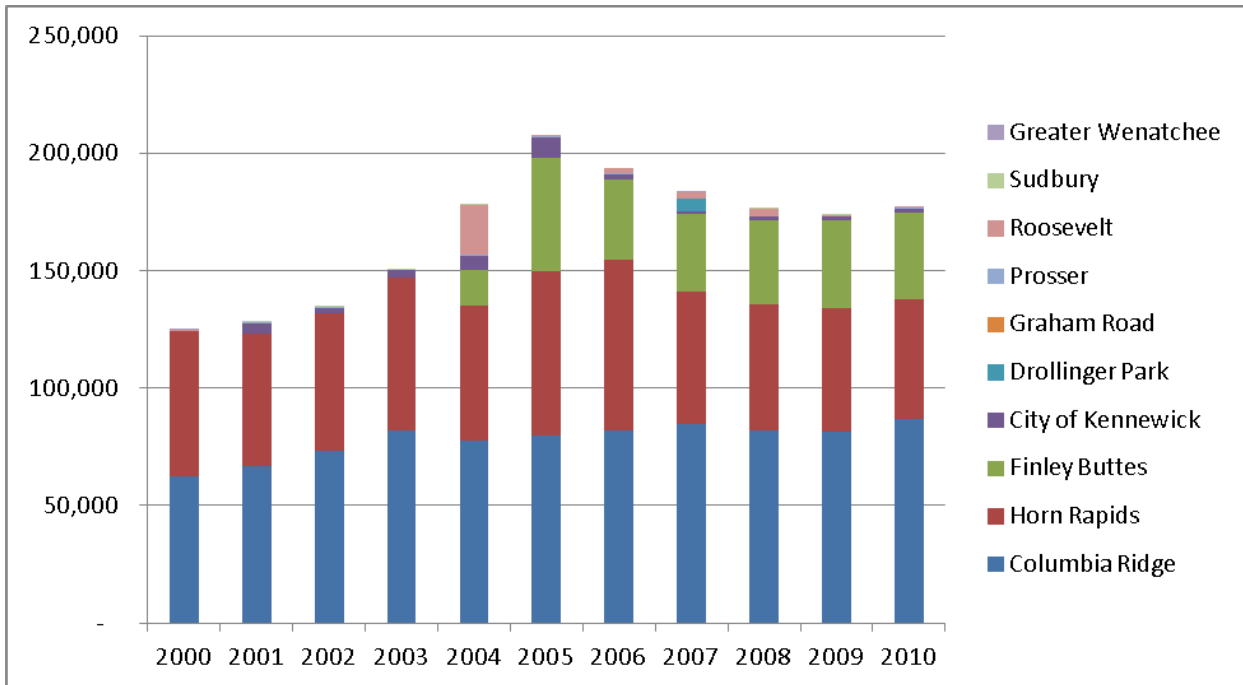
The Benton County tonnages reported for these landfills are provided in **Exhibit 5-2**.

Horn Rapids Landfill--

The City of Richland owns and operates the Horn Rapids Landfill, located approximately 3.5 miles northwest of town, off of Highway 240. Approximately 46 acres, out of 114, of the property is permitted for solid waste disposal. Adjacent to the permitted area is a separately permitted area of approximately 25 acres for the land application of biosolids, including 6 acres for the compost facility. In addition, there are approximately 14 acres which are occupied with facilities that include:

- An office/toll booth and a scale for weighing incoming loads.
- A transfer station for use by self-haul residential and small commercial waste and recyclables haulers.
- An area for land farming of petroleum contaminated soils generated in Benton County.

Exhibit 5-2. Disposal Summary for Benton County



The landfill operates under a solid waste disposal permit issued by the Benton-Franklin Health District in compliance with provisions of Chapter 173-351 WAC. The existing landfill was constructed prior to Subtitle D regulations, and therefore was not designed with a bottom liner or leachate collection system. A 4-acre vadose monitoring zone has been established within the Northeast corner of the permitted 46-acre disposal area. Small amounts of organic contamination have appeared in the water samples collected at the property boundary. Additional wells were installed in 1998 closer to the active disposal area to further define concentration levels of contaminants. The City of Richland has finished the remedial investigation, as required by the Toxics Control Act, and designed and installed a landfill gas extraction system that has been approved by the Department of Ecology. Part of the gas system design also includes a modified closure design that extends the landfill’s capacity, projected to be 2018. The City’s financial assurance for Closure/Post-Closure is being funded by a surcharge collected against each ton of waste crossing the scales. The City has completed a Master Plan for the future of the site.

Due to the advent of the City’s voluntary residential recycling program, waste disposal activities within the currently permitted area are projected to continue until 2018. Expanding diversion programs to commercial customers and to further expand construction and demolition recycling will add more time to the use to the current facility. After the current facility is full, the City will need to develop and use a new permitted space or long haul waste to a regional landfill.

The Landfill is open to city and non-city residents. City residents are allowed to dispose of waste at the Landfill for \$10 a visit for up to 1,200 lbs; non-city residents pay \$25 for up to 1,200 lbs. Residents must be present, have proper identification and show their City of Richland utility bill in order to dispose of their waste. Richland commercial and non-Richland commercial customers are charged for disposal according to the rate schedule established at the Landfill. The rates are assigned by vehicle type for residential waste, and by vehicle type and weight for commercial and construction debris. Some exceptions can be made for Richland residential waste hauled in a commercial vehicle, as determined by the Landfill site superintendent. In addition, rates are also established for different types of wastes.

Information on the Horn Rapids Composting Facility is included in Chapter 3, Section 3.4.1.

Data on the use of the landfill is available for the past 5 years, including number and types of users, and volume and weight of materials disposed. Historical data for landfill transactions and disposal for the last 6 years is summarized in **Exhibit 5-3**.

Exhibit 5-3. Horn Rapids Landfill Use

Year	Visits	Tons
2007	55,145	68,183
2008	51,947	65,932
2009	75,151	58,327
2010	57,393	52,521
2011	50,737	52,597
2012	48,730	49,948

City of Prosser Inert Landfill--

The City of Prosser owns and operates an inert waste landfill located on the south side of town within the City limits. The landfill is used by the City Public Works Department only and is not open to the general public. The site was permitted by the BFHD on September 19, 1990; however, material has been accepted at the site since August 1, 1990. In 2010, a reported 250 tons of material were disposed at the facility.

City of Kennewick Inert Landfill--

The City of Kennewick operates an inert waste facility in a similar manner to Prosser. In 2010, approximately 1,458 tons of materials were disposed at the landfill from Benton County.

Columbia Ridge Landfill--

The Columbia Ridge Landfill is a regional landfill that is owned and operated by Waste Management, Inc. The landfill is situated on a 2,036-acre site located in Arlington, Oregon. The facility is designed to meet both state and federal environmental standards and operates under

Oregon Department of Environmental Quality Permit #391. The landfill became operational in 1990 and has a life expectancy of over 100 years. In 2010, approximately 86,603 tons of material was disposed at the landfill from Benton County.

Finley Buttes Landfill--

The Finley Buttes Regional Landfill is located in Morrow County, Oregon. It is a regional solid waste management facility, owned by Waste Connections, which serves the Pacific Northwest. The landfill is located 10 miles south of Boardman, Oregon. Access to the site is by highway, Columbia River barge system, and rail.

The site is operated under ODEQ Solid Waste Disposal Permit No. 394 and the landfill is designed, constructed, and operated to be in compliance with all requirements of the Oregon DEQ and EPA Subtitle D MSW landfill requirements. Landfilling operations at the site began in 1990. Waste Connections is permitted to utilize 510-acres of the 1,802-acre site for municipal solid waste (MSW) disposal.

The estimated available fill capacity at the site, as currently permitted by the Oregon DEQ, is 90 million tons of MSW. The landfill receives over 500,000 tons of MSW annually. In 2010, 37,109 tons of material was accepted from Benton County. The projected life of the currently permitted landfill exceeds the 20-year period covered by the 2006 Benton County Solid Waste Management Plan Update.

Graham Road Limited Purpose Landfill--

The Graham Road Facility is owned and operated by Waste Management of Washington, Inc., and is located in Spokane County. Graham Road is a Limited Purpose Landfill that accepts construction and demolition debris, asbestos, tires, wood, concrete, asphalt, special waste, petroleum-contaminated soils, creosote-contaminated wood, and railroad ties. Graham Road has been in operation since 1991. Waste Management has owned and operated the landfill since 1997. In 2010, approximately 8.7 tons of asbestos-containing waste was sent to the facility from Benton County.

Roosevelt Regional Landfill--

The Roosevelt Regional Landfill is located in a remote area of Klickitat County in South Central Washington. The largest private landfill in the state, Roosevelt covers an area of 2,545-acres, has a 120 million ton capacity, and a 40-year expected life span. The landfill is designed to meet all current solid waste landfill regulations, including the Criteria for Municipal Solid Waste Landfills (WAC 173-351). The landfill is operated by Allied Waste/Republic Service Company. This landfill currently accounts for 69% of the State's disposal capacity and in 2010 received

some type of solid waste from 26 counties in Washington.¹ In 2010, approximately 477 tons of material was accepted from Benton County.

Sudbury Road Landfill--

This landfill is located in Walla Walla County, Washington. It is owned by the City of Walla Walla. Since 1994, limited amounts of asbestos containing materials originating from Benton County have been sent to this landfill for disposal. In 2008, 11 tons of asbestos containing material and about 12 tons of MSW were sent for disposal to this facility. In 2009, about 2 tons of asbestos containing material and 6 tons of MSW were sent to this facility. No material was taken to the Sudbury Road Landfill in 2010.

5.3 Waste Import/Waste Export

5.3.1 Waste Import

“Waste import” refers to transfer of waste into Benton County from other areas. Some waste entering the County comes from neighboring Franklin County residents bringing materials to the Horn Rapids Landfill in Richland. This is assumed to be a very small amount of waste, and is not tracked independent of regular residential waste brought to the landfill. Periodically, Yakima County residents may use the Prosser Drop Box Facility, particularly during Prosser Cleanup Days. The Prosser Inert Landfill, as stated above, only accepts demolition waste from its Public Utility Department. Therefore, the importation of municipal solid waste for landfill disposal is essentially non-existent in Benton County.

5.3.2 Waste Export

“Waste export” refers in this section to the transfer of waste from Benton County to a landfill located outside the area. Waste Management of Kennewick, Ed’s Disposal, Inc., and Basin Disposal, Inc., of Pasco, and Sanitary Disposal of Hermiston provide for the collection of solid waste, and export waste out of the county for disposal. Information on the provision of this service is provided below.

Waste Management

Currently, Waste Management of Kennewick is under contract with the City of Kennewick, and under a WUTC franchise certificate to portions of unincorporated Benton County, for the collection and disposal of solid waste. Waste collected by Waste Management of Kennewick is transported to its transfer station in Kennewick. At the transfer station, the waste is off-loaded and compacted into closed-top transfer vehicles for transport to Waste Management’s Columbia Ridge Landfill in Arlington, Oregon. Waste Management utilizes third party transportation companies for the 90-mile transfer of waste from the Kennewick transfer station to the Columbia

¹ Washington State Department of Ecology, *Solid Waste in Washington State--Nineteenth Annual Status Report*.

Ridge Landfill. Currently, eight to nine fully loaded transfer trucks (each carrying 31 tons of compacted solid waste) make the trip from the Kennewick transfer station to the Columbia Ridge Landfill each day. Additional transport can be added to accommodate waste for the planning period.

Ed's Disposal, Inc.

Ed's Disposal, Inc., of Pasco collects waste from unincorporated areas of Benton County, and the cities of West Richland and Benton City. The waste is brought to the BDI Transfer Station in Pasco and long-hauled to the Finley Buttes Landfill for final disposal. The BDI Transfer Station can easily accommodate volumes of waste projected for the 20-year planning period.

Basin Disposal, Inc.

Basin Disposal, Inc., of Pasco collects waste in unincorporated areas of Benton County and the City of Prosser. Waste collected by Basin Disposal, Inc., is brought to the transfer station in Pasco, and is long-hauled to the Finley Buttes facility for final disposal.

Sanitary Disposal

Sanitary Disposal, Inc. collects waste from unincorporated areas in the southern portion of Benton County. Waste collected in this section of the county is transported to Sanitary Disposal's transfer station in Umatilla County, Oregon, and is then long-hauled to the Finley Buttes Regional Landfill in Morrow County, Oregon.

5.4 Landfill Capacity

Given current technology and disposal patterns, landfills are and will remain a necessary and important component of waste management. Source reduction and recycling can divert significant portions of the waste stream, but not all components of the waste stream are recyclable. Therefore, Benton County will be required to continue to secure out-of-county disposal capacity or create additional capacity within the County.

As discussed above, three landfills provide the majority of disposal capacity for the County:

- The Horn Rapids Landfill, located in Richland.
- Two regional landfills: Columbia Ridge Landfill and Finley Buttes Landfill.

The Horn Rapids Landfill has the capacity to accept waste generated by the City of Richland for approximately 6 years. The current permitted capacity is anticipated to be used up sometime in 2018 at the City's current rate of waste placement. After the current facility is full, the City will need to develop and use a new permitted space or long haul waste to a regional landfill. The two regional landfills have capacity well beyond the timeframe addressed by this plan.

5.5 Options

The following options are presented for consideration:

1. Monitor the City of Richland's Process to Evaluate the Feasibility of Expanding the Horn Rapids Landfill to Ensure In-County Disposal Capacity.

The City is evaluating the feasibility of expanding the Horn Rapids Landfill. Initial studies indicate the landfill could be expanded to accommodate seven million tons, or approximately 65,000 tons per year for 66 years, depending on the quantity of material disposed per year. The landfill would be constructed in compliance with Subtitle D regulations for sanitary landfills, and would accept municipal solid waste for disposal. The expanded facility would provide convenient disposal opportunity for residents and businesses at the same level of service as the existing facility. The estimated cost to expand the Landfill is \$33 million over the 53 year life of the new facility. The first phase of the new Landfill will be about \$6 million to begin operations. Operations and maintenance costs would be similar to existing costs. Expansion would ensure in-County disposal capacity for County and City residents.

The County and cities should monitor the City's planning effort, and where feasible, provide input into the process.

5.6 Recommendations

The Solid Waste Advisory Committee reviewed the options discussed above and has recommended the following options:

The County and cities will monitor the City's planning effort, and where feasible, provide input into the process.



Chapter 6

Miscellaneous Wastes

6.0 Miscellaneous Wastes

The purpose of this section is to review the generation, handling, and disposal methods for several special wastes in Benton County. These wastes require special handling and disposal and are generally managed separately from municipal solid waste. The wastes addressed in this chapter are:

- Agricultural wastes.
- Asbestos.
- Biomedical wastes.
- Construction, demolition, inert and disaster debris.
- Petroleum contaminated soil.
- Street wastes.
- Tires.
- Electronic wastes.

Wastes such as low-level radioactive wastes and biosolids will not be addressed in the Plan. Universal waste is addressed in the MRW Plan included in Chapter 7. There may be other items for the special waste category but they have not been identified or have not caused a problem in the County. The nature and sources of these wastes, as well as the existing programs for managing these wastes in Benton County are described, and where warranted, options are presented.

6.1 Goals and Objectives

With respect to specific waste streams, the County has adopted the following goal and objectives:

Goal #6: Establish guidelines and strategies for management of specific waste streams.

Objectives:

- Develop a plan to prepare for management of disaster debris.
- Develop Best Management Practices for agricultural waste reuse and recycling.
- Develop a plan for managing tires.
- Develop a plan for managing universal waste.
- Continue and expand the use of litter work crews.

6.2 Agricultural Waste

Agricultural wastes are by-products of farming and ranching that include crop harvesting waste and manure.

6.2.1 Existing Conditions

According to the 2007 Census of Agriculture, the number of farms in Benton County is increasing; up 24 percent from 1,313 farms in 2002 to 1,630 farms in 2007. The total farm acreage increased by 4 percent, totaling 632,636 acres in 2007 over the 607,963 acres in 2002.¹ The 2007 cattle inventory was 39,324 up from 28,513 in 2002.

Agricultural wastes result from farming and ranching activities, and consist of primarily crop residues and manure. In 2007, the top crop items in acreage were listed as follows:

- Wheat for grain, 94,268 acres.
- Vegetables harvested for sale, 73,530 acres
- Potatoes, 32,170 acres
- Grapes, 23,322 acres
- Sweet corn, 22,500 acres

The Port of Benton, in cooperation with the Benton County Solid Waste Advisory Committee, conducted a study in 2009 to evaluate organic wastes in Benton County that may be useful for generating renewable energy. This work was funded by a grant from the Washington State Department of Ecology (Ecology). The results of the study showed that, in general, the top categories of available agricultural waste materials are food processing wastes, wheat straw from irrigated wheat fields, corn stover, grape pomace, mint slug, and turf grass straw. The report estimated that over 300,000 tons per year of organic agricultural residuals are available in Benton County. **Exhibit 6-1** summarizes the estimated quantity of organic agricultural residuals available in Benton County. In addition, the report identified additional, larger quantities of materials in neighboring counties, such as Franklin, Yakima, Walla Walla, and Klickitat. The report is on file in the Benton County Public Works Department, 620 Market St., Prosser, Washington, or can be viewed online at www.co.benton.wa.us.

¹ 2007 Census of Agriculture, Benton County, United States Department of Agriculture, Washington Agricultural Statistics Service.

Exhibit 6-1. Summary of Organic Residuals Available in Large Quantities in Benton County

Material	Estimated Annual Quantity (tons)	Availability
Food Processing Wastes	>200,000	Potentially available (potato waste and apple pomace in demand for cattle feed).
Corn Stover (assumes 50% left in field)	72,000	Available (some existing collection and use)
Wheat Straw (irrigated fields, assumes 50% left in field)	35,000	Available (some existing use)
Wood (woody orchard prunings)	3,200 to 8,300	Partially available
Grape Pomace	12,000-20,000	Available
Horse and cattle manure (non-dairy)	15,000	Available
Mint	6,400-8,300	Available
Turf Grass Straw	7,400-12,500	Available (some alternate uses)

6.2.2 Options

1. Continue to Work Cooperatively with Port of Benton and Regional Agencies to Identify Opportunities for Beneficial Use of Organic Residuals from Agriculture

Given the rural nature of Benton County, the potential exists for the generation of significant amounts of agricultural waste. Although little agricultural waste requires disposal in Benton County, the Port of Benton report identified opportunities for use of the materials for energy generation and/or establishment of regional organics management centers, either in the county or on the county perimeter.

A committee has been formed that discusses potential opportunities in the County to further investigate opportunities for developing these types of alternative energy industries. Interested and affected stakeholders to be included in the discussions have included city and county representatives, farmers, processors, energy industry representatives, and the waste and recycling industry.

6.3 Asbestos

Asbestos is a material that was used for thermal insulation, surfacing materials, and other purposes in buildings throughout the 1950s, 1960s, and 1970s. When asbestos-containing material (ACM) becomes easily crumbled by hand pressure, it is called friable and dangerous because it can release asbestos fibers into the air. Likewise, cutting or sanding of non-friable

ACM can release asbestos fibers into the air. Friable asbestos fibers are a known carcinogen, which can cause lung cancer and other disabling and fatal diseases.

Federal regulations governing handling, transportation, and disposal of ACM are known as the National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61). Requirements for asbestos disposal include, to name a few, standards for covering the waste, maintenance of waste shipment records, and maintenance of records concerning location and quantity of waste disposed.

Ecology Dangerous Waste Regulations (WAC 173-401-531 Thresholds for hazardous air pollutants) states that asbestos waste that contains 0.01% of friable asbestos exceeds the criteria for carcinogenic dangerous waste and must be regulated. The Benton Clean Air Authority (BCAA) is the local agency responsible for enforcing federal, state, and local asbestos regulations. The Authority has adopted local regulations, consistent with existing federal and state regulations, for the removal, encapsulation, and disposal of ACM. In its regulations, BCAA has lowered the limits for notification and emission control from 260 linear feet (or 160 square feet) to 10 linear feet (or 48 square feet). Asbestos may only be removed by licensed asbestos contractors or by homeowners after a notice is provided to BCAA. Asbestos contractors are licensed by the Washington State Department of Labor and Industries.

6.3.1 Existing Conditions

Municipal solid waste landfills can accept non-friable asbestos wastes if acceptance and disposal procedures are in compliance with federal, state, and local regulations. There are a limited number of facilities that currently accept ACM for disposal. Asbestos waste generators in Benton County can haul their waste to either the Columbia Ridge Landfill (Oregon) or the Roosevelt Regional Landfill (located in Klickitat County) for disposal. Both sites have approved programs for asbestos waste disposal. As discussed in Chapter 5, some ACM originating in Benton County is sent to Sudbury Road and Graham Road landfills. The Horn Rapids Landfill has modified their waste policy to accept ACM (non-friable asbestos).

Asbestos-containing materials can be disposed of in solid waste landfills if they are encapsulated, packaged, and covered for disposal in accordance with the local, state, and federal asbestos regulations described previously. Acceptance of asbestos at a landfill facility requires special handling of the material, additional paper work, and additional training of personnel. These requirements increase asbestos waste disposal costs.

6.3.2 Options

- 1. Encourage BCAA to Increase Enforcement of Asbestos Waste Disposal Activities*

Asbestos regulations require a written notice of intent to remove or encapsulate asbestos. This notice is provided to the BCAA and includes information for handling of the wastes, from removal and encapsulation to disposal. The BCAA is responsible for ensuring that the procedures outlined in the notice of intent are enforced. The BCAA should be encouraged to increase enforcement of asbestos waste disposal activities, including additional follow-up on notices of intent to ensure that the wastes were disposed of in the approved manner. Fining illegal dumpers and publicizing incidents of illegal asbestos dumping in local newspapers should help to discourage illegal dumping and help the public become educated and aware of proper disposal practices.

2. Provide Education to Homeowners on Proper Handling and Disposal

Much of the asbestos waste generated results from demolition and remodeling projects. The quantities generated are a direct result of the amount of this type of work that is conducted. While private contractors are generally aware of asbestos handling requirements, homeowners doing their own project work may not recognize asbestos-containing materials. Current BCAA requirements allow homeowners to remove their own asbestos if they are doing the renovation/remodeling work themselves. Some homeowners may be unknowingly placing asbestos-containing materials from small remodeling projects in with their trash. There may be a need to educate homeowners about proper identification of asbestos-containing materials and proper handling and disposal methods. While some information is available on the BCAA website, the County could work with BCAA to develop more comprehensive information and outreach strategies.

6.4 Biomedical Wastes

Medical treatment and research facilities generate a wide range of special wastes that require handling and disposal. Because of the variety of waste streams, several different regulatory agencies at the local, regional, state, and federal level have regulations pertaining to best management practices, and apply their own definitions to waste types. For the purpose of this Plan Update, biomedical waste means, and is limited to the following types of waste in accordance with RCW 70.95K.010:

- a. **Animal Waste:** Waste animal carcasses, body parts, and bedding of animals that are known to be infected with or that have been inoculated with, human pathogenic microorganisms infectious to humans.
- b. **Biosafety Level 4 Disease Waste:** Waste contaminated with blood, excretions, exudates, or secretions from humans or animals which are isolated to protect others from highly communicable infectious diseases that are identified as pathogenic organisms assigned to biosafety Level 4 by the Centers of Disease Control, National Institute of Health, Biosafety in Microbiological and Biomedical Laboratories, current edition.

- c. **Cultures and Stocks:** Wastes infectious to humans, includes specimen cultures, cultures and stocks of etiologic agents, wastes from production of biologicals and serums, discarded live and attenuated vaccines, and laboratory waste that has come into contact with cultures and stocks of etiologic agents or blood specimens. Such waste includes but is not limited to culture dishes, blood specimen tubes, and devices used to transfer, inoculate, and mix cultures.
- d. **Human Blood and Blood Products:** Discarded waste human blood and blood components, and materials containing free-flowing blood and blood products.
- e. **Pathological Waste:** Waste human source biopsy materials, tissues, and anatomical parts that emanate from surgery, obstetrical procedures, and autopsy. "Pathological waste" does not include teeth, human corpses, remains, and anatomical parts that are intended for interment or cremation.
- f. **Sharps Waste:** All hypodermic needles, syringes with needles attached, IV tubing with needles attached, scalpel blades, and lancets that have been removed from the original sterile package.

The handling, transport, treatment, and disposal of infectious waste are regulated in some fashion by the following entities:

- U.S. Environmental Protection Agency.
- Washington Department of Ecology.
- Washington Department of Health.
- Washington Department of Transportation.
- Washington Utilities and Transportation Commission (WUTC).
- Benton-Franklin Health District.
- National Hospital Certification Association.

Under the Medical Waste Tracking Act of 1988 (MWTA), the EPA gives states the responsibility of permitting infectious waste treatment technologies. Treatment technologies must be consistent with the requirements of Title V of the Federal Clean Air Amendments.

Washington State agencies most directly involved in this process are Ecology, the Department of Health, and the WUTC. Ecology administers permits for the following biomedical wastes treatment alternatives:

- Incineration.
- Autoclaving.
- Chemical Disinfection.
- Microwaving.
- Macrowaving (for offsite treatment only).
- Gas vapor and irradiation sterilization.

6.4.1 Existing Conditions

The two major hospitals in the area (Kennewick General Hospital and Kadlec Medical Center, located in Richland) no longer incinerate their biomedical wastes. One franchise hauler, Stericycle, has a certificate granted by the WUTC (certificate G-244) to collect biomedical throughout the state. The collection service is provided on an on-call and regular basis.

Major generators of biomedical wastes in Benton County dispose of their wastes through a licensed state franchise service provider. At this time there have been neither reported problems with biomedical wastes nor identification of biomedical waste disposed improperly in the waste stream. Although no problems have been identified, a potential exists for improper disposal of these wastes. The BFHD provides a brochure on proper home disposal of syringes and lancets, and refers the medical community to Stericycle for disposal options.

While most medical facilities are informed about proper management of biomedical wastes, residential generators may not be informed about proper management for sharps and outdated pharmaceuticals. Pharmaceutical wastes present both wastewater and solid waste management issues. Often residents flush unwanted pharmaceuticals down toilets or pour them down drains, leading to potential contamination of surface waters, ground waters, and biosolids. In areas where there are wells and septic systems, this practice could affect drinking water. Proper disposal is also an issue for solid waste collection workers who must handle the waste.

6.4.2 Options

Two options to address residential biomedical waste are presented:

1. Educational materials for correct management of medical waste generated by residents.

Educational materials should continue to inform residents about the risks associated with their wastes and the services available to properly store and dispose of them. Residential sharps generators can use information about correct containers and collection opportunities.

2. Collection of sharps by garbage haulers, and outdated pharmaceuticals by local law enforcement agencies.

Most garbage haulers will accept sharps in their collection bins. Some will provide sharps containers, but most encourage residents to use sturdy, shatter and puncture proof, plastic bottles as sharps containers. Residents are provided label to use to identify the bottle as a sharps container, so it is not inadvertently put in a recycling bin. Local law enforcement agencies hold semi-annual pharmaceutical collection events in conjunction with the Drug Enforcement Agency.

6.5 Construction and Demolition Debris

Construction and demolition (C&D) debris consists of the materials generated during the construction, renovation, and demolition of buildings, roads, and bridges, and included within the definition of Solid Waste (WAC 173-350-100). This waste stream often contains:

- Concrete
- Wood (from buildings)
- Asphalt (from roads and roofing shingles)
- Gypsum (the main component of drywall)
- Metals
- Bricks
- Glass
- Plastics
- Salvaged building components (doors, windows, and plumbing fixtures)
- Trees, stumps, earth, and rock from clearing sites

A category closely related to C&D is “inert waste.” Inert waste includes cured concrete that has been used for structural and construction purposes, including embedded steel reinforcing and wood, that was produced from mixtures of Portland cement and sand, gravel, or other similar materials; asphaltic materials that have been used for structural and construction purposes (e.g., roads, dikes, paving) that were produced from mixtures of petroleum asphalt and sand, gravel, or other similar materials; brick and masonry that have been used for structural and construction purposes; ceramic materials produced from fired clay or porcelain; and glass, composed primarily of sodium, calcium, silica, boric oxide, magnesium oxide, lithium oxide or aluminum oxide. Glass presumed to be inert includes, but is not limited to, window glass, glass containers, glass fiber, glasses resistant to thermal shock, and glass-ceramics. Glass containing significant concentrations of lead, mercury, or other toxic substance is not presumed to be inert; nor are stainless steel and aluminum.

The primary difference between the two types of waste is that demolition waste is considered susceptible to decomposition, whereas inert waste is considered resistant to decomposition.

6.5.1 Disposal Regulations

Under WAC 173-350-400, Limited Purpose Landfills include, but are not limited to, landfills that receive segregated industrial solid waste, construction, demolition and landclearing debris, wood waste, ash (other than special incinerator ash), and dredged material. WAC 173-350 require liners and leachate collection systems for Limited Purpose Landfills.

Disposal of inert wastes is specifically addressed in WAC 173-350-990. Under that regulation, the requirements for inert sites are significantly reduced from those required for solid waste landfills. For example, no liners, leachate collection or treatment systems are required for inert fills. The less stringent requirements would result in cost savings in all aspects of construction,

operation, and maintenance of the inert fill. It is often advantageous to divert inert wastes from the municipal solid waste stream for disposal at an inert landfill. This reduces the amount of costly landfill space consumed by wastes that do not necessarily require disposal in a solid waste landfill. A higher level of regulatory oversight should be part of any permitted Inert Waste Landfill so that non-permitted material (i.e. non-inert Solid Waste) does not become deposited in a non-lined landfill).

Options for disposal of C&D and inert wastes include:

- g. **Use of Inert Waste as Fill Material:** WAC 173-350-410 provides for use of limited amounts (less than 250 cubic yards) of inert waste as general unregulated fill material.
- h. **Disposal in Inert Waste Landfills:** Inert landfills may only manage concrete, asphalt, masonry, ceramics, glass, aluminum, and stainless steel. The waste must meet the definition of “inert” provided earlier.
- i. **Disposal in Limited Purpose Landfills:** Limited purpose landfills are available to accept many other types of wastes including industrial waste, demolition waste, problem waste, and wood waste. Design criteria for limited purpose landfills are performance based, subject to location standards, design and operating criteria, ground water monitoring, and financial assurance. Limited purpose landfill design specifications always include a liner and leachate collection system.

6.5.2 Existing Conditions

C&D waste generated in Benton County is managed at several landfills, which were previously discussed in Chapter 5. The tonnages of Benton County demolition and inert waste accepted at these facilities are provided in **Exhibit 6-2**. The majority of C&D materials are delivered to the Horn Rapids Landfill, where the materials are reused, recycled, or disposed. The City uses a tub grinder to pulverize wood material for use as intermediate cover material at the Landfill.

Limited recycling and reuse opportunities exist for C&D in Benton County. Opportunities do exist for scrap metals, asphalt, and concrete recycling in the City and region. **Exhibit 6-3** contains a list of facilities in the region that accept C&D materials. Concrete and asphalt pavement is crushed and used as base material for new construction or as aggregate in new asphalt. Wood waste is processed and sold for landscaping mulch or used to produce new wood products. It is often used for hog fuel for steam-generated electricity. Gypsum from wallboard is ground and used to manufacture new wallboard, and fertilizer. Architecturally valuable timbers, hardware, doors and windows are salvaged and reused with minimal or no processing. When recovered, these materials are not regulated as disposed solid waste.

Exhibit 6-2. Demolition and Inert Waste Disposal Summary for Benton County

Disposal Site	2005			2006			2007			2008			2009			2010		
	Dem.	Inert	Total	Dem	Inert	Total	Dem.	Inert	Total	Dem.	Inert	Total	Dem.	Inert	Total	Dem.	Inert	Total
Horn Rapids Landfill	16,569	1,520	18,089	11,380	1,119	12,499	22,267	1,640	23,907	21,101	823	21,924	18,594	1,541	20,135	18,014	36,626	54,640
Roosevelt	125		125	669		669	160		160			0	70		70			0
Columbia Ridge						0			0			0			0			0
Graham Road (LP)	4	2	6			0	2.5		3	21		21	1.34		1			0
Prosser (I/D)		207	207			0		453	453			0			0		69	69
City of Kennewick (I/D)		9,130	9,130			0		2,513	2,513			0			0		979	979
Total	16,698	10,859	27,557	12,049	1,119	13,168	22,430	4,606	27,036	21,122	823	21,945	18,665	1,541	20,206	18,014	37,674	55,688

Source: Washington Department of Ecology, Solid Waste Disposal Data by County (Landfilled and Incinerated: 1994 – 2010)

Exhibit 6-3. Regional C&D Facilities

Facility	City	Materials
Ray Poland and Sons, Inc.	Kennewick	Concrete, rebar
Pacific Steel and Recycling	Kennewick	All grades of construction metals
Twin City Metals	Kennewick	Aluminum, Brass , Copper, Ferrous scrap, Lead, Nonferrous, Porcelain/cast-iron, Stainless steel, Wire (ferrous, bare wire, insulated)
HVAC Recovery / Pick Up	Kennewick	Copper
R S Davis Recycling Incorporated	Hermiston, OR	Scrap metal
Ross Scrap Yard	Hermiston, OR	Scap metal
Super Scrap	Kennewick	Scrap metal
DLC Recycling	Yakima	Scrap metal
DRS	Richland	Clean drywall
Mayflower Metals	Prosser	Scrap metal
Tommy's Steel and Salvage	Pasco	Ferrous and non-ferrous metals
Central Pre-Mix	Pasco	Clean concrete block, bricks, rock, and gravel
Inland Asphalt	Richland	Concrete and asphalt
American Rock Products	Richland	Concrete (No metal or asphalt)

6.5.3 Options

Many C&D materials, such as wood, asphalt, concrete, rock, gypsum, and various metals, have multiple potential uses and are cost-effectively recovered, processed, and used as raw materials for new (or renewed) end uses. Wood waste is processed and sold for landscaping mulch or used to produce new wood products. It is often used for hog fuel. Gypsum from wallboard is ground and used to manufacture new wallboard, and fertilizer. Architecturally valuable timbers, hardware, doors and windows are salvaged and reused with minimal or no processing. When recovered, these materials are not considered, or regulated, as solid waste.

Such activities reduce pressure on waste disposal facilities, reduce dependence on “virgin” raw materials, and decrease energy use. In addition, the economic value of this market activity is enormous. In many communities, C&D and inert materials are now recognized as having significant potential to contribute to recycling goals and reduce waste overall.

C&D wastes are generated at a rate which is proportional to construction activity in a county and therefore dependent on the economic climate as well as population growth. Since Benton County will continue to experience growth and redevelopment, there will be C&D waste to be handled.

Historically, C&D and inert wastes have been collected, transported, recycled, and disposed by the private sector. This responsibility should remain with the private sector. Benton County should, however, support private efforts by encouraging separation of recyclable or reusable materials from the waste stream.

In keeping with the state goals and policies for waste reduction and recycling, the following options have been presented to the Solid Waste Advisory Committee as a means to gain more control and insight into the disposal of demolition wastes, to reduce the amount of C&D and inert wastes requiring disposal, and to prepare for emergencies and disasters that create debris:

1. Provide Education Programs for Contractors.

A straightforward method to help divert C&D and inert waste is to provide general contractors with educational material and information about alternative facilities that take C&D and inert waste. This could be as simple as providing a brochure listing the diversion facilities in the region, with hours, location, cost, and material types accepted. Providing information on reuse opportunities, such as exchange programs, can also be useful. A key opportunity for informing contractors about reduction and recycling opportunities is during the permitting process.

In addition to general reduction and recycling opportunities, contractors could be provided information about deconstruction and green building practices:

Deconstruction: This involves dismantling of a structure, salvaging building contents and components, and finding viable markets and outlets for materials. This practice can be used to varying degrees, which can range from reuse of an entire structure or foundation, to select assemblies and systems, to the careful removal of specific materials or items.

Green Building: Increasing the amount of green building practices is one of the five key initiatives identified in the State's Beyond Waste Plan. Green building is defined by the Beyond Waste plan as "design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas: sustainable site planning; conservation of materials and resources; energy efficiency and renewable energy; safeguarding water and water efficiency; and indoor air quality." The Beyond Waste Plan adopted a short-term goal of "dramatically increasing adoption of environmentally preferable building construction, operation and deconstruction practices throughout the state and the region." A separate long-term goal was also adopted, which is for "green building to be a mainstream and usual practice throughout the state."

The Beyond Waste Plan makes seven recommendations specifically for green building:

- a. Coordinate and facilitate partnerships to implement the green building action plan.
- b. Lead by example in state government.
- c. Provide incentives that encourage green design, construction and deconstruction and begin removing disincentives.
- d. Expand capacity and markets for reusing and recycling construction and demolition materials.
- e. Provide and promote statewide residential green building programs.

- f. Increase awareness, knowledge and access to green building resources.
 - g. Encourage innovative product design.
2. *Establish C&D and Inert Waste Diversion Specifications for County or City Projects.*

Another method for encouraging C&D and inert waste diversion is to include C&D and inert waste diversion requirements/procedures into project specifications, which are part of the contract between the contractor and the project owner. Because specifications are a major communication tool to convey the requirements of a construction or demolition project, specifications that contractors are required to follow could also include conditions and requirements for diverting C&D and inert materials. If the conditions are not met, the contractor could be held accountable.

The specification would require the contractor to submit a C&D waste management plan to the project owner and architect which will recover 50 - 75% of the C&D wastes for reuse and recycling. The plan must include a list of reuse and recycling facilities that will be used and materials that will be recovered. At the end of the project, the contractor must provide a final accounting of the disposition of recovered materials, including submittal of receipts, to receive final payments.

3. *Use Recycled Content Building Specifications for County or City Projects.*

There are building materials made with recycled content (insulation, plastic lumber, tiles) that are market ready, competitively priced and perform as well as virgin products. To generate demand and promote the reuse of C&D and inert materials in their present and recycled form, Benton County and the cities would require the use of recovered and recycled materials for county building and renovation projects.

As discussed above, the Beyond Waste Plan Green Building Initiative objective is “to dramatically increase adoption of environmentally preferable building construction, operation and deconstruction practices throughout the state and the region.” The long-term goal of this initiative is “for green building to be a mainstream and usual practice throughout the state.”

Other governmental actions are being taken on the state and local level. The High Performance Green Building Bill was signed in to law by Governor Gregoire on April 8, 2005. This bill adopts LEED (Leadership in Energy and Environmental Design) standards for state-owned buildings and schools.

4. Develop a Disaster Management Plan for Benton County.

In the aftermath of a disaster, the primary focus of government response teams is to restore and maintain public health and safety. As a result, debris diversion programs such as recycling and reuse can quickly become secondary. Advance planning, through a Disaster Management Plan, can help Benton County identify options for collecting, handling, storing, processing, transporting, diverting, and disposing of debris. Preparing a plan before an emergency happens can save valuable time and resources if it is needed.

5. Additional Oversight of Small Inert Waste Fill Projects

The county adheres to the state regulation that inert waste fill of less than 250 cubic yards does not have to be permitted. Improvements could be made in the level of control or scrutiny the county applies to individual demolition and/or construction projects, especially those in the unincorporated areas of the county. Some record of volume, waste type, fill location, and responsible party should be maintained. This could be facilitated through the issuance of demolition permits or through the building permit process.

6.6 Petroleum-Contaminated Soils

Petroleum-contaminated soils (PCS) are soils that have been contaminated by a petroleum product through leaks from petroleum product storage tanks or spills. Some PCS can be contaminated with lead, benzene, solvents, and PCBs and therefore may be considered hazardous. This section discusses only non-hazardous PCS.

PCS requires clean up when hydrocarbon contamination levels exceed those specified in Ecology's Model Toxics Control Act Cleanup Regulation (MTCA) (WAC 173-340). Under the MTCA, there are separate cleanup levels for industrial versus non-industrial zoned land along with maximum allowable levels for each individual constituent. PCS above MTCA cleanup levels can be treated in-situ, in place, or excavated and treated onsite or at an approved treatment facility.

6.6.1 Existing Conditions

Proper disposal of PCS is largely the responsibility of the generator. PCS generated in Benton County may be disposed of in several ways, including treating their soils onsite, disposing of them at a regional treatment center, or disposing of them at a permitted landfill. The generator must select a method approved by Ecology and typically will use cost to make the final selection of disposal method.

One option which is only available to generators in Benton County is to haul the PCS to the Horn Rapids Landfill, where the wastes are land farmed, disked in with native soils, and then used as

cover and road-building materials at the landfill. The Benton-Franklin Health District monitors the acceptance of PCS at the landfill and requires testing of the material before it is used at the landfill at least 6 months after it was first land farmed. The Horn Rapids Landfill uses a special form and procedure to track PCS through the treatment process. The BFHD approves and monitors PCS delivered to the Horn Rapids Landfill for treatment and re-use.

Other options for disposal are the Kennewick and Pasco transfer stations and export to one of the regional landfills. Generators with PCS designated as dangerous wastes must find other methods of appropriately disposing of their wastes that complies with all local, state, and federal regulations.

Present disposal and treatment options for PCS appear to be adequate. PCS wastes generated in Benton County will continue to be disposed at the Horn Rapids Landfill, on-site, Roosevelt Regional Landfill, Finley Buttes Landfill, and Columbia Ridge Landfill.

6.6.2 Options

1. Maintain Existing System

The County and cities should promote the private sector to continue to manage and dispose of PCS. These operations are likely to continue to use the Horn Rapids Landfill or other appropriately permitted facilities. Where appropriate, the County and cities should support and encourage the private sector to treat contaminated soils to minimize the amounts landfilled.

6.7 Street Wastes

Street wastes are collected during maintenance activities of cleaning streets, parking lots, storm sewers, and drainage systems. They are considered a solid waste in RCW 70.95.030 when the liquids have been decanted. Typically these street wastes fail the Model Toxics Control Act standards for total petroleum hydrocarbon (WTPH 418.1 Modified) and heavy metals; however, on the east side of Washington, street sweepings do meet MTCA standards due to the high volatilization. Many generators are now disposing of this material in landfills at considerable expense.

6.7.1 Existing Conditions

Street sweepings and vactor truck wastes collected at the Richland and Kennewick Decant Facilities have routinely tested under MTCA levels. Kennewick disposes of the material at their Inert Landfill, while Richland uses it for cover at the landfill. Prosser also disposes of street sweepings in their Inert Landfill. Decanted water from both decant facilities enter oil/water separators and each city's sewerage system. The City of Kennewick is looking into the feasibility of a decant facility that would handle contaminated street waste.

6.7.2 Options

1. Evaluate Potential Reuse of Street Wastes

Numerous reuse options for street wastes are potentially available. For example, the material might be used as feedstock in cement manufacture, asphalt production, composting, concrete manufacture, and industrial fill. Other reuse options include construction uses like fill or roadbed material. Some of the processing and reuse options for street wastes may not be realistic given regulations, permitting requirements, and material specifications involved in the options, leaving landfilling or treatment as the only options. Richland and Kennewick have both constructed street waste facilities, with all wastes going to landfills.

6.8 Tires

A waste tire is a tire no longer usable for its original intended purpose because of wear, damage, or defect (RCW 70.95.550) Tires do not include the metal wheel to which they are usually fastened. With its useful life over, it must be stored (temporarily), and then recycled or disposed. Tire dealerships remove most old tires in the process of selling new ones. Individuals may also accumulate old tires. When vehicles are junked, the tires on the vehicle, spares, and snow tires may be stored by the owner or taken to a wrecking yard.

In 2005, the Washington State Legislature passed SHB 2085, creating a Waste Tire Removal Account with funds for cleanup of unauthorized and unlicensed tire piles. Funds for this account come from a \$1 fee for each new replacement tire sold in Washington. The 2009 Legislature passed Senate Bill 5976 that transfers most of the collected tire fee revenue to Department of Transportation every other year (starting in 2011) (RCW 70.95.532). Ecology currently receives an annual tires budget of \$500,000. This funding reflects an 80% reduction from previous years.

Ecology is changing the focus of the Tire Program in light of the funding reduction. At the start of the program, we focused on removal of unauthorized tire piles. All of the tire piles identified in the 2005 Study of Unauthorized Tire Piles have been cleaned up along with many others.

6.8.1 Existing Conditions

The tire pile regulations are applicable and enforceable for piles where more than 800 tires are stored (WAC 173-350). Currently, there are no permitted tire pile facilities in the County (a previously permitted facility has been abandoned by the owner and is not under a permit). Tire collection events are held in Prosser and West Richland, sponsored by the Benton County Mosquito Control District.

Tires are accepted for a fee at the Horn Rapids Landfill. Tires are no longer buried, but transported off site to recycling operations. Waste Management accepts tires at the Kennewick Transfer Stations for a fee. Tires are not collected curbside with refuse. Tires are shipped by

Waste Management to a facility in Richland. Tires are accepted at the BDI Transfer Station for a fee, and tires are collected at curbside with the refuse in West Richland, Prosser and Benton City, as well as Ed's Disposal and Basin Disposal's county service areas.

Most large tire retailers contract with a tire collector for transport away from the site and eventual disposal/recycling. The majority of tires collected in the county are transported out of the county or state.

Tires will continue to be accepted at the Richland Landfill, Kennewick Transfer Station, BDI Transfer Station, and local tire retailers. The BFHD will identify tire piles that do not comply with state regulations and require compliance with these regulations. Tire policy and enforcement should be a consistent focus of Benton County to prevent the accumulation of tires outside of the traditional solid waste system.

6.8.2 Options

1. Develop a Plan for Management of Tires

Although currently there are a variety of ways in which tires are safely collected, in Benton County, the collection of tires at individual residents or businesses has the potential to become a nuisance. The County and cities should develop a plan to address the accumulation of tires on individual properties, and should pursue state grants, if available, to assist in tire pile cleanup. Municipal and county solid waste staff should coordinate tire recycling activities with programs in other jurisdictions.

2. County and City Purchasing Programs for Recycled Tire Products.

As was discussed in Chapter 3, Benton County can use its purchasing power to promote markets for scrap tires. There are a wide variety of tire-derived products available in the marketplace such as molded rubber products (e.g., carpet underlay, flooring material, dock bumpers, patio decks, railroad crossing blocks, roof walkway pads, rubber tiles and bricks, movable speed bumps). EPA has developed recycled-content recommendations for many products made from scrap rubber. Additionally, rubberized asphalt can have applications in many public works projects and loose fill crumb rubber can be used in a variety of applications for recreation and outdoor use such as playgrounds and walking trails.

Purchasing programs also can promote the use of retreads in government fleets, which is a common practice in commercial fleets for large truck tires. Retreading refers to reusing a tire casing and applying a new tread to the tire surface. EPA also has a procurement guideline developed for retread tires.

2. County and City Programs to Reduce Tire Waste.

City and county governments can divert tires from the waste stream from their fleets through maintenance and repair programs. Good tire maintenance can extend the life of a tire significantly. Windshield stickers can be used to remain maintenance facilities to check tires just as stickers are used for oil changes. Tires also can be repaired, if damaged, to increase their life span. Tire waste also can be reduced by purchasing longer-life tires.

3. Public Education Programs.

Consumers can be educated on tire maintenance, tire repair, and lifecycle costs to encourage purchase of longer-life tires. One specific target for educational materials could be companies that operate commercial fleets.

6.9 Electronic Waste

Electronic waste refers to discarded computers, monitors, printers, fax machines, cell phones, electronic cables, and other electronic products. In 2006, the Washington State Legislature passed Engrossed Substitute Senate Bill 6428, which established the Washington State Electronics Product Recycling Law. The law requires manufacturers of electronic products sold in Washington State to finance and implement electronics collection, transportation, and recycling programs in Washington State no later than January 1, 2009. This program is available to households, small governments, small businesses, and charities. Ecology oversees this program. Electronic products that are covered in the legislation include cathode ray tube (CRT) and flat panel computer monitors having a viewable area greater than 4 inches when measured diagonally, desktop computers, laptops, portable computers, and e-readers.

6.9.1 EXISTING CONDITIONS

Implemented in January 2009, E-Cycle Washington provides free recycling of computers, monitors, laptops, e-readers, and televisions to residents, charitable organizations, small businesses, and small government agencies.

The business locations that accept and recycle or reuse electronic materials in Benton County include the following:

- Clayton Ward Recycling, 119 East Albany, Kennewick
- Clayton Ward Recycling, 1936 Saint St., Richland
- Goodwill - Columbia Center Mall, 100 Columbia Center Blvd., Kennewick
- Goodwill - Fred Meyer Donation Center, Corner of 10th and Hwy 395, Kennewick
- Goodwill - Albertsons Donation Center, 140 W. Gage Blvd., Richland
- Goodwill - Walmart Donation Center, 2801 Duportail St., Richland
- Value Village, 731 N Columbia Center Blvd., Kennewick
- Stay Tan West, 3680 W. Van Giesen, West Richland
- Staples, 1480 Tapteal Dr., Richland
- Office Depot, 1717 George Washington Way, Richland

- Office Depot, 6815 W. Canal Dr., Kennewick
- Best Buy, 6809 W. Canal Dr., Kennewick

6.9.2 OPTIONS

1. Monitor and Evaluate E-Waste Program

The County should monitor the current E-Cycle program for effectiveness. Beginning in 2010, local governments and local communities are encouraged to submit an annual "Satisfaction Report" to Ecology by March 1. The entity responsible for preparing the solid waste management plan for an area is responsible for submitting the Satisfaction Report. The report must use a template Ecology provides that will include information on:

Accessibility and convenience of services and how they are working in their community.

- What services aren't working and why.
- Suggestions for improvements to services plans provide.
- Description of public outreach and education.
- Any other relevant information.

One copy is to be submitted electronically, and an additional paper copy is to be submitted by mail. Within 90 days, Ecology will either approve the report or request additional information.

Ecology will use information in these reports when evaluating recycling plan service levels and revisions.

2. E-Waste Education

Local governments are required by Ecology to provide their citizens with information about the E-Cycle program through existing educational methods typically used by local government. This includes listing locations and hours of operation of local collection sites and services. Ecology has developed a Local Government Toolkit, to promote E-Cycle Washington. This toolkit is available on the Department of Ecology web site. This public education program will promote the existing drop-off locations in the County that are part of the state program.

3. Update list of available opportunities for e-waste collection and recycling

This information is on the County's website, along with a link to the Ecology website. The County should regularly update the information to ensure it is accurate.

6.10 Recommendations

The SWAC reviewed the options for special wastes, and recommends the following policies and programs for implementation:

Benton County and the Cities will continue to monitor the handling of special wastes and pursue increased education and continued support in the enforcement and cleanup of hazardous wastes. We will work on developing a disaster management plan for Benton County and in cooperation with its Cities.



Chapter 7

Moderate Risk Waste

7.0 Moderate Risk Waste

7.1 Introduction

The purpose of this Plan is to establish the goals and objectives for the safe handling and management of moderate risk waste (MRW), which is composed of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste generated in the County. The Plan will direct and guide the management of these wastes over a twenty year planning period, from 2012 to 2032. The recommendations included in this Plan are based on existing conditions and forecasts of future conditions in the County.

This Plan includes the geographic area of Benton County, including both the incorporated and unincorporated areas. The lead agency in its development is the Benton County Department of Public Works. The population distribution across the County averages 106 people per square mile, with more residents living in the incorporated cities/towns of the county (77%) as compared to the unincorporated area (23%). In 2010, the total County population was 188,931 people. Population growth from 2000 to 2010 was approximately 32%. Estimates prepared by the Washington State Office of Financial Management (high series) project the population to be 250,842 by the year 2030.

The Plan was prepared with input from the Solid Waste Advisory Committee (SWAC) during the 2012 Solid Waste Management Plan update process. A list of the SWAC members and the meeting dates, along with information on where minutes from those meetings are archived, is included in Chapter 1.

7.2 Current Conditions

A Moderate Risk Waste facility operated at the Horn Rapids Landfill from 1995 to 2010. The facility was staffed with two full time personnel, and accepted waste from households and small quantity generators in Benton County. The types of materials collected at the Horn Rapids Facility included the following:

- Paint (oil base and latex)
- Cleaning Agents
- Polishes
- Antifreeze
- Batteries
- Gasoline
- Adhesives and glues
- Fluorescent light bulbs/tubes
- Propane Cylinders
- Aerosols
- Transmission & brake fluid
- Wood preservatives and stains
- Pesticides
- Motor oil and anti-freeze
- Pool Chemicals

The quantities of materials collected at the facility and at collection events, from 2008 through 2011, are indicated in **Exhibit 7-1**.

**Exhibit 7-1. MRW Materials Collected in Benton County
2008-2011 (pounds)**

Year	Household Hazardous Waste (HHW)	Small Quantity Generator Waste (SQG)	TOTAL	% HHW	%SQG
2008	295,069	19,693	314,762	94%	6%
2009	356,852	6,328	363,180	98%	2%
2010 ¹	117,131	7,356	124,487	94%	6%
2011 ²	137,754	N/A	137,744	N/A	N/A

¹Partial year due to fire

² Two collection events, participants not tracked

The previous MRW facility received an average of approximately 4,675 customers per year, with the majority of customers coming from Richland, West Richland, and Kennewick, and small numbers of customers from Prosser, Benton City, and unincorporated Benton County, see **Exhibits 7-2 and 7-3**.

Exhibit 7-2: MRW Customer Trips

Year	Trips HHW	Trips SQG	Trips TOTAL
2008	4,450	79	4,529
2009	4,748	77	4,825
2010 ¹	3,815	48	3,863

¹Partial year due to fire

Source: 2008 – 2010 trip counts from MRW and SQG Annual Reports. 2009 and 2010 forms track used oil, battery, and antifreeze customers separately and customer trips for these materials are not tracked.

**Exhibit 7-3: MRW Customer Source Breakdown
(based on 2008 MRW Customer Tracking)**

City	Trips	Percent of Total
West Richland	386	8.7%
Richland	3,633	81.6%
Prosser	12	0.3%
Kennewick	271	6.1%
Benton City	71	1.6%
Benton County (other)	77	1.7%
TOTAL	4,450	100%

In addition to the former MRW facility at the Horn Rapids Landfill, Benton County offered satellite HHW drop-off facilities in Benton City and Prosser to provide convenient disposal options for County residents. These facilities were operated by Basin Disposal, Inc. of Pasco, WA.

The Benton City satellite facility is located at the City shop south of the intersection of Della St and 7th St. In Prosser, the satellite facility is located at the City Yard/transfer station at 10th St. & Sherman St. These facilities currently collect only used oil. The used motor oil is collected and recycled by Oil Recycling and Refining Company, whose local facility is at 403 N. Dayton, Kennewick.

In 2010, the facility was destroyed in a fire. Since that time, the County has operated collection events twice yearly to provide opportunities for County residents and eligible businesses to properly dispose of MRW. For participation rates for the four collection events held in Kennewick in 2012 and 2013 see **Exhibit 7-4**.

**Exhibit 7-4 HHW Collection Participant Breakdown
(based on tracking at events held in 2012 and 2013)**

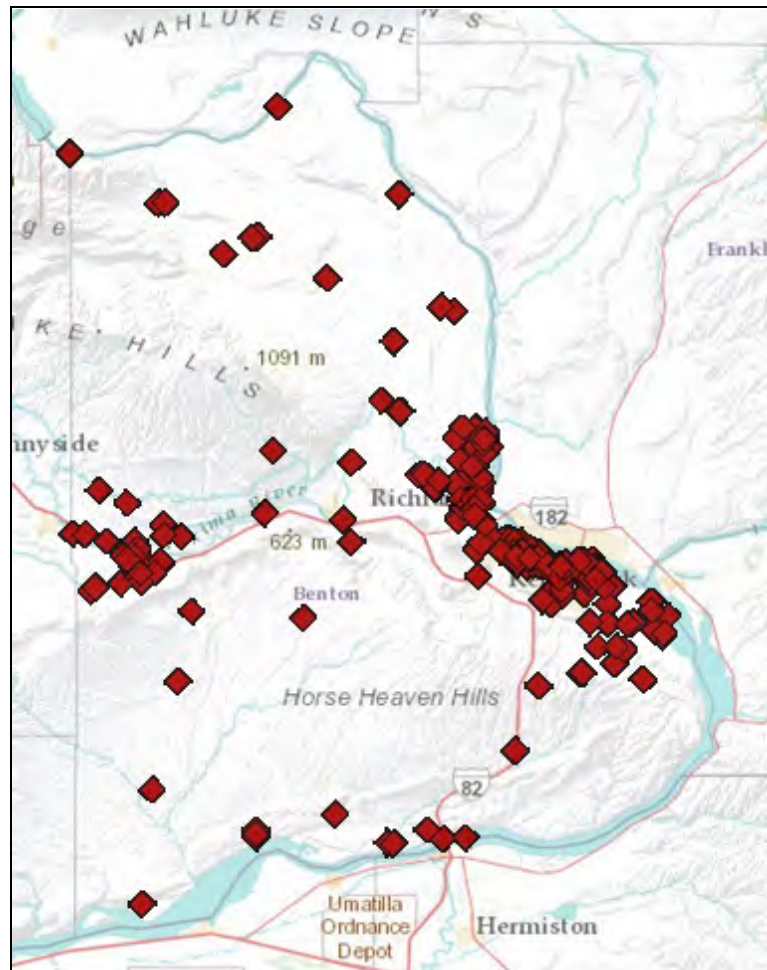
City	Participants	Percent of Total
Benton City	37	1.2%
Kennewick	3,633	41.8%
Prosser	12	0.5%
Richland	271	26.8%
W. Richland	71	6.3%
Benton County	77	6.9%
Other (did not stop for survey)	503	16.4%
TOTAL	4,450	100%

7.3 Hazardous Waste

Businesses or institutions producing or accumulating hazardous waste above the quantity exclusion limits are required to meet a stringent set of regulations when storing, handling, and disposing of their hazardous wastes. In addition, these fully regulated hazardous waste generators must comply with extensive waste tracking and reporting requirements. CESQGs must meet certain requirements for identifying and managing their hazardous wastes, but are exempt from portions of the waste tracking and reporting requirements.

7.3.1. Hazardous Waste Generators

Businesses in the County that are registered as hazardous waste generators have an EPA/State identification number issued under Chapter 173-303-WAC, as listed in Ecology's Facility Site Identification (F/SID) database (as of February 2012). A map showing the distribution of the registered hazardous waste generators is included as **Exhibit 7-5**.

Exhibit 7-5. Distribution of Hazardous Waste Generators

7.3.2. Hazardous Waste Sites

Ecology publishes the Hazardous Sites List as required by WAC 173-340-330. The list is updated twice per year. It includes all sites that have been assessed and ranked using the Washington Ranking Method. Also listed are National Priorities List (NPL) sites. Sites on the Hazardous Sites List (excluding NPL and TSP sites) have undergone a preliminary study called a Site Hazard Assessment (SHA). An SHA provides Ecology with basic information about a site. Ecology then uses the Washington Ranking Method (WARM) to estimate the potential threat the site poses, if not cleaned up, to human health and the environment. The estimate is based on the amount of contaminants, how toxic they are, and how easily they can come in contact with people and the environment. Sites are ranked relative to each other on a scale of one to five. A rank of one represents the highest level of concern relative to other sites, and a rank of five the lowest. Hazard ranking helps Ecology target where to spend cleanup funds. However, a site's actual impact on human health and the environment, public concern, a need for an immediate

response, and available cleanup staff and funding also affect which sites get first priority for cleanup. A site may be removed from the list only if the site is cleaned up. In some cases, long-term monitoring and periodic reviews may be required to ensure the cleanup is adequate to protect the public and the environment. Placing of a site on the list does not, by itself, imply that persons associated with the site are liable under Chapter 70.105D RCW.

7.4 Transporters and Facilities

Hazardous waste transportation companies that are registered with Ecology which can service businesses in Benton County are included in Exhibit 7-6. This is a partial list, and does not constitute a recommendation. All transporters of hazardous waste require a common carrier permit issued by the Washington Utilities and Transportation Commission (WUTC), under RCW 81.80.

There are presently no household hazardous waste collection facilities in the County. If it became necessary to site a hazardous waste facility in the County to handle the County’s waste, the 2006 Comprehensive Plan designates specific areas of the County for Heavy Industrial land uses. Heavy industries are by definition those that in the normal course of activity transport, store or produce emissions, smoke, glare, noise, odor, dust and hazardous materials as products or byproducts. Lands designated Heavy Industry on the Land Use Map are lands wherever they have, or are in reach of attributes essential to industrial activities, and where they will not present unmanageable conflicts with other land uses, and have rail and water borne transportation access; isolation from high density residential and commercial uses; large acreages for outside storage and maneuvering of trucks and rail equipment. Heavy Industrial lands are designated in the south county, in the south Finley area, north of Prosser, and on the Hanford Site. The county's supply of Industrial designated lands is augmented by similar designations within cities in the county.

Furthermore, in Chapter 11.34 of the County Zoning Code under the Heavy Industrial (HI) district, Section 11.34.05 Uses Requiring a Conditional Use Permit, allows for a hazardous waste treatment and/or hazardous waste storage facility treating waste not generated on the same or a contiguous parcel; provided that such facility complies with Washington State siting criteria set forth in RCW 70.105.210, and if a conditional use permit is issued by the Board of Adjustment after notice and public hearing.

Exhibit 7-6. Hazardous Waste Transporters

Company	Location
Able Cleanup Technologies	Spokane
Adar Construction, Inc.	Spanaway
Advanced Waste Services	West Allis
ARCOM Oil	Tacoma
BELFOR Environmental, Inc.	Portland

Exhibit 7-6. Hazardous Waste Transporters

Company	Location
Big Sky Industrial	Spokane
Bulk Service Transport	Spokane
CCS (a division of PNE Corp.)	Longview
Certified Cleaning Services	Tacoma
Chemical Waste Management	Arlington
Chem-Safe Environmental	Kittitas
Clean Harbors	SeaTac
Coeur d'Alene Dredging	Valleyford
Emerald Services	Seattle
EQ (Environmental Quality Company)	Wayne
FBN Enterprises	Bellevue
HAZCO Environmental Services	Richmond
Innovac	Edmonds
Marine Vacuum Service	Seattle
Phoenix Environmental Services	Tacoma
PSC Environmental Services	Washougal
Regional Disposal (RABANCO)	Seattle
Safety Kleen	North Highlands
SQG Specialists	Salem
TW Services	Madison
U.S. Ecology	Grand View
Univar USA	Redmond
Veolia Environmental Services (formerly Onyx)	Phoenix
Waste Management of Auburn	Auburn
WasteXpress Environmental Services	Portland

7.5 Legal Authority for Program

Local governments are required by the Washington State Hazardous Waste Management Act (HWMA, Chapter 70.105 RCW) to address moderate risk waste management in their jurisdictions. Moderate risk

wastes are hazardous wastes produced by households, and by businesses and institutions in small quantities. Commercial and institutional generators of hazardous waste are conditionally exempt from full regulation under the HWMA, provided that they do not produce or accumulate hazardous waste above specified quantities defined by Ecology (quantity exclusion limits). These “small quantity generators” produce hazardous wastes in quantities that do not exceed the following State regulatory limits:

- 220 pounds (100 kg) of dangerous waste per month or per batch.
- 2.2 pounds (1 kg) of acute or extremely hazardous waste per month or per batch.

In addition, to maintain its status as a small quantity generator, a business or institution may not accumulate more than 2,200 pounds of dangerous waste or more than 2.2 pounds of acute or extremely hazardous waste at one time.

Businesses or institutions producing or accumulating hazardous waste above the quantity exclusion limits are required to meet a stringent set of regulations when storing, handling, and disposing of their hazardous wastes. In addition, these fully regulated hazardous waste generators must comply with extensive waste tracking and reporting requirements. Small-quantity generators must meet certain requirements for identifying and managing their hazardous wastes, but are exempt from portions of the waste tracking and reporting requirements.

In 1991, RCW 70.951.020 was added requiring local governments to amend their local hazardous waste plans to include the Used Oil Recycling Act, for the management of used oil as part of MRW management.

The Beyond Waste Plan, published in 2004, establishes five initiatives as starting points for reducing wastes and toxic substances in Washington. Initiative #2 is Reducing Small-Volume hazardous materials and wastes. The goal of this initiative “...is to accelerate progress toward eliminating the risks associated with products containing hazardous substances.” Specifically, the initiative encompasses products and substances commonly used in households and in relative small quantities by businesses.

In 2009, Ecology updated the MRW Planning Guidelines, and in 2010 Ecology updated the Guidelines for the Preparation of Solid Waste Management Plans. Included in the new guidelines are new requirements for a combined Solid Waste and MRW Plan. This section has been prepared to meet the requirements for a combined Solid Waste and MRW Plan.

7.6 Financing

Benton County’s MRW program is funded from a number of sources, including revenue from garbage excise fees, matching monies from Cities, and grant funding. Costs for the program include labor and operations. The 2010 costs and revenue for the Benton County MRW program are presented in **Exhibit 7-7**.

Exhibit 7-7. MRW Program Costs and Revenue (2010)

Activity	\$ Amount
Costs (includes contractor costs, wages, permits, etc.)	\$280,000
Revenue (includes grants)	\$280,000

7.7 Governance

The legal authority for decisions regarding the implementation of the MRW plan is the responsibility of the Benton County Board of County Commissioners.

7.8 Program Philosophy

The following are the goals and objectives of the Benton County MRW program:

- Protect natural resources and public health by eliminating the discharge of moderate risk waste into solid waste systems, wastewater treatment system, and into the environment through indiscriminate disposal;
- Manage moderate risk wastes in a manner that promotes, in order of priority: waste reduction, recycling, physical, chemical, and biological treatment, incineration, solidification and stabilization, and landfilling;
- Increase public awareness of available alternatives and the importance of proper disposal of moderate risk wastes;
- Improve opportunities for the safe disposal of moderate risk wastes by citizens and businesses within Benton County;
- Improve disposal options available to farmers and ranchers for agricultural chemical waste;
- Reduce health risks for workers coming in contact with moderate risk wastes that may be disposed of in the solid waste stream or in wastewater treatment systems;
- Coordinate moderate risk waste management programs with existing and planned systems for waste reduction, recycling, and other programs for solid waste management;
- Encourage cooperation and coordination among all levels of government, citizens, and the private sector in managing moderate risk wastes;
- Emphasize local responsibility for solving problems associated with moderate risk waste, rather than relying on the state or federal government to provide solutions; and

- Comply with the requirements of the Washington State Hazardous Waste Management Act (RCW 70.105.220) directing each local government to prepare a local hazardous waste management plan.

The County's overall vision is to reduce the generation of MRW, and to eliminate the improper disposal of MRW. Through education and outreach, the County envisions a change in behavior and habits that will accomplish these goals and objectives.

7.9 Program Services

The County is considering a number of options for household hazardous waste collection, public education, and business technical assistance, as described below:

7.9.1. Household Hazardous Waste Collection

The Benton County MRW facility, located at the Horn Rapids Landfill, was lost due to a fire in 2010. In 2011, a feasibility study was initiated to identify the optimum approach for MRW management in the county, and the funding mechanisms to develop and operate the selected system. The analysis looked at four potential operating scenarios, including:

- 1) Permanent facility similar to the previous operations at the Horn Rapids Landfill
- 2) Permanent facility similar to the previous operations at an alternate location
- 3) Permanent facility with increased operations, including satellite facilities with an expanded list of materials for collection.
- 4) Joint Benton-Franklin counties facility

Based on feedback from City MRW staff, provisions for the following MRW activities were also considered in the evaluation and conceptual design of a new facility:

- MRW processing including can crushing, material bulking, and fluorescent tube crushing
- Enclosed facility for weather protection and staff comfort
- Provisions for use and storage of forklift
- Covered customer unloading area for weather protection
- Facility located on industrial zoned site (or easily changed to industrial)
- Access and layout to allow for maneuvering of semi-truck for material loadout
- Consideration for administrative area

Included in the study was an analysis of the potential level of service to be provided, such as targeted materials, projected customer types, operating days and hours, and staffing. Projected MRW quantities through the year 2030 are provided in **Exhibit 7-7**. The projections are based on average material quantities received in 2008 and 2009 (prior to interruption of fixed MRW facility operation), an average of 95% of materials received from HHW customers and 5% of materials received from SQG, and population projections per the Washington State Office of Financial Management's High Series.

**Exhibit 7-7: Projected MRW Quantities
(pounds)**

Year	HHW	SQG	TOTAL
2015	347,256	18,277	365,533
2020	373,058	19,635	392,693
2025	398,866	20,993	419,859
2030	423,312	22,280	445,592

The MRW facility feasibility study also identified potential locations to site an MRW facility and conceptual facility layouts were developed and evaluated to determine the most efficient MRW operations. Based on the siting analysis, further evaluation of three of the identified potential sites was recommended: the City of Richland shop (or adjacent parcel), Benton County Road Maintenance Shop, and I-82/Badger Road sites. The Horn Rapids Landfill remains a viable site for the MRW facility if the no growth scenario is determined to be the optimal operational model.

Capital and annual O&M cost estimates for the various operating scenarios, as well as a discussion of possible funding sources for the various operating scenarios were also developed as part of the study. The study will conclude with an evaluation matrix for determining an optimal MRW facility and operating scenario, based on identified level of service criteria, operational models, preferred sites, conceptual layouts, capital and O&M costs, and funding mechanisms. The complete study is included in **Appendix E**.

7.9.2. Public Education

Household hazardous waste outreach efforts will be continued and may be increased, including distribution of flyers to households, businesses, at County facilities, and on the County websites. These efforts will be continued on an ongoing basis to reach new residents. The County will utilize flyers/handouts available from Ecology and the Washington Toxics Coalition to distribute information to residents and businesses on MRW generation and disposal

7.9.3. Small Business Technical Assistance

The County could provide free technical assistance to businesses wanting to learn how to reduce and manage hazardous waste. The program would include a set of outreach, education, and assistance components integrated with other waste reduction programs.

7.9.4. Small Business Collection Assistance

The County would continue the existing program of offering small businesses the opportunity to bring their wastes to the MRW facility for proper handling and disposal.

7.10 Process for Updating Implementation Plan

The County and SWAC will review the Plan on a regular basis to identify any necessary changes to the goals, objectives, and implementation plan. Changes may be deemed necessary due to changes in State law, conditions in the County, budgets, and/or others issues. If changes are identified, the County and SWAC will work together to develop the changes, for review and approval by the County and local jurisdictions.

7.11 Implementation Plan

The following constitutes the Implementation Plan for the Benton County Solid Waste Management and Moderate Risk Waste Management Plan .

The SWAC is continuing to study the purchase of property suitable to siting a new Moderate Risk Waste Facility. Once suitable property has been procured, plans will be developed for permitting, construction and/or retrofitting for a facility, and for operation of the facility.

7.12 Annual Budget

The County's budget for the implementation of the Plan is included in **Exhibit 7-8**. Actual budgets to carry out the Plan will vary from year to year as specific programs are defined, and will depend upon availability of grant funding and the budget approved by participating local governments.

Exhibit 7-8. MRW Plan Implementation Budget and Schedule

Activity	Projected Costs	Funding Mechanism (Tip Fees/Grants/Others)	Implementation Year
Public Education	\$50,000	Grants, excise fees	2012
Business Technical Assistance	\$10,000	Grants, excise fees	2012
MRW Facility			
Capital Costs	\$890,000 - \$1,500,000	Grants, loans, excise fees	2016
Operating Costs	\$395,000 - \$518,000/yr	Grants, excise fees	2018



Chapter 8

Administration and Enforcement



8.0 Administration and Enforcement

8.1 Administration

The Washington State Solid Waste Management Act, RCW 70.95, assigns local government the primary responsibility for managing solid waste. This chapter describes the administrative structure for solid waste management planning and permitting in Benton County.

Administrative responsibility for solid waste management in Benton County is divided among several agencies and jurisdictions. The administrative responsibilities of each organization are described below.

8.1.1 Solid Waste Advisory Committee

The State requires that counties establish a Solid Waste Advisory Committee (SWAC) to assist in the development of programs and policies concerning solid waste handling and disposal (RCW 70.95). The Benton County SWAC is an advisory board to the Board of Benton County Commissioners and makes recommendations to the Commissioners on matters relative to the development of solid waste handling programs and policies. One of its main functions is to provide a forum within the community for the expression of opinions regarding solid waste handling and disposal plans, ordinances, resolutions, and programs prior to adoption. SWAC members represent citizens, public interest groups, business, the waste management industry, and local government. The SWAC has a significant role in developing and updating Benton County's Comprehensive Solid Waste Management Plan.

8.1.2 Benton County Public Works Department Solid Waste Program

RCW 36.58 authorizes Benton County to develop, own, and operate solid waste handling facilities in unincorporated areas of the county, or to accomplish these activities by contracting with private firms. The County also has the authority and responsibility to prepare comprehensive solid waste management plans for unincorporated areas and for jurisdictions that agree to participate with the County in the planning process.

The County has entered into interlocal agreements with all of the incorporated cities within the county for the purpose of solid waste management planning and implementation. Interlocal Agreements are developed in accordance with Chapter 39.34 RCW, Interlocal Cooperation Act, for the purpose of permitting local governments to cooperate with one another in the performance of tasks, thus achieving economies of scale and reducing duplication of effort. An Interlocal Agreement is signed by the authorized officials of the local governments involved, and specifies the services and/or facilities to be provided and any compensation between the local governments for such services and/or facilities. The Interlocal Agreements between Benton County and the incorporated cities will remain in effect through December 2013, and will be negotiated for renewal for 2014-2016. A copy is included in Appendix C.

Benton County exercises its solid waste responsibilities through the Benton County Public Works Department, and specifically through the Solid Waste program. The Solid Waste program has the responsibility for developing and implementing the solid waste management plan, formulating interlocal agreements, administering public education programs, and providing staff support for the SWAC.

8.1.3 Incorporated Cities

RCW 35.21.152 allows cities to develop, own, and operate solid waste handling systems and to provide for solid waste collection services within their jurisdictions. There are five incorporated cities and towns in Benton County. The City of Richland operates its own residential garbage collection system and the remaining four cities contract with private haulers.

8.1.4 Benton-Franklin Health District

The Environmental Health Division within the Benton-Franklin Health District provides much of the regulatory oversight in Benton County. The agency is the responsible local authority (per RCW 70.95.160) for issuing permits for solid waste facilities. The agency also is responsible for assessing compliance with permit conditions and has the responsibility for maintaining compliance through enforcement activities. The Health District's responsibilities extend to the following areas for solid waste management:

Solid Waste Facilities: The Health District issues operating permits for waste handling facilities, including landfills, transfer stations, and recycling facilities.

Special Wastes: The Health District issues permits for limited purpose landfills and facilities for managing septic and street wastes.

The specific permit requirements for solid waste disposal facilities are defined in WAC 173-351 and WAC 173-350. Health District responsibilities for processing and evaluating these permits are defined in RCW 70.95.180. These state regulations require jurisdictional health departments to evaluate solid waste permit applications for their compliance with all existing laws and regulations and their conformance with the Solid Waste Management Plan and all zoning requirements. The Department of Ecology's review and appeal process for a permit issued by the Health District is explained in RCW 70.95.185.

8.1.5 Benton Clean Air Authority

The Benton Clean Air Authority is responsible for controlling the emission of air contaminants from sources in the Benton County with authority derived from federal and Washington State Clean Air Acts. Relevant laws are the Code of Federal Regulations (40 CFR) and RCW 70.94, respectively. In addition, there are a limited number of local regulations in the Benton Clean Air Authority Regulation 1. The WAC 173-400 series of the administrative code is the principal source of regulatory implementation of Washington State air pollution laws.

In terms of solid waste management, the issue is principally one of media transfer in which potential air pollutants are not allowed to be released into ambient air under compliance and enforcement responsibilities of the BCAA. Consequently, some materials, such as vegetative matter that was previously burned legally, can no longer be burned, and specific prohibited materials that could never have been burned legally are being diverted to the solid waste stream. Outdoor burning is currently restricted to permitted residential, land clearing, and agricultural burning plus a certain exempted burning of vegetative materials, principally outside Urban Growth Boundaries. No outdoor burning is allowed within Urban Growth Boundaries except agricultural burning and specifically exempted burning.

Another specifically regulated material that is solid waste is asbestos containing material for which the BCAA requires proper removal, handling, transport, and landfill disposal. The BCAA is also responsible for regulating odor and any hazardous or toxic emissions from any material of biological or non-biological origin. A specific example of the latter is composting facilities. In so far as these materials are involved with a diversionary activity or recycling, the requirements for compliance with air regulations may affect the feasibility of such efforts, operation of relevant materials handling facilities, and whether these materials may be in or out of the solid waste stream.

Some specific compliance and enforcement responsibilities of the BCAA are permitting for composting facilities, landfills, and wastewater treatment plants. Nuisance odor and fugitive dust are among the regulated events.

8.1.6 Washington State Department of Ecology

Ecology has the primary authority for solid waste at the state level. Ecology assists local governments in the planning process by reviewing, providing comments, and approving preliminary and final drafts of solid waste management plans. This review is to ensure that local plans conform to applicable state laws and regulations. In its Guidelines for the Development of Local Solid Waste Management Plans and Plan Revisions, Ecology offers recommendations on the preparation of solid waste management plans. Ecology also makes recommendations and comments on reviews of solid waste handling and disposal permits to ensure that the proposed site or facility conforms to applicable laws and regulations.

8.1.7 Washington Utilities and Transportation Commission--

The Washington Utilities and Transportation Commission (WUTC) regulates solid waste collection activities under RCW 81.77, through the issuance of certificates entitling private companies to provide solid waste collection services within specified geographic areas of the state. RCW 70.95.096 also grants the WUTC the authority to review solid waste management plans to assess solid waste collection cost impacts on rates charged by collection companies regulated under RCW 81.77 and to advise the County and Ecology of the probable effects of the Plan's recommendations on those rates.

8.2 Enforcement

A number of different entities are responsible for enforcing solid waste management regulations and requirements within Benton County: the Benton-Franklin Health District, the Benton Clean Air Authority, the Benton County Sheriff's Office, the Washington State Department of Ecology, the Washington Utilities and Transportation Commission, and the incorporated cities. The enforcement responsibilities of these entities are discussed below.

8.2.1 Benton-Franklin Health District--

The Benton-Franklin Health District (BFHD) carries the responsibility for enforcing many solid waste regulations and programs within Benton County. State law gives local health departments responsibility for:

“ordinances governing solid waste handling implementing the comprehensive solid waste management plan covering storage, collection, transportation, treatment, utilization, processing and final disposal including but not limited to the issuance of permits and establishment of minimum levels and types of service for any aspect of solid waste handling.” (RCW 70.95.160)

In addition, RCW 70.95.160 states that:

“such...ordinances shall assure that solid waste storage and disposal facilities are located, maintained, and operated in a manner so as properly to protect the public health, prevent air and water pollution, are consistent with the priorities established in RCW 70.95.010 and avoid the creation of nuisances.”

Falling under the definition of “solid waste handling facilities” are landfills, wood and tire piles, construction and demolition debris sites, compost facilities, transfer stations, and landfills.

The BFHD's enforcement responsibilities extend to the following areas of solid waste management:

Illegal dumping: BFHD receives and investigates public health related complaints resulting from illegal dumping, improper storage, and littering. If, after notification from BFHD, the property has not been cleaned up, the information is forwarded to the Benton County Prosecuting Attorney's Office for legal action. It also issues clean-up orders.

Solid waste facilities: BFHD issues and renews permits, and makes periodic inspections of solid waste handling facilities. Inspections ensure that these facilities do not create public health problems, nuisances, or environmental contamination. All solid waste facilities accepting solid waste are inspected at a minimum of every 2 months. Facilities, such as closed facilities or facilities with active permits that are not currently accepting waste, are inspected two times per year. The Horn Rapids Landfill is inspected at least quarterly by the Health District for

compliance with State Criteria for Municipal Solid Waste Landfills and Benton-Franklin Health District regulations.

8.2.2 Benton Clean Air Authority--

The Benton Clean Air Authority has the responsibility of monitoring the emission of air contaminants from sources in Benton County and is responsible for enforcement of emissions standards. The Authority also regulates asbestos handling and open burning in the County.

8.2.3 Benton County Sheriff's Office--

Complaints against illegal dumping are handled by the Sheriff's Office in Benton County. Offenders are fined approximately \$150 for each day the garbage remains at the illegal dumpsite. Few offenders are apprehended.

8.2.4 Washington State Department of Ecology--

Although primary enforcement for solid waste management is through jurisdictional health departments, Ecology has a range of enforcement authorities under various statutes to address existing or potential sources of pollution, including those which result from improper solid waste handling and management. For instance, Ecology has broad authority to take enforcement actions under the State Water Pollution Control Act, the Hazardous Waste Management Act, and the Model Toxics Control Act. Collectively, these laws allow Ecology to issue orders and impose penalties for noncompliance. Under some circumstances, Ecology may also take direct action to remedy threats to public health and the environment, and seek to recover costs from potentially liable parties.

In some instances, Ecology may assume the duties and responsibilities of jurisdictional health departments. RCW 70.95.163 authorizes local health departments to enter into an agreement with Ecology to assume some, or all, of their solid waste regulatory responsibilities and authorities, such as biosolid and septic permitting and enforcement.

8.2.5 Washington Utilities and Transportation Commission

The Washington Utilities and Transportation Commission (WUTC) regulates the collection of solid waste in unincorporated areas of the County. The WUTC's enforcement mechanisms include fines and revocation of the right of private collectors to collect solid waste. The WUTC also enforces against companies that illegally collect solid waste without a certificate.

8.2.6 Incorporated Cities

Cities and counties have the authority to establish solid waste programs, pass ordinances, and provide resources to monitor compliance and take corrective action where necessary. For instance, within the City of Richland's Public Works Department, the Solid Waste Department is responsible for enforcing compliance with refuse collection regulations. The Department

monitors compliance of daily operations at the landfill. The Department also works with the Health District to enforce litter control and illegal dumping programs. The cities are also responsible for enforcing local ordinances covering zoning, land use, illegal dumping, and littering.

8.3 Options

Responsibilities for implementing the Solid Waste Management Plan are assigned to various local agencies. Since responsibilities for specific tasks are assigned to more than one agency, each of the jurisdictions needs to recognize the importance of carrying out all tasks in a manner that ensures efficient use of resources (by avoiding duplication of effort), avoids gaps in program activities, and avoids conflicts or inconsistencies. This can be accomplished by holding regular coordination meetings, sharing informational materials, and briefing the Solid Waste Advisory Committee. Participating jurisdictions should track progress as they implement each of the recommendations contained in the Plan as a means to determine the effectiveness of each element of the Plan and the need for adjustments or revisions. As programs are implemented, participating agencies should also solicit comments and suggestions from citizens and participating businesses, regarding the programs' adequacy and effectiveness. The SWAC and the Central Regional Office of the Department of Ecology should receive progress reports on the Plan's implementation. The SWAC should be asked to review and recommend any necessary adjustments or revisions to planned activities.

Enforcement activities within Benton County generally are focused on compliance with permit conditions and regulatory standards, littering, and illegal dumping. Response often comes from law enforcement agencies for littering. Code Enforcement and the BFHD are responsible for enforcement of illegal dumping/improper disposal. One key issue is to ensure adequate staffing and funding for the agencies responsible for enforcement.

A second key enforcement issue pertains to illegal dumping. Washington's Model Litter Control and Recycling Act (RCW 70.93) prohibits the deposit of garbage on any property not properly designated as a disposal site. Revisions (RCW 70.93.060) provide stiffer penalties for littering and illegal dumping in rural areas including classification as a misdemeanor, punishable by specific penalties. Illegal dumping can be addressed through enhanced enforcement activities and education.

The following options address administration and enforcement of solid waste issues in Benton County:

- 1. Facilitate Interagency cooperation*

The large number of different agencies and jurisdictions responsible for solid waste management in Benton County makes interagency cooperation essential. This can be achieved through commitments on the part of each entity to participate on the advisory committee(s), and

coordinating committee meetings between the counties and municipalities to facilitate the exchange of information. In addition, coordination can be achieved if technical staff work closely with their counterparts in the other jurisdictions performing similar or related functions.

A cooperative approach to program evaluation is also essential to ensure that the goals and objectives of solid waste management are being met, and to monitor changes that take place in solid waste generation and disposal. Once Benton County and the municipalities have adopted the Plan, mechanisms will need to be developed to ensure that the Plan is effectively implemented. One method for evaluating programs is to continue to utilize the Planning Committee of the SWAC to review the success of individual program components and the Plan as a whole. Methods of review could include tracking waste quantities, participation rates, expenses, income, and implementation problems. Reviews could occur periodically to make necessary adjustments once the Plan is implemented.

2. *Coordinate enforcement activities to attain maximum impact without duplication.*

Complex environmental issues, increased emphasis on recycling and waste reduction programs, more complicated operational requirements at sanitary landfills, and the need to coordinate all aspects of the solid waste system, including hazardous waste, have drawn attention to enforcement. Jurisdictions must take the time and effort, not only to understand the laws, but they must also examine their organizations and staffing levels to adequately address the requirements of the laws. Because the majority of solid waste problems are regional, each jurisdiction needs to establish appropriate means of interacting with other jurisdictions.

3. *Improve coordination among County agencies, cities, and other relevant public agencies responsible for illegal dumping cleanup, education, and prevention programs.*

Several Washington communities have addressed illegal dumping concerns by convening a task force to evaluate the roles of the county, cities, and other relevant public agencies responsible for illegal dumping cleanup, education, and prevention programs. Such an effort can lead to better coordination, reduced overlap of responsibilities, and reduced gaps in coverage. This can also lead to uniform enforcement capabilities and quicker response to halt illegal activities.

4. *Develop a coordinated public outreach and education program.*

Education is an important aspect of addressing illegal dumping and related problems. The purpose of a preventive action program is to raise public awareness about illegal dumping. Each jurisdiction could pool their efforts for coordinated outreach. Emphasis could be placed on encouraging citizens to report illegal dumping sites by establishing a “hotline,” so that dump sites may be cleaned up before they become a larger problem.

8.4 Recommendations

The Solid Waste Advisory Committee reviewed the option discussed above and has recommended the following options:

1. Facilitate Interagency cooperation;
2. Coordinate enforcement activities to attain maximum impact without duplication;
3. Improve coordination among County agencies, cities, and other relevant public agencies responsible for illegal dumping cleanup, education, and prevention programs;
4. Develop a coordinated public outreach and education program.



Chapter 9

Implementation



9.1 INTRODUCTION

The purpose of this chapter is to outline the actions and budget necessary to implement the recommendations contained in this plan.

9.2 SIX-YEAR CAPITAL AND OPERATING FINANCING

The RCW (Section 70.95.101(3)(c)) requires the solid waste management plan to contain a 6-year construction and capital acquisition program for public solid waste handling facilities, including development and construction or purchase of publicly financed solid waste management facilities. The legislation further requires plans to contain a means for financing both capital costs and operations expenditures of the proposed solid waste management system. Any recommendation for the development, construction, and/or purchase of public solid waste management and recycling facilities or equipment should be included in this discussion. Financing operation expenditures should also be added to this section of the plan.

Capital and operating expenses to implement the Plan recommendations over the next 6 years are summarized in Exhibit 9-1. Actual budgets to carry out the recommendations will vary from year to year as specific programs are defined, and will depend upon availability of grant funding and budget approved by local governments. It is important to note that because Benton County relies on the private sector for the majority of solid waste management activities, very few capital costs are projected for the participating jurisdictions for the first 3-4 years. The major funding source has always been, and still remains, grant funding from the Department of Ecology. Benton County bases its Solid Waste Program on these grants, and budgets accordingly. Matching monies are raised in Benton County by way of a garbage excise fee assessed on the gross revenues generated by garbage services provided in unincorporated Benton County. The Cities fund their matching monies through utility fees, which are funded 100% by customer rates. In the future, as additional operational and capital costs become necessary, and as the availability of grant funding decreases, it may be necessary to raise these fees, charge for services heretofore provided for free (i.e. HHW collection), and/or to seek out loans or partnerships with businesses.

9.3 IMPLEMENTATION SCHEDULE

The implementation of the recommendations contained in this Plan will begin upon approval of the Plan by the jurisdictions and Ecology. The schedule for implementation is included as Exhibit 9-2. The schedule may be revised as the Plan is updated, and as the objective and needs of the County and jurisdictions change. As indicated, for some recommendations, the programs have been or will be implemented within a few months, for other recommendations implementation will span many years.

Exhibit 9-1. Implementation Costs

CHAPTER	Recommendation	Cost			Expense type
		Year 1	Year 3	Year 6	
3. Outreach and Education	1. Update Website	\$600	\$700	\$800	Labor
	2. Provide Technical Assistance to Schools and Businesses	\$200	\$1,200	\$400	Labor
	3. Arrange Recycling Facility Tours/Interactive Education	\$50	\$100	\$150	Labor
3. Waste Reduction	1. Support Product Stewardship and Extended Producer Responsibility Policies	\$50	\$50	\$50	Labor
	2. Promote Environmentally Preferable Products Preference and Purchasing	\$50	\$50	\$50	Labor
	3. Promote Waste Reduction Practices in County and City operations	\$50	\$50	\$50	Labor
	4. Promote Use of Online Materials Exchanges	\$50	\$50	\$50	Labor
	5. Encourage Use of Reuse Stores and organizations	\$50	\$50	\$50	Labor
	6. Consider Implementing Waste Reduction Requirements for New Developments	\$50	\$50	\$50	Labor
	7. Monitor Progress and Efficacy of Waste Management and Reduction Measures	\$250	\$400	\$600	Labor
3. Recycling	1. Evaluate Need for Additional Materials and New Locations for Drop-Box Program	\$50	\$50	\$50	Labor
	2. Consider Implementing a Rewards Program for Residential Recyclers	\$50	\$5,000 (if implemented)	\$6,000 (if implemented)	Labor Cash or Merch for Awards
	3. Provide Commercial Waste Assistance as Needed	\$50	\$400	\$600	Labor
	4. Evaluate Recycling Opportunities Related to the Wine	\$200	\$300	\$400	Labor

Exhibit 9-1. Implementation Costs

CHAPTER	Recommendation	Cost			Expense type
		Year 1	Year 3	Year 6	
	Industry				
3. Organics	1. Expand Yard Waste Chipping Program as Funding and Markets Become Available	\$1,600	\$0 (assuming program become self-sufficient)		Labor, Equip-ment Rental
	2. Encourage Curbside Green Waste Collection for Commercial Customers	\$1,200	\$0 (assuming market for green waste becomes available or paid for through increased garbage fees)		Labor, Equipment Costs for Hauling
	3. Evaluate Diversion Opportunities for Organic Waste from Wine Industry	\$50	\$50	\$50	Labor
4. Collection Systems	1. Consider Mandatory Collection in Unincorporated Areas.	Minimal costs assuming garbage fees would cover cost			
	2. Further Evaluation of Recycling Service Level Changes for County Unincorporated Area	\$50	\$50	\$50	Labor
5. Transfer and Disposal	1. The County will monitor, and where appropriate and feasible, provide input into the City of Richland's process evaluating the feasibility of expanding Horn Rapids Landfill.	\$300	\$300	\$300	Labor
6. Agricultural waste	1. Continue to Work Cooperatively with Port of Benton and Regional Agencies to Identify Opportunities for Beneficial Use of Organic Residuals from Agriculture	\$50	\$50	\$50	Labor
6. Asbestos	1. Encourage BCAA to Increase Enforcement of Asbestos Waste Disposal Activities	\$50	\$50	\$50	Labor
	2. Provide Education to Homeowners on Proper Handling and Disposal	\$50	\$50	\$50	Labor, copying

Exhibit 9-1. Implementation Costs

CHAPTER	Recommendation	Cost			Expense type
		Year 1	Year 3	Year 6	
6. Biomedical Waste	1. Provide educational materials for correct management of medical waste generated by residents.	\$50	\$50	\$50	Labor, copying
	2. Evaluate feasibility of sharps and outdated pharmaceuticals collection at household hazardous waste collection sites.	\$50	\$50	\$50	Labor
6. Construction and Demolition Debris	1. Provide waste reduction, green building and debris management information to contractors	\$300	\$300	\$300	Labor
	2. Evaluate establishing C&D and Inert Waste Diversion Specifications for private Projects.	\$50	\$50	\$50	Labor
	3. Evaluate establishing C&D and inert waste diversion specifications for public (city and county) projects	\$50	\$50	\$50	Labor
	4. Develop a Disaster Management Plan for Benton County.	\$3,200	\$200	\$200	Labor
	5. Provide additional Oversight of Small Inert Waste Fill Projects	\$300	\$300	\$300	Labor
6. Petroleum Contaminated Waste	1. Maintain Existing System	\$50	\$50	\$50	Labor
6. Street Wastes	1. Evaluate Potential Reuse of Street Wastes	\$50	\$50	\$50	Labor
6. Tires	1. Develop a Plan for Management of Tires accumulated on individual properties.	\$1,200	\$0 (assuming fees for tire collection would cover costs)		Labor Equipment Rental
	2. Evaluate implementation of County and City Purchasing Programs for Recycled Tire Products.	\$50	\$50	\$50	Labor
	3. Implement Programs to Reduce Tire Waste.	\$2,000	\$2,500	\$3,000	Labor Increased costs for tire

Exhibit 9-1. Implementation Costs

CHAPTER	Recommendation	Cost			Expense type
		Year 1	Year 3	Year 6	
					purchases
	4. Initiate Public Education Programs.	\$300	\$500	\$600	Labor, Printing Costs
6. Electronic Waste	1. Monitor E-cycle program effectiveness and submit annual satisfaction report when feasible	\$50	\$50	\$50	Labor
	2. Provide E-cycle information on website	\$50	\$50	\$50	Labor
	3. Update website with e-waste collection and recycling information.	\$50	\$50	\$50	Labor
7. Moderate Risk Waste	1. Household Hazardous Waste Collection- Develop New MRW Facility				
	Land purchase	\$0	\$300,000		Land purchase
	Permits, site plans, retrofitting for minimal collection only		\$600,000		Permitting, retrofitting, consultant costs
	Construction of larger facility to allow for processing and storage; operation & labor expenses			1.6M	Construction, Operations
	2. Continue, and expand as possible, public outreach and education efforts.	\$50	\$50	\$50	Labor
	3. Provide technical assistance, as possible, to small business	\$400	\$500	\$600	Labor
	4. Provide opportunities for small business to dispose of	\$0 (Assuming that fees for			

Exhibit 9-1. Implementation Costs

CHAPTER	Recommendation	Cost			Expense type
		Year 1	Year 3	Year 6	
	small quantities of waste at future facility.	collection and disposal would cover costs)			
	5. Contact business to sponsor collection events	\$50	\$50	\$50	Labor
8. Administration and Enforcement	1. Facilitate interagency relationships on issues related to solid waste management.	\$50	\$50	\$50	Labor
	2. The various agencies in the county involved in solid waste management will work together to coordinate enforcement activities.	\$50	\$50	\$50	Labor
	3. The county, cities, and other relevant public agencies, to the extent practicable, will coordinate programs regarding illegal dumping cleanup, education, and prevention.	\$200	\$300	\$400	Labor
	4. Implement a coordinated public outreach and education program addressing illegal dumping and related problems	\$200	\$300	\$400	Labor

Exhibit 9-2. Implementation Schedule

CHAPTER	OPTION	IMPLEMENTATON YEAR					
		2013	2014	2015	2016	2017	2018
3. Outreach and Education	1. Update Website						
	2. Provide Technical Assistance to Schools and Businesses						
	3. Arrange Solid Waste Facility Tours/Interactive Education						
3. Waste Reduction	1. Support Product Stewardship and Extended Producer Responsibility Policies						
	2. Promote Environmentally Preferable Products Preference and Purchasing						
	3. Promote Waste Reduction Practices in County and City operations						
	4. Promote Use of Online Materials Exchanges						
	5. Encourage Use of Reuse Stores and organizations						
	6. Consider Implementing Waste Reduction Requirements for New Developments						
	7. Monitor Progress and Efficacy of Waste Management and Reduction Measures						
3. Recycling	1. Evaluate Need for New Materials and Locations for Drop-Box Program						
	2. Consider Implementing a Rewards Program for Residential Recyclers						
	3. Provide Commercial Waste Assistance as Needed						
	4. Evaluate Recycling Opportunities Related to Wine Industry						

Exhibit 9-2. Implementation Schedule

CHAPTER	OPTION	IMPLEMENTATON YEAR					
		2013	2014	2015	2016	2017	2018
3. Organics	1. Expand Yard Waste Chipping Program as Funding and Markets Become Available						
	2. Encourage Curbside Green Waste Collection for Commercial Customers						
	3. Evaluate Diversion Opportunities for Organic Waste from Wine Industry						
4. Collection Systems	1. Consider Mandatory Collection in Unincorporated Areas.						
	2. Further Evaluation of Recycling Service Level Changes for County Unincorporated Area						
5. Transfer and Disposal	1. The County will monitor, and where appropriate and feasible, provide input into the City of Richland’s process evaluating the feasibility of expanding Horn Rapids Landfill.						
6. Agricultural waste	1. Continue to Work Cooperatively with Port of Benton and Regional Agencies to Identify Opportunities for Beneficial Use of Organic Residuals from Agriculture						
6. Asbestos	1. Encourage BCAA to Increase Enforcement of Asbestos Waste Disposal Activities						
	2. Provide Education to Homeowners on Proper Handling and Disposal						
6. Biomedical Waste	3. Provide educational materials for correct management of medical waste generated by residents.						
	4. Evaluate feasibility of sharps and outdated pharmaceuticals collection at household hazardous waste collection sites.						

Exhibit 9-2. Implementation Schedule

CHAPTER	OPTION	IMPLEMENTATON YEAR					
		2013	2014	2015	2016	2017	2018
6. Construction and Demolition Debris	1. Provide waste reduction, green building and debris management information to contractors						
	2. Evaluate establishing C&D and Inert Waste Diversion Specifications for private Projects.						
	3. Evaluate establishing C&D and inert waste diversion specifications for public (city and county) projects						
	4. Develop a Disaster Management Plan for Benton County.						
	5. Provide additional Oversight of Small Inert Waste Fill Projects						
6. Petroleum Contaminated Waste	1. Maintain Existing System						
6. Street Wastes	1. Evaluate Potential Reuse of Street Wastes						
6. Tires	1. Develop a Plan for Management of Tires accumulated on individual properties.						
	2. Evaluate implementation of County and City Purchasing Programs for Recycled Tire Products.						
	3. Implement Programs to Reduce Tire Waste.						
	4. Initiate Public Education Programs.						
6. Electronic Waste	4. Monitor E-cycle program effectiveness and submit annual satisfaction report when feasible						
	5. Provide E-cycle information on website						
	6. Update website with e-waste collection and recycling information.						

Exhibit 9-2. Implementation Schedule

CHAPTER	OPTION	IMPLEMENTATON YEAR					
		2013	2014	2015	2016	2017	2018
7. Moderate Risk Waste	1. Household Hazardous Waste Collection- Develop New MRW Facility		■	■	■	■	■
	6. Continue, and expand as possible, public outreach and education efforts.	■	■	■	■	■	■
	7. Provide technical assistance, as possible, to small business	■	■	■	■	■	■
	8. Provide opportunities for small business to dispose of small quantities of waste at future facility.		■				
	9. Contact businesses to sponsor collection events	■	■	■			
8. Administration and Enforcement	5. Facilitate interagency relationships on issues related to solid waste management.	■					
	6. The various agencies in the county involved in solid waste management will work together to coordinate enforcement activities.	■					
	7. The county, cities, and other relevant public agencies, to the extent practicable, will coordinate programs regarding illegal dumping cleanup, education, and prevention.		■	■			
	8. Implement a coordinated public outreach and education program addressing illegal dumping and related problems		■	■			

**APPENDIX A
WASTE COMPOSITION DATA**

Material	Percent	Estimated Benton County Tons
Paper Packaging	10.4%	19,649
Newspaper Packaging	0.0%	0
Cardboard/Kraft Paper Packaging	5.3%	10,013
Other Groundwood Paper Packaging	0.2%	378
Mixed/Low Grade Paper Packaging	3.2%	6,046
Compostable Paper Packaging	0.9%	1,700
R/C Paper Packaging	0.8%	1,511
Paper Products	8.2%	15,492
Newspaper	1.2%	2,267
Cardboard/Kraft Paper Products	0.0%	0
Magazines	0.6%	1,134
High-Grade Paper Products	0.6%	1,134
Other Groundwood Paper Products	0.2%	378
Mixed Low Grade Paper Products	1.9%	3,590
Compostable Paper Products	2.9%	5,479
Paper Processing Sludge	0.0%	0
R/C Paper Products	0.8%	1,511
Plastic Packaging	6.7%	12,658
#1 PETE Plastic Bottles	1.0%	1,889
#1 PETE Plastic Non-bottles	0.3%	567
#2 HDPE Plastic Natural Bottles	0.4%	756
#2 HDPE Plastic Colored Bottles	0.3%	567
#2 HDPE Plastic Jars & Tubs	0.2%	378
#3 PVC Plastic Packaging	0.0%	0
#4 LDPE Plastic Packaging	0.0%	0
#5 PP Plastic Packaging	0.3%	567
#6 PS Plastic Packaging	0.6%	1,134
#7 Other Plast1c Packaging	0.7%	1,323
PLA Packaging	0.0%	0
Plastic Merchandise Bags	0.5%	945
Non-industrial Packaging Film Plastic	1.5%	2,834
Industrial Packaging Film Plastic	0.8%	1,511
R/C Plastic Products	0.1%	189

**APPENDIX A
WASTE COMPOSITION DATA**

Material	Percent	Estimated Benton County Tons
Plastic Products	4.8%	9,069
#1 PETE Plastic Products	0.0%	0
# 2 HOPE Plastic Products	0.0%	0
#3 PVC Plastic Products	0.1%	189
#4 LOPE Plastic Products	0.0%	0
#5 PP Plastic Products	0.0%	0
# 6 PS Plastic Products	0.0%	0
#7 Other Plastic Products	1.2%	2,267
PLA Products	0.0%	0
Plastic Garbage Bags	1.2%	2,267
Plastic Film Products	0.4%	756
R/C Plastic Products	1.9%	3,590
Glass	3.5%	6,613
Clear Glass Containers	1.4%	2,645
Green Glass Containers	0.3%	567
Brown Glass Containers	0.9%	1,700
Plate Glass	0.2%	378
Stoneware/Kitchen Ceramics/Glassware	0.1%	189
R/C Glass	0.6%	1,134
Metal	6.2%	11,714
Aluminum Beverage Cans	0.6%	1,134
Aluminum Foil/Containers	0.1%	189
Other Aluminum	0.2%	378
Other Nonferrous	0.1%	189
Food Cans Tinned	0.7%	1,323
Food Cans Coated	0.1%	189
White Goods	0.0%	0
Other Ferrous Metal	1.9%	3,590
R/C Metals	2.5%	4,723
Organics	26.2%	49,500
Food -Vegetative	9.2%	17,382
Food - Non-vegetative	3.1%	5,857
Leaves & Grass	8.8%	16,626
Prunings	1.1%	2,078
Animal Manure	1.2%	2,267
Animal Carcasses	0.0%	0
Crop Residues	0.0%	0

**APPENDIX A
WASTE COMPOSITION DATA**

Material	Percent	Estimated Benton County Tons
Fruit Waste	1.4%	2,645
R/C Organics	1.4%	2,645
Wood Debris	9.9%	18,704
Treated Wood	1.4%	2,645
Painted Wood	2.9%	5,479
Dimensional Lumber	1.2%	2,267
Engineered Wood	1.0%	1,889
Pallets & Crates	1.9%	3,590
Other Untreated Wood	0.2%	378
Wood By-Products	0.0%	0
R/C Wood Wastes	1.3%	2,456
Construction Materials	11.1%	20,971
Natural Wood	0.0%	0
Insulation	1.0%	1,889
Asphalt Paving	0.3%	567
Concrete	0.2%	378
Drywall	1.0%	1,889
Carpet	2.1%	3,968
Carpet Padding	0.6%	1,134
Soil, Rocks, Sand	1.4%	2,645
Asphalt Roofing	1.6%	3,023
Plastic Flooring	0.2%	378
Ceramics & Brick	0.2%	378
R/C Construction Materials	2.5%	4,723
Consumer Products	8.5%	16,059
Televisions - CRT	0.7%	1,323
Televisions - LCD	0.0%	0
VCRs , DVDs, DVRs	0.0%	0
Computer Monitors - CRT	0.1%	189
Computer Monitors - LCD	0.0%	0
Computers	0.0%	0
Computer Peripherals	0.1%	189
Audio Equipment	0.1%	189
Gaming Equipment	0.0%	0
Other Consumer Electronics	0.3%	567
Textiles- Organic	2.1%	3,968
Textiles - Synthetic	1.2%	2,267
Shoes. Purses. Belts	0.3%	567
Tires & Rubber	0.5%	945

**APPENDIX A
WASTE COMPOSITION DATA**

Material	Percent	Estimated Benton County Tons
Furniture	2.1%	3,968
Mattresses	0.4%	756
R/C Consumer Products	0.6%	1,134
Hazardous/Special Wastes	3.2%	6,046
Pesticides/Herbicides	0.0%	0
Mercury Vapor Lighting	0.0%	0
Compact Fluorescent Lights	0.0%	0
Fluorescent Tubes	0.0%	0
Asbestos	0.0%	0
Latex Paint	0.1%	189
Solvent-based Glues	0.0%	0
Latex -based Glues	0.0%	0
Oil-based Paint & Solvent	0.0%	0
Caustic Cleaners	0.0%	0
Dry-cell Batteries	0.0%	0
Wet-cell Batteries	0.0%	0
Gasoline Kerosene	0.0%	0
Motor Oil	0.0%	0
Antifreeze	0.0%	0
Other Vehicle Fluids	0.0%	0
Oil Filters	0.0%	0
Explosives	0.0%	0
Med1ca l Wastes	1.1%	2,078
Pharmaceuticals Vitamins	0.0%	0
Disposable Diapers	1.9%	3,590
Other Cleaners and Soaps	0.1%	189
Other Hazardous	0.0%	0
Other Non-hazardous	0.0%	0
Residues	1.2%	2,267
Ash	0.1%	189
Dust	0.0%	0
Fines	1.1%	2,078
Sludge/Special l Industrial	0.0%	0
Total	99.9%	188,742

To: Pete Rogalsky, PE; City of Richland Donna Holmes, Benton County	
From: Nona Diediker, HDR Project Manager	Project: Benton County – Moderate Risk Waste (MRW) Facility Site Identification
CC:	
Date: June 27, 2013	Job No: 174159

This is the final siting memo in a series of memos related to a site search for a MRW facility. All preceding memos are summarized within. HDR was tasked by Benton County (County) to identify a list of three to six potential sites that are currently available for sale that meet the criteria for a new regional MRW facility. The search was broken into five distinct phases with screening criteria for each phase as summarized below. All phases of the research are now complete and a final list of potential sites is provided.

Phase 1: Fatal Flaw Search Criteria

The fatal flaw search criteria utilized the most critical criteria established in the initial siting study conducted by HDR, and applied to all Benton County properties to eliminate sites that did not meet the minimum requirements for a candidate site. These criteria included:

1. Land use/zoning - Current land use or zoning of “industrial” and properties vacant or unimproved.
2. Proximity to residential zoning - At least 1,000 feet from any property with a current land use or zoning of “residential”.
3. Floodplain - Located outside of the 100-year floodplain area.

Phase 2: Primary Search Criteria

The base line search criteria were applied to all candidate sites that were not eliminated under the fatal flaw analysis. This search utilized the remaining criteria established in the initial siting study conducted by HDR, and was applied in the order listed below. These criteria were used to refine the list of candidate properties to at least six preferred sites, and included:

1. Proximity to major population base - Within the municipal boundaries of the Cities of Richland or Kennewick.
2. Property Size – one-acre minimum for all properties; up to five-acre maximum for privately owned properties.
3. Easy access from highway or major roadway - Within three miles of a highway or arterial road.
4. Site Ownership - First preference given to sites owned by the City of Richland, City of Kennewick, or County of Benton. Local government-owned property is preferred. Alternate municipal ownership or site lease also considered.

5. Cultural Sites - Must not contain culturally significant archeological or historical sites; based on available data. This research was limited to readily available information found on the Department of Archaeology and Historic Preservation (DAHP) website, <http://www.dahp.wa.gov/>, of known cultural and historic sites. Sites that have not been previously disturbed may require additional review for cultural finds potential. Additional review could include tasks such as literature review, informal consultation with DAHP, a pedestrian survey of the site, and subsurface sampling by a professional archaeologist.
6. Contamination - Must not contain any known contaminated sites, based on readily-available data. This research was limited to what was found on the Department of Ecology's website, <https://fortress.wa.gov>. A Phase I Environmental Site Assessment is recommended prior to purchase of selected property or for a limited shortlist of properties.
7. Terrain - Must be on relatively flat terrain; not in a steep canyon, valley, or hillside. This research was limited to map views and preliminary site visits to some parcels.

Phase 3: Secondary Search Criteria

The secondary site review criteria was applied to the preferred sites and used for establishing a ranked list of sites in order to identify a final list of recommended sites. As part of the criteria, if there were not enough sites that were available for sale, the parameters of the primary search criteria would be expanded to increase the pool of preferred sites. These criteria were also be applied to the top three sites identified during the original site study conducted by HDR.

1. Estimated Cost to Purchase.
2. Available for Sale.
3. Soundness of Title.
4. Availability of utilities (water and power) to site assuming storm water and sewer will be managed on site.
5. Estimated property purchase/agreement schedule.

The initial Phase 1 and Phase 2 research resulted in a raw data list of over 300 parcels. The Phase 1 research criteria was ultimately refined to only include industrial zoned properties, after zoning research indicated that industrial zoning and public use properties were likely the only property use types to support the MRW facility without extensive rezoning. Improved properties were also excluded from the Phase 1 search criteria and the Phase 2 search criteria was modified to only identify properties within the Cities of Richland and Kennewick. These noted changes in criteria resulted in a more reasonable and manageable list of 135 candidate sites which was then further refined to the non-city owned (**Table 1**) and city-owned sites (**Table 2**).

Table 1. Non City Owned Sites

Parcel ID	Owner	Location Address	Acres	Land Use Description	Richland Zoning	Kennewick Zoning
127083000022000	MEHIC DULE	UNKNOWN,RICHLAND,WA,99352,	1.0	Industrial: Vacant land	Medium Industrial	
127083000023000	MEHIC DULE & ALMA	UNKNOWN,RICHLAND,WA,99352	1.0	Industrial: Vacant land	Medium Industrial	
134082000007000	LAMB-WESTON INC	UNDETERMINED,WA,USA	1.15	Industrial: Vacant land	Medium Industrial	
127084000005000	BRESINA WILLIAM L	UNDETERMINED,WA,USA	1.53	Industrial: Vacant land	Medium Industrial	
127083000002000	PORT OF BENTON	UNDETERMINED,WA,USA	2.08	Undeveloped HBU Commercial	Medium Industrial	

Parcel ID	Owner	Location Address	Acres	Land Use Description	Richland Zoning	Kennewick Zoning
134081000022000	DKSMITH PROPERTIES LLC	2004 SAINT ST,RICHLAND,WA,99354,	2.1	Business services	Medium Industrial	
134082000005000	LAMB-WESTON INC	UNDETERMINED,WA,USA	2.1	Industrial: Vacant land	Medium Industrial	
134082000016000	HENNINGSSEN ENTERPRISES INC	TO BE ASSIGNED,RICHLAND,WA,99352,	2.12	Industrial: Vacant land	Medium Industrial	
134082000001002	GARTIN WILLIAM J & JOAN R	UNDETERMINED,WA,USA	2.77	Industrial: Vacant land	Medium Industrial	
134082000014000	LAMB-WESTON INC	UNDETERMINED,WA,USA	2.78	Industrial: Vacant land	Medium Industrial	
134081000026000	GILBERT PAUL A	UNDETERMINED,WA,USA	2.8	Industrial: Vacant land	Medium Industrial	
134081000003000	CHAPMAN JOHN H	UNDETERMINED,WA,USA	3.28	Commercial Retail Land	Medium Industrial	
134082000004000	LAMB-WESTON INC	UNDETERMINED,WA,USA	3.38	Industrial: Vacant land	Medium Industrial	
127083000003005	WALIGURA TRUSTEE NICHOLAS C	ROBERTSON DR,RICHLAND,WA,99354,	3.53	Industrial: Vacant land	Medium Industrial	
134082000006000	LAMB-WESTON INC	UNDETERMINED,WA,USA	4.13	Industrial: Vacant land	Medium Industrial	
134082000012000	PORT OF BENTON	UNDETERMINED,WA,USA	4.67	Industrial: Vacant land	Medium Industrial	
127083000014000	PORT OF BENTON	UNKNOWN,RICHLAND,WA,99352,	4.82	Industrial: Vacant land	Medium Industrial	
121081012558001	TIMBERLINE PROCESS & CONTROLS IA	2680 BATTELLE BLVD,RICHLAND,WA,99352,	1.96	Industrial: Vacant land	Heavy Manufacturing	
122082000001000	PACIFIC ECOSOLUTIONS INC	1991 BATTELLE BLVD,RICHLAND,WA,99352,USA	5	Industrial: Vacant land	Heavy Manufacturing	
131904010146002	NORTH PACIFIC GRAIN GROWERS	UNDETERMINED,WA,USA	1.386	Food & kindred products		Industrial, Heavy
131904000003000	NORTH PACIFIC GRAIN GROWERS	UNDETERMINED,WA,USA	2.69	Industrial grain elevators		Industrial, Heavy
132994013084002	PORT OF KENNEWICK	6504 W HOOD PL,KENNEWICK,WA,99336,	1.11	Industrial: Vacant land		Industrial, Light
132994013084003	PORT OF KENNEWICK	6416 W HOOD PL,KENNEWICK,WA,99336,	1.25	Industrial: Vacant land		Industrial, Light
132994000001003	KELLER KENNEWICK PARTNERSHIP	W DESCHUTES,WA,USA	1.27	Industrial: Vacant land		Industrial, Light
106801020025001	PUBLIC UTILITY DISTRICT #1	UNKNOWN,KENNEWICK,WA,99337,	1.32	Industrial: Vacant land		Industrial, Light
132994020003009	FALCON VIDEO COMMUNICATIONS LPA	JOHN DAY,WA,USA	1.34	Industrial: Vacant land		Industrial, Light
132994012775001	KADINGER JESSE C & YVONNE M	6517 W HOOD PL,KENNEWICK,WA,99336,	1.352	Industrial: Vacant land		Industrial, Light
132994000018000	MUSSER SCOTT S & TERESA L	UNKNOWN,,,,,USA	1.56	Industrial: Vacant land		Industrial, Light
132994013084001	SAGE BAY COMPANY LLC	6512 W HOOD PL,KENNEWICK,WA,99336,	1.61	Industrial: Vacant land		Industrial, Light
106801020026001	BECKER CO TRUSTEES DONALD L & PAMALA	UNKNOWN,KENNEWICK,WA,99337,	2.44	Repair services		Industrial, Light
132994020003015	PORT OF KENNEWICK	JOHN DAY,WA,USA	2.91	Industrial: Vacant land		Industrial, Light
106802000002000	CURTIS- CERVO TRUSTEE FREEDA	512 E COLUMBIA DR,KENNEWICK,WA,99336,	3.07	Commercial Retail Land		Industrial, Light
132993000006007	KENNEWICK IRRIGATION DISTRICT	UNKNOWN,KENNEWICK,WA,99336,	3.08	Industrial: Vacant land		Industrial, Light
132993000009002	PORT OF KENNEWICK	6951 W GRANDRIDGE BLVD,KENNEWICK,WA,9933	1.83	Commercial Retail Land		Public Facilities

Table 2. City of Richland and City of Kennewick Properties

Parcel ID	Owner	Location Address	Acres	Land Use Description	Richland Zoning	Kennewick Zoning
127083000018000	CITY OF RICHLAND	2277 ROBERTSON DR,RICHLAND,WA,99354,	1.17	Industrial: Vacant land	Medium Industrial	
127083000024000	CITY OF RICHLAND	UNKNOWN,RICHLAND,WA,99352,	1.23	Industrial: Vacant land	Medium Industrial	
127083000019000	CITY OF RICHLAND	2235 ROBERTSON DR,RICHLAND,WA,99354,	1.99	Industrial: Vacant land	Medium Industrial	
127083000015000	CITY OF RICHLAND	UNKNOWN,RICHLAND,WA,99352,	2.72	Industrial: Vacant land	Medium Industrial	
127084000006000	CITY OF RICHLAND	UNKNOWN,RICHLAND,WA,99352,	2.87	Industrial: Vacant land	Medium Industrial	
121081012558002	CITY OF RICHLAND	2650 BATTELLE BLVD,RICHLAND,WA,99352,	1.39	Industrial: Vacant land	Heavy Manufacturing	
121081012558003	CITY OF RICHLAND	2630 BATTELLE BLVD,RICHLAND,WA,99352,	1.41	Industrial: Vacant land	Heavy Manufacturing	
106801030003001	CITY OF KENNEWICK	416 N KINGWOOD,KENNEWICK,WA,99337	1.04	Utilities		Industrial, Heavy
106801020010000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	1.94	Industrial: Vacant land		Industrial, Heavy
106801020017000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2	Industrial: Vacant land		Industrial, Heavy
106801020008000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.56	Industrial: Vacant land		Industrial, Heavy
701891000002016	CITY OF KENNEWICK	UNDETERMINED,KENNEWICK,WA,99336,	1.54	Office / Retail Condo		Industrial, Light
106801020018001	CITY OF KENNEWICK	UNKNOWN,KENNEWICK,WA,99337,	3.13	Industrial: Vacant land		Industrial, Light
106801020003002	CITY OF KENNEWICK	UNDETERMINED,WA,USA	1.31	Utilities		Public Facilities
106801020016000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.3	Utilities		Public Facilities
106801020024000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.32	Utilities		Public Facilities
106801020019000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.34	Utilities		Public Facilities
106801020027000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.34	Utilities		Public Facilities
106801020020000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.5	Utilities		Public Facilities
106801020023000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.5	Utilities		Public Facilities
106801020015000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.5	Utilities		Public Facilities
106801020006000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.64	Utilities		Public Facilities
106801020001000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	2.9	Utilities		Public Facilities
106801020011000	CITY OF KENNEWICK	UNDETERMINED,WA,USA	4.84	Utilities		Public Facilities

The non City Owned Sites were cross referenced against current commercial properties listed for sale on the Commercial Brokers Association (CBA) web site and one site from that list was identified as on the market. That site is owned by DK Smith Properties LLC and is shown in **Table 3**.

To further expand the list of properties currently available for sale, we reviewed all available properties on the CBA site using a slightly more relaxed criterion (commercial properties were accepted) which resulted in the list of properties noted in **Table 3**.

Table 3. Phase 3 Sites Meeting Baseline Criteria

Parcel ID	Owner	Land Use/ Zoning	1000 ft from Res Property	Outside 100 yr floodplain	Within Richland Kennewick City Limits	1-5 Ac	Within 3 mi of hwy or arterial road	Area SF	Comments
132993013280005	KENNEWICK PUBLIC HOSPITAL DISTA	Com	Yes	Yes	Yes	Yes	Yes	78,408	Within commercial shopping and office bldgs, adjacent to medical offices/hospital
132993013280003	KENNEWICK PUBLIC HOSPITAL DISTA	Com	Yes	Yes	Yes	Yes	Yes	50,530	Within commercial shopping and office bldgs, adjacent to medical offices/hospital
134081000022000	DKSMITH PROPERTIES LLC	Ind	Yes	Yes	Yes	Yes	Yes	91,476	Adjacent to industrial property use and warehouse type activities
103891011524005	BJAZEVICH ANDREW & DALENE	Com	No	Yes	Yes	Yes	Yes	77,101	About 3.3 miles inside 1000 ft res buffer
132993013280006	KENNEWICK PUBLIC HOSPITAL DISTA	Com	No	Yes	Yes	Yes	Yes	78,408	About 60ft of property is within 1000 ft res buffer
131991012977001	CCH BUSINESS PARK LLC	Com	No	Yes	Yes	Yes	Yes	109,335	About 300ft inside 1000 ft res buffer
131994013034008	GRANDRIDGE INVESTORS LLC	Com	No	Yes	Yes	Yes	Yes	44,431	About 600ft inside 1000 ft res buffer

The original three preferred site alternatives identified in the Draft MRW Conceptual Layouts and Preliminary Siting Evaluation Memo completed by HDR on March 26, 2012, were also reviewed using the above-noted criteria. The results of this analysis are presented in **Table 4**.

Table 4. Original Sites subjected to Phase 3 Criteria

Parcel ID	Owner	Land Use/ Zoning	1000 ft from Res Property	Outside 100 yr floodplai n	Within Richland Kennewic k City Limits	1-5 Ac	Within 3 mi of hwy or arterial road	Area SF	Comments
116984020002002	City of Richland	Ind	No	Yes	Yes	No	Yes	1,300,266	About 900ft inside 1000ft res buffer; 29.85 ac.
111892020046002	Benton County Road Maintenance Shop	PF	No	Yes	Yes	Yes	Yes	111,078	About 3 miles inside 1000 ft res buffer
111884000001000	Clarence T Bumgardner et al) I-82/Badger	Com	No	Yes	Yes	No	Yes	841,144	About 320ft inside 1000 ft res buffer; 19.31 ac.

The research in this memo and the March 2012 memo has resulted in a prospective site list of ten private properties with six individual owners and two public properties owned by Benton County and the City of Richland. Phase 3 analyses of these properties used the criteria below with interim results shown in Table 5. An overview map of the Phase 3 sites is presented in Exhibit 1.

1. Estimated Cost to Purchase.
2. Available for Sale.
3. Soundness of Title.
4. Availability of utilities (water and power) to site assuming storm water and sewer will be managed on site.
5. Estimated property purchase/agreement schedule.

Table 5. Phase 3 Evaluation of Sites

Parcel ID	Owner	Estimated Cost	Available For Sale	Soundness of Title	Utilities to Site	Purchase Closing Schedule
132993013280005	KENNEWICK PUBLIC HOSPITAL DISTA	\$430,046 listing	Yes	To be completed	Yes	3-4 months
132993013280003	KENNEWICK PUBLIC HOSPITAL DISTA	\$278,152 listing	Yes	To be completed	Yes	3-4 months
134081000022000	DKSMITH PROPERTIES LLC	\$175,000 listing	Yes	To be completed	Yes	3-4 months
103891011524005	BJAZEVICH ANDREW & DALENE	\$50,000 listing	Yes	To be completed	TBD	3-4 months
132993013280006	KENNEWICK PUBLIC HOSPITAL DISTA	\$461,963 listing	Yes	To be completed	TBD	3-4 months
131991012977001	CCH BUSINESS PARK LLC	\$792,680 listing	Yes	To be completed	TBD	3-4 months
131994013034008	GRANDRIDGE INVESTORS LLC	\$339,879 listing	Yes	To be completed	TBD	3-4 months
116984020002002	City of Richland	\$2,703,180 estimate	No	To be completed	TBD	6-9 months
111892020046002	Benton County Road Maintenance Shop	\$259,090 estimate	No	To be completed	TBD	6-9 months
111884000001000	I-82/Badger (Clarence T Bumgardner et al)	\$772,400 estimate	Yes?	To be completed	TBD	3-4 months

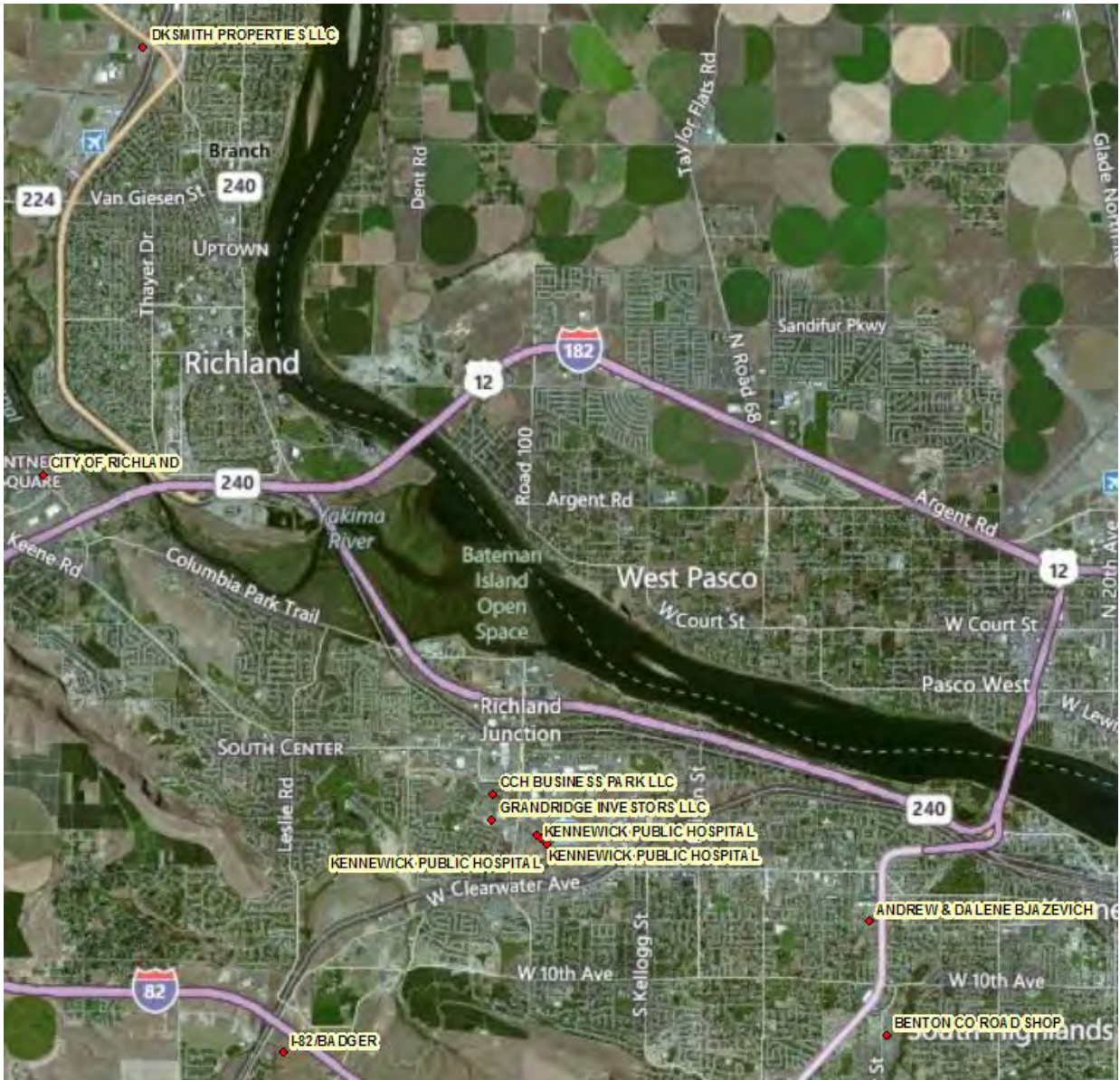
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Exhibit 1. Overview Map of Phase 3 Sites



Kennewick Public Hospital



DK Smith Properties



Andrew & Darlene Bjazevich



CCH Business Park LLC



Grandridge Investors LLC



City of Richland



Benton County



Lawrence Bumgardner



Phase 4: Expanded Search Criteria for Areas of Interest

A meeting was held on December 12, 2012 with representatives from the County and cities of Richland, West Richland, and Kennewick to discuss the results of Phase 3 and provide guidance on the next phase of the project.

During the above-noted meeting, the following sites were determined to be non compatible sites.

<u>Site Location</u>	<u>Reason For Deletion</u>
Kennewick Public Hospital (multiple sites)	Not compatible with future development plans; adjacency to Vista Field and entertainment district
Andrew & Dalene Bjazevich	Incompatible Land Use; immediately adjacent to hotel, restaurant, high-density residential, and retail/commercial
CCH Business Park LLC	Incompatible Land Use; adjacent properties consist of offices, restaurants, hotels, professional services (e.g., dental, medical, and law offices)
Grandridge Investors LLC	Incompatible Land Use; adjacent properties consist of offices, restaurants, hotels, professional services (e.g., dental, medical, and law offices)

Based on the above-noted results, three potential “areas of interest” from the sites identified in Table 5 were identified: City of Richland; I-182/Badger; and Benton County sites. Additional research was requested for areas within the vicinity of the noted sites and for properties owned by the Kennewick Irrigation District (KID). A third tier list of sites was produced based on the search criteria indicated below. The Phase 4 list of sites (**Table 6**) was generated with the intent of further review and refinement in order to add to the preferred site list generated in Phase 3. Maps of the three areas of interest and associated Phase 4 sites are provided in **Exhibit 2**.

Third Tier Parcel List Research Criteria

1. Selected the City of Richland, I-182/Badger, and Benton County sites and created a 1,000 ft buffer around them.
2. Selected all parcels that intersect this 1,000 ft buffer (182 parcels).
3. Selected all parcels from previous selection that were between one to five acres in size (56 parcels).
4. Selected all parcels from previous selection that had their centroid in the likeable zoning layer (26 parcels). *This count includes the Benton County and I-182/Badger sites that were buffered by 1,000 ft.
5. Created a new layer that included all KID parcels that were near the three parcels needing additional research (15 parcels).
6. Selected only those records that were between one to five acres in size (four parcels) for KID.
7. This resulted in identification of four KID parcels, two of which were removed from the list because they are not zoned for Business Commerce.
8. Combined the three areas of interest list and the KID list to produce the Phase 4 list of sites.

Table 6. Phase 4 Sites

Parcel ID	Owner	Location Address	Acres	Land Use Description	Benton County Zoning	Kennewick Zoning	Richland Zoning	Within 1000ft of Residential
116983BP4176001	KENNEWICK IRRIGATION DISTRICT	3771 KENNEDY RD, RICHLAND, WA 99352	1.51	Commercial Retail Land			Business Commerce	Yes
121981000002018	KENNEWICK IRRIGATION DISTRICT	UNKNOWN, RICHLAND, WA 99352	1.02	Commercial Retail Land			Business Commerce	Yes
116984013070002	BB QUEENSGATE LLC	2560 QUEENSGATE DR, RICHLAND, WA 99352	1.17	RT General Merchandise			General Business	Yes
116984013070003	BB QUEENSGATE LLC	2530 QUEENSGATE DR, RICHLAND, WA 99352	2.54	Commercial Retail Land			General Business	Yes
116984013096001	BDC RICHLAND LLC	2762 DUPORTAIL ST, RICHLAND, WA 99352	1.69	Commercial Retail Land			General Business	Yes
116984020002004	CITY OF RICHLAND	3000 QUEENSGATE DR, WA	1.00	Industrial: Vacant Land			General Business	No
116984000002012	FIRST RICHLAND L.P.	UNDETERMINED, RICHLAND, WA 99352	2.63	Commercial Retail Land			General Business	Yes
116984013161003	FIRST RICHLAND L.P.	2751 DUPORTAIL ST, RICHLAND, WA 99352	1.11	RT Eating and Drinking			General Business	Yes
116984013161004	FIRST RICHLAND L.P.	2725 DUPORTAIL ST, RICHLAND, WA 99352	1.87	RT General Merchandise			General Business	No
116984013162001	FIRST RICHLAND L.P.	2935 DUPORTAIL ST, RICHLAND, WA 99352	1.00	RT General Merchandise			General Business	Yes
116984013162002	FIRST RICHLAND L.P.	2927 DUPORTAIL ST, RICHLAND, WA 99352	1.46	RT General Merchandise			General Business	Yes
116984013162003	FIRST RICHLAND L.P.	2921 DUPORTAIL ST, RICHLAND, WA 99352	2.68	Commercial Retail Land			General Business	Yes
116984013162004	FIRST RICHLAND L.P.	2917 DUPORTAIL ST, RICHLAND, WA 99352	2.38	Commercial Retail Land			General Business	Yes
116984013163001	FIRST RICHLAND L.P.	2701 QUEENSGATE DR, RICHLAND, WA 99352	1.74	Finance Insur Real Estate			General Business	Yes
116984013163003	FIRST RICHLAND L.P.	2651 DUPORTAIL ST, RICHLAND, WA 99352	2.00	RT General Merchandise			General Business	Yes
116984013163004	FIRST RICHLAND L.P.	2947 QUEENSGATE DR, RICHLAND, WA 99352	1.71	Commercial Retail Land			General Business	No
116984012471001	RABER LLC	686 TRUMAN AVE, RICHLAND, WA 99352	1.30	Misc Manufacturing			General Business	No
116984012471002	RABER LLC	670 TRUMAN AVE, RICHLAND, WA 99352	1.30	Business Services			General Business	No
116984012471003	RABER LLC	654 TRUMAN AVE, RICHLAND, WA 99352	1.51	Contract Construction Services			General Business	No
116984020002005	STARWEED LLC	3050 QUEENSGATE DR, RICHLAND, WA 99352	1.39	Business Services			General Business	No

Parcel ID	Owner	Location Address	Acres	Land Use Description	Benton County Zoning	Kennewick Zoning	Richland Zoning	Within 1000ft of Residential
111892020046002	BENTON COUNTY	UNDETERMINED, WA	2.55	Governmental Services		Public Facilities		Yes
110891000024000	BENTON COUNTY PUD	UNDETERMINED, WA	1.04	Utilities		Public Facilities		Yes
111892010477001	BENTON COUNTY PUD	UNDETERMINED, WA	2.68	Utilities		Public Facilities		Yes
111892020047003	CITY OF KENNEWICK	1811 S ELY ST, KENNEWICK, WA 99337	4.22	Governmental Services		Public Facilities		Yes
111892020015006	PUBLIC UTILITY DISTRICT #1	UNDETERMINED, KENNEWICK, WA 99337	3.16	Utilities		Public Facilities		Yes
111881020000011	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	1.38	Commercial Retail Land	INTERCHANGE COMMERCIAL			No
111881020000012	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	1.47	Commercial Retail Land	INTERCHANGE COMMERCIAL			No
111881020000013	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	2.07	Commercial Retail Land	INTERCHANGE COMMERCIAL			No

Exhibit 2. Phase 4 Areas of Interest and Sites

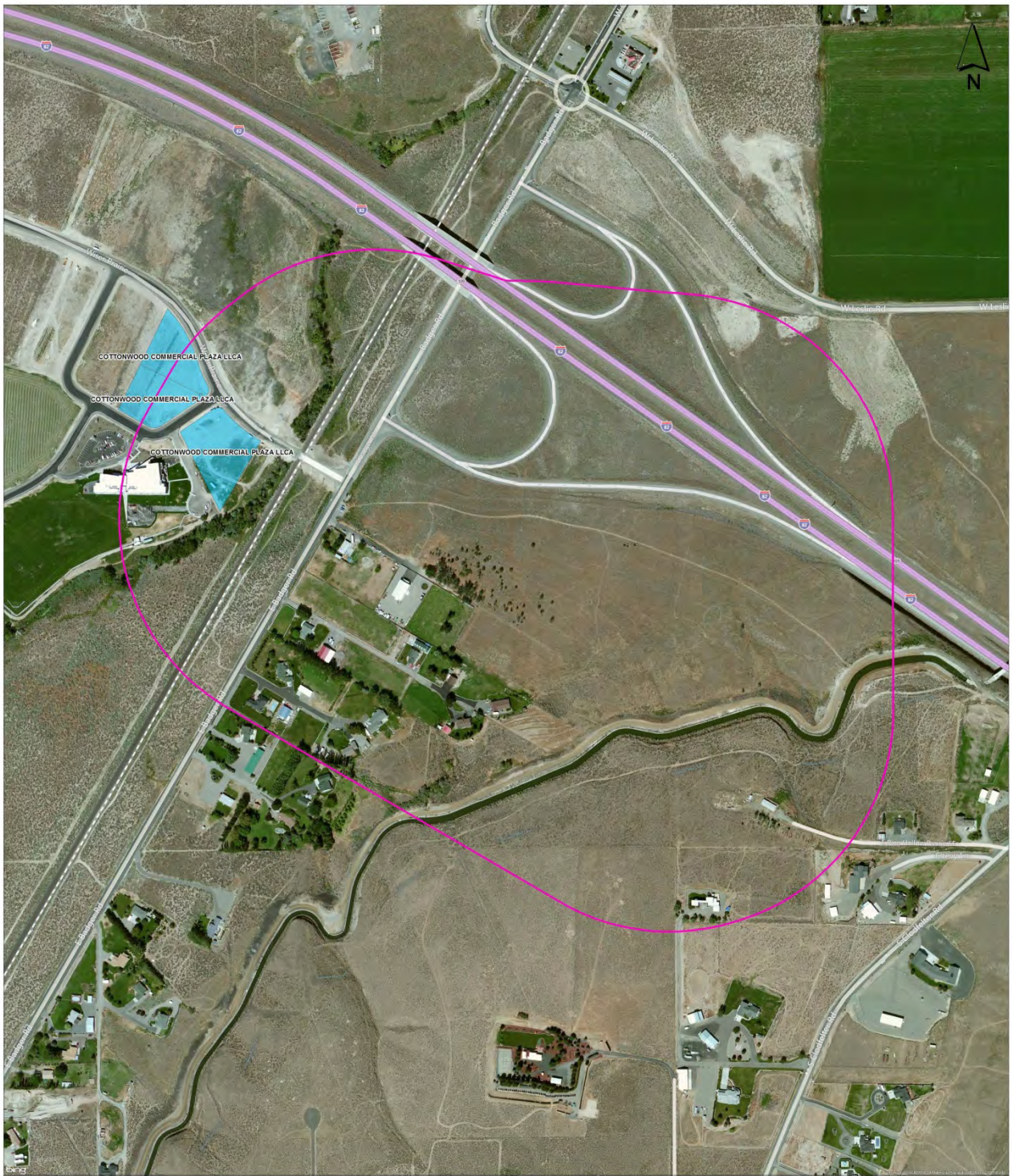


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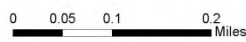


MRW Potential Sites
I-82/Badger Research Area



- 1000ft Buffer on Research Parcels
- Fourth Tier Parcels

Date: 2/13/2013



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MRW Potential Sites
Benton County Road Shop Research Area

- 1000ft Buffer on Research Parcels
- Fourth Tier Parcels

Date: 2/13/2013



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Phase 5: Final Site List

Following review and input regarding the Phase 4 information, the Phase 4 site list was refined. The goal was to identify 2-3 preferred sites to add to the Phase 3 sites (for a total of 6 sites), and review the list using the following criteria:

1. Estimated cost to purchase
2. Available for sale
3. Soundness of title
4. Availability of utilities (water and power) to site assuming storm water and sewer will be managed on site
5. Estimated property purchase/agreement schedule.

The process began with the three original preferred sites (City of Richland City Shops, Benton County Road Maintenance Shop, and Bumgardner property) and continued parcel by parcel from the three research areas until a total of six sites were identified (3 preferred, 3 new). Per direction from the SWAC at the March 13, 2013 meeting, the site search was to begin in the I-82/Badger research area and progress to the City of Richland research area, and end with the Benton County Road Shop research area until three new viable sites were identified. However, subsequent to the meeting, the County withdrew the three Cottonwood sites from the I-82/Badger research area due to their proximity to an elementary school. Therefore, the search began with the Richland City Shops research area.

The tasks included in this process were as follows:

1. Complete a detailed site review including site visits by one project staff if site access is feasible, review readily available property sales listing data, order and review of title, and prepare a preliminary cost estimate to acquire the properties based on available public data of the sites on the preferred list along with the three sites identified in the preliminary siting process.
2. Compile final results into a brief MRW Site Identification Technical Memo. Potential issues were identified through review of readily available public information sources (e.g., comprehensive plans, sensitive areas ordinances, agency websites, and aerial photos) and onsite observations if site access is feasible.

Table 7 presents the list of sites that were eliminated from further consideration and reason for dismissal. Table 8 presents the final sites meeting all the MRW site criteria. Photos of 3 of the 4 final sites are provided in Exhibit 3.

Table 7. Sites Dismissed from Further Study

Parcel ID	Owner	Location Address	Reason for Dismissal
111892020047003	CITY OF KENNEWICK	1811 S ELY ST, KENNEWICK, WA 99337	City not interested in selling
111881020000011	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	Incompatible land use; adjacent to elementary school
111881020000012	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	Incompatible land use; adjacent to elementary school
111881020000013	COTTONWOOD COMMERCIAL PLAZA LLCA	UNDETERMINED, KENNEWICK, WA 99338	Incompatible land use; adjacent to elementary school
116984012471001	RABER, LLC	686 Truman Ave Richland, WA 99352	Owner not interested in selling any of the 3 parcels
116984020002005	STARWEED, LLC	3050 Queensgate Drive RICHLAND, WA 99353	Owner not interested in selling; mini-storage facility
11189202004003	CITY OF KENNEWICK	1811 S. ELY St. KENNEWICK, WA 99337	City of Kennewick City Fire Training Facility
111892010477001	BENTON CO. PUD	524 S AUBURN ST KENNEWICK, WA 99336	PUD STORAGE FACILITY
111891000024000	BENTON CO. PUD	524 S AUBURN ST KENNEWICK, WA 99336	PUD STORAGE FACILITY & SHOPS

Table 8. Sites Still Under Consideration

Parcel ID	Owner	Location Address	Estimated Cost ¹	Available for Sale	SEPA Issues ²	Comments
116983BP4176001	KENNEWICK IRRIGATION DISTRICT	3771 KENNEDY RD, RICHLAND, WA 99352	\$270,000 OR \$4.00/SF	Yes	None identified; transportation impact analysis consideration	Awaiting appraisal requested by KID's Property Mgr.
111884000001000	C. L. BAUMGARTNER	X'ing of I-82 & Badger Rd.	\$772,400 OR \$0.90/SF	Yes	None identified	Unable to reach property owner by phone
1169840200022800	City of Richland	2800 Queensgate	\$2,703,180 or \$2.07/SF	Not listed	None identified; transportation impact analysis consideration	Currently City of Richland shops and storage yard
111892020046002	Benton County	East side of S. Ely next to Kennewick Fire Training facility	\$313,160 or \$6.91/SF	Not Listed	None identified	Road Shop & equipment storage

¹ Assessed value as of May 8, 2013

² Based on readily available data including review of DAHP and Ecology websites for known cultural or contaminated sites respectively.

Exhibit 3 – Site Photos

Kennewick Irrigation District



Baumgartner



City of Richland – Queensgate



INTER-LOCAL AGREEMENT
REGARDING SOLID WASTE MANAGEMENT
BENTON COUNTY

This Agreement addresses City-County joint participation in the countywide Solid Waste Plan and joins public agencies to exercise their powers, thereby maximizing their ability to provide services and facilities which will best fulfill the needs of the community as a whole, and is made and entered into effective the first day of January 2012, by and between Benton County, a political subdivision of the State of Washington, hereafter referred to as the Lead Agency, and the cities of Benton City, Kennewick, Richland, Prosser, and West Richland, political subdivisions of the State of Washington, and hereafter referred to as Participating Jurisdictions. The Participating Jurisdictions and Lead Agency may be referred to herein collectively as the Parties, also referred to as the Solid Waste Advisory Committee (SWAC).

I. RECITALS

WHEREAS, the parties hereto recognize the requirement to prepare and implement solid and hazardous waste plans under RCW Chapter 70.95 and RCW Chapter 70.105, and

WHEREAS, the parties hereto recognize the requirement to conduct a public review process to develop and review the Benton County Comprehensive Solid Waste Plan; and

WHEREAS, the parties hereto recognize the adopted Benton County Comprehensive Solid Waste Plan fulfills their jurisdictional requirements under RCW Chapter 70.95 and RCW Chapter 70.105; and

WHEREAS, the parties hereto wish to enter into a cooperative effort to administer, plan, and implement the recommendations contained within the adopted Benton County Comprehensive Solid Waste Plan; and

WHEREAS, each Participating Jurisdiction and Lead Agency shall have one equal vote with regards to policies and decisions made pursuant to all matters of policy and finance; And

Interlocal Agreement
Benton County Solid Waste Management

WHEREAS, the Lead Agency will manage, track and provide custody for this Agreement, and

WHEREAS, the undersigned signatories of this Agreement are duly authorized to enter into the same by properly adopted resolutions,

NOW THEREFORE, in consideration of the foregoing recitals and the mutual agreements and covenants herein contained, the parties agree as follows:

II. AGREEMENTS

A. AUTHORITIES

The parties to this Agreement have and possess, both jointly and severally, the primary responsibility for effective solid and hazardous waste management, planning and implementation under RCW Chapters 70.95 and 70.105. Under RCW Chapter 39.34, the Inter-local Cooperation Act, local governments are authorized to cooperate to provide themselves with services of the nature herein agreed to.

B. PURPOSE

This Agreement is entered into pursuant to RCW Chapter 39.34 for the purpose of cooperative management of solid waste within Benton County. It is the intent of the parties to work cooperatively in developing a comprehensive solid waste management plan pursuant of RCW Chapters 70.95 and 70.105 that is viable and economically responsible to their citizens. Specifically, this Agreement will provide for the administration, planning and operations of the adopted Benton County Comprehensive Solid Waste Management Program.

C. DEFINITIONS

For the purpose of this Agreement, the following definitions shall apply:

‘Fair Share’ - the amount owed by each of the Parties based upon current population figures supplied by the Washington State Office of Financial Management (OFM), and the corresponding population percentage applied to the Solid Waste Program Budget.

‘Solid Waste Advisory Committee’ (SWAC) - a committee comprised of a representative of each of the Parties. Each Party shall designate its representative to the SWAC to the Lead Agency. The SWAC shall review Solid Waste Program budget and activities and make recommendations to the Benton County Commissioners.

‘Lead Agency’ - Benton County, a political subdivision of the State of Washington. The Lead Agency, will administer, plan and implement the Plan and Solid Waste Program.

Interlocal Agreement
Benton County Solid Waste Management

'Participating Jurisdictions' - any City who has entered into the County-wide Solid Waste Inter-local Agreement with the Lead Agency and who has agreed to mutually support and financially contribute to the administration, planning and implementation of the Plan.

'Parties' or 'Solid Waste Advisory Committee' - the collective term for all Participating Jurisdictions and Lead Agency.

'Plan' - the Benton County Comprehensive Solid Waste Management Plan, as the same exists now or may hereafter be amended.

'Routine Operating Agreement' (ROA) - an agreement that is established for the purpose of accomplishing a task set forth by the Parties and is funded within the Solid Waste Program Budget.

'Solid Waste Advisory Committee Members Bylaws' - the bylaws the same as now exist or may hereafter be amended.

'Solid Waste Program Budget' - the annual Countywide Solid Waste Budget, as prepared by Benton County and accepted by the SWAC, that appropriates funds to Routine Operating Agreements and administrative functions that meet specific requirements in RCW 70.95 and/or accomplishes goals as set fourth in the Plan.

'Task' - a project, program, activity, etc., that is annually funded from the Solid Waste Program Budget. All tasks are approved by the SWAC as needed and shall meet the recommendations set forth in the Plan.

'Task Manager' is designated to lead and manage a Task per the ROA.

D. LOCAL ADOPTION OF PLAN

Under the authority of RCW 70.95.080 each Participating Jurisdiction has elected to enter into this agreement with the County pursuant to which those jurisdictions shall participate in preparing a joint City-County Plan. Prior to the Plan's "Final Draft" phase, when it goes to Ecology for review, each Participating Jurisdiction is required to adopt the Plan. If any Participating Jurisdiction elects not to adopt the Plan, the Lead Agency will call for a SWAC vote. If a supermajority vote (i.e. 5 of 6) is reached in favor of adopting, the opposing jurisdiction will have to choose between developing a Plan alone, or adopting the favored Plan. If two or more jurisdictions oppose adopting the Plan, then the Parties will revert back to the phase of "Revising the Preliminary Draft Plan" during which a draft Plan revision will be made to satisfy a supermajority vote. The Plan will be adopted by at least the "in favor" supermajority and submitted to Ecology for final approval.

E. PLAN IMPLEMENTATION

Interlocal Agreement
Benton County Solid Waste Management

Pursuant to RCW 70.95.080 and RCW 70.105.220, the Participating Jurisdictions and Lead Agency will jointly prepare a Plan in accordance with "Guidelines for the Development of Local Solid Waste Plans and Plan Revisions" (*i.e.* Department of Ecology (WDoE) Publication No. 90-11) and implement the Plan's recommendations. Pursuant to RCW 70.95.094, the "Final Draft Plan" shall be deemed approved, if the WDoE does not disapprove it within forty-five (45) days of receipt.

F. BENTON COUNTY SOLID WASTE ADVISORY COMMITTEE

The Parties hereto recognize and support the SWAC as an advisory board created under authority of RCW 70.95.165. The SWAC is an ongoing advisory committee. The SWAC is the focal point of the public involvement effort used in the planning, development and implementation of the Plan. The SWAC also provides advice to the Parties on solid and hazardous waste issues and assists the Parties in developing solid waste ordinances, rules, guidelines and policies prior to their adoption.

G. REGIONAL PLANNING AREA

The Parties hereto recognize the geographical planning area covered by this Agreement to be the incorporated areas of the Participating Jurisdictions and the unincorporated area of Benton County. The Hanford Nuclear Reservation is exempted from the Plan and this Inter-local Agreement.

H. ROUTINE OPERATING AGREEMENT IMPLEMENTATION

Prior to the annual Solid Waste Program Budget workshop, all task managers are required to submit their ROA. As a minimum, an ROA will include: 1) Task Introduction Statement; 2) Task Scope of Work; 3) Task Responsibilities; 4) Annual Task Cost; and 5) Quality Control. Eligibility of an ROA request is based on task cost and meeting recommendations set forth in the Plan. The SWAC will approve tasks based on a supermajority (*i.e.* 5 of 6) in-favor vote.

I. SOLID WASTE PROGRAM BUDGET

The Parties agree to mutually and financially support the administration, planning and operations of the Plan recommendations or as specified in RCW 70.95. The Lead Agency shall prepare a Solid Waste Program Budget each year for the upcoming budget year. The budget will also include Routine Operating Agreements that provide information on projects funded by the annual budget.

J. FAIR SHARE

The Parties agree to pay a Fair Share of the administration, planning and operation of the Solid Waste Program, as determined and voted-on by the SWAC and approved by the Benton County Commissioners. Said Fair Share shall be a percentage of

Interlocal Agreement
Benton County Solid Waste Management

all program costs that are not covered by Coordinated Prevention Grant Funds, share percentages to be updated each January of the Agreement, being based on the most recent population figures as supplied by the Washington State OFM. The Parties agree to remit their fee to the Lead Agency within sixty (60) days of receiving an invoice from the Lead Agency. The Lead Agency's fair share shall be based on the population for the unincorporated areas of the County.

K. DISBURSEMENT OF ASSETS AND DEBTS

If this Agreement is terminated, all Parties to this Agreement shall determine the disbursement of any outstanding debts and the allocation of any assets. If the Parties cannot agree to the disbursement of any outstanding debts and the allocation of any assets, the issues are to be submitted for arbitration, pursuant to state law, RCW 7.04 *et seq.* The Lead Agency and the contesting jurisdiction agree that such arbitration shall be conducted before one (1) disinterested arbitrator.

L. DURATION

This Agreement shall commence on the date set forth above and will continue in effect for two (2) years, or until superseded by another Interlocal Agreement. As stipulated within RCW 70.95.110(1), each Plan shall be maintained in a current condition and reviewed and revised periodically as may be required by the WDoE. Upon each review such plans shall be extended to show long-range needs for solid waste handling facilities for twenty (20) years in the future, and a revised implementation schedule and implementation budget for six (6) years in the future.

M. REVIEW AND RENEGOTIATION

Any Party may request a review and/or renegotiations on any provision of the Agreement during the six-month period immediately preceding the ending date for the Agreement. Such request must be made in writing to the Lead Agency and must specify the provision(s) of the Agreement for which review/renegotiation(s) are requested. Review and/or renegotiation(s) pursuant to such a written request shall be immediately referred to the SWAC for their review and recommendation. Notwithstanding any other provisions in this paragraph to the contrary, the Parties may, pursuant to the procedure outlined within the Solid Waste Advisory Committee Members Bylaws, modify or amend any provision(s) of this Agreement at any time during the term of this Agreement.

N. TERMINATION

This Agreement may be terminated by any Participating Jurisdiction, by written notice to the Lead Agency no less than three hundred sixty five (365) days immediately preceding the implementation date of the next Solid Waste Program Budget. This Agreement may be terminated by the Lead Agency by written notice to each Participating Jurisdiction no less than three hundred sixty five (365) days immediately preceding the implementation date of the next Solid Waste Program Budget. The Parties agree: (1) that

Interlocal Agreement
Benton County Solid Waste Management

the termination will not absolve a terminating Party of any financial responsibility to the extent a financial responsibility continues to exist pursuant to the provisions of this Agreement; and (2) that prior to termination, a withdrawing City shall submit to the SWAC how it intends on meeting its planning obligation under RCW 70.95.080.

O. WAIVER

No waiver by any of the Parties of any term or condition of this Agreement shall be deemed or construed to constitute a waiver of any other term or condition or of any subsequent breach whether of the same or a different provision of this Agreement.

P. ENTIRE AGREEMENT

This Agreement, including the recitals and all subsequent attachments and addendums, constitutes the entire Agreement between the Parties and shall be governed by the laws of the State of Washington. There are no other oral or written agreements or understanding between the Parties as to the subject matter contained herein. The venue for any action of law, suit in equity and judicial proceeding for the enforcement of this Agreement shall be instituted and maintained only in the courts of competent jurisdiction in Benton County, Washington.

Q. SEVERABILITY

Any provisions of this Agreement that is determined to be illegal, invalid or unenforceable for any reason shall be ineffective to the extent of such prohibition without invalidating the remainder of this Agreement.

FOR BENTON COUNTY, WASHINGTON.

Shon Small, Chairman
Board of County Commissioners

3/12/2013
Date

Attest:

[Signature]
Clerk of the Board

3-12-2013
Date

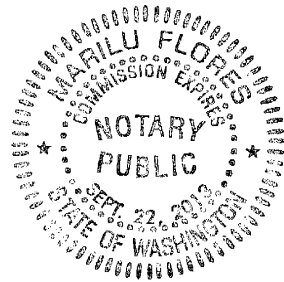
Approved as to Form:

[Signature]
Deputy Prosecuting Attorney

2-24-13
Date

I certify that on this 12 day of March, 2013, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Shon Small ~~James R. Beaver~~, to me known to be the Chairman of the Board of Commissioners for Benton County, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of Benton County.

Witness my hand and official seal hereto affixed the day and year first above written.



[Signature]
Notary Public in and for the State of
Washington residing at Prosser WA
My commission expires: 9-22-13

Interlocal Agreement
Benton County Solid Waste Management

Signature Page - Benton County

FOR THE CITY OF BENTON CITY, WASHINGTON.

Lloyd Carnahan
Lloyd Carnahan, Mayor

9/4/12
Date

Attest:

Stephanie Haug
Stephanie Haug, CMC, City Clerk/Treasurer

9/4/12
Date

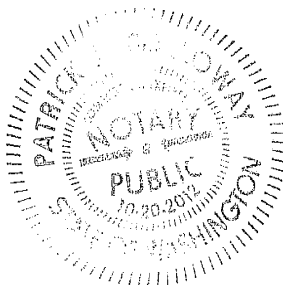
Approved as to Form:

Lee Kerr #39345
Lee Kerr, City Attorney

9/4/12
Date

I certify that on this 4th day of September, 2012, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Lloyd Carnahan and Stephanie Haug, to me known to be the Mayor and City Clerk-Treasurer, respectively, of the City of Benton City, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of the City of Benton City.

Witness my hand and official seal hereto affixed the day and year first above written.

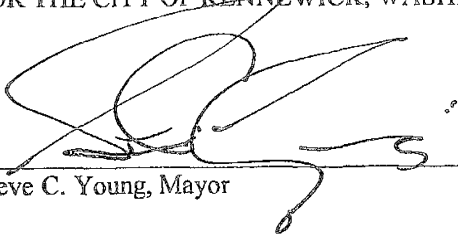


Patrick S. Lowway
Notary Public in and for the State of
Washington residing at Benton Co
My commission expires: 10/20/2012

Interlocal Agreement
Benton County Solid Waste Management

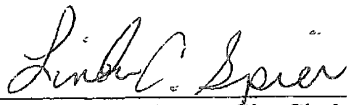
Signature Page - City of Benton City

FOR THE CITY OF KENNEWICK, WASHINGTON.


Steve C. Young, Mayor

12/18/12
Date

Attest:


Linda C. Spier, Deputy City Clerk

12/18/12
Date

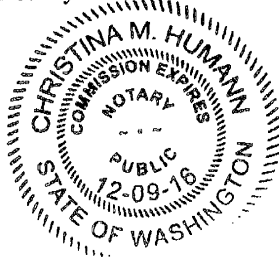
Approved as to Form:



Lisa Beaton, City Attorney

12/18/12
Date

I certify that on this 18th day of December, 2012, before me, the undersigned Notary Public in an for the State of Washington, duly commissioned and sworn, personally appeared Steve C. Young and Linda C. Spier, to me known to be the Mayor and Deputy City Clerk, respectively, of the City of Kennewick, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of the City of Kennewick.

Witness my hand and official seal hereto affixed the day and year first above written.




Notary Public in and for the State of
Washington residing at Kennewick
My commission expires: 12/9/2016

Interlocal Agreement
Benton County Solid Waste Management

Signature Page - City of Kennewick

FOR THE CITY OF PROSSER, WASHINGTON.

Paul Warden
Paul Warden, Mayor

11-28-2012
Date

Attest:

Rachel Shaw
Rachel Shaw, City Clerk

11/28/2012
Date

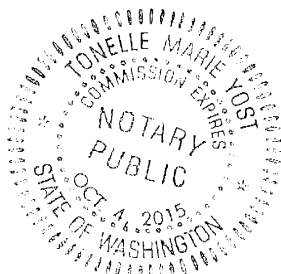
Approved as to Form:

Howard Saxton
Howard Saxton, City Attorney

11/28/2012
Date

I certify that on this 28th day of November, 2012, before me, the undersigned Notary Public in an for the State of Washington, duly commissioned and sworn, personally appeared Paul Warden and Rachel Shaw, to me known to be the Mayor and City Clerk, respectively, of the City of Prosser, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of the City of Prosser.

Witness my hand and official seal hereto affixed the day and year first above written.

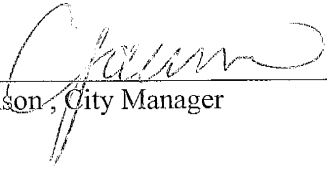


Tonelle M Yost
Notary Public in and for the State of WA
Washington residing at Prosser, WA
My commission expires: 10/4/2015

Interlocal Agreement
Benton County Solid Waste Management

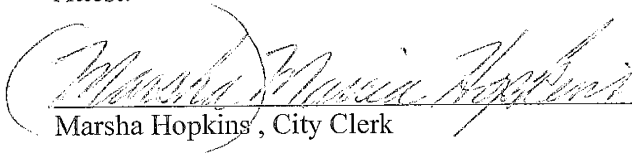
Signature Page - City of Prosser

FOR THE CITY OF RICHLAND, WASHINGTON.


Cindy Johnson, City Manager

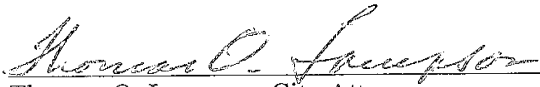
8-31-12
Date

Attest:


Marsha Hopkins, City Clerk

8/31/12
Date

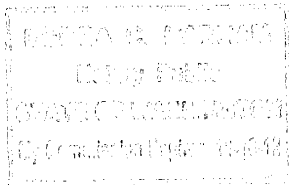
Approved as to Form:

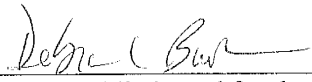

Thomas O. Lampson, City Attorney

8/27/12
Date

I certify that on this 31 day of AUGUST, 2012, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Cindy Johnson and Marsha Hopkins, to me known to be the City Manager and City Clerk, respectively, of the City of Richland, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of the City of Richland.

Witness my hand and official seal hereto affixed the day and year first above written.




Notary Public in and for the State of
Washington residing at BENTON COUNTY
My commission expires: 11/16/12

FOR THE CITY OF WEST RICHLAND, WASHINGTON.

Donna Noski
Donna Noski, City Mayor

8/29/12
Date

Attest:

Julie Richardson
Julie Richardson, City Clerk

8/29/12
Date

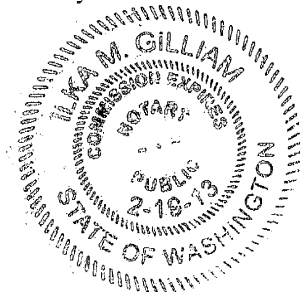
Approved as to Form:

Bronson Brown
Bronson Brown, City Attorney

8/29/12
Date

I certify that on this 29th day of August, 2012, before me, the undersigned Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Donna Noski and Julie Richardson, to me known to be the Mayor and City Clerk, respectively, of the City of West Richland, Washington, the corporation that executed the foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said municipal corporation for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute said instrument and that the seal affixed is the corporate seal of the City of West Richland.

Witness my hand and official seal hereto affixed the day and year first above written.



Tika M. Gilliam
Notary Public in and for the State of
Washington residing at Kennewick
My commission expires: 2-19-13

APPENDIX D

WUTC COST ASSESSMENT QUESTIONNAIRE

Please provide the information requested below:

PLAN PREPARED FOR THE COUNTY OF: BENTON

PLAN PREPARED FOR THE CITY OF: N/A

PREPARED BY: HDR Engineering, Inc.; Michelle Leonard, Project Manager

CONTACT TELEPHONE: 509.546.2041 DATE: 4/16/2013

DEFINITIONS

Please provide these definitions as used in the Solid Waste Management Plan and the Cost Assessment Questionnaire.

Throughout this document:

YR.1 shall refer to **2013.**

YR.3 shall refer to **2015.**

YR.6 shall refer to **2018.**

Year refers to (circle one) **calendar** (Jan 01 - Dec 31)

1. **DEMOGRAPHICS:** To assess the generation, recycling and disposal rates of an area, it is necessary to have population data. This information is available from many sources (e.g., the State Data Book, County Business Patterns, or the State Office of Finance and Management).

1.1 Population

- 1.1.1 What is the **total** population of your County/City?

YR.1 197,954 YR.3 203,736 YR.6 209,836

- 1.1.2 For counties, what is the population of the area **under your jurisdiction?** (Exclude cities choosing to develop their own solid waste management system.)

YR.1 45,528 YR.3 46,859 YR.6 48,262

1.2 References and Assumptions

Population projections using OFM High Growth Management Series, which anticipates growth over the next 20 years by approximately 7-8% every 5 years.

2. **WASTE STREAM GENERATION:** The following questions ask for total tons recycled and total tons disposed. Total tons disposed are those tons disposed of at a landfill, incinerator, transfer station or any other form of disposal you may be using. If other, please identify.

2.1 Tonnage Recycled

- 2.1.1 Please provide the total tonnage **recycled** in the base year, and projections for years three and six.

YR.1 88,243 YR.3 113,352 YR.6 129,196

2.2 Tonnage Disposed

- 2.2.1 Please provide the total tonnage **disposed** in the base year, and projections for years three and six.

YR.1 177,979 YR.3 171,089 YR.6 163,761

2.3 References and Assumptions

Disposal and diversion data from Ecology and County records. Diversion estimates assumes County will increase diversion approximately 2% per year, to 50% by 2020, as outlined in Chapter 1, Plan Goals and objectives section 1.2.

3. SYSTEM COMPONENT COSTS: This section asks questions specifically related to the types of programs currently in use and those recommended to be started. For each component (i.e., waste reduction, landfill, composting, etc.) please describe the anticipated costs of the program(s), the assumptions used in estimating the costs and the funding mechanisms to be used to pay for it. The heart of deriving a rate impact is to know what programs will be passed through to the collection rates, as opposed to being paid for through grants, bonds, taxes and the like.

3.1 Waste Reduction Programs

3.1.1 Please list the solid waste programs which have been implemented and those programs which are proposed. If these programs are defined in the SWM plan please provide the page number. (Attach additional sheets as necessary.)
Refer to sections 3.1.1 and 3.2.1 for existing programs.

IMPLEMENTED

PROPOSED

Public Education and outreach
Donations to non-profits

EPR Support and guidelines
Technical assistance to schools and business
Promotion of reuse opportunities
Promotion of online waste exchanges
Requirements for new developments
Measuring of waste reduction

3.1.2 What are the costs, capital costs and operating costs for waste reduction programs implemented and proposed?

IMPLEMENTED

YR.1	<u>\$150,000</u>	YR.3	<u>\$ 160,000</u>	YR.6	<u>\$170,000</u>
------	------------------	------	-------------------	------	------------------

PROPOSED

YR.1	<u>\$180,000</u>	YR.3	<u>\$200,000</u>	YR.6	<u>\$200,000</u>
------	------------------	------	------------------	------	------------------

3.1.3 Please describe the funding mechanism(s) that will pay the cost of the programs in 3.1.2.

IMPLEMENTED

YR.1	<u>Grant</u>	YR.3	<u>Grant</u>	YR.6	<u>Grant</u>
------	--------------	------	--------------	------	--------------

PROPOSED

YR.1	<u>Grant</u>	YR.3	<u>Grant</u>	YR.6	<u>Grant</u>
------	--------------	------	--------------	------	--------------

3.2 Recycling Programs

3.2.1 Please list the proposed or implemented recycling program(s) and, their costs, and proposed funding mechanism or provide the page number in the draft plan on which it is discussed (attach additional sheets as necessary).

IMPLEMENTED

PROGRAM	COST	FUNDING
<u>Drop boxes</u>	<u>\$ 20,000</u>	<u>Grants; revenue from recyclables</u>

PROPOSED

PROGRAM	COST	FUNDING
<u>Expand drop boxes</u>	<u>\$50,000</u>	<u>Grants; revenue from recyclables</u>
<u>Technical assistance</u>	<u>\$20,000</u>	<u>Grants; revenue from recyclables</u>

3.3 Solid Waste Collection Programs

3.3.1 Regulated Solid Waste Collection Programs

Fill in the table below for each **WUTC regulated** solid waste collection entity in your jurisdiction. (Make additional copies of this section as necessary to record all such entities in your jurisdiction.)

WUTC Regulated Hauler Name: Basin Disposal, Inc.
G-Permit # 118

RESIDENTIAL	<u>YR.1</u>	<u>YR.3</u>	<u>YR.6</u>
- # of Customers	1,005	1,035	1,066
- Tonnage Collected	1,333	1,373	1,414
COMMERCIAL			
- # of Customers	155	160	164
- Tonnage Collected	6,205	6,391	6,582

WUTC Regulated Hauler Name: Ed's Disposal, Inc.
G-permit #110

RESIDENTIAL	<u>YR. 1</u>	<u>YR3.</u>	<u>YR.6</u>
- # of Customers	3,131	3,224	3,321
- Tonnage Collected	4,947	5,095	5,248
COMMERCIAL			
- # of Customers	136	140	144
- Tonnage Collected	719	741	763

**WUTC Regulated Hauler Name: Waste Management of Kennewick
G-permit #237**

RESIDENTIAL	<u>YR1.</u>	<u>YR3.</u>	<u>YR.6</u>
- # of Customers	5,372	5,533	5,699
- Tonnage Collected	6,196	6,382	6,573

COMMERCIAL			
- # of Customers	519	535	551
- Tonnage Collected	5,205	5,361	5,522

**WUTC Regulated Hauler Name: Sanitary Disposal, Inc.
G-permit #173**

RESIDENTIAL	<u>YR.1.</u>	<u>YR3.</u>	<u>YR.6</u>
- # of Customers	176	181	187
- Tonnage Collected	587	605	623

COMMERCIAL			
- # of Customers	36	37	38
- Tonnage Collected	1,774	1,827	1,882

Waste collection projections based on population projections for county, OFM, high series.

3.3.2 Other (non-regulated) Solid Waste Collection Programs Fill in the table below for other solid waste collection entities in your jurisdiction. (Make additional copies of this section as necessary to record all such entities in your jurisdiction.)

Hauler Name: City of Richland

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
# of Customers	16,845	17,800	18,900
Tonnage Collected	37,000	39,000	41,000

3.4 Energy Recovery & Incineration (ER&I) Programs

(If you have more than one facility of this type, please copy this section to report them.)

3.4.1 Complete the following for each facility:

Name: N/A
Location: _____
Owner: _____

Operator: _____

3.4.2 What is the permitted capacity (tons/day) for the facility? N/A

3.4.3 If the facility is not operating at capacity, what is the average daily throughput?

YR.1 N/A YR.3 N/A YR.6 N/A

3.4.4 What quantity is estimated to be land filled which is either ash or cannot be processed.

YR.1 N/A YR.3 N/A YR.6 N/A

3.4.5 What are the expected capital costs and operating costs, for ER&I programs (not including ash disposal expense)?

YR.1 N/A YR.3 N/A YR.6 N/A

3.4.6 What are the expected costs of ash disposal?

YR.1 N/A YR.3 N/A YR.6 N/A

3.4.7 Is ash disposal to be: N/A _____ on-site?
 _____ in county?
 _____ long-haul?

3.4.8 Please describe the funding mechanism(s) that will fund the costs of this component.
N/A

3.5 Land Disposal Program

(If you have more than one facility of this type, please copy this section to report them.)

3.5.1 Provide the following information for each **land disposal facility** in your jurisdiction which receives garbage or refuse generated in the county.

Landfill Name: **Horn Rapids Landfill**
Owner: **City of Richland**
Operator: **City of Richland**

3.5.2 Estimate the **approximate tonnage** disposed at the landfill by **WUTC regulated haulers**. If you do not have a scale and are unable to estimate tonnages, estimate using cubic yards, and indicate whether they are compacted or loose.¹

YR.1 N/A YR.3 N/A YR.6 N/A

¹ Compacted cubic yards will be converted at a standard 600 pounds per yard. Loose cubic yards will be converted at a standard 300 pounds per cubic yard. Please specify an alternative conversion ratio if one is presently in use in your jurisdiction.

All waste collected by WUTC regulated haulers is disposed outside the County.

3.5.3 Using the same conversion factors applied in 3.5.2, please estimate the **approximate tonnage** disposed at the landfill by other contributors.

YR.1 **54,359** YR.3 **55,446** YR.6 **56,555**

This includes City of Richland and self-haulers at Horn Rapids Landfill

3.5.4 Provide the cost of operating (including capital acquisitions) each landfill in your jurisdiction. For any facility that is privately owned and operated, skip these questions.

YR.1 **N/A** YR.3 **N/A** YR.6 **N/A**

The Horn Rapids Landfill is owned and operated by the City of Richland.

3.5.5 Please describe the funding mechanism(s) that will defray the cost of this component.
N/A

3.6 Administration Program

3.6.1 What is the budgeted cost for administering the solid waste and recycling programs and what are the major funding sources.

Budgeted Cost

YR.1 **\$80,000** YR.3 **\$100,000** YR.6 **\$ 120,000**

Funding Source

YR.1 **Grants/County and Inter-local contributions** YR.3 **Same** YR.6 **Same**

3.6.2 Which cost components are included in these estimates?

Expenses included in the estimate are as follows: salaries and wages, personnel benefits, supplies, permits, other services and charges, and capital expenditures.

3.6.3 Please describe the funding mechanism(s) that will recover the cost of each component.

Funding mechanisms include grants. The Benton Governance Technical Advisory Committee, Solid Waste Advisory Committee and County Commissioners target grants for specific programs as determined.

3.7 Other Programs

For each program in effect or planned which does not readily fall into one of the previously described categories please answer the following questions. (Make additional copies of this section as necessary.)

3.7.1 Describe the program, or provide a page number reference to the plan.

NA

3.7.2 Owner/Operator

3.7.3 Is WUTC Regulation Involved? If so, please explain the extent of involvement in section 3.8.

NA

3.7.4 Please estimate the anticipated costs for this program, including capital and operating expenses.

YR.1 \$NA YR.3 \$NA YR.6 \$NA

3.7.5 Please describe the funding mechanism(s) that will recover the cost of this component.

NA

3.7 **References and Assumptions** (attach additional sheets as necessary)

4. FUNDING MECHANISMS: This section relates specifically to the funding mechanisms currently in use and the ones, which will be implemented to incorporate the recommended programs in the draft plan. Because the way a program is funded directly relates to the costs a resident or commercial customer will have to pay, this section is crucial to the cost assessment process. Please fill in each of the following tables as completely as possible.

Table 4.1.1 Facility Inventory

Facility Name	Type of Facility	Tip Fee per Ton	Transfer Cost**	Transfer Station Location	Final Disposal Location	Total Tons Disposed	Total Revenue Generated (Tip Fee x Tons)
NONE							

Table 4.1.2 Tip Fee Components

Tip Fee by Facility	Surcharge	City Tax	County Tax	Transportation Cost	Operational Cost	Administration Cost	Closure Costs
NONE							

Table 4.1.3 Funding Mechanism

Name of Program Funding Mechanism will defray costs	Bond Name	Total Bond Debt	Bond Rate	Bond Due Date	Grant Name	Grant Amount	Tip Fee	Taxes	Other	Surcharge
Outreach and Education; waste reduction					CPG	\$20,000				
Yard Waste Chipping Program					ATB	\$14,000				
Recycling Drop Box Program					CPG	\$20,000				
HHW Collection Events					CPG	\$180,000				
MRW Facility					CPG	\$N/A				

Table 4.1.4 Tip Fee Forecast

Tip Fee per Ton by Facility	Year One	Year Two	Year Three	Year Four	Year Five	Year Six

4.2 **Funding Mechanisms** summary by percentage: In the following tables, please summarize the way programs will be funded in the key years. For each component, provide the expected percentage of the total cost met by each funding mechanism (e.g., Waste Reduction may rely on tip fees, grants, and collection rates for funding). You would provide the estimated responsibility in the table as follows: Tip fees = 10%; Grants = 50%; Collection Rates = 40%. The mechanisms must total 100%. If components can be classified as “other,” please note the programs and their appropriate mechanisms. Provide attachments as necessary.

Table 4.2.1 Funding Mechanism by Percentage						
Year One						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Education and Outreach; waste reduction		75		25		100
Yard waste chipping program		75		25		100
Recycling Drop Box Program		75		25		100
HHW Collection Events		75		25		100
MRW Facility Development		75		25		100

Table 4.2.2 Funding Mechanism by Percentage						
Year Three						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Small business hazardous waste disposal at MRW facility	100					100
MRW Facility Development		25	25	25	25	100
Education and Outreach; waste reduction		75		25		100
Yard waste chipping program		75		25		100
Recycling Drop Box Program		75		25		100

Table 4.2.3 Funding Mechanism by Percentage						
Year Six						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
MRW Facility Operations		25		25	50	100
Education and Outreach; waste reduction		75		25		100
Yard Waste chipping program		75		25		100
Recycling Drop Box Program				100		100

4.3 References and Assumptions

Please provide any support for the information you have provided. An annual budget or similar document would be helpful.

4.4 Surplus Funds

Please provide information about any surplus or saved funds that may support your operations.

Appendix L
Agricultural Land Reclassification
Memorandum (2018)

Memorandum

January 1, 2018

To: Jerrod MacPherson, Benton County Planning Department

From: Adam Hill and Ben Floyd, Anchor QEA

Re: Agricultural Resource Land Reclassification

Introduction

Benton County is amending their Comprehensive Plan through a comprehensive 2017 plan update. As part of these amendments, it was determined that a county-wide review of agricultural resource lands be completed, as the designated lands had not been reviewed and updated for several years, and to confirm a more complete set of designation factors are addressed in the updated analysis. This memorandum describes work completed as part of this review and analysis process, including the elements necessary to consider for agricultural resource land classification, findings from the review, and recommended changes to agricultural resource lands in Benton County.

Agricultural Resource Land Considerations

Benton County is required to implement a comprehensive plan under Revised Code of Washington (RCW) 36.70A.040. As part of this requirement, “the county...**shall designate** critical areas, **agricultural lands**, forestlands, and mineral resource lands, and **adopt development regulations conserving these designated agricultural lands**, forestlands, and mineral resource lands and protecting these designated critical areas” (emphasis added) (RCW 36.70A.040(3)(b)).

Agricultural land is defined as “**land primarily devoted to the commercial production** of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees..., finfish in upland hatcheries, or livestock, **and that has long-term commercial significance for agricultural production**” (emphasis added) (RCW 36.70A.030(2)). Long-term commercial significance “includes the **growing capacity, productivity, and soil composition of the land** for long-term commercial production, in consideration with the land’s proximity to population areas, and the possibility of more intense uses of the land” (emphasis added) (RCW 36.70A.030(10)). Additionally, in *Lewis County v Western Washington Growth Management Hearings Board* (2006), it is noted that “[i]f the farm industry cannot use land for agricultural production due to economic, irrigation, or other constraints, the possibility of more intense uses of the land is heightened. RCW 36.70A.030(10) permits such considerations in designating agricultural lands.”

Further, each county “shall designate where appropriate [a]gricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products” (RCW 36.70A.170(1)(a)). A county “may use a variety of innovative zoning techniques in areas designated as agricultural lands of long-term commercial significance.... The innovative zoning techniques should be designed to conserve agricultural lands and encourage the agricultural economy” (RCW 36.70A.177(1)).

Washington Administrative Code (WAC) 365-190-050 establishes minimum guidelines to assist counties in classifying and designating agricultural lands. The following sections go through the minimum guidelines in WAC 365-190-050 and the approach being used to follow the guidelines.

Classification/Designation Approach

WAC 365-190-050(1) states that “counties must approach the effort as a county-wide or area-wide process. Counties...should not review resource lands designations solely on a parcel-by-parcel process. Counties...must have a program for the transfer or purchase of development rights prior to designating agricultural resource lands in urban growth areas. Cities are encouraged to coordinate their agricultural resource lands designations with their county and any adjacent jurisdictions” (WAC 365-190-050(1)).

The first part of this guideline (county-wide/area-wide process) is met because analyses and approaches developed in the following sections of this memorandum are applied county-wide as part of the review process to determine if agricultural land designations need revisions. Individual parcels are not evaluated in this process. Figure 1 shows the existing agricultural resource land designations of Benton County.

No lands are being designated as agricultural resource lands in urban growth areas, so a program to transfer or purchase development rights is not required by Benton County.

Several cities are adjacent to Benton County planning jurisdictions. Figure 1 also shows the delineation of city limits and urban growth areas within Benton County.

Development Regulations

WAC 365-190-050(2) states that counties “must adopt development regulations that assure the conservation of agricultural resource lands” (WAC 365-190-050(2)). Benton County has adopted regulations to meet this guideline; these regulations are coded in Benton County Code (BCC) Chapter 11.18. These regulations discuss allowable uses, uses requiring permits, and building requirements.

Additionally, coordination with the Benton Conservation District (CD) Board of Supervisors and staff occurred over two meetings in preparing this memorandum, one with the District Manager on

May 19, 2017, and another with the Board on June 14, 2017. The CD inquired about a setback or buffer zone between Growth Management Act (GMA) agricultural resource land and residential development, to further protect agricultural lands of long-term commercial significance, and to avoid future land use conflicts. The County confirmed a 150-foot setback is in place to perform these functions. Additionally, the Conservation District suggested opportunities for strengthening the analysis to the findings and conclusions, and provided other comments on evaluation criteria, how to incorporate Conservation Reserve Program (CRP) lands and other topics. Revisions to this memorandum were made to address these comments.

Designation Factors

WAC 365-190-050(3) states that "lands should be considered for designation as agricultural resource lands based on three factors:" 1) specifically is not characterized by urban growth, 2) is used or is capable of being used for agricultural production, and 3) has long-term commercial significance for agriculture. Each of these factors are described in more detail and analyzed below.

Urban Growth

WAC 365-190-050(3)(a) states that lands should be considered for agricultural resource designation if "the land is not already characterized by urban growth" (WAC 365-190-050(3)(a)). Urban growth areas are characterized in WAC 365-196-310. Figure 2 shows the areas in Benton County already characterized by urban growth.

These urban growth areas mapped in Figure 2 were not under consideration as agricultural resource lands for this analysis.

Production Capability

WAC 365-190-050(3)(b) states that lands should be considered for agricultural resource designation if "the land is used or capable of being used for agricultural production. This factor evaluates whether lands are well suited to agricultural use based primarily on their physical and geographic characteristics" (WAC 365-190-050(3)(b)). Production capability is described in further detail, stating that lands currently used or capable to be used for agricultural production "must be evaluated for designation" (WAC 365-190-050(3)(b)(i)), and that counties "shall use the land-capability classification system of the United States Department of Agriculture Natural Resources Conservation Service [NRCS] as defined in relevant Field Office Technical Guides" (WAC 365-190-050(3)(b)(ii)).

The NRCS land-capability classification divides soil types into eight classes. Classes 1 through 4 are generally suitable for cultivation, while Classes 5 to 8 are generally not suitable for cultivation. However, with certain types of land management, Classes 5 to 7 could be used for agriculture (Duncan 2017). Classes are different for the same soil type for irrigated and non-irrigated lands. An analysis was done using Benton CD data to determine land that is irrigated; the remaining land is

assumed to be non-irrigated. Figure 3 maps the NRCS land-capability classification for Benton County, splitting the classes into suitable, suitable with management, and non-suitable land for cultivation.

Figure 3 shows that there are some areas currently designated as agricultural resource lands that are not well suited to agricultural use, areas that can be suitable for agricultural use with certain types of land management, and other areas not designated as agricultural resource lands that may be well suited to agricultural use. Figure 4 highlights these areas. Of the areas highlighted, areas near the fringe of the current areas designated as agricultural land (along the freeway corridor and along the Columbia River) will be more likely considered for designation changes from agricultural resource lands as these areas are nearer to population centers and would have the possibility of more intense uses of the land in the long-term. Additionally, in some instances these are also the more marginal lands, particularly when considering dryland production areas.

This mapping procedure is done as an initial step to check the potential for areas to be well suited for addition or removal from agricultural resource land designation, as one consideration in the evaluation process.

Long-Term Commercial Significance

WAC 365-190-050(3)(c) states that lands should be considered for agricultural resource designation if "the land has long-term commercial significance for agriculture" (WAC 365-190-050(3)(c)). As part of determining this, counties should consider classification of prime and unique farmland soils, availability of public facilities including roads used in transporting agricultural products, tax status, public service availability, proximity to urban growth areas, predominant parcel size, land use settlement patterns, intensity of nearby land uses, history of nearby land development permits, land values under alternative uses, and proximity to markets (WAC 365-190-050(3)(c)). In addition to the factors listed in WAC 365-190-050(3)(c), considerations for long-term commercial significance in Benton County include water availability/precipitation, enrollment in CRP/conservation land, and pesticide restrictions. The considerations employed in this analysis are described in the following order:

- Water availability/precipitation
- Parcel size
- Nearby urban growth areas, settlement patterns, land use, land values, and development permits
- Land in CRP or conservation land
- Prime farmlands
- Pesticide restrictions
- Public facilities and proximity to markets
- Tax status

Water Availability/Precipitation

One of the main considerations in Benton County for long-term commercial significance is water availability. Water availability can either come from irrigation or precipitation. If there is insufficient water available, lands cannot be commercially significant in the long-term.

To assist in determining water availability for dryland production areas, an analysis of precipitation was completed using data from Washington State University's AgWeatherNet, a network of weather stations throughout Washington State (including Benton County) that monitor several weather aspects, including precipitation. The mean (average) annual precipitation was collected from the AgWeatherNet web site and averages over the past 5 years, 9 years, and over the period of record (up to 24 years) were compared for the 32 stations in Benton County. Most stations (27 of the 32) had at least 5 years of records, and over half had at least 9 years of records. The 9-year average was also similar to the period of record for stations with longer records, so for purposes of this analysis, a 9-year annual average was used. Precipitation was estimated for most of Benton County using an inverse distance weighted interpolation that was log-normalized and back-transformed through GIS analysis. Figure 5 shows the results of this analysis.

The precipitation analysis is compared against non-irrigated lands that are suitable for cultivation in Figure 6. This figure highlights lands that would typically be suitable but may not be getting sufficient water to be long-term commercially significant. For this analysis, it was assumed that less than 6.5 inches (annual average) was not sufficient. This is based on information provided by John Christensen, a Benton County producer, who has records of yield and net profits or losses information for dryland farming at various annual precipitations and elevations. Lower precipitation areas had significant net losses while higher precipitation areas had net profits. Specifically, areas with mean annual precipitations of 4 to 6 inches had net losses of \$13 to \$62 per acre for continuous crops and net losses of \$68 to \$118 per acre for summer/fallow crops. Areas with mean annual precipitation of 9 to 11 inches had net profits of \$90 to \$118 per acre for continuous crops and net profits of \$41 to \$69 per acre of summer/fallow crops (Christensen 2016).

The areas that fit into non-sufficient precipitation and dryland farming include land immediately south of the Richland/Kennewick border, areas in Finley, and areas south of Prosser on the Horse Heaven Hills. In communications with the CD Board of Supervisors, the Board identified that most of the lands with lower yields are enrolled in CRP, or were enrolled historically, with many of these lands left uncultivated after CRP contracts expired.

Elevations in Benton County were also briefly reviewed to note any relationship between elevation and precipitation in Benton County. Generally, precipitation increased as elevations increased. The low-lying areas near Richland and Kennewick had a much lower average annual precipitation than most areas in the Horse Heaven Hills in the southeastern area of the county, except as noted above.

These analyses are meant to give a general idea of precipitation in Benton County. Some areas may have more precipitation than modeled and some areas may have less precipitation than modeled. Findings from precipitation analysis are considered sufficiently accurate to draw conclusions for long-term commercial significance determinations.

Parcel Size

Agricultural lands must be large enough in area to have long-term commercial significance. An analysis was completed that compares parcel size to land use designation with a threshold of 10 acres—the threshold assumed to be needed for land to be long-term commercially significant, acknowledging as pointed out by the CD that smaller acreages may be adequate for certain high value crops such as tree fruits or wine grape vineyards. County land use designations for smaller parcels allow for development of these higher value crops, as desired. Figure 7 highlights the large parcels outside of agricultural resource land designation and small parcels inside of agricultural resources designation that may have potential for change based solely on parcel size. Capability class is also included in Figure 7 for reference.

Lands that have parcel sizes below the 10-acre threshold that are currently designated as agricultural resource lands include areas southwest of Richland and southeast of Benton City, and areas south of West Richland and northeast of Benton City.

Lands with parcel sizes above the 10-acre threshold and not currently designated as agricultural resource lands include areas east of Paterson, areas north of Plymouth, and land throughout the highway corridor. Many of these lands do not have suitable soils for cultivation without management, or they are already reserved as public or open spaces.

Nearby Urban Growth Areas, Settlement Patterns, Land Use, Land Values, and Development Permits

Some areas were included as agricultural lands when these lands included irrigation systems, permanent crops, and other evidence of ongoing agricultural land use, if they were larger parcels, and had a mix of rural residential and smaller agricultural operations around them with no clear land use settlement or higher intensity uses nearby. These lands were often adjacent to other agricultural lands. Other areas, including larger parcels in some cases, were considered for reclassified from GMA Agriculture to other designations if they were more marginal farm ground (typically dryland) and adjacent to areas developing that had experienced recent or ongoing higher intensity or urban land use settlement, associated higher land values, and also had roads and utilities in relative close proximity, as described further below. The areas demonstrating this kind of growth and development/intensity of nearby land uses to agricultural lands are the Southridge area, Badger Canyon, higher intensity residential development in Finley, and development south of Badger Mountain in South Richland.

Land Enrolled in Conservation Reserve Program or Conservation Land

Land in CRP or conservation land may or may not mean that a land has long-term commercial significance. In some cases, land may return from CRP or conservation and have long-term commercial significance; in other cases, the land is in CRP or conservation because it is not viable to farm the land. Figure 8 maps the land noted as CRP or conservation land in Benton County.

Prime Farmlands

Some farmlands are designated as farmland of statewide importance or farmland of unique importance. These areas are mapped in Figure 9. Statewide important and unique important farmland are reviewed with previous elements listed to determine if any areas should be designated as agricultural resource land.

Some areas near Finley, areas south of Richland, and areas between the northern area of West Richland and Richland are noted as farmlands of statewide importance.

Pesticide Restrictions

Benton County has restrictions to certain pesticide applications. Some areas have more stringent restrictions than others, which include prohibition of aerial application of insecticides labeled with the signal words "danger/poison" and restricted use herbicides (WAC 16-230-810). These areas are specifically located in the Northeast Horse Heaven Hills and reduce the potential of being long-term commercially viable due to the potential of added costs of hand-applying pesticides or reduced yield from not applying pesticides. While as a stand-alone factor, this may not result in removal of land classified as long-term commercially significant, it can be one additional factor in areas where lower yields typically occur could tip the balance away from designating an area as long-term commercially significant.

Public Facilities and Proximity to Markets

Most areas in Benton County have sufficient facilities available to the public for transportation of agricultural goods such that they are not limiting to long-term commercial significance. Some areas were considered for reclassification from GMA Agriculture to other designations if they had public facilities such as urban water and sewer systems nearby and available, and a relatively dense network of public roads also available. These areas include the Southridge area, Badger Canyon, and the area south of Badger Mountain.

In terms of proximity to markets, most areas are relatively close to markets such that this element does not limit an area's long-term commercial significance.

Tax Status

Tax status for lands analyzed were unremarkable. The tax status for the areas reviewed and considered for agricultural land removal includes residential vacant lots, limited use areas, mobile homes, rural residential, dry agricultural land, and pasture.

Food Security

WAC 365-190-050(4) states that "counties may consider food security issues, which may include providing local food supplies for food banks, schools and institutions, vocational training opportunities in agricultural operations, and preserving heritage or artisanal foods (WAC 365-190-050(4)).

Benton County does not explicitly consider food security issues as Benton County is a net exporter of agriculture; however, this element was reviewed to ensure food security is not a concern for the area.

Sufficiency

WAC 365-190-050(5) states that "the process should result in designating an amount of agricultural resource lands sufficient to maintain and enhance the economic viability of the agricultural industry in the county over the long term; and to retain supporting agricultural businesses, such as processors, farm suppliers, and equipment maintenance and repair facilities" (WAC 365-190-050(5)).

In addition to agricultural resource land, Benton County has proposed adding a new land designation called Rural Resource land. This land is less dense than previous land designations (typically changing from 5-acre to 20-acre minimums), preserving agriculture and range lands generally on steeper and north-facing sloped lands, and expanding the areas where agriculture production can occur. This new designation is a variation of an innovative zoning approach as referenced in introductory information above.

To ensure the sufficiency of agricultural resource lands, an area comparison will be made of agricultural resource areas designated for removal and new agricultural resource area designations.

Local Importance

WAC 365-190-050(5) states that "counties...may further classify additional agricultural lands of local importance. Classifying additional agricultural lands of local importance should include, in addition to general public involvement, consultation with the board of the local conservation district and the local committee of the farm service agency" (WAC 365-190-050(5)).

Benton County has two American Viticultural Areas (AVAs) fully within the county boundaries and two AVAs partially located in the county boundaries. Figure 10 maps the AVAs located fully within Benton County.

Much of the AVAs are already designated as agricultural resource lands; it is recommended that these areas not be removed from designation.

Findings and Conclusions

Using the information presented in the previous sections, multiple areas in the County may be considered for reclassification. In general, it is important to maintain continuity in agricultural resource land designation; unless there are sufficient reasons that the agricultural resource land should be de-designated, land should remain as agricultural resource land to protect the resource. Therefore, many areas that may not be as suitable as agricultural land may remain within agricultural resource land designation due to its proximity to lands of other types.

Additionally, there are many areas that have potential to be removed from designation in some analyses, but not others. For example, there are several areas north of Prosser that have small parcel sizes but are currently designated as agricultural resource land. However, these areas are irrigated lands with suitable soils, so it would not be appropriate to remove them from agricultural resource land designation.

The areas that should be removed from agricultural resource land designation are areas south of Richland, Kennewick, and West Richland. These areas are near population centers, adjacent to growing areas, proximate to utilities and roads, have low precipitation without irrigation, are outside of AVAs, and follow the recent settlement pattern of the County. Some of these areas also have more restrictive pesticide regulations. Together these considerations threaten or have already reduced the viability for the long-term commercial significance of the land as agricultural land, which fits the considerations noted in *Lewis County v Western Washington Growth Management Hearings Board (2006)*.

Areas that should be added to agricultural resource land designation are areas south of Finley, west of Benton City, and near Prosser. These areas are currently farmed, are irrigated and often have permanent crops in place, are large parcels, exist outside of urban growth areas, and are near existing land that is already designated as agricultural resource land and other rural uses.

Additionally, approximately 7,130 acres are proposed to be changed from higher density current designations to Rural Resource. This change in designation will preserve these lands for rangeland uses and agricultural production opportunity areas, such as vineyards and orchards. This can be considered an innovative zoning technique that fits RCW 36.70A.177(1) as being designed to conserve agricultural lands and encourage the agricultural economy.

Based on the information and analyses in the previous sections, some areas are proposed to be added to the agricultural land designation, some areas are proposed to be removed from the agricultural land designation. The changes are shown in Figure 11. Details of areas proposed to be added are summarized in Table 1. Details of areas proposed to be removed are summarized in Table 2.

**Table 1
Agricultural Resource Lands Proposed Additions**

Township/Range/Section	Area (acres)	Previous Land Use Designation	Reason(s) for Addition
T09N R24E S20,29	67	General Commercial	Irrigated land, suitable soil type, large parcel size
T09N R24E S24	171	Light Industrial	Irrigated land, large parcel size, farmland of statewide importance
T09N R24E S29,30	68	Rural Lands 5	Irrigated land, suitable soil type, large parcel size
T09N R26E S10,11,14,15,17,20,24 T09N R27E S19,30	1,160	Rural Lands 5	Irrigated land, suitable soil type, large parcel size, farmland of statewide importance
T08N R30E S34	144	Rural Lands 5	Irrigated land, suitable soil type, large parcel size
T09N R24E S24,28 T09N R25E S19,20,28,29,33,34 T09N R26E S04,05,07,17,18,19,20 T10N R26E S26,35	2,338	Rural Lands 5	Irrigated land, suitable soil type, large parcel size, farmland of statewide importance
T08N R24E S07,08,09	457	Rural Lands 5	Irrigated land, suitable soil type, large parcel size
T07N R30E S12	20	Rural Lands 5	Irrigated land, suitable soil type, large parcel size, farmland of statewide importance
T08N R30E S28,29,30	588	Rural Lands 5	Irrigated land, suitable soil type, large parcel size, farmland of statewide importance
T09N R26E S02,11	555	Rural Lands 5	Irrigated land, suitable soil type, large parcel size
T05N R27E S01 T05N R28E S06	483	Heavy Industrial	Irrigated land, suitable soil type, large parcel size
Total area (acres)	6,051		

**Table 2
Agricultural Resource Lands Proposed Removals**

Township/Range/Section	Area (acres)	New Land Use Designation	Reason(s) for Removal
T06N R30E S13,23,24,26,27 T06N R31E S07,18	122	Public	Not suitable soil type, public access to river
T08N R27E S30	2	Public	Small parcel size, public
T08N R27E S02 T08N R28E S27 T08N R30E S32 T09N R27E S21	797	Rural Remote	Parcel size, non-irrigation with low precipitation, near population center/urbanizing areas, follows settlement patterns extending to south and west of Tri- Cities, next to areas increasing in property value
T08N R28E S13,24 T08N R29E S17,18,19,20,22,23,26,27	3,644	Rural Remote	Non-irrigation with low precipitation, near population center/urbanizing areas, follows settlement patterns extending to south and west of Tri- Cities, next to areas increasing in property value
Total area (acres)	4,565		

Areas proposed for addition include areas that are currently farmed, are irrigated, have a suitable soil type, and are large enough to be commercially viable in the long-term. They are generally located on the border of the existing designated agricultural resource land. Areas proposed for removal are generally located near population centers, transportation systems, and public services, and have potential for more intense use.

As shown in Table 1, the areas proposed to be added to agricultural resource land designation total about 6,050 acres, while Table 2 shows the areas proposed to be removed from agricultural resource land designation total 4,565 acres. This is a net increase of approximately 1,500 acres of designated agricultural resource land. Lands added are larger in size and are already irrigated on suitable soils, while lands removed have either small parcel size, are public access, or are non-irrigated with low average annual precipitation.

In addition to the net increase of 1,500 acres of designated agricultural resource land, about 7,130 acres are designed to be changed from denser land uses to rural resource land, which (as noted

previously) is less dense than previous land designations that can be used for farms, orchards, and other agricultural land use to preserve agricultural lands.

These recommended changes follow the goals of the GMA in regard to agricultural lands. As noted in *Clark County v. Western Washington Growth Management Hearings Board* (2011), “[a] significant goal of the GMA is to identify, maintain, enhance, and conserve agricultural lands. See RCW 36.70a.020(8).” With the increase in agricultural resource land designation, removal of land that does not have long-term commercial significance, and a new land designation of rural resource land, these changes help maintain the GMA goals for agricultural lands.

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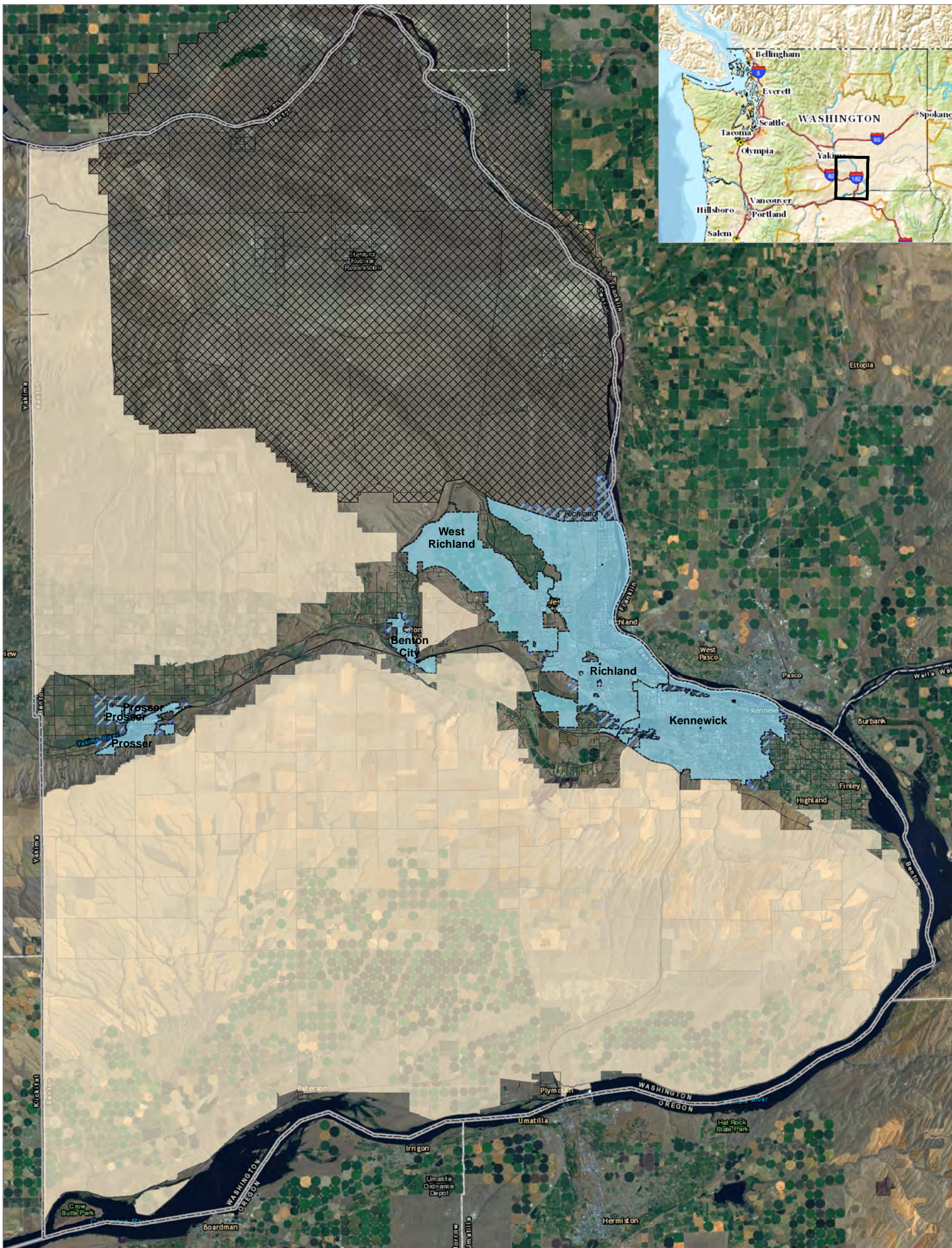
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Figures



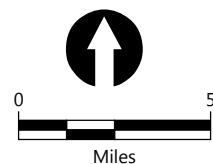
LEGEND:

- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site

Land Use (2011)

- District
- GMA AG

NOTE(S):

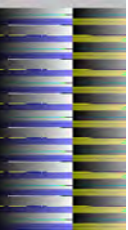
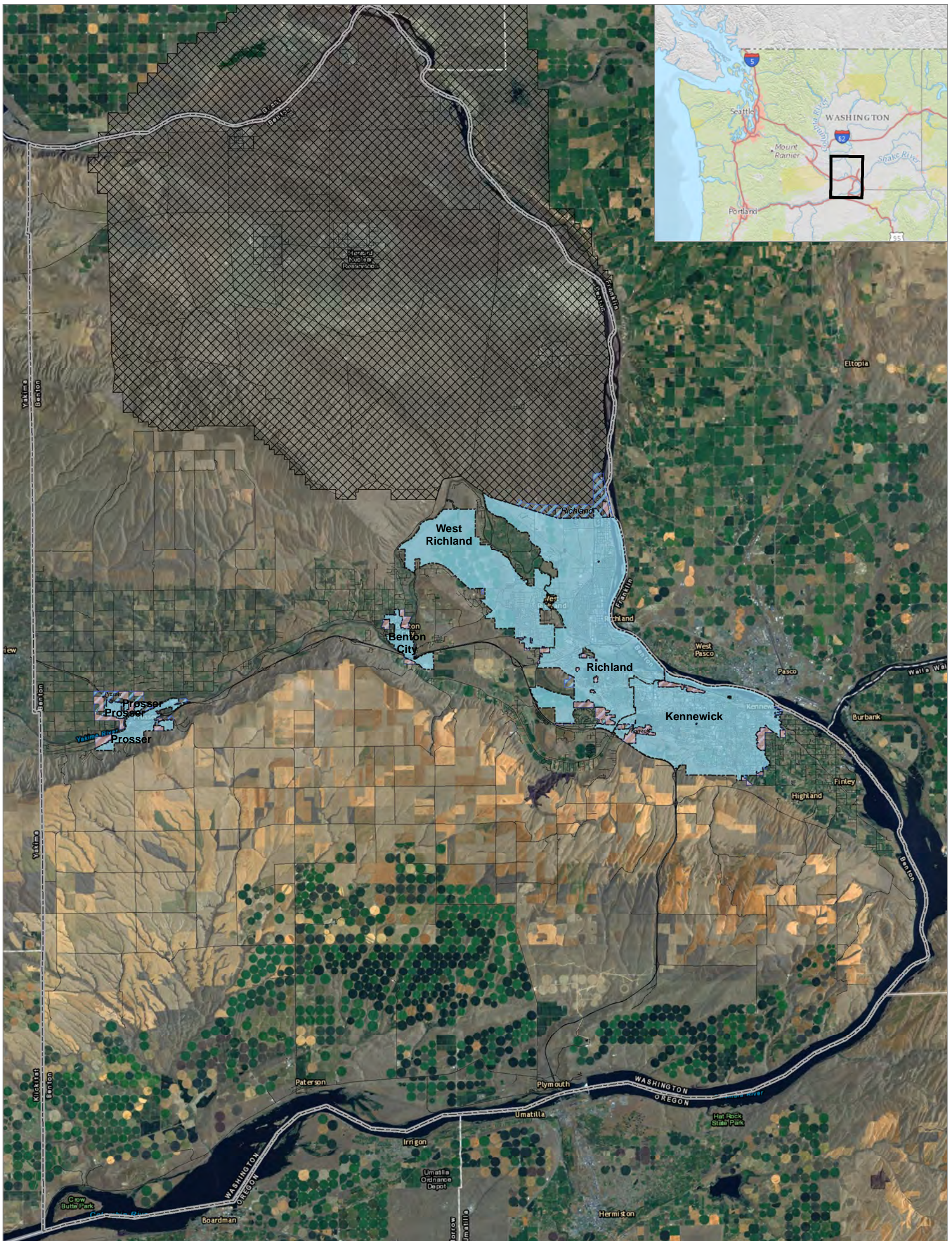


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Figure 1
Existing Designated Agricultural Resource Lands and City Planning Areas

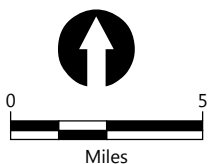
Benton County
 Agricultural Resource Land Reclassification



LEGEND:

- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site
- Land Use (2011)**
- District**
- UGA

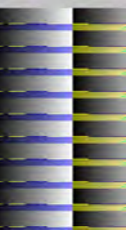
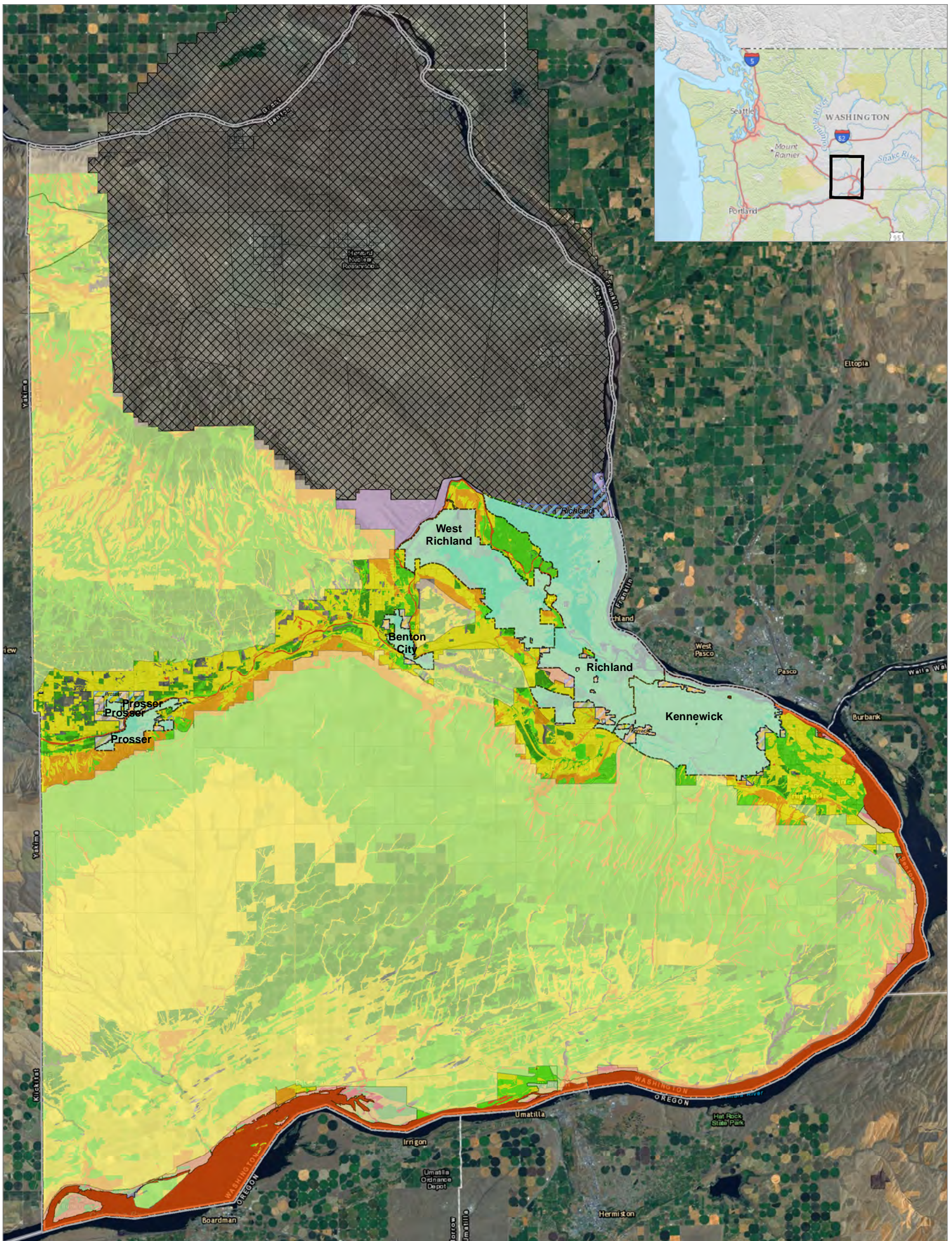
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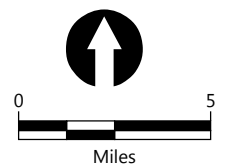
Figure 2
Urban Growth Areas
 Benton County
 Agricultural Resource Land Reclassification
 BEN EXH-2002 Page 0971 of 1511



LEGEND:

- | | | |
|-----------------|------------------------|--------------------------------------|
| — Roads | Land Use (2011) | Capability Class |
| City Limits | District | ■ Suitable - Class 2 |
| UGA | ■ PARK DISTRICT | ■ Suitable - Class 3 |
| County Boundary | ■ UGA | ■ Suitable - Class 4 |
| Hanford Site | ■ GMA AG | ■ Suitable with Management - Class 6 |
| | | ■ Suitable with Management - Class 7 |
| | | ■ Non-suitable - Class 8 |

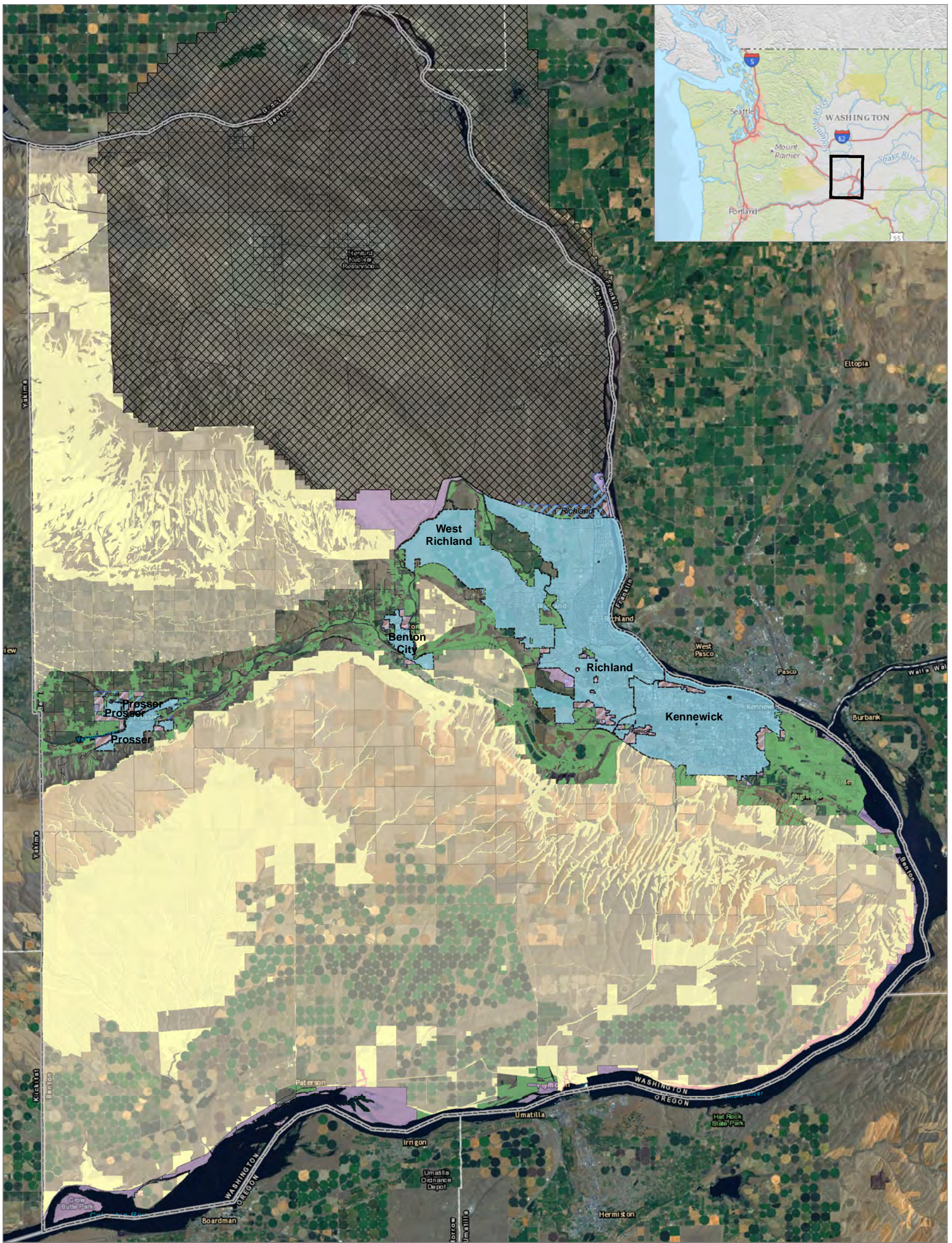
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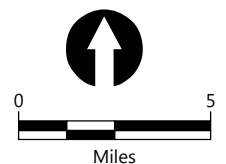


Figure 3
NRCS Capability Class
 Benton County
 Agricultural Resource Land Reclassification
 BEN EXH-2002 Page 0972 of 1511



LEGEND:

- | | | |
|-------------------|------------------------|---|
| — Roads | Land Use (2011) | ■ Suitable capability not in GMA AG |
| ■ City Limits | District | ■ Suitable capability with management in GMA AG |
| ■ UGA | ■ PARK DISTRICT | ■ Non-suitable capability in GMA AG |
| ■ County Boundary | ■ UGA | |
| ■ Hanford Site | ■ GMA AG | |

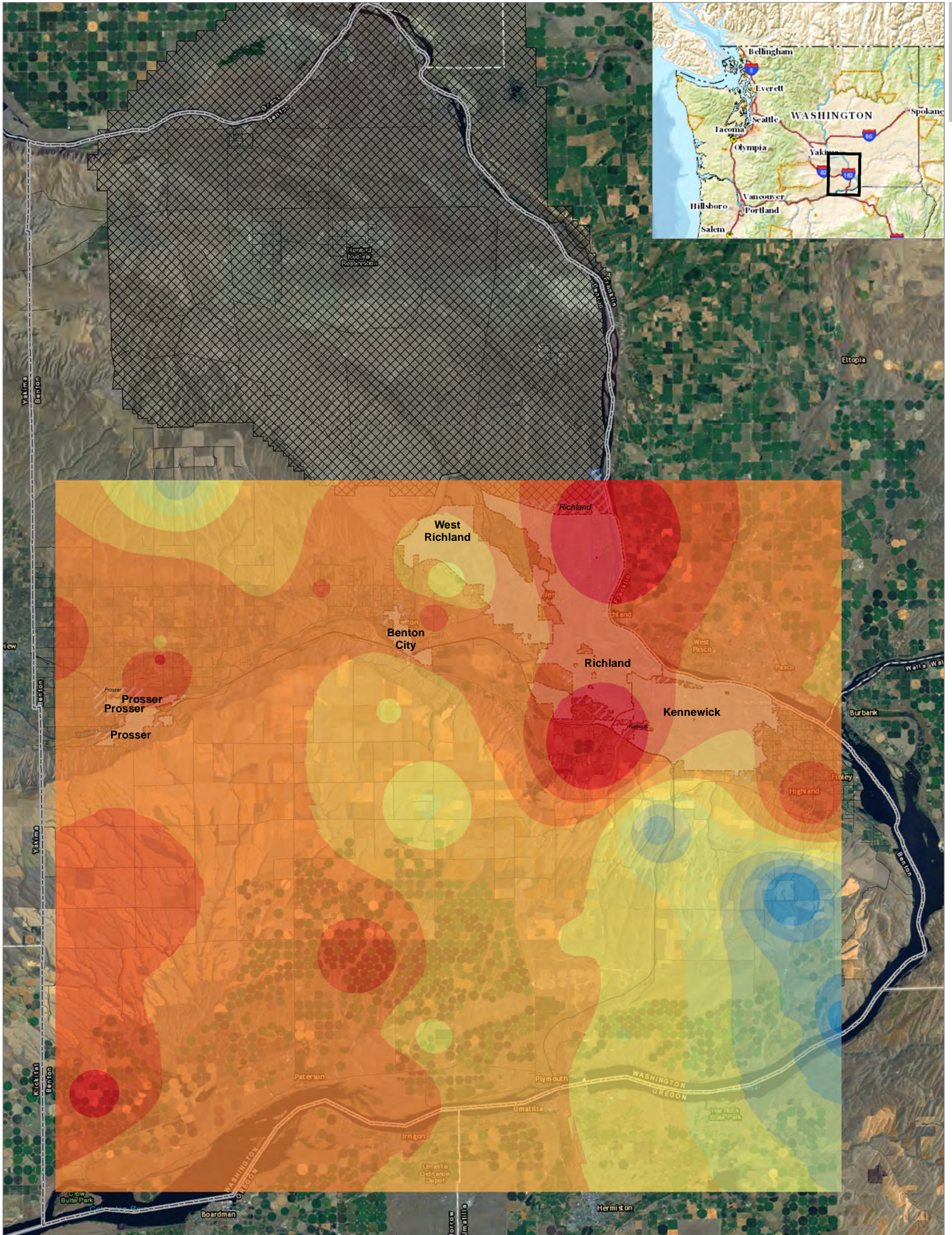


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Figure 4
Capability/Land Use Potential Mismatch Areas

Benton County
 Agricultural Resource Land Reclassification
 BEN EXH-2002 Page 0973 of 1511

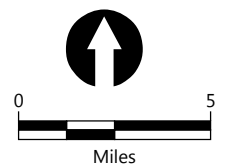


LEGEND:

- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site

Interpolated Annual Precipitation (9-Year Average)

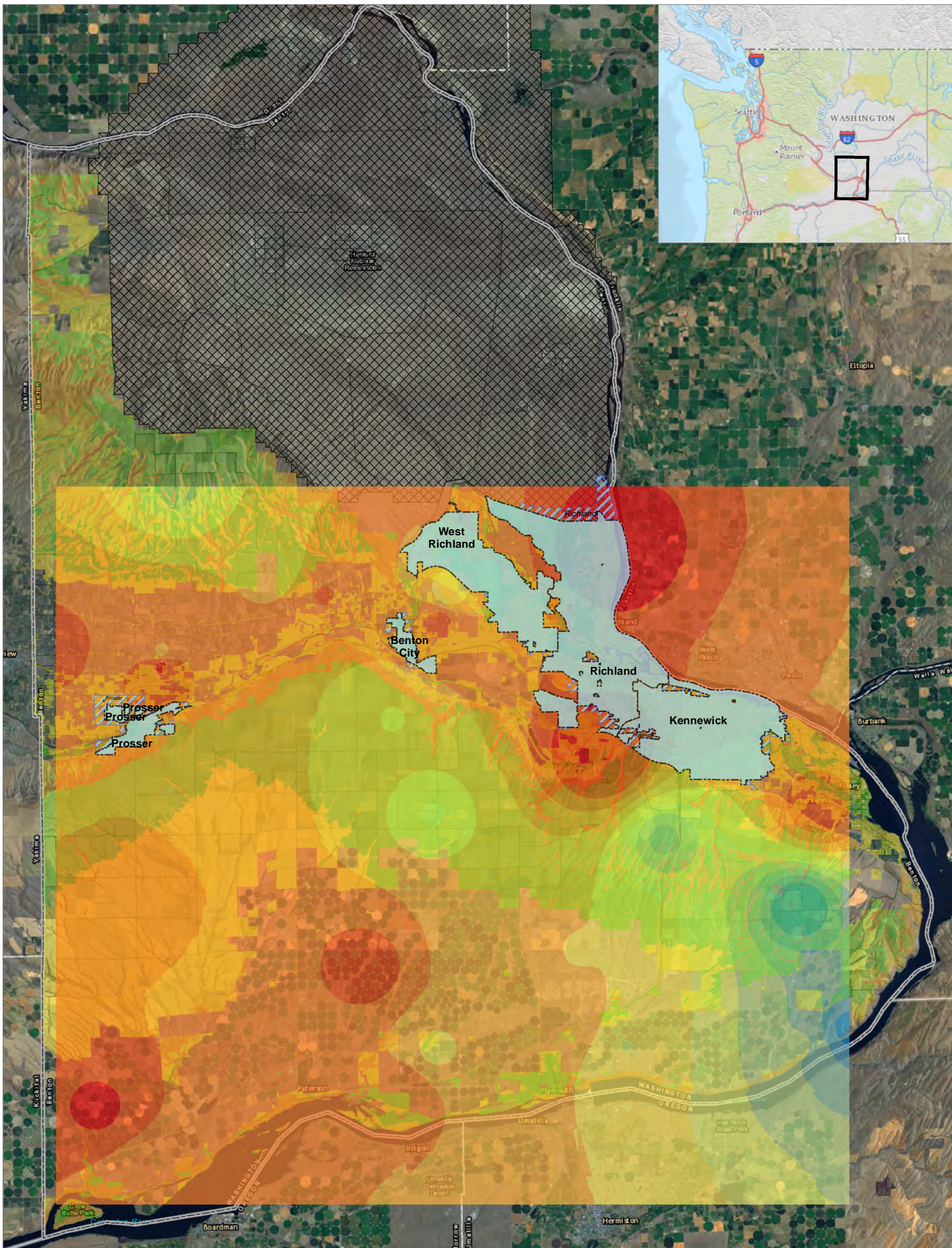
- less than 6"
- 6-6.5"
- 6.5-7"
- 7-7.5"
- 7.5-8"
- 8-8.5"
- 8.5-9"
- 9-9.5"
- 9.5-10"
- above 10"



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Figure 5
Annual Average Precipitation Analysis
 Benton County



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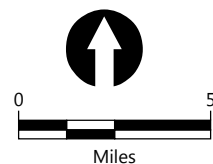
- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site

Non-irrigated Land Capability

- Suitable - Class 2
- Suitable - Class 3
- Suitable - Class 4
- Suitable with Management - Class 6
- Suitable with Management - Class 7

Interpolated Annual Precipitation (9-Year Average)

- less than 6"
- 6-6.5"
- 6.5-7"
- 7-7.5"
- 7.5-8"
- 8-8.5"
- 8.5-9"
- 9-9.5"
- 9.5-10"
- above 10"

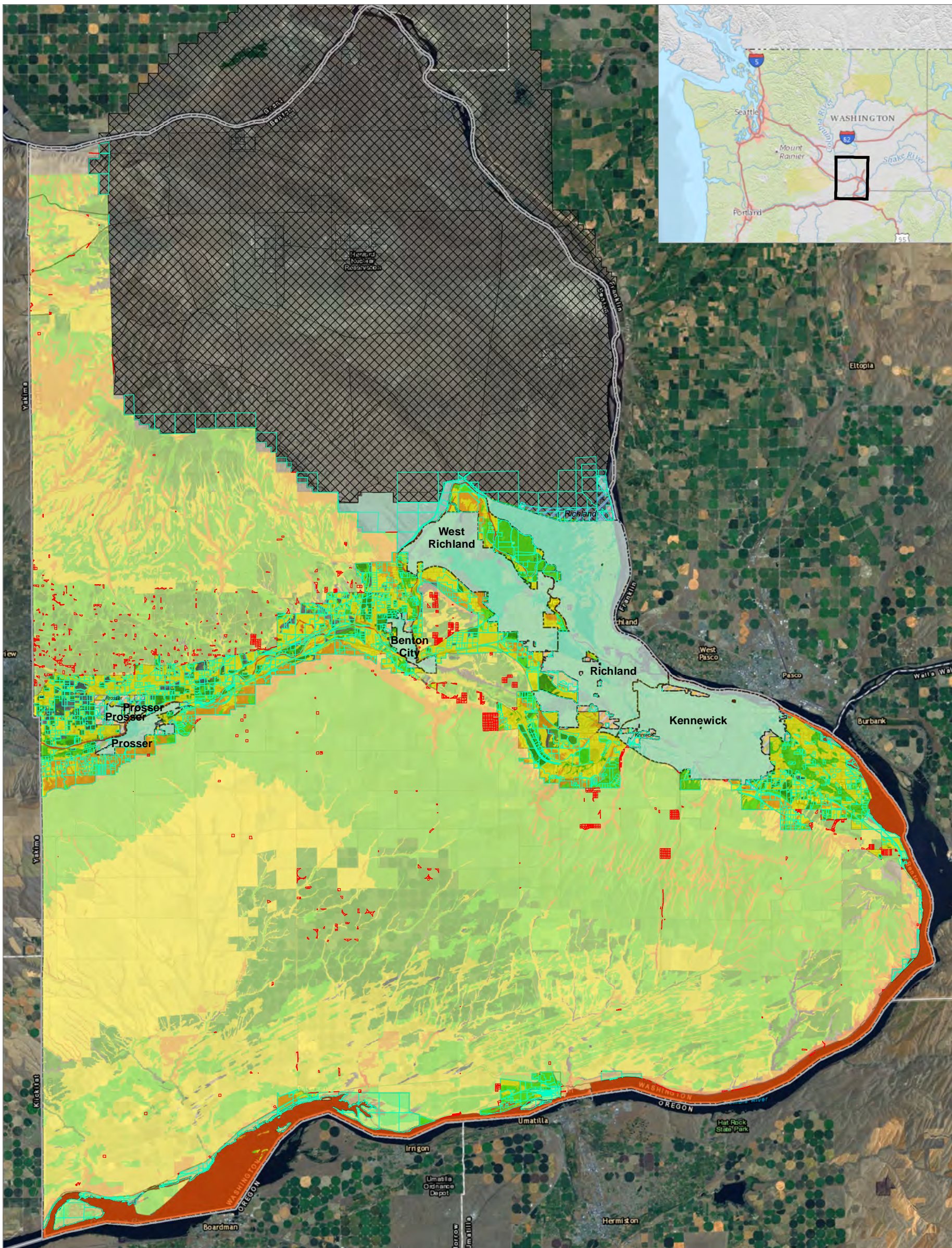


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Figure 6
Precipitation and Non-irrigated Lands Suitable for Cultivation

Benton County
 Agricultural Resource Land Reclassification



LEGEND:

- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site
- Parcels below 10 acres in GMA AG
- Parcel above 10 acres not in GMA AG

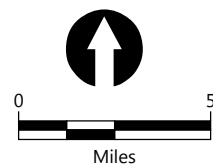
Land Use (2011)

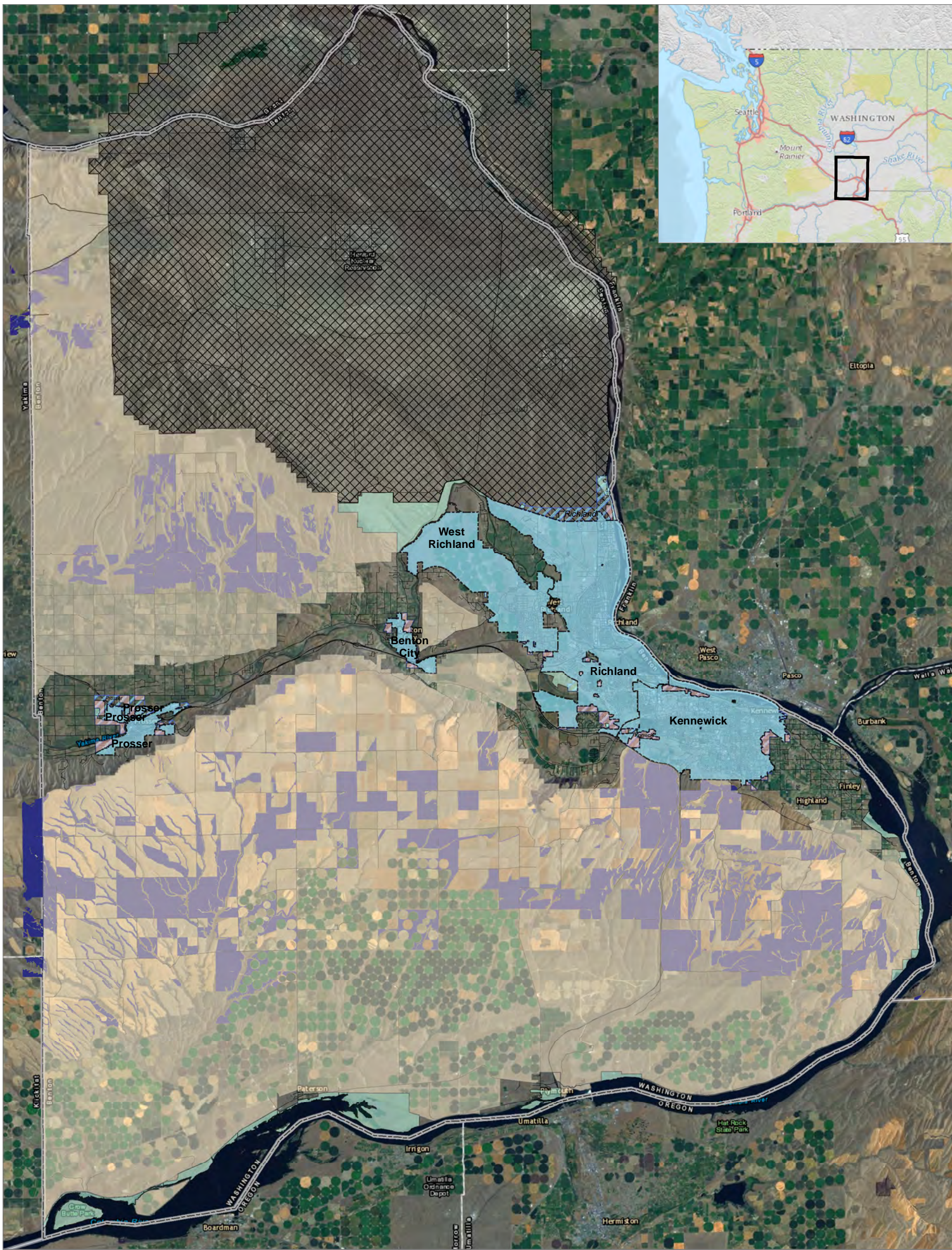
- District**
- PARK DISTRICT
- UGA
- GMA AG

Capability Class

- Suitable - Class 2
- Suitable - Class 3
- Suitable - Class 4
- Suitable with Management - Class 6
- Suitable with Management - Class 7
- Non-suitable - Class 8

NOTE(S):





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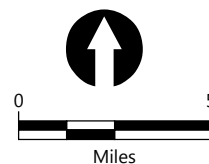
- Roads
- City Limits
- UGA
- County Boundary
- Hanford Site

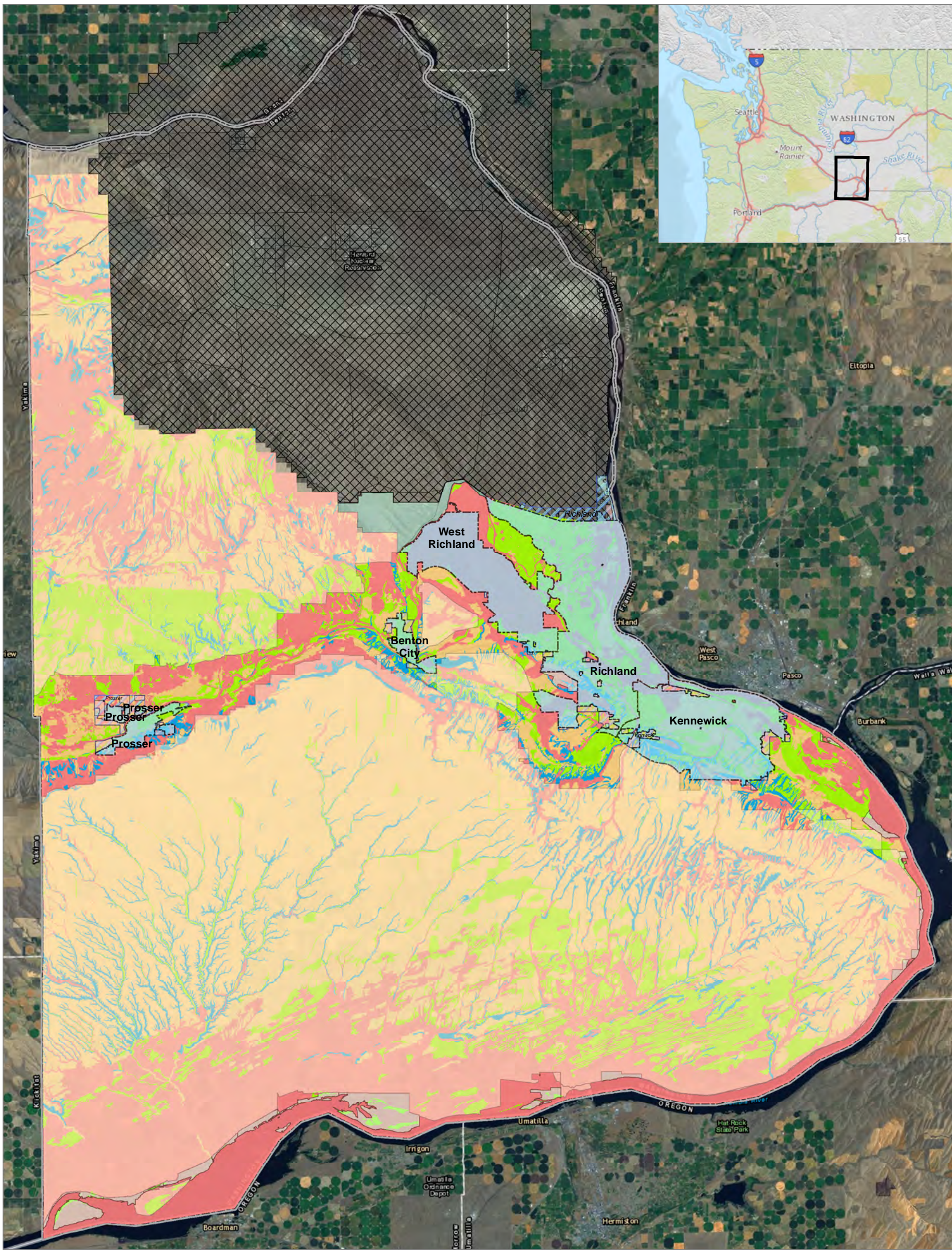
- Land Use (2011)**
- District**
- PARK DISTRICT
 - UGA
 - GMA AG

Crop Type

- CRP/Conservation

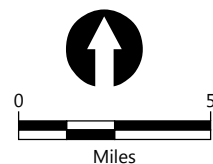
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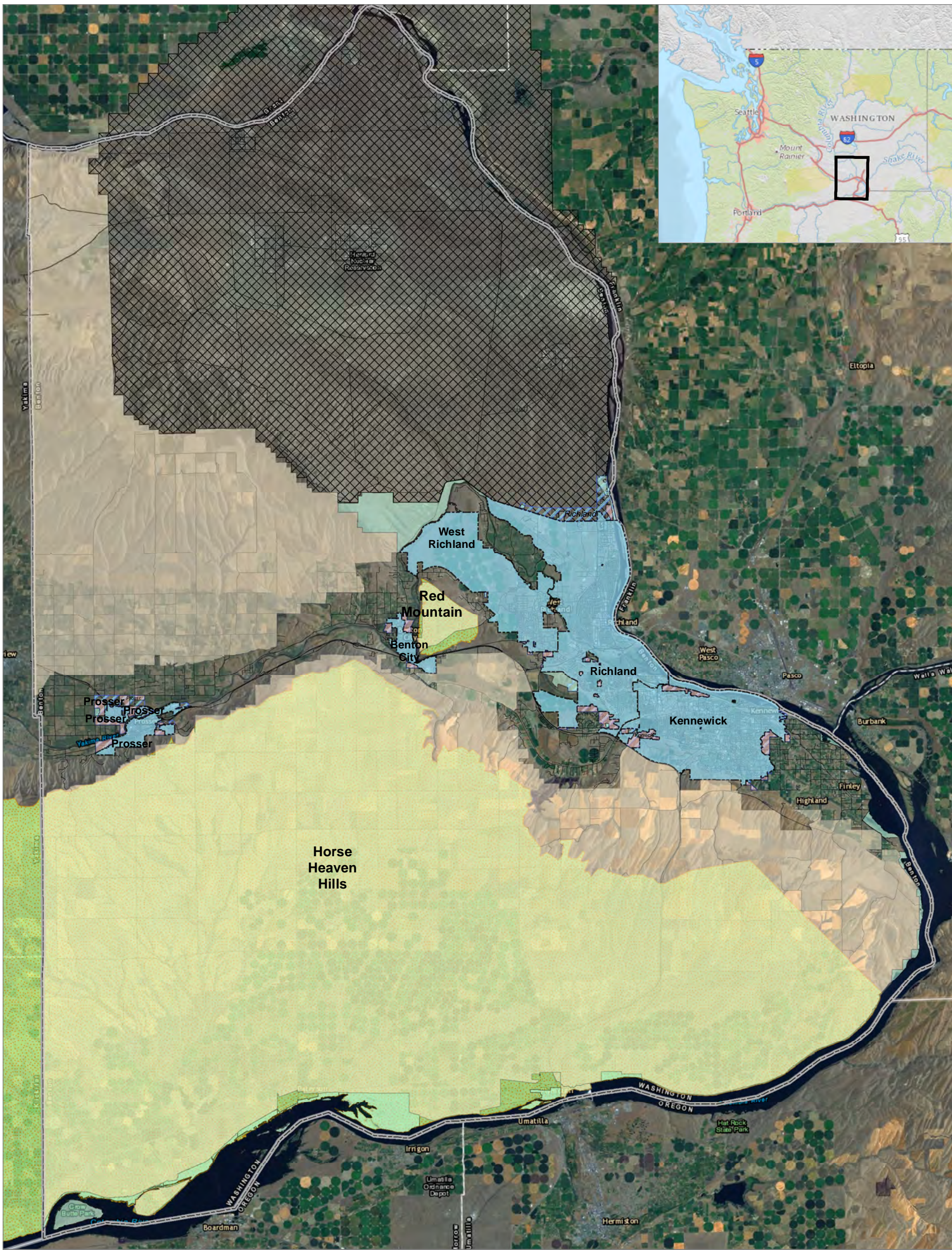
- | | | |
|-----------------|------------------------|-------------------------------------|
| — Roads | Land Use (2011) | Soils - Farmland Designation |
| City Limits | District | Farmland of statewide importance |
| UGA | PARK DISTRICT | Farmland of unique importance |
| County Boundary | UGA | Not prime farmland |
| Hanford Site | GMA AG | Prime farmland if irrigated |



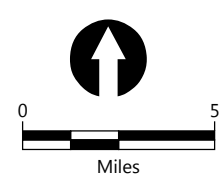
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Figure 9
Prime Farmland Designation
 Benton County
 Agricultural Resource Land Reclassification
 BEN EXH-2002 Page 0978 of 1511



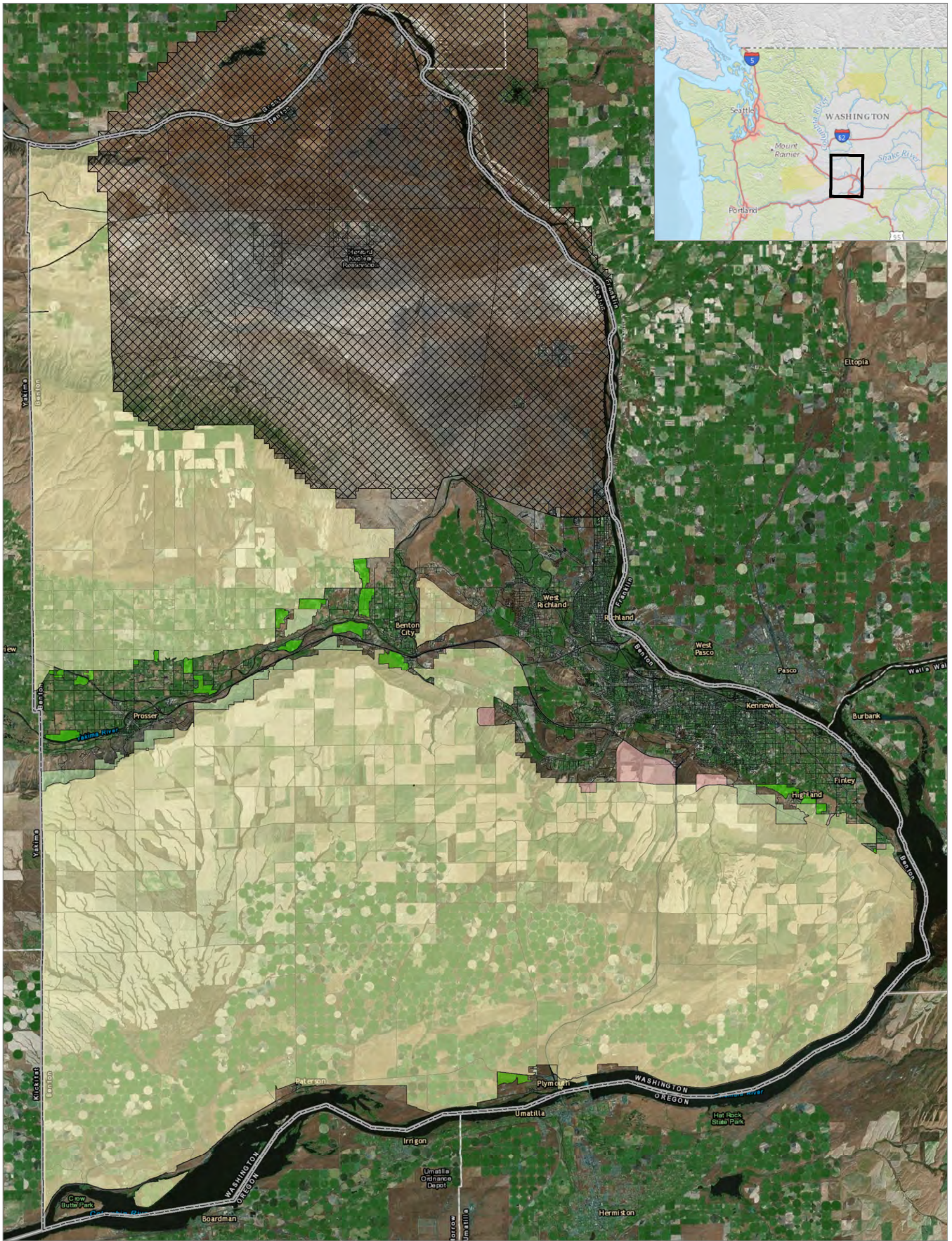
- LEGEND:**
- Roads
 - City Limits
 - UGA
 - County Boundary
 - Hanford Site
 - American Viticultural Area (AVA)
- Land Use (2011)**
- District**
- PARK DISTRICT
 - UGA
 - GMA AG



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Figure 10
American Viticultural Areas
 Benton County
 Agricultural Resource Land Reclassification
 BEN EXH-2002 Page 0979 of 1511

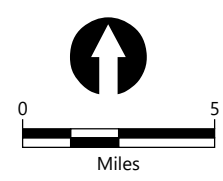


LEGEND:

- Roads
- ▭ County Boundary
- ⊠ Hanford Site

Change to Agricultural Resource Land Designations

- Addition
- No change
- Rural Resource
- Removal



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Figure 11
Proposed Changes to Agricultural Resource Land Designations

Appendix M
Benton County Community
Wildfire Protection Plan (2018)

Benton County, Washington

Community Wildfire Protection Plan 2018



Benton County Emergency Management

651 Truman Avenue
Richland, WA 99352
(509) 628-2600



Prepared By
Northwest Management, Inc.

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Acknowledgements

This Community Wildfire Protection Plan represents the efforts and cooperation of a number of organizations and agencies working together to improve preparedness for wildfire events while reducing factors of risk.



To obtain copies of this plan contact:

Benton County Emergency Management
651 Truman Avenue
Richland, WA 99352
(509) 628-2600

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Forward

The process of developing a Community Wildfire Protection Plan (CWPP) can help a community clarify and refine its priorities for the protection of life, property, and critical infrastructure in the wildland–urban interface on both public and private land. It also can lead community members through valuable discussions regarding management options and implications for the surrounding land base. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk. Through the collaboration process, the CWPP steering committee discusses potential solutions, funding opportunities, and regulatory concerns and documents their resulting recommendations in the CWPP. The CWPP planning process also incorporates an element for public outreach. Public involvement in the development of the document not only facilitates public input and recommendations, but also provides an educational opportunity through interaction of local wildfire specialists and an interested public.

The idea for community-based forest planning and prioritization is neither novel nor new. However, the incentive for communities to engage in comprehensive forest planning and prioritization was given new and unprecedented impetus with the enactment of the Healthy Forests Restoration Act (HFRA) in 2003. This landmark legislation includes the first meaningful statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. In order for a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP).

A countywide CWPP steering committee generally makes project recommendations based on the issue causing the wildfire risk, rather than focusing on individual landowners or organizations. Thus, projects are mapped and evaluated without regard for property boundaries, ownership, or current management. Once the CWPP is approved by the Benton County Commissioners, the steering committee will begin further refining proposed project boundaries, feasibility, and public outreach as well as seeking funding opportunities.

*The **Benton County Community Wildfire Protection Plan** expands on the wildfire chapter of the Benton County Hazard Mitigation Plan updated in 2019. This project was funded by the Washington Department of Natural Resources with assistance from Benton County Emergency Management, Benton County Fire Agencies, and Bureau of Land Management.*

RESOLUTION 2018 964

BEFORE THE BOARD OF COMMISSIONERS OF BENTON COUNTY, WASHINGTON:

IN THE MATTER OF COUNTY PLANNING RELATING TO ADOPTION OF THE BENTON COUNTY COMMUNITY WILDFIRE PROTECTION PLAN (BCWPP)

WHEREAS, areas of Benton County are vulnerable to fire hazards and risk to life and economic cost of wildfires; and

WHEREAS, Benton County realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

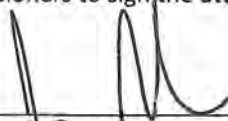
WHEREAS, Benton County has been an active participant in the Benton County Community Wildfire Protection Planning Committee, which has addressed fire hazards and risks within the county; and

WHEREAS, The Benton County Community Wildfire Protection Plan has been prepared and issued for consideration and adoption by the communities and jurisdictions of Benton County, State and Federal Agencies, and local Fire Districts; and

WHEREAS, The Benton Community Wildfire Protection Plan is compatible with FEMA requirements for a Hazard Mitigation Plan, while also adhering to the guidelines proposed in the National Fire Plan, and the Healthy Forests Restoration Act (2003); **NOW THEREFORE**,

BE IT RESOLVED that Benton County hereby concurs with the Benton County Community Wildfire Protection Plan and authorizes the Benton County Board of Commissioners to sign the attached plan.

Dated this 18 day of December 2018.



Chairman of the Board



Member



Member

Constituting the Board of County
Commissioners of Benton County
Washington

Attest 

Clerk of the Board

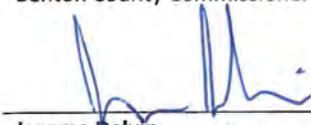
Signature Pages

This Benton County Community Wildfire Protection Plan Update has been developed in cooperation and collaboration with representatives of the following organizations and agencies:

Benton County Board of Commissioners



James Beaver, Date 12-18-2018
Benton County Commissioner District #3



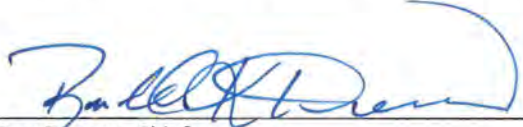
Jerome Delvin, Date 12-18-2018
Benton County Commissioner District #1



Shon Small Date 12-18-2018
Benton County Commissioner District #2

Benton County Fire Protection Districts and Departments

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed.



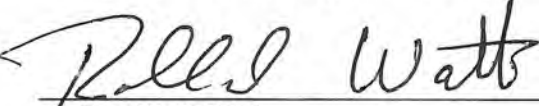
Ron Duncan, Chief
Benton City - *Benton County Fire Protection District #2*

12/18/18
Date



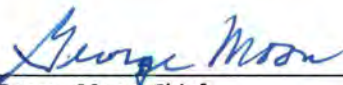
Lonnie E. Click, Chief
Kennewick - *Benton County Fire District #1*

12/18/2018
Date




Rolland Watt, Chief
Paterson - *Benton County Fire District #6*

12/18/2018
Date



George Moon, Chief
Prosser - *Benton County Fire Protection District #5*

12/18/18
Date



Seth Johnson, Chief
Prosser - *West Benton Fire Rescue*

12/19/18
Date



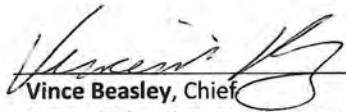
Tom Huntington, Chief
Richland - *Richland Fire Department*

12/18/2018
Date



William Whealan, Chief
West Richland - *Benton County Fire Protection District #4*


12/19/2018
Date


Vince Beasley, Chief
Kennewick – Kennewick Fire Department

12/18/18
Date

Other Committee Representatives

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed. These members of the CWPP steering committee formally recommended that this document be approved by the Benton County Commissioners.



Alan Lawson,
Washington Department of Natural Resources

Date 12/20/18



Deanna Davis, Emergency Manager
Benton County Emergency Management

Date 12-18-18



George Geissler, State Forester; Deputy Supervisor for Wildfire
Washington Department of Natural Resources

Date 2/1/19

N/A

Aaron Everett, Deputy Supervisor,
Forest Practices and Federal Relations, State Forester, Washington
State Department of Natural Resources

Date _____

N/A

Lindsey Babcock, Border Resource Manager
Spokane District Bureau of Land Management

Date _____

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Chapter 1: Plan Overview and Development

In 2017, the Washington Department of Natural Resources contracted with Northwest Management Inc. through Bureau of Land Management grants to conduct an in-depth risk assessment for the hazards of wildland fire. Wildfire events occur almost annually in Benton County; thus, programs and projects that mitigate the impacts of this hazard are a benefit to the local residents, property, infrastructure, and the economy. In October 2017 the Washington Department of Natural Resources met with the newly formed planning committee to introduce their plans to perform a wildland fire risk assessment and incorporate that information into a Community Wildfire Protection Plan.

This Community Wildfire Protection Plan for Benton County, Washington, is the result of analyses, professional collaboration, and assessments of wildfire risks and other factors focused on reducing wildfire threats to people, structures, infrastructure, and unique ecosystems in Benton County.

Agencies and organizations that participated in the planning process include:

Benton City	City of Prosser
Benton County	City of Richland
Benton County Emergency Management	City of West Richland
Benton County Fire District #1	Irrigation Districts
Benton County Fire District #2	Kennewick Fire Department
Benton County Fire District #4	Port of Benton
Benton County Fire District #5	Richland Fire & Emergency Services
Benton County Fire District #6	U.S. Fish and Wildlife Service
Bureau of Land Management	Washington DNR
City of Kennewick	West Benton Fire Rescue

Northwest Management, Inc. of Moscow, Idaho was selected to assist the planning committee by facilitating meetings, leading the assessments, and authoring the document. The project lead from Northwest Management, Inc. was Tera King.

Goals and Guiding Principles

This section outlines the underlying themes and commitments, as determined by Benton County, planning committee members, and partnering entities, which serve as the ideological foundation of this document.

Planning Philosophy and Goals

The goals of the planning process include integration with the National Fire Plan, the Healthy Forests Restoration Act, and the Disaster Mitigation Act. The plan utilizes the best and most appropriate science from all partners as well as local and regional knowledge about wildfire risks and fire behavior while meeting the needs of local citizens and recognizing the significance wildfire can have to the regional economy.

Mission Statement

To make Benton County residents, communities, state agencies, local and federal governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, Wildland Fire Public Education, and local planning efforts. To also provide a plan that will not diminish the Private Property Rights of land/asset owners within Benton County.

Washington DNR Mission Statement

The Department of Natural Resources endeavors to educate and inform the public to increase wildfire awareness. Cooperatively and in coordination with other agencies, and through public outreach and educational events, the DNR disseminates information to the public regarding wildfire safety and preparedness.

Vision Statement

Our combined focus will be the protection of people, structures, infrastructure, agriculture, state and federally listed species, and unique ecosystems that contribute to our way of life and the growth and sustainability of the local and regional economy through education, training, support, and planning.

Goals

1. Educate citizens about the unique challenges of wildfire preparedness and reclamation in the county through the introduction of the Firewise program and encourage homeowners to manage their property accordingly.

2. To protect people, structures, assets, critical infrastructure, state and federally listed species, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.
3. Identify and map Wildland Urban Interface (WUI) boundaries.
4. Provide a plan that balances private property rights of landowners in Benton County with personal safety and responsibility
5. Encourage the development of regulatory measures such as state building codes and road standards specifically targeted to reduce the wildland fire potential and reduce the potential for loss of life and property.
6. Determine areas at risk of wildfire and establish/prioritize mitigation projects, without regard to ownership, and recommend both conventional and alternative treatment methods to protect people, homes, infrastructure, state and federal listed species, and natural resources throughout Benton County.
7. Improve county and local fire agency eligibility for funding assistance (National Fire Plan, Healthy Forest Restoration Act, FEMA, and other sources) to reduce wildfire hazards, prepare residents for wildfire situations, and enhance fire agency response capabilities.
8. Improve emergency response times through enhanced radio communications and greater road signage throughout the county.
9. Improve the ability of the Benton County Fire Districts to provide fire protection for the residents of the county through improved resources, recruitment and retention of volunteers, and training.

United States Government Accountability Office (GAO)

Since 1984, wildland fires have burned an average of 850 homes each year in the United States and, because more people are moving into fire-prone areas bordering wildlands, the number of homes at risk is likely to grow. The primary responsibility for ensuring that preventative steps are taken to protect homes lies with homeowners. Although losses from fires made up only 2 percent of all insured catastrophic losses from 1983 to 2002, fires can result in billions of dollars in damages.

GAO was asked to assess, among other issues, (1) measures that can help protect structures from wildland fires, (2) factors affecting use of protective measures, and (3) the role technology plays in improving firefighting agencies' ability to communicate during wildland fires.

The two most effective measures for protecting structures from wildland fires are: (1) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where flammable vegetation and other objects are reduced; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows

and building materials, surface treatments, sprinklers, and geographic information systems mapping – can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for fire protection. Federal, state, and local governments, as well as other organizations, are attempting to increase property owners' use of protective measures through education, direct monetary assistance, and laws requiring such measures. In addition, some insurance companies have begun to direct property owners in high risk areas to take protective steps¹.

State and Federal CWPP Guidelines

This Community Wildfire Protection Plan includes compatibility with FEMA requirements for a Hazard Mitigation Plan, while also adhering to the guidelines proposed in the National Fire Plan, and the Healthy Forests Restoration Act (2003). This Community Wildfire Protection Plan has been prepared in compliance with:

- Washington Department of Natural Resources Wildfire Strategic Plan: “The state's future Wildland Fire Protection Strategic Plan will provide a blueprint for effective wildland fire protection in Washington and inform associated policy and resource decisions.”
- The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan (December 2006).
- Healthy Forests Restoration Act (2003).
- National Cohesive Wildland Fire Management Strategy (March 2011). The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.
- The Federal Emergency Management Agency's Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Multi-Hazard Mitigation Plan.
- National Association of State Foresters – guidance on identification and prioritizing of treatments between communities (2003).

¹ United States Government Accountability Office. [Technology Assessment – Protecting Structures and Improving Communications during Wildland Fires](#). Report to Congressional Requesters. GAO-05-380. April 2005.

The objective of combining these complementary guidelines is to facilitate an integrated Community Wildfire Protection Plan, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Benton County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

Additional information detailing the state and federal guidelines used in the development of the Benton County Community Wildfire Protection Plan is included in Appendix 1.

Integration with other Local Planning Documents

During development of this Community Wildfire Protection Plan, several planning and management documents were reviewed in order to avoid conflicting goals and objectives. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the mitigation objectives outlined in this document. The following sections identify and briefly describe some of the existing Benton County planning documents and ordinances considered during development of this plan.

Benton County Hazard Mitigation Plan

As a requirement to receive certain types of federal non-emergency disaster assistance, including funding for hazard mitigation projects, Benton County and the cities and towns of Kennewick, Richland, Prosser, West Richland, and Benton City are required to develop and maintain an up-to-date local hazard mitigation plan. The jointly developed Benton County Hazard Mitigation Plan was is currently under revision with an expected approval date of January 2019. The Federal government requires that hazard mitigation plans be updated every five years.

Benton County Comprehensive Plan

The Countywide Comprehensive Plan is the guiding document that establishes the vision for growth and development in the county. The goals and policies of the plan create the framework for designating properties into comprehensive plan map designations and their correlating zoning districts.

This Community Wildfire Protection Plan will “dove-tail” with the county’s Comprehensive Plan during its development and implementation to ensure that the goals and objectives of each are integrated. This planning effort is intended to be compatible with the goals and objectives of the county’s Comprehensive Plan.

Master Mutual Aid Agreement/Tri-County Mutual Aid Agreement

Mutual aid agreements are the means for one jurisdiction to provide resources, facilities, services and other required support to another jurisdiction during an incident. Each jurisdiction should be party to a mutual aid agreement with appropriate jurisdictions they expect to provide assistance to or receive assistance from during an incident. This would normally include all neighboring or nearby jurisdictions, as well as relevant private-sector and non-governmental organizations. States should participate in interstate compacts and look to establish intrastate agreements that encompass all local jurisdictions. Mutual aid agreements are also needed with private organizations, such as the American Red Cross, to facilitate the timely delivery of private assistance at the appropriate jurisdictional level during incidents.

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Chapter 2: Documenting the Planning Process

Documentation of the planning process, including public involvement, is necessary to meet FEMA's DMA 2000 requirements (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

Description of the Planning Process

The Benton County Community Wildfire Protection Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Chapter 1 of this document. The planning process included five distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed throughout the process):

1. **Collection of Data** about the extent and periodicity of the wildfire hazard in and around Benton County.
2. **Field Observations and Estimations** about risks, location of structures and infrastructure relative to risk areas, access, and potential treatments.
3. **Mapping** of data relevant to pre-wildfire mitigation and treatments, structures, resource values, infrastructure, risk assessments, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee to news releases, public meetings, public review of draft documents, and acknowledgement of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, provide ample review and integration of committee and public input, and signing of the final document.

The Planning Team

Northwest Management facilitated the Community Wildfire Protection Plan meetings. Stakeholders involved in the meetings included representatives from local communities, fire districts, municipal fire departments, federal and state agencies, and local organizations with an interest in the county's fire safety.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal, state, and local agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between participants. When the public meetings were held, many of the committee members were in attendance and shared their support and experiences and their interpretations of the results.

Multi-Jurisdictional Participation

44 CFR §201.6(a)(3) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans which impact multiple jurisdictions. In addition to the participation of federal agencies and other organizations, the following local jurisdictions were actively involved in the development of this Community Wildfire Protection Plan:

Benton City	City of Prosser
Benton County	City of Richland
Benton County Emergency Management	City of West Richland
Benton County Fire District #1	Irrigation Districts
Benton County Fire District #2	Kennewick Fire Department
Benton County Fire District #4	Port of Benton
Benton County Fire District #5	Richland Fire & Emergency Services
Benton County Fire District #6	Washington State DNR
City of Kennewick	West Benton Fire Rescue

These jurisdictions were represented on the planning committee and in public meetings either directly or through their servicing fire department or district. They participated in the development of hazard profiles, risk assessments, and mitigation measures. The planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in the following ways:

- Planning committee leadership visits to local group meetings where planning updates were provided, and information was exchanged.
- One-on-one visits between the planning committee leadership and representatives of the participating jurisdictions (e.g. meetings with county councilors, city councilors and mayor, fire district commissioners, and community leaders).
- Written correspondence between the planning committee leadership and each jurisdiction updating the participating representatives on the planning process, making requests for information, and facilitating feedback.

Like other areas of Washington and the United States, Benton County's human resources have many demands placed on them in terms of time and availability. In Benton County, elected officials (county and town councilors and mayor) do not serve in a full-time capacity; some of

them have other employment and serve the community through a convention of public service. Recognizing this and other time constraints, many of the jurisdictions decided to identify a representative to cooperate on the planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction.

Planning Committee Meetings

The following people participated in planning committee meetings, volunteered time, or responded to elements of the Benton County Community Wildfire Protection Plan's preparation.

Name	Organization
Al Lawson	Washington State DNR
Deanna Davis	Benton County Emergency Management
Kyle Kurth	Benton City
Scott Clemenson	Richland Fire Department
Pete Rogalsky	Richland Public Works
Cary Roe	City of Kennewick
Anthony Muri	City of Kennewick
Neil Hines	Kennewick Fire Department
Seth Johnson	West Benton Fire Rescue
Kevin Howard	Port of Benton
Jerrold MacPherson	Benton County
John Janak	United States Fish & Wildlife Service
Lori Ferris	Benton County Emergency Management
Charles Cronk	Bureau of Land Management
Lonnie Click	Benton County Fire District #1
Ron Duncan	Benton County Fire District #2
Bonnie Benitz	Benton County Fire District #4
William Whealan	Benton County Fire District #4
George Moon	Benton County Fire District #5
Rolland Watt	Benton County Fire District #6
Tera King	Northwest Management Inc.
Vaiden Bloch	Northwest Management, Inc.
Eric Nelson	Northwest Management Inc.

Committee Meeting Minutes

Committee meetings were scheduled and held from October 2017 through July 2018. These meetings served to facilitate the sharing of information and to lay the groundwork for the Benton County Community Wildfire Protection Plan. Northwest Management, Inc. as well as other planning committee leadership attended the meetings to provide the group with regular updates on the progress of the document and gather any additional information needed to complete the Plan. Planning committee meeting minutes are included in Appendix 2.

Public Involvement

Public involvement was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. The idea is to allow members of the public to provide information and seek an active role in protecting their own homes and businesses, and in some cases, it may lead to the public becoming more aware of the process without becoming directly involved in the planning.

News Releases

Under the auspices of the planning committee, periodic press releases were submitted to the various print and online news outlets that serve Benton County residents. Press releases served to inform the public about the plan development process and opportunities for public participation. News releases are located in Appendix 2.

Public Meetings

Public meetings were scheduled in strategic locations during the wildfire risk assessment phase of the planning process to share information on the plan, obtain input on the details of the wildfire risk assessments, and discuss potential mitigation treatments. Attendees at the public meetings were asked to give their impressions of the accuracy of the information generated and provide their opinions of potential treatments.

The schedule of public meetings in Benton County included three locations and two different dates. Meeting announcements were sent to local papers and attendance at the three meetings was variable (Appendix 2):

- Richland: April 25th At the Richland Public Library, the meeting was only attended by several committee members.
- Kennewick: April 25th at the Benton PUD auditorium, only one committee member and one member of the general public attended the meeting.
- Prosser: April 26th at West Benton Fire and Rescue, the meeting was attended by both committee members and members of the general public.

Documented Review Process

Opportunities to review and comment on this plan have been provided through multiple means for both committee members as well as members of the general public.

During regularly scheduled committee meetings in the fall of 2017 and spring of 2018, the committee met to discuss findings, review mapping and analysis, and provide written comments on draft sections of the document. During the public meetings, attendees observed map analyses and photographic collections, discussed general findings from the community assessments, and made recommendations on potential project areas.

The first draft of the document was prepared after the public meetings and presented to the committee in December for a full committee review. The committee was given two weeks to provide comments to the plan.

Public Comment Period

A public comment period was conducted from November 26th through December 7th to allow members of the general public an opportunity to view the full draft plan and submit comments and any other input to the committee for consideration. A press release was submitted to the local media outlets announcing the comment period, the location of the plan for review, and instructions on how to submit comments. Each hardcopy was accompanied by a letter of instruction for submitting comments to the planning committee. The newspaper advertisement for the public comment period is included in Appendix 2.

Hardcopies of the draft were printed and made available at the following locations:

- BCES 651 Truman Ave., Richland, WA
- Richland Library 955 Northgate, Richland, WA

Public comments can also be submitted through email at:

- Publiccomment@bces.wa.gov

Continued Public Involvement

Benton County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan. Benton County Emergency Services, working through the planning committee, will be responsible for the review and update of the plan.

The public will have the opportunity to provide feedback annually on the anniversary of the adoption of this plan, at an open meeting of the planning committee. Copies of the plan will be catalogued and kept at all of the appropriate agencies in the county. The plan also includes the

address and phone number of Benton County Emergency Management, who is responsible for keeping track of public comments on the Plan.

A public meeting will also be held as part of each annual evaluation or when deemed necessary by the planning committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The County Department of Emergency Management will be responsible for using county resources to publicize the annual public meetings and maintain public involvement through the webpage and various print and online media outlets.

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Chapter 3: Benton County Characteristics

Benton County is located in south-central Washington in the middle of the Columbia Basin. The Columbia River forms the county's northern, eastern, and southern boundaries, forming an arc some 120 miles long. Benton County is bordered to the west by Yakima and Klickitat counties, to the north by Grant County, to the east by Franklin and Walla Walla counties, and to the south by two Oregon counties, Umatilla and Morrow. Benton County covers an area of 1,722 square miles. The highest elevation in the county is 3,629 feet, located in the Rattlesnake Mountains north of Prosser. The lowest elevation is 265 feet, found near Plymouth along the north bank of the Columbia River. The Yakima River flows from west to east through the middle of the county. The Yakima, Snake, and Walla Walla rivers join the Columbia River within 30 miles of each other along Benton County's eastern border near Sacajawea State Park.

Incorporated cities and towns in Benton County include Benton City, Kennewick, Prosser, Richland, and West Richland. Most of the unincorporated areas of the County are rural areas with low-density agriculture-based land use. However, there are also several distinct unincorporated communities, including Paterson, Plymouth, Finley, and Whitstran. Benton County was created in 1905 from the eastern portions of Yakima and Klickitat Counties. Prosser is the county seat.

Of the county's five incorporated communities, Prosser, Benton City, and West Richland are located adjacent to the Yakima River, Richland is at the confluence of the Yakima and the Columbia Rivers, and Kennewick borders the Columbia River downstream of Richland. Richland and Kennewick, together with Pasco (across the Columbia River in Franklin County) are all located on the banks of Lake Wallula, created after the construction of the McNary Dam. These cities are collectively referred to as the Tri-Cities due to their interlocking economic dependence and their geographic proximity to each other. The unincorporated community of Finley lies to the southeast along the Columbia River, just outside of Kennewick. Elevations for all of the communities are in the 300 to 700 feet above sea level range. The two unincorporated communities of Plymouth and Paterson border the Columbia River at the county's southern border below McNary Dam. Elevations of Plymouth and Paterson are 300 and 400 feet, respectively.

Description

The Columbia River was historically an important fishery and its associated lowlands used as wintering ground by several Native American tribes including the Umatilla, Wallowa, Wanapum, Nez Perce, and Yakama tribes. Permanent settlement of the region accelerated in the 1890s when infrastructure was completed that allowed irrigation of the arid shrub-steppe lands in the area. This, along with the completion of the Dalles-Celilo Canal in 1915, which first connected

the Tri Cities to the Pacific Ocean, turned Benton County into an important agricultural center. The proximity of the Hanford Nuclear Site, which was a key facility for the development of nuclear weapons during World War II, and the construction of three Washington Public Power Supply System (WPPSS) nuclear plants at Hanford in the 1970s, had significant impacts on the economic development of the county.

Benton County is currently one of the top ten agricultural counties in Washington, based on the total value of all agricultural products (crop and livestock). The area produces carrots, onions, potatoes, wheat, barley, oats, apples, grapes, and cherries. In addition to crop production, there is a significant food-processing industry in the Tri-Cities. Area plants produce French fries, grape juice, baby carrot sticks, and other foods. Winter wheat is the dominant crop cover. Washington State University Irrigated Agriculture Research and Extension Center, one of the world's largest irrigated experiment stations, is located in Benton County approximately four miles north of Prosser. In recent years the wine industry has become a rapidly growing segment of the agriculture industry, with many new wineries opening. The state's largest winery, Columbia Crest, is located at Paterson.

The Tri-Cities area of Benton County is a major transportation hub for the Pacific and Inland Northwest. The Tri-Cities are served by Interstate Highway 82, which connects the Tri-Cities directly to the three nearby transcontinental Interstate Highways, I-84, I-90 and I-5. Several Federal Highways and multiple State Highways service the area. Additionally, Tri-Cities offers mainline rail freight service by both Burlington Northern Santa Fe and Union Pacific Railroads and is the only major metropolitan and major manufacturing area between the Cascade and Rocky Mountains offering this level of service by these two major national rail carriers. The Columbia-Snake River System connects the region to the Pacific Ocean and allows the transport of commodities to locations throughout the world. Barge service is available through the Port of Benton.

Climate and Geography

Benton County is located in the central part of the Columbia Basin, which has a landform surrounded by mountain ranges that have a pronounced effect on the region's climate. The following are characteristics of the as summarized in the 2017 Benton County Comprehensive Plan:

Climate

Benton County is located in the central part of the Columbia Basin, which is surrounded by the Cascade and Rocky mountain ranges to the west and east, respectively. These ranges have a pronounced effect on the region's climate, which is dry and arid. The growing season in the

region is approximately 185 days from mid-April to mid-October, with high temperatures exceeding 90 °F during the summer months and as low as 6 °F or colder during the winter months. Mean annual precipitation in the area ranges from 5 to 10 inches, with mean annual precipitation levels ranging from 10 inches or greater in discrete areas in Horse Heaven and Rattlesnake Hills (see Appendix A: Map Folio, Figure 6 – Precipitation Map). Approximately 70 percent of the precipitation in the region occurs between November and April with intermittent thunderstorms and other precipitation events occurring between March and October. Winter season snowfall accumulation ranges between 4 to 21 inches during the winter months, with snow melt and/or river icing during the winter and spring seasons occasionally causing flooding of the Yakima River.

Topography

The topography of Benton County is characterized by basin and valley lowlands, separated by the upland plateaus and ridges of the Yakima Folds Belt. The landscape is the product of seismic upheavals, volcanic eruptions, magmatic flows, glacial epochs, and cataclysmic floods. The legacy of this history is the present geologic landscape that includes the Hanford area, productive soils on the Benton County Comprehensive Plan Update 55 February 2018 flanks of anticlinal ridges, the Horse Heaven plateau, Rattlesnake Hills, Saddle Mountain, water resources of three major rivers, and the basaltic vertical columns and outcrops. A thin layer of biology has adapted to the area's geologic base. The layer is relatively sparse and fragile on the dry uplands of shrub-steppe and bunch grasses, but diverse and resilient along reaches of rivers, tributaries, and creeks that flow throughout the County. From north to south, the major topographic features of Benton County are as follows:

Pasco Basin: A basal plane that comprises most of what is now the Hanford Site. Topography is flat to hilly, with elevations ranging from around 300 feet in the east to nearly 1,000 feet at the base of Rattlesnake Mountain.

Rattlesnake Hills: This segment of the Yakima Folds separates the Pasco Basin from the Yakima Valley. The ridge extends in a southeasterly-northwesterly alignment from its beginning in eastern Yakima County to a point where it merges with the Horse Heaven Hills south of Finley. Rattlesnake Ridge is discontinuous through the middle of the County where it has been perforated by the Yakima River (resulting in Red, Candy, and Badger mountains) and contains Rattlesnake Mountain, the highest unforested “peak” in Washington State. At 3,629 feet, Rattlesnake Mountain is also the highest point in Benton County.

Yakima River: The river bisects the County into north and south portions and is responsible for much of the varied topography of central Benton County. The river has been cutting the valley sediments in this syncline that separates Rattlesnake Ridge from the Horse Heaven Hills for tens of thousands of years. The present valley floor ranges from about 300 feet above sea level, at

its confluence with the Columbia River at the City of Richland, to around 700 feet at the Yakima County line.

Horse Heaven Hills: This plateau constitutes the southern half of Benton County. The elevations of the Horse Heaven Hills rise from the County’s low point of 265 feet near Crow Butte to 1,600 to 2,200 feet along the ridgeline which overlooks the Yakima Valley and the Badger Coulee. The Horse Heaven Hills are unique among the Yakima Folds: it is the southern-most and longest running ridge in the system at some 60 miles; it is the most severely “lop-sided” of the ridges, becoming more of a monocline than an anticline in areas; and it takes a definitive, 90 degree turn to the south at Kiona, which is the geographic center of the County. The ridgeline is highest at Jump Off Joe Butte south of Kennewick, and the plateau slides southward toward the Columbia River.

Population and Demographics

Benton County was created by the Washington State Legislature on March 8, 1905. The County government consists of an elected County Commission, consisting of three full time County Commissioners. The Commissioners are elected to four-year terms in a general election. Each commissioner represents a district determined by population boundaries. Other elected county officials include: Assessor, Auditor, Clerk, Coroner, Prosecuting Attorney, Treasurer, Sheriff, and Superior Court and District Court judges.

The U.S. Census Bureau reported that the Benton County population was 175,171 in 2010—a 23 percent increase from 2000. The cities of Kennewick and Richland saw the most significant population increase during this time span. Table 1 shows historical changes in population in Benton County and in selected communities. Table 2 was taken from the most recent Benton County Comprehensive Plan Update (February 2018); it shows total population for Benton County by incorporated and unincorporated areas in Benton County. Of the 193,500 people reported to be in Benton County in 2017, almost 35,100 people live in unincorporated areas.

Table 1) Historical and estimated current populations for communities in Benton County, WA from 1960 to 2016.

	1960	1970	1980	1990	2000	2010	2016*
Benton County	62,070	67,540	109,440	112,560	142,475	175,171	193,686
Benton City	1,210	1,070	1,980	1,806	2,624	3,038	3276
Kennewick	14,244	15,212	32,397	42,155	54,693	73,917	80,454
Prosser	2,763	2,954	3,896	4,476	4,838	5,714	6,040
Richland	23,548	26,290	33,587	32,315	38,708	48,054	54,989
West Richland	1,347	1,107	2,935	3,962	8,385	1,181	14,198
*2016 population estimated based on 2010 census							

The 2016 Benton County population was estimated to be 193,686. The median age was 35.6, with approximately 72.8 percent of the population 18 years and over. Approximately 82.4 percent of the population is White and 18.7 percent is Hispanic or Latino. The Census reports there are 27,726 residents (17.9 percent) who speak a language other than English at home, including 6.4 percent (8,391 people 5 years and over) who speak English less than “very well.” Spanish is the language other than English most often spoken at home by 20,551 residents (13.3 percent). Of those speaking Spanish at home, 10,234, or 5.8 percent of Benton County’s population, speak English less than “very well.”²

Table 2) 20 year population estimates for Benton County, WA (OFM 2017).

Year	Population in Unincorporated Benton County	Total Population in Benton County
2017	35,085	193,500
2037 Projection	53,220	280,109
20 Year Increase	18,135	86,609

Land Ownership

The data used in this section was taken from the 2010 BLM land ownership database. Local government property (i.e. county) is likely included in the Private ownership category. The majority of ownership, approximately 67%, within Benton County is private (Table 3). Federal ownerships account for 27% of the land base with the Hanford Site encompassing the largest portion with over 194,000 acres and the U.S. Fish & Wildlife Service and Bureau of Land Management accounting for the remaining 105,470 acres. Less than 6% of Benton County is owned by the state. Figure 1 shows the distribution of land ownership in Benton County.

Land use in Benton County is predominately for agricultural purposes. According to the 2012 Census of Agriculture, approximately 703,505 acres of privately-owned land is classified as agricultural which is just over 94% of all private land and just over 63% of the total area of Benton County. Of the 703,505 acres classified as agriculture about 74% is cropland and 16% is pastureland.

² U.S. Census Bureau. “QuickFacts”. <https://www.census.gov/quickfacts/fact/table/bentoncountywashington/PST045217>. Accessed April 2018.

Table 3) Land ownership in Benton County, WA

Entity	Acres	Percent Coverage
BLM	11,020	1%
COE	54	<1%
Federal (DOD)	194,450	17%
FWS	98,220	9%
Private	746,948	67%
State	45,782	4%
State Fish & WL	5,812	1%
State Parks	612	<1%
Water	10,329	1%
Total	1,113,227	100%

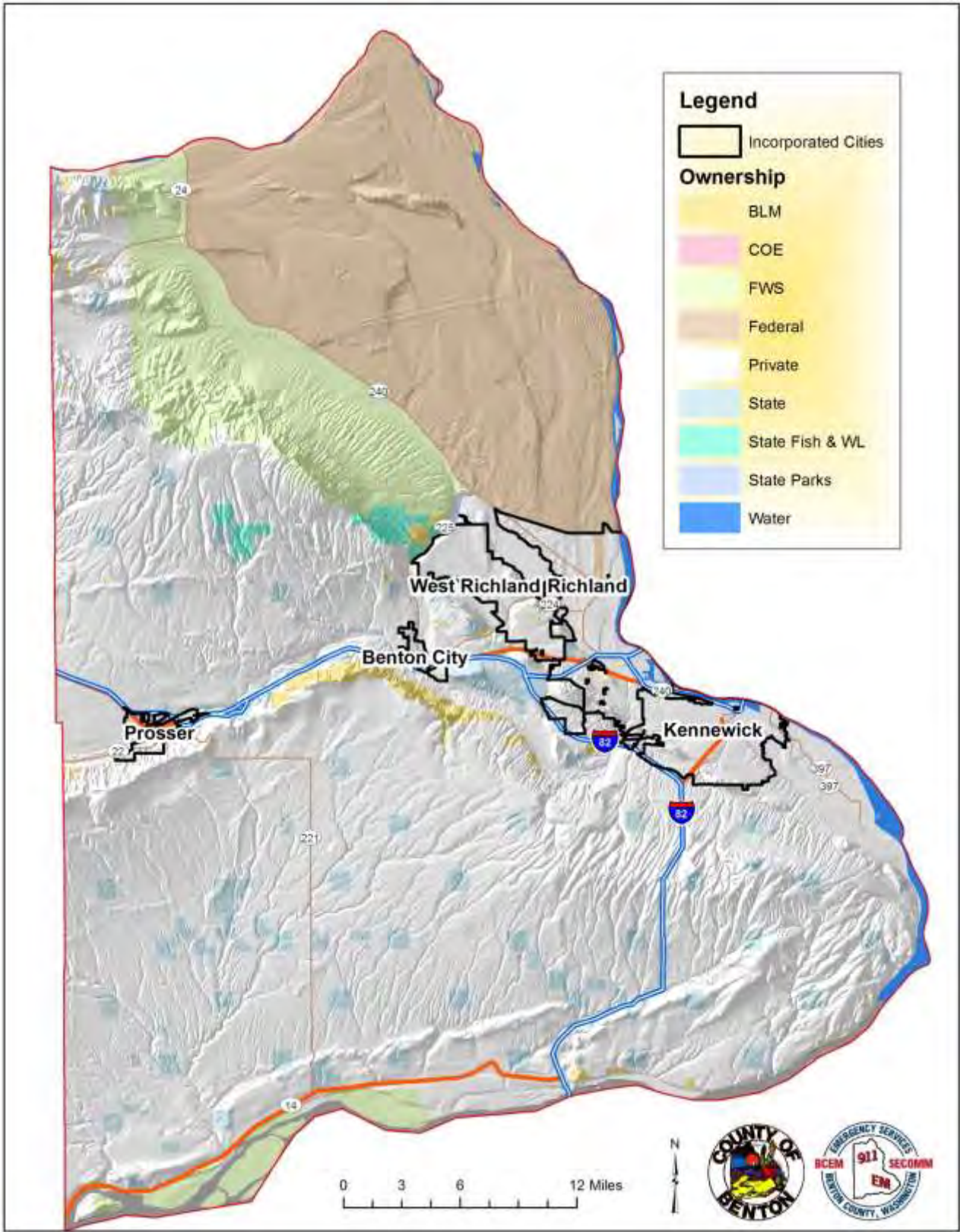


Figure 1) Land ownership in Benton County, WA.

Development Trends

The Following is excerpted from Chapters 3.7 and 3.8 in the 2017 Benton County Comprehensive Plan:

Population growth in Benton County from 2011 to 2016 grew at a rate reflective of the slow growth of the nation's economy; the improved national economy of 2017 has provided a rebound in growth reminiscent of the growth in 2009. Figure 3-2 reflects the population trend in the last 10 years in Benton County.

The latest population projections from OFM, using the "high" series estimates, indicate that Benton County can expect a population increase of 86,609 over the next 20 years. This will result in a year 2037 population of 280,109, which is an increase of 45 percent over the current population of 193,500. The County will review the future growth trends and adjust population projections if necessary.

Approximately 18 percent of the total County population, or 35,085 people (OFM 2017), reside in the unincorporated area of Benton County. The 20-year OFM projection also indicates the unincorporated County population will grow to 53,220 persons in 2037. This will add 18,135 additional people in the next 20 years who are projected to seek housing in unincorporated areas of the County between now and the year 2037. This growth represents a 52 percent increase over the current rural population. Table 2 indicates the population estimates in Benton County and the unincorporated areas of the County.

At an estimated 2.7 residents per household, the increased population in unincorporated Benton County would require approximately 6,716 new homes in the next 20 years. This growth will be accommodated mostly in the Urban lands of the UGAs, Rural Transition areas, and Rural Remote areas. Some growth will also take place in the Rural Community Centers and Rural Resource areas.

There are currently 78,952 acres designated for the rural residential uses within the four rural land use designations of Benton County (outside of Hanford and the agricultural areas).

A land capacity analysis on vacant and existing units in the Rural Transition land (1 du/acre) and Rural Remote land (1 du/5 acre) indicates adequate land supply to accommodate future housing demand. However, additional growth is also anticipated to occur in the Rural Community Centers and Urban areas. Table 4 indicates potential allocation of future population in these two land use categories:

Table 4) Potential allocation of future population per land use category

Land Use	New Units
Urban	134
Rural Transition	1,142
Rural Remote	5,652
Rural Community Centers	34
Total	6,961

1) Does not include UGAs

2) Lot size is determined by minimum lot size requirements; i.e., how many units are allowed per given acreage

Natural Resources

Benton County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural/man-induced disturbance process. Nearly a century of wildland fire suppression coupled with past land-use practices (primarily agriculture and grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some areas of Benton County have become more susceptible to large-scale, high-intensity fires posing a threat to life, property, and natural resources including wildlife and plant populations. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Fish and Wildlife

There are many species of wildlife that inhabit the shrub / steppe region of central Washington. Some of the species present even rely on this type of ecosystem to survive. Sage grouse (*Centrocercus urophasianus*), Ferruginous hawk (*Buteo regalis*), and Burrowing owl (*Athene cunicularia*) once heavily populated this region of Washington; however due to habitat loss (among other reasons); these populations have been drastically reduced in numbers and in some instances genetically isolated from other populations. There has been a significant effort by federal, state, and private landowners in recent years to increase the availability of preferred habitat through the Conservation Reserve Program and incorporating higher grazing standards throughout the region.³

³ Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 174 pp.

Vegetation

The Columbia Basin supports a complex landscape composed of native shrub-steppe vegetation and agriculture or rangeland. Areas that have not been converted to agriculture typically exhibit scattered sagebrush or bitterbrush with a bunchgrass understory. The understory usually consists of bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*) or various needlegrass (*Achnatherum sp.*) species. Land largely converted to agricultural use or rangeland is often dominated by exotic plants or native vegetation tolerant of persistent land use.⁴

Vegetation in Benton County is a mix of shrubland, grassland, agricultural, and some riparian ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. Grasslands compose almost 60% of the vegetative coverage in Benton County with shrublands representing approximately 26% of the total coverage. The remaining land cover consists of riparian areas dominated by shrubs and hardwoods and developed and non-vegetated areas. Figure 2 shows the distribution of existing vegetation types in Benton County and Table 5 shows the percent coverage that each vegetation type represents.

Table 5) Vegetative cover types in Benton County, WA.

Existing Vegetation Type	Acres	Percent of Total Area
Annual Graminoid/Forb	488,839	43%
Deciduous open tree canopy	28,260	3%
Developed	53,667	5%
Evergreen closed tree canopy	18,194	2%
Evergreen dwarf-shrubland	4,999	<1%
Evergreen open tree canopy	353	<1%
Evergreen shrubland	193,487	17%
Herbaceous - grassland	10,565	1%
Mixed evergreen-deciduous open tree canopy	5,531	<1%
Mixed evergreen-deciduous shrubland	90,425	8%
Non-vegetated	40,556	4%
Perennial graminoid grassland	47,523	4%
Perennial graminoid steppe	131,926	12%
Sparsely vegetated	12,076	1%
Total	1,126,400	100%

⁴ A Riparian Vegetation Classification of the Columbia Basin, Washington.
<http://www1.dnr.wa.gov/nhp/refdesk/pubs/columbiarip.pdf> Accessed May, 2013

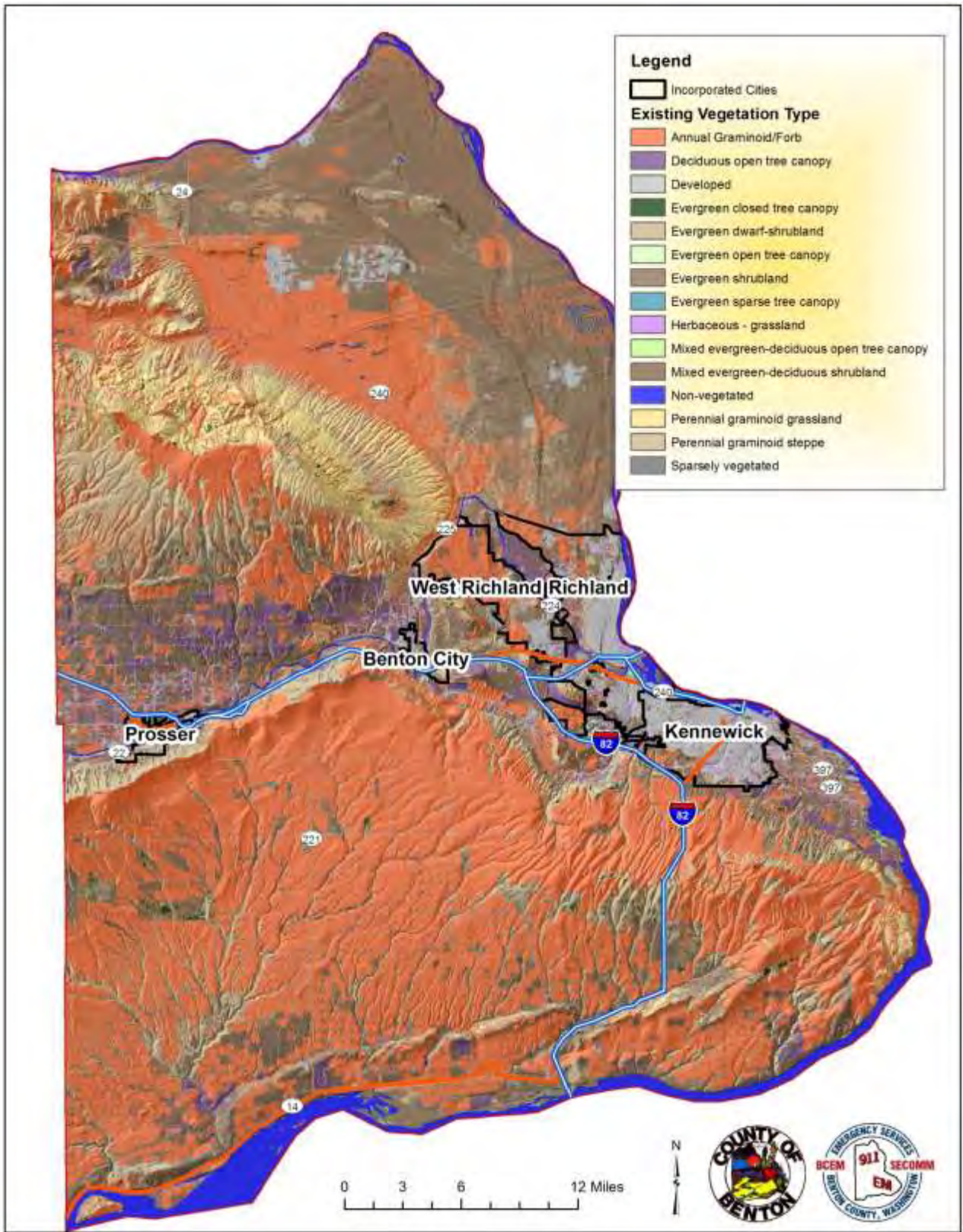


Figure 2) Map of Existing Vegetation Types in Benton County, WA.

Hydrology

The Washington Department of Ecology, Water Resources Program is charged with the development of the Washington State Water Plan. Included in the State Water Plan are the statewide water policy plan and component basin and water body plans, which cover specific geographic areas of the state (WDOE 2005). The Washington Department of Ecology has prepared general lithology of the major ground water flow systems in Washington.

The State may assign or designate beneficial uses for particular Washington water bodies to support. These beneficial uses are identified in section WAC 173-201A-200 of the Washington Surface Water Quality Standards (WQS). These uses include:

- ***Aquatic Life Uses:*** char; salmonid and trout spawning, rearing, and migration; nonanadromous interior redband trout, and indigenous warm water species
- ***Recreational Uses:*** primary (swimming) and secondary (boating) contact recreation
- ***Water Supply Uses:*** domestic, agricultural, and industrial; and stock watering

While there may be competing beneficial uses in streams, federal law requires protection of the most sensitive of these beneficial uses.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

Of critical importance to Benton County will be the maintenance of the domestic watershed supplies in the Alkali-Squilchuck (WRIA 40), Lower Yakima (WRIA 37), and Rock-Glade (WRIA 31)⁵ watersheds.

Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides.⁶

⁵ Washington Department of Ecology, Water Resources Program website. <http://www.ecy.wa.gov/watershed/index.html>. Accessed August, 2013.

⁶ USDA-Forest Service (United States Department of Agriculture, Forest Service). 2000. Incorporating Air Quality Effects of Wildland Fire Management into Forest Plan Revisions – A Desk Guide. April 2000. – Draft.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority of the U.S. Environmental Protection Agency. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the Organization for Air Quality Protection Standards (OAQPS) is responsible for setting the NAAQS standards for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.⁷

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in Washington are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall.

Due principally to local wind patterns, air quality in Benton County is generally good to excellent, rarely falling below Washington Department of Ecology pollution standards.

Benton Clean Air Agency

Benton Clean Air Agency (Benton Clean Air) is one of seven local air pollution control agencies in Washington state. Benton Clean Air is a municipal corporation that is governed by a 5-member Board of Directors. Benton Clean Air is responsible for enforcing Federal and State Clean Air Acts, and BCAA Regulation 1 in Benton County.

Benton Clean Air is dedicated to the preservation of public health as it relates to outdoor air quality. In carrying out this role, the BCAA works with industry, individuals, cities, the county, and other local entities, whose activities potentially affect air quality. The BCAA office in Kennewick, WA can be reached at (509) 783-1304.

Washington State Smoke Management Plan

The Department of Natural Resources (DNR), Department of Ecology (DOE), U.S. Forest Service (USDA), National Park Service (NPS), Bureau of Land Management (BLM), U.S Fish and Wildlife Service (USDI), participating Indian nations, military installations (DOD), and small and large forest landowners have worked together to deal with the effect of outdoor burning on air.

Protection of public health and preservation of the natural attractions of the state are high priorities and can be accomplished along with a limited, but necessary, outdoor burning

⁷ Louks, B. 2001. Air Quality PM 10 Air Quality Monitoring Point Source Emissions; Point site locations of DEQ/EPA Air monitoring locations with Monitoring type and Pollutant. Idaho Department of Environmental Quality. Feb. 2001. As GIS Data set. Boise, Idaho.

program. Public health, public safety, and forest health can all be served through the application of the provisions of Washington State law and this plan, and with the willingness of those who do outdoor burning on forest lands to further reduce the negative effects of their burning.

The Washington State Smoke Management Plan pertains to DNR-regulated silvicultural outdoor burning only and does not include agricultural outdoor burning or outdoor burning that occurs on improved property. Although the portion of total outdoor burning covered by this plan is less than 10 percent of the total air pollution in Washington, it remains a significant and visible source.

The purpose of the Washington State Smoke Management Plan is to coordinate and facilitate the statewide regulation of prescribed outdoor burning on lands protected by the DNR and on unimproved, federally-managed forest lands and participating tribal lands. The plan is designed to meet the requirements of the Washington Clean Air Act.

The plan provides regulatory direction, operating procedures, and advisory information regarding the management of smoke and fuels on the forest lands of Washington State. It applies to all persons, landowners, companies, state and federal land management agencies, and others who do outdoor burning in Washington State on lands where the DNR provides fire protection, or where such burning occurs on federally-managed, unimproved forest lands and tribal lands of participating Indian nations in the state.

The plan does not apply to agricultural outdoor burning and open burning as defined by Washington Administrative Code (WAC) 173-425-030 (1) and (2), nor to burning done "by rule" under WAC 332-24 or on non-forested wildlands (e.g., rangelands).

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Chapter 4: Risk and Preparedness Assessments

Wildland Fire Characteristics

In general, wildland fire behavior describes how fire reacts to available fuels, local topography, and current weather conditions. The relationships between these three components are dynamic; changing one condition can often exacerbate the affects that the other conditions have on fire behavior. As such, fire behavior is often modeled as a triangle with fuels, topography, and weather serving as the three sides (Figure 3).

Understanding the relationships between the fire behavior components has important implications for not only managing an active wildfire but also mitigating wildfire risk. Since fuel is the only component that can be managed directly, management decisions regarding fuel types and fuel loading across the landscape need to be made based on characteristics that are inherent of the region; climate and topography. Strategic fuel breaks, conservation and restoration of native species, and prescribed burns are examples of management activities that can reduce wildfire risk and simplify the process of assessing potential wildfire behavior.

A brief description of each of the fire behavior elements follows in order to illustrate their effect on fire behavior.

Weather

Fire behavior is largely influenced by weather conditions. Wind, moisture levels, temperature, and relative humidity are all factors that determine the rates at which fuels dry and vegetation cures. The ignition potential of fuels is also determined by these factors; weather patterns and trends can be analyzed to determine how likely or easily a certain fuel type will ignite and if a fire will be sustained. Once started, the behavior of a wildfire is further determined by atmospheric stability and local and regional weather. As temperature, wind speed, wind direction, precipitation, storm systems, and prevailing winds all influence fire behavior, weather is the most difficult component of the fire triangle to predict and interpret. As observed in the Yarnell Hill fire in Arizona that killed 19 firefighters, a storm cell can cause a flaming front to change direction abruptly, 90 degrees in the case of the Yarnell Hill fire, and rapidly accelerate up to speeds of 10 to 15 mph.

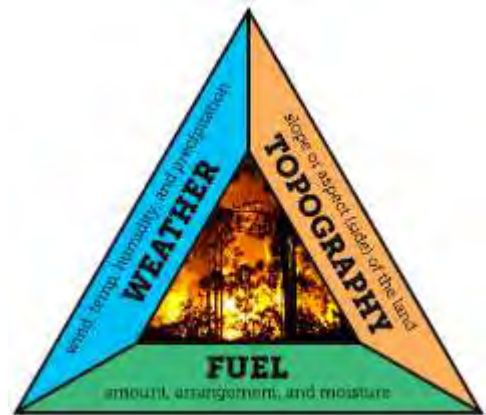


Figure 3) Fire Behavior Triangle
(learn.weatherstem.com)

Topography

Fires burning in similar fuel types will burn differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influences vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. In General, north slopes tend to be cooler, wetter, more productive sites. This typically results in heavy fuel accumulations, high fuel moistures, lower rates of curing for fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun and therefore have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. The combination of light fuels and dry sites leads to fires that typically display the highest rates of spread. These slopes also tend to be on the windward side of mountains which means they tend to be “available to burn” for a greater portion of the year. Slope also plays a significant role in the rate of spread of a fire as fuels upslope from the flaming front are subjected to preheating which means that they readily combust as the fire draws closer. The preheating process is exacerbated as slope increases which results in greater rates of spread and increased flame lengths. Therefore, steep slopes with a south –southwest aspect generally promote intense fire behavior due to dry fuels and the likelihood of predominant, westerly winds.⁸

Fuels

In the context of wildfire, fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest-floor litter, conifer needles, and buildings are all examples of fuel types. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content, and continuity and arrangement all have an effect on fire behavior. In general, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. Fine fuels, those with high surface to volume ratios, are considered the primary carriers of surface fire. As fuel size increases, the rate of spread tends to decrease due to a decrease in the surface to volume ratio. Fires in large fuels generally burn at a slower rate but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control.⁹

Fuels are classified by diameter as that has important implications for fuel moisture retention. The smaller the diameter, the more quickly the moisture content of a given fuel type changes while larger diameter fuels take longer to change. In terms of fire potential on the landscape

⁸ Auburn University website https://fp.auburn.edu/fire/topos_effect.htm. Accessed December 2016

⁹ Gorte, R. 2009. Congressional Research Service, Wildfire Fuels and Fuel Reduction.

and fire suppression, the amount of time that is required for a fuel type to become volatile is critical which is why instead of referring to fuels by size, they are referred to as either one-hour, ten-hour, 100 hour, or 1000 hour fuels. This method of classifying fuels describes the amount of time required for a particular fuel's status to change from non-combustible to combustible as a result of altered moisture levels in the surrounding environment.

Wildfire Hazards

In the 1930s, wildfires consumed an average of 40 to 50 million acres per year in the contiguous United States, according to US Forest Service estimates. By the 1970s, the average acreage burned had been reduced to about 5 million acres per year. Accounting for the substantial reduction in burned acreage was an increase in fire suppression efforts and development of firefighting equipment and strategy. Since 1970, about 3.5 million acres burn annually in the western U.S. The 2014 wildfire season set a new record for 31 days at Preparedness Level (PL) 5 and had one of the largest wildfires in Washington History, the Carlton Complex at 256,108 acres. There was a total of 425,136 acres consumed in the state of Washington.¹⁰

The potential volatility of a fire season can be predicted from winter snowfall, snowpack longevity, spring temperatures, and total precipitation. When winter snowfall is limited and snowpack melts early due to warm spring temperatures, conditions begin to favor fire activity as fine fuels dry out and spring storms generate lightning and high winds. Additionally, human activity increases in natural areas and recreation areas in warm weather months; typically, April through October in the Columbia River Basin. This increases the likelihood of a human-caused ignition, particularly in natural areas where fuels are abundant, that could result in a wildfire, threatening both populated areas and natural resources.

Fire History

Historically, most plant communities in the state of Washington were fire-adapted and burned at fairly regular intervals. Frequent, low intensity fires limited fuel accumulation across the landscape and contributed to the distribution of native, fire-adapted plant communities. In contrast to modern day conditions, fire return intervals (the amount of time between fires in a defined area) were shorter but fires burned with less intensity. Shorter return intervals between fire events often resulted in less dramatic changes in plant species composition.¹¹ Across the landscape, fires typically burned 1 to 50 years apart in a given area with most fire returning between 5 and 20 years.¹² With infrequent return intervals, plant communities

¹⁰ <http://www.nwccinfo.blogspot.com>. Accessed July 2017.

¹¹ Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.

¹² Barrett, J.W. 1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 106 p.

tended to burn more severely and be replaced by vegetation communities different in composition, structure, and age.¹³ Native plant communities in this region developed under the influence of fire. These adaptations to fire are evident at the species, community, and ecosystem levels.

Fire history for Benton County is largely unknown, but large fires that have occurred since the 1980's are well document and have been mapped. Local knowledge suggests that Native Americans did historically perform burns which played an important role in shaping the vegetation throughout the county. The Bureau of Land Management is helping to fund future research to further map fire history in central Washington through fire scars and charcoal deposits. Although this data is not available for the development of this document, it should be available for a future update of this plan.

Since 1980, fire activity has largely been concentrated in the northern third of Benton County as well as the slopes of the Horse Heaven Hills along the south side of I-82 and in the Badger Mountain area. Numerous small fires have also occurred along at the southern end of the county along the Columbia River (Figure 4). Looking at Figure 4, it appears that most of wildfires that have occurred in Benton County were in proximity to road systems or recreational areas which would support that most fires were human-caused. Ignition causes are displayed in Table 7 in the Wildfire Ignition Profile section. Historical fires at least 1000 acres in size that have occurred in Benton County since 1980 are summarized in Table 6. Benton County has had six wildfires between 10,000-99,000 acres and two that were 100,000 acres or larger. The 24 Command fire that occurred in 2000 was the largest wildfire in Benton County since 1980. It burned upwards of 192,000 acres and came within two miles of the radioactive waste storage tanks located at the Hanford Site. Most recently was the Bofer Fire that started on August 8th, 2018. It started along the highway and destroyed five homes and damaged four others.

¹³ Johnson, C.G.; Clausnitzer, R.R.; Mehringer, P.J.; Oliver, C.D. 1994. Biotic and Abiotic Processes of Eastside Ecosystems: The Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.

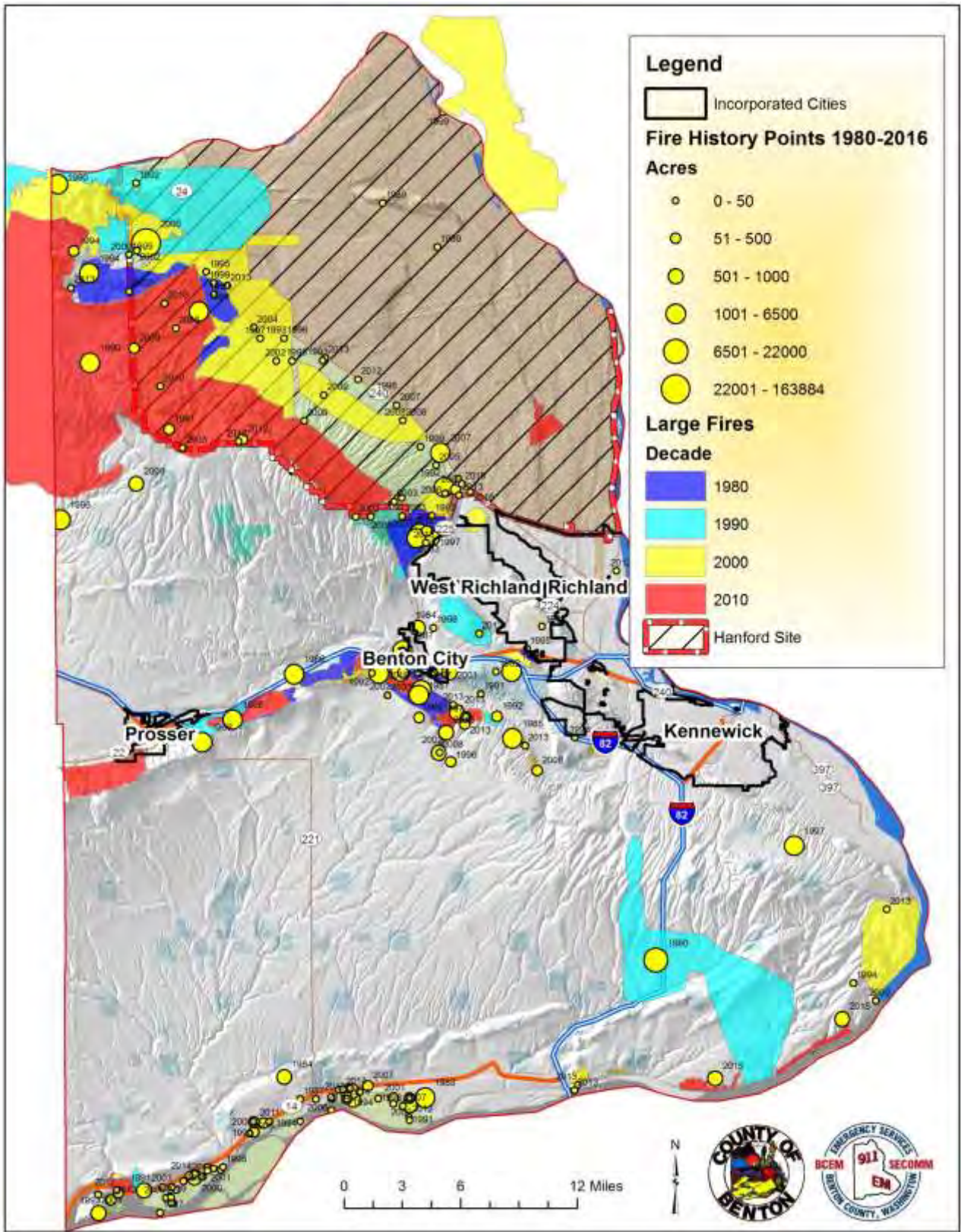


Figure 4) Fires by decade and acreage for Benton County, WA.

Table 6) History of wildfires 300 acres in size or larger for Benton County, WA since 1981. Acres denoted with an asterisk (*) were taken from wildfire GIS layers.

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Horse Heaven Hills	1981	Unknown	5,440		BLM
SR395 (HWY14/27 th)	6/26/1981	Unknown	600	BC#1	Tri City Herald
Rancho Reata	6/27/1981	Unknown	900	BC#1	Tri City Herald
Silver Dollar	7/1/1981	Unknown	25,600	HFD	Tri City Herald
Candy Mountain #1	7/25/1981	Unknown	3000	BC#4	Tri City Herald
Keene (Hwy 12)	7/28/1981	Human	700	BC#4	Tri City Herald
Coyote Canyon (Clodfelter)	8/4/1981	Welder / Grinder	500	BC#1	Tri City Herald
1981 - TOTAL ACRES			36,740		
Yakima Ridge	1982	Unknown	26,880		
1982 - TOTAL ACRES			26,880		
Meals (Yellepit)	7/9/1985	Unknown	2,000	BC#1	Tri City Herald
Badger Canyon	7/21/1985	Unknown	3,000	BC#1	Tri City Herald
1985 - TOTAL ACRES			5,000		
Chandler	1986	Natural	1,207	BC#2 (?)	BLM
Jump Off Joe	8/24/1986	Unknown	500	BC#1	Tri City Herald
Goose Gap (182)	9/4/1986	Controlled Burn	500	BC#1	Tri City Herald
1986 - TOTAL ACRES			2,207		
Drilling	1987	Human	3,190		
Benton	1987	Human	2,070		BLM
Trinity & Horne	9/3/1987	Unknown	2,150	BC#2	Tri City Herald
Nine Mile (Lower Blair)	9/1/1987	Human	900	BC#1	Tri City Herald
1987 - TOTAL ACRES			8,310		
Gibbon	1988	Human	1,320		BLM
Candy Mountain	7/1/1988	Exhaust Sparks	650	BC#4	Tri City Herald
1988 - TOTAL ACRES			1970		
Ely (53 rd)	8/19/1989	Lightning	300	KFD	Tri City Herald
1989 - TOTAL ACRES			300		
Locust Grove (I-82)	7/30/1990	Lightning	30,000	BC#1	Tri City Herald
Emerson	1990	Natural	3,700		BLM
Nake	1990	Human	1,345		BLM
Wilkerson Ranch	8/1/1990	Unknown	3,500	BC#1	Tri City Herald
1990 - TOTAL ACRES			38,545		
Coline	1991	Human	767*		
1991 - TOTAL ACRES			767*		
Webber 2	1992	Unknown	323*		

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Edwards (Locust)	6/26/1992	Exhaust Pipe	1,200	BC#1	Tri City Herald
Jump Off Joe	7/4/1992	Fireworks		BC#1	
Flat Top	7/19/1992	Controlled Burn (?)	400	BC#4	Tri City Herald
1992 -TOTAL ACRES			1,600		
McNary Dam	6/7/1993	Unknown	400	BC#1/BC#6	Tri City Herald
Ely (53 rd ; Inspiration Point)	7/11/1993	Unknown	2,000	KFD	Tri City Herald
Candy Mountain	7/21/1993	Unknown	300	BC#4	Tri City Herald
Red Mountain (Ruppert)	11/3/1993	Unknown	2,000	BC#4	Tri City Herald
1993 -TOTAL ACRES			4,700		
Cold Creek (Silver Dollar)	7/22/1994	Unknown	11,520	HFD	Tri City Herald
Johnson Butte (Bateman)	7/28/1994	Unknown	1,500	BC#1	Tri City Herald
Badger Canyon (Triple Vista, Clodfelter)	8/15/1994	Unknown	2,000	BC#1	Tri City Herald
1994 -TOTAL ACRES			15,020		
North of Plymouth	8/7/1995	Unknown	500	BC#6	Tri City Herald
1995 -TOTAL ACRES			500		
Silver Dollar	1996	Unknown	1,094*		BLM
Appaloosa	1996	Unknown	2,687*	RFD (?)	BLM
Ayers Road	1996	Unknown	7,000	BC#1	Ch. Click
Red Mountain	7/30/1996	Unknown	2,000	BC#4	Tri City Herald
Cold Creek	1996	Unknown	58,000	HFD	Tri City Herald
1996 -TOTAL ACRES			70,781		
Corral Canyon	1997	Unknown	1,313*	BC#2	BLM
Meals (Hover)	7/31/1997	Lightning (?)	750	BC#1	Tri City Herald
Hover (Ayers)	8/14/1997	Equipment (?)	1,500	BC#1	Tri City Herald
Olympia St. Fire (Oly & 73 rd)	8/26/1997	Unknown	6,000	BC#1/KFD	Tri City Herald
1997 -TOTAL ACRES			9,563		
Coyote Canyon (Clodfelter)	1998	Unknown	500	BC#1	Tri City Herald
Prosser View Point (SR 221)	7/7/1998	Human	3,880	BC#3(WBFD) / BC#5	Tri City Herald
I-82 (Yakitat)	7/8/1998	Unknown	2,000	WBFR/BC#2	Tri City Herald

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Rattlesnake Mtn. West of Hanford	7/28/1998	Lightning	6,000	HFD	Tri City Herald
1998 -TOTAL ACRES			12,380		
Command 24	2000	Human / Car Accident	192,000	HFD, BC#2, US F&W	BLM
2000 -TOTAL ACRES			192,000		
Rt 4 N/Rt 1	6/1/2001	Lightning	1,250	HFD	State Fire Marshal's Office
Candy Mountain	6/18/2001	Unknown	750	BC#4	State Fire Marshal's Office
Ayers Rd	7/12/2001		4,000	BC#1	State Fire Marshal's Office
2001 -TOTAL ACRES			6,000		
Hwy 24	2002	Human	4,800		BLM
McBee	2002	Unknown	1,771*		BLM
Nine Canyon (Holtziner Farms)	6/12/2002	Debris Burning / Torch	600	BC#1	State Fire Marshal's Office
(Hinzerling N of Prosser (?))	7/13/2002	Lightning	1,200	BC#3 (WBFR)	State Fire Marshal's Office
Johnson Butte	7/16/2002	Unknown	1,200	BC#1	State Fire Marshal's Office
Ayers (Meals)	7/28/2002	Unknown	400	BC#1	State Fire Marshal's Office
2002 -TOTAL ACRES			9,971		
Horn Rapids Fire	2003	Unknown	1,227*		BLM
Shooting Range	2003	Human	1,391		BLM
(12510 E Kennedy Rd)	6/30/2003	Equipment	300	BC#2	State Fire Marshal's Office
(MP 9 SR 225)	7/16/2003	Unknown	1,750	BC#2	State Fire Marshal's Office
(32203 Clodfelter Rd)	10/12/2003	Unknown	3,000	BC#1	Fire Marshall
2003 -TOTAL ACRES			7,668		

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
(MP 118 I-82)	7/14/2004	Unknown	700	BC#1	State Fire Marshal's Office
(MP 118 I-82)	8/26/2004	Unknown	700	BC#1	State Fire Marshal's Office
2004 -TOTAL ACRES			1,400		
Lincoln Grade	5/26/2005	Unknown	300	BC#6	State Fire Marshal's Office
Painted Hills (1415 Scenic)	5/26/2005	Incendiary / Model Rocket	1,000	Prosser FD (WBFR)	State Fire Marshal's Office
Hammer Command	6/17/2005	Incendiary / Blasting Agent	1,270	Hanford FD	State Fire Marshal's Office
Kirk (Meals)	7/25/2005	Unknown	3,500	BC#1	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@1400)	Unknown	500	BC#6	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@2000)	Unknown	500	BC#6	State Fire Marshal's Office
MP 86 I-82	8/15/2005	Unknown	600	BC#4	State Fire Marshal's Office
MP 87 I-82	8/19/2005	Equipment	1500	BC#3 (WBFR)	State Fire Marshal's Office
2005 -TOTAL ACRES			9,170		
Les Blair	2007	Unknown	7,038*	BC#1	BLM
Wautoma (SR 241)	8/16/2007	Unknown	67,303*	Hanford FD	BLM
Milepost 17	2007	Unknown	6,453*		BLM
(SR 225)	5/12/2007	Shooting	2,500	BC#2	State Fire Marshal's Office
(Harrington / Twin Bridges / Berto)	6/13/2007	Equipment	400	BC#4	State Fire Marshal's Office
(MP 126 I-82)	6/16/2007	Unknown	3,000	BC#6	State Fire Marshal's

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
					Office
(MP 126 I-82)	6/17/2007	Unknown	2,000	BC#6	State Fire Marshal's Office
(MP 88 I-82)	6/25/2007	Unknown	400	Hanford FD	State Fire Marshal's Office
(Hover Rd)	7/2/2007	Unknown	740	BC#1	State Fire Marshal's Office
McBee	7/13/2007	Natural	4,000	BC#2	State Fire Marshal's Office
(Finley Rd/Lower Les Blair)	7/29/2007	Equipment	3,000	BC#1	State Fire Marshal's Office
(Meals/Gamefarm (?))	8/4/2007	Incendiary	300	BC#1	State Fire Marshal's Office
2007 -TOTAL ACRES			97,134		
(I-82 / Beck EB)	6/30/2008	Natural	450	BC#1	State Fire Marshal's Office
(Hammer Training Facility)	8/8/2008	Lightning	549	Hanford FD	State Fire Marshal's Office
(Jump Off Joes Near West Powerlines)	8/15/2008	Unknown	1,200	BC#1	State Fire Marshal's Office
2008 -TOTAL ACRES			2,199		
(38714 W Oie)	6/9/2009	Unknown	2,000	BC#2	State Fire Marshal's Office
(SR 397 / Nine Canyon)	6/29/2009	Equipment	586	BC#1	State Fire Marshal's Office
Dry Creek Complex	8/21/2009	Natural	48,931*	HFD / BC#1 (Multiple)	BLM
2009 -TOTAL ACRES			51,517		
	8/6/2010		1,164	Hanford FD	State Fire Marshal's Office
FFTF	8/18/2010		1,265	Hanford FD	State Fire

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
					Marshal's Office
(Lower Blair W of Nine Canyon)	8/21/2010	Natural	542	BC#1	State Fire Marshal's Office
(Jump Off Joe?)	8/21/2010	Natural	1,200	Hanford FD	State Fire Marshal's Office
(Ayers/Meals)	8/26/2010	Equipment	500	BC#1	State Fire Marshal's Office
2010 -TOTAL ACRES			4,671		State Fire Marshal's Office
(Finley Rd./E. Kirk)	7/20/2011	Other	1300	BC#1	State Fire Marshal's Office
(Finley Rd./Albright)	7/22/2011	Explosives	1300	BC#1	State Fire Marshal's Office
	8/2/2011	Equipment	400	Hanford FD	State Fire Marshal's Office
(Meals/Ayers)	8/6/2011	Equipment	400	BC#1	State Fire Marshal's Office
(Owens/HWY 397)	8/12/2011	Other	400	BC#1	State Fire Marshal's Office
2011 -TOTAL ACRES			3,800		
(SR 241 MP 24)	7/19/2012	Human	4,515	Hanford FD	BLM
(56205 E. Badger Rd.)	7/19/2012	Natural	400	BC#1	State Fire Marshal's Office
(38507 E. Ridge Crest Dr.)	8/13/2012	Equipment	300	BC#4	State Fire Marshal's Office
(SR 397)	8/17/2012	Other	305	BC#1	State Fire Marshal's Office
(Beck Rd.)	9/16/2012	Other	400	BC#1	State Fire Marshal's Office

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
2012 -TOTAL ACRES			5,920		
(106207 E 297 PR SE / Clodfelter)	6/11/2013	Other	750	BC#1	State Fire Marshal's Office
	6/17/2013	Natural	500	BC#1 (ST 160 Area)	State Fire Marshal's Office
Kelandren Dr.	8/6/2013	Electrical Distribution	350	BC#3 (WBFR)	State Fire Marshal's Office
Les Blair	8/9/2013	Unknown	11,000	BC#1	State Fire Marshal's Office
2013 -TOTAL ACRES			12,600		
132016 E. Locust Grove Rd.	5/27/2014	Equipment	310	BC#1	State Fire Marshal's Office
26604 Badger Rd.	7/6/2014	Unknown	600	BC#1	State Fire Marshal's Office
(182 EB MP 87)	7/15/2014	Other	2,100	BC#3 (WBFR)	State Fire Marshal's Office
(182 MP 126)	7/23/2014	Unknown	500	BC#1	State Fire Marshal's Office
(ST 62 (?))	8/20/2014	Natural	500	KFD	State Fire Marshal's Office
2014 -TOTAL ACRES			4,010		
Clodfelter	2015	Unknown	485	BC#1	CH Click
(Meals/Ayers)	6/5/2018	Undetermined	485	BC#1 & BC#3 (WBFR)	State Fire Marshal's Office
(143504 Finley / Spaw Canyon)	6/27/2015	Other	2800	BC#1	State Fire Marshal's Office
(SR 397/OLY/I-82)	7/12/2015	Undetermined	350	BC#1	State Fire Marshal's Office
(182 / MP88)	10/10/2015	Other	460	BC#3 (WBFR)	State Fire Marshal's Office

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
2015 -TOTAL ACRES			4,580		
McBee Command	7/14/2016	Shooting	5,000	BC#2 & WBFR	State Fire Marshal's Office
327255 E SR 397	7/13/2016	Other	400	BC#1	State Fire Marshal's Office
Bennett Rd.	7/30/2016	Other	12,800	WBFR	State Fire Marshal's Office
Range 12	7/30/2016	Shooting	175,491	Multiple	BLM
South Ward Gap	7/31/2016		7,000	WBFR	State Fire Marshal's Office
2016 -TOTAL ACRES			198,691		
Silver Dollar	7/2/2017	Unknown	15,000	HFD (?)	Inciweb
Candy Mountain	9/8/2017	Other	450	BC#4	State Fire Marshal's Office
2017 -TOTAL ACRES			15,450		
Rt 4 South	2018	Lightning	2,800	Hanford FD	Hanford FD
Les Blair	6/4/2018	Railroad Maintenance	875	BC#1	BC#1
Easterday	6/22/2018	Power pole malfunction	1,000	BC#1	BC#1
Shooting Range	6/25/2018	Shooting	500	BC#2 / USFWS	BC#2
Montecito Fire (Kelandren)	6/27/2018	Possible Electrical Fire	1,877	WBFR	WBFR
Weber Canyon	7/13/2018	Shooting or fireworks	300	BC#2 & BLM (?)	BC#2
Locust Grove	7/21/2018	Farm Equipment	2,275	BC#1	BC#1
Bofer	8/11/2018	Human	5,000	BC#1 / KFD	BC#1
Wagon Wheel	9/1/2018	Electrical Distribution and Squirrel	4,000	BC#2	BC#2
2018 -TOTAL ACRES			18,627		

Wildfire Ignition Profile

Detailed records of wildfire ignitions and extents from the Washington Department of Natural Resources (DNR) and Bureau of Land Management (BLM) have been analyzed. In interpreting these data, it is important to keep in mind that the information represents only the lands protected by the agency specified and may not include all fires in areas covered only by local fire departments or other agencies. Because the data that was used was only a subset and did not contain all ignitions from 1983 to 2016, it seemed reasonable to assume that the ratio of ignition causes could be a fair representation of average annual fire activity in Benton County.

From 1983 to 2016, almost 7,700 acres burned per year in Benton County (Table 7). The majority of fires that occurred were related to human activity, 83% of total ignitions per year on average, while others originated naturally or the source of ignition was unknown (Figure 5). The greatest number of acres burned in a single year in Benton County occurred during the 2000 fire season with just over 164,000 acres burned.

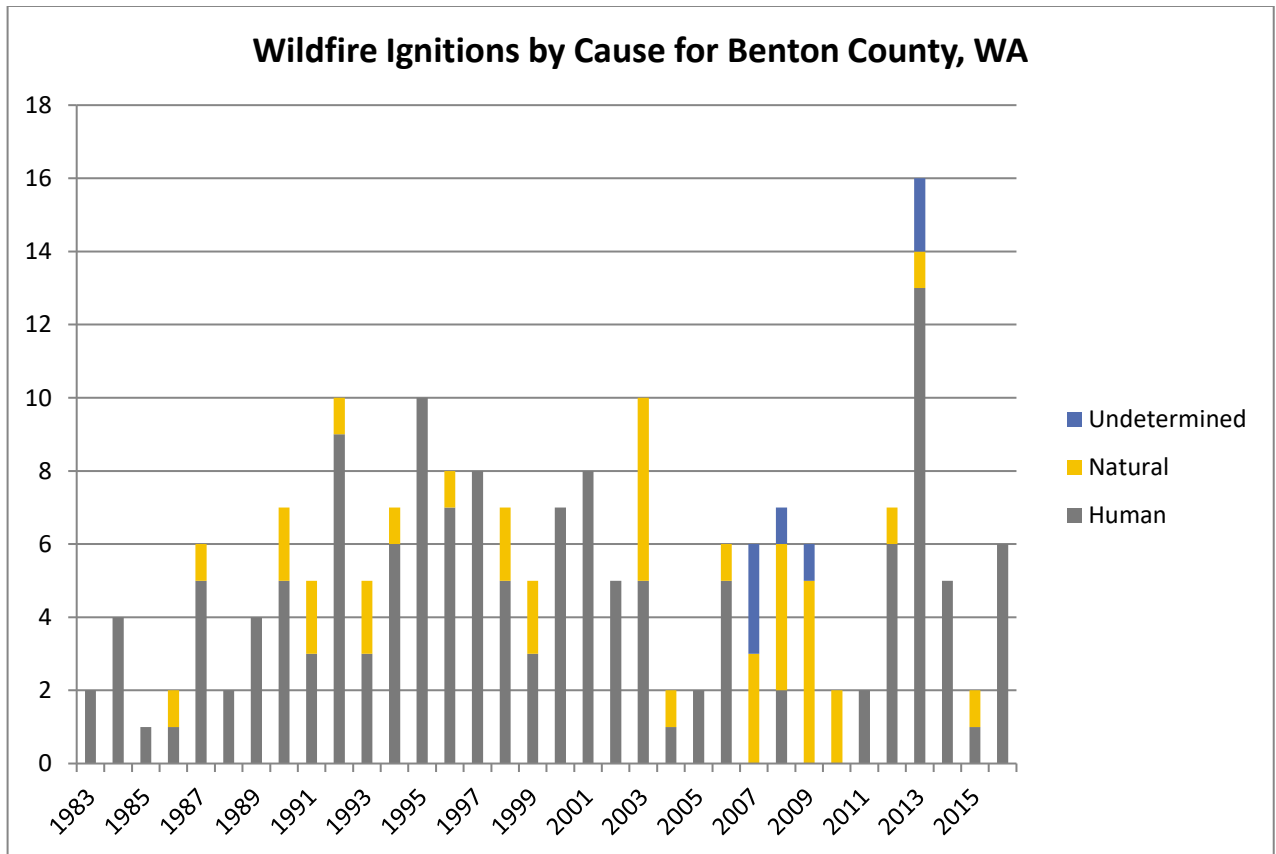


Figure 5) Number of wildfire ignitions by cause for Benton County, Washington from 1983 to 2016.

Table 7) Number and type of ignitions and acreage burned by wildfire from 1983 to 2016 in Benton County, Wa. Due to uncertainty over the dataset, only the ratio of ignition causes is presented in the table while actual ignition count values were omitted.

Cause	Percent of Total Ignitions by Cause	Total Acreage	Avg. Annual Acreage Burned
Human	83%	216,891	6,379
Natural	15%	39,764	1,170
Unknown	2%	5,029	148
Total	100%	261,684	7,697

Based on the agencies’ combined datasets specific to Benton County, there has been an increase in the number of ignitions occurring annually within Benton County and, based on data provided by Benton County, an increase in acreage burned annually since 1983.

The increasing trend observed in annual acreage burned by wildfire in Benton County (Figure 6) matches the national trend (Figure 9). One factor that likely explains the trend is the extensive grassland fuel type found throughout most of Benton County and the increasing component of cheat grass and other invasive species found across the landscape. Fuel loading and distribution across the landscape is largely dependent on spring precipitation. Increased fuel loads and greater fuel continuity often mean that the potential for wildfire and more severe fire behavior also increases. Cheat grass and other invasive species have almost certainly spread and become a greater component of grassland landscapes in Benton County since 1983. Cheat grass changes the fire regime of native plant communities by altering fire behavior and reducing fire return intervals. As cheat grass becomes a greater component of grasslands in Benton County, any infested areas will burn more often, and more acreage will likely burn before a fire is suppressed. This may also explain the increase in the number of annual fire starts occurring in Benton County since 1983 (Figure 7) which is the opposite of the national trend which indicates a decrease in the number of fire starts occurring each year (Figure 10). As population, vehicle traffic, and human activity increase in Benton County an increased number of fire-starting events should be expected.

The data reviewed above provides a general picture regarding the level of wildland-urban interface fire risk within Benton County. There are several reasons why the fire risk may be even higher than suggested above, especially in developing wildland urban interface areas.

- 1) Large fires may occur infrequently, but statistically they will occur. One large fire could significantly change the statistics. In other words, 40 years of historical data may be too short to capture large, infrequent wildland fire events.
- 2) The level of fire hazard depends profoundly on weather patterns. A several year drought period would substantially increase the probability of large wildland fires in

Benton County. For smaller areas, with grass, brush and small trees, a much shorter drought period of a few months or less would substantially increase the fire hazard.

- 3) The level of fire hazard in WUI areas is likely significantly higher than for wildland areas as a whole due to the greater risk to life and property. The probability of fires starting in interface areas is much higher than in wildland areas because of the higher population density and increased activities. Many fires in the WUI are not recorded in agency datasets because the local fire department responded and successfully suppressed the ignition without mutual aid assistance from the state or federal agencies.

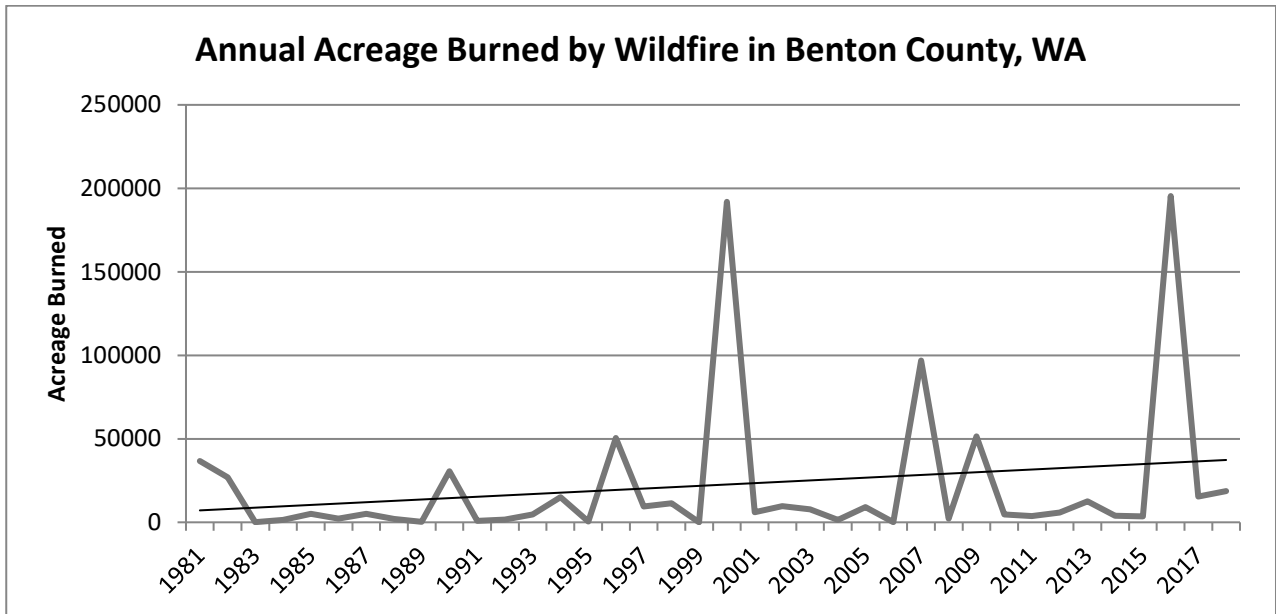


Figure 6) Acreage burned annually by wildfire in Benton County, WA from 1983 to 2016.

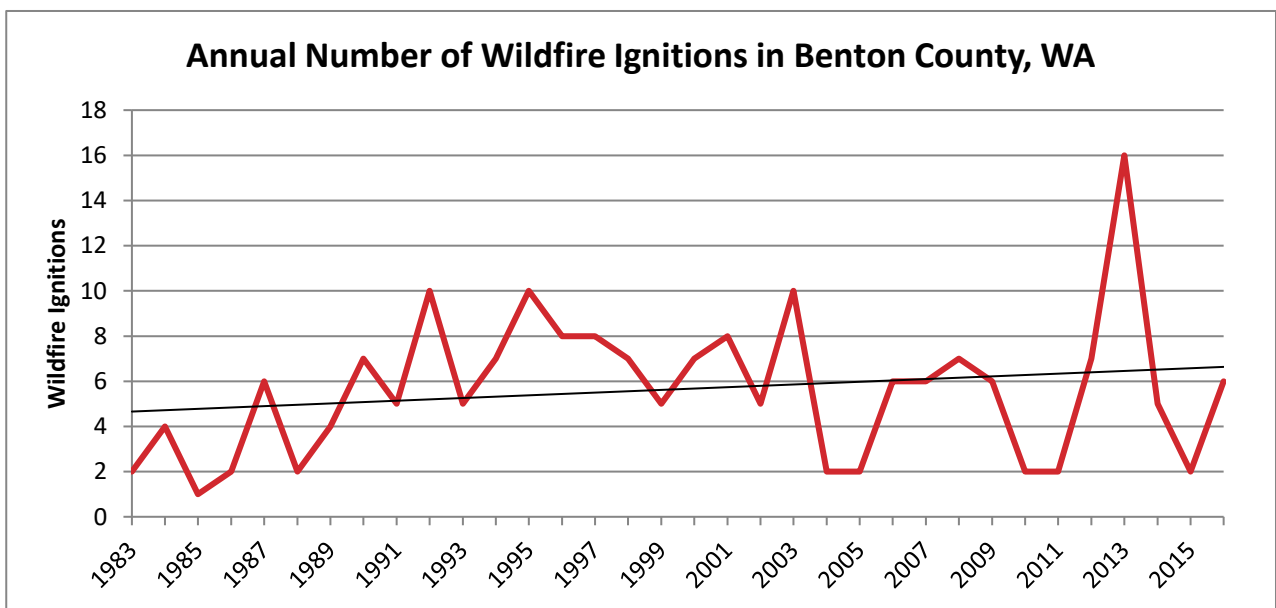


Figure 7) Annual number of wildfire starts in Benton County, WA from 1983 to 2016.

Wildfire Extent Profile

The National Interagency Fire Center and the National Incident Coordination Center maintains records of fire costs, extent, and related data for the entire nation. The number of wildland fire starts, total acreage burned, and annual cost to control figures were created using data from end-of-year reports compiled by all wildland fire agencies after each fire season. The agencies include the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, Forest Service, and all state agencies.

Across the west, wildfires have been increasing in extent and cost of control (Figure 8). Even though the number of fires that occur annually has decreased since 1990 (Figure 10), the total number of acres burned has increased (Figure 9). Over the last few decades summers have become warmer and drier; this trend has had significant implications for the severity of recent fire seasons, particularly in areas where decades of fire suppression have resulted in overstocked stands and heavy fuel loading. However, the inverse relationship between total number of fires and total acres burned can likely be attributed to a few other factors as well. Fire awareness programs have likely reduced the number of fire starts per season by making the public more cognizant of the impacts of wildfire and therefore more diligent when recreating or working in high risk areas. While in addition to recent climate trends, the increase in acreage burned each year can partially be attributed to changes in wildland firefighting tactics and emphasis on safety. In some situations, fire management teams are electing to intentionally burn additional acreage with a back burn operation or let the fire burn itself out or burn to a point where it can be contained with a greater level of assurance and under safer conditions.

The trends displayed in these figures are likely to continue into future fire seasons. Particularly as fire seasons extend earlier and later into the year and conditions become more volatile at the hottest and driest times of the year. As populations continue to increase and the WUI expands, more people, structures, and infrastructure will be exposed to wildfire risks which continue to increase the value of fire planning and fire mitigation work.

The fire suppression agencies in Benton County respond to numerous wildland fires each year, but few of those fires grow to a significant size. According to national statistics, only 2% of all wildland fires escape initial attack. However, that 2% accounts for the majority of fire suppression expenditures and threatens lives, properties, and natural resources. These large fires are characterized by a size and complexity that require special management organizations drawing suppression resources from across the nation. These fires create unique challenges to local communities by their quick development and the scale of their footprint.

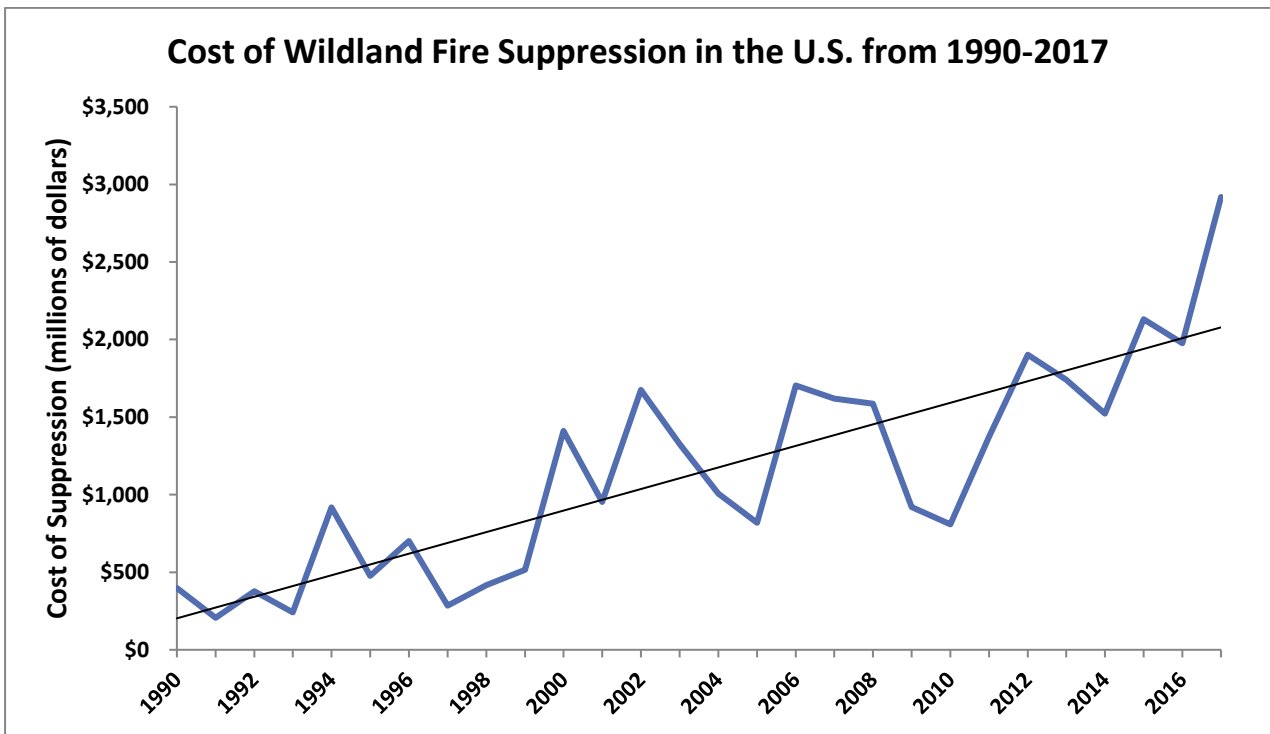


Figure 8) Annual cost of wildland fire suppression in the United States from 1990 to 2017. Values were not adjusted for inflation.

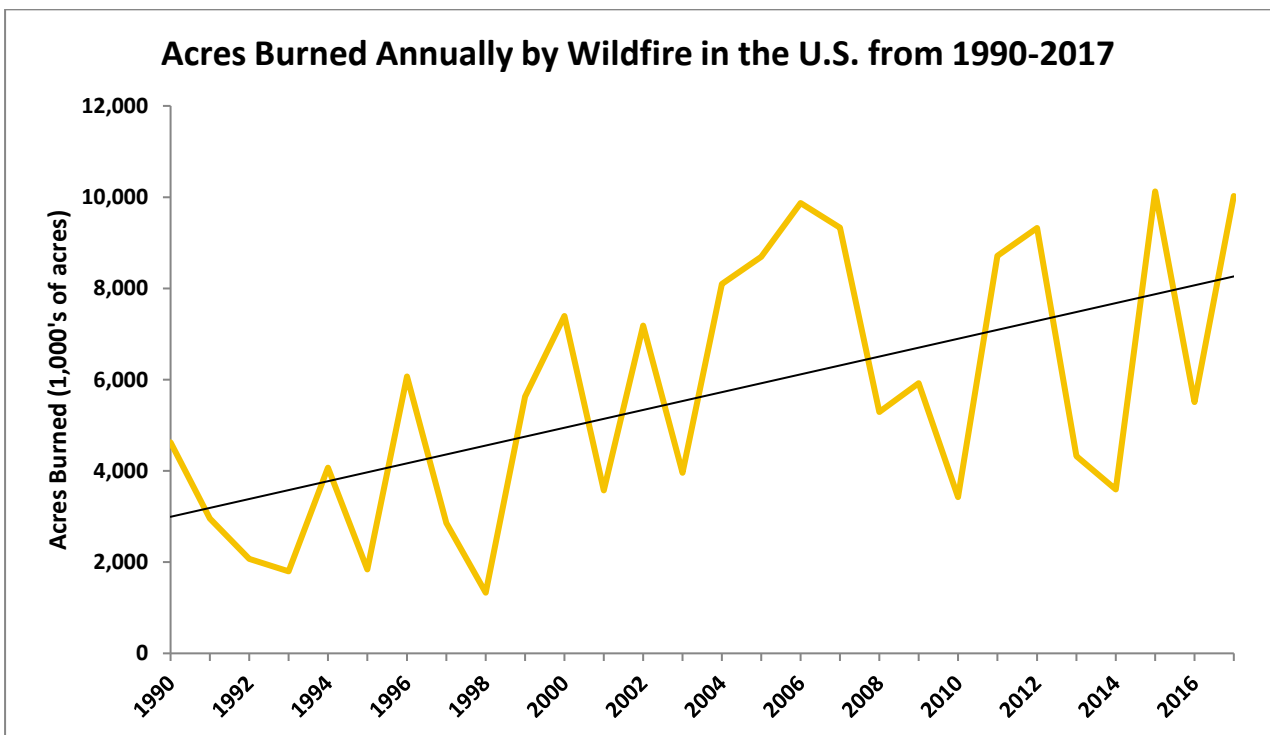


Figure 9) Annual acreage burned as a result of wildfire in the United States from 1990 to 2017.

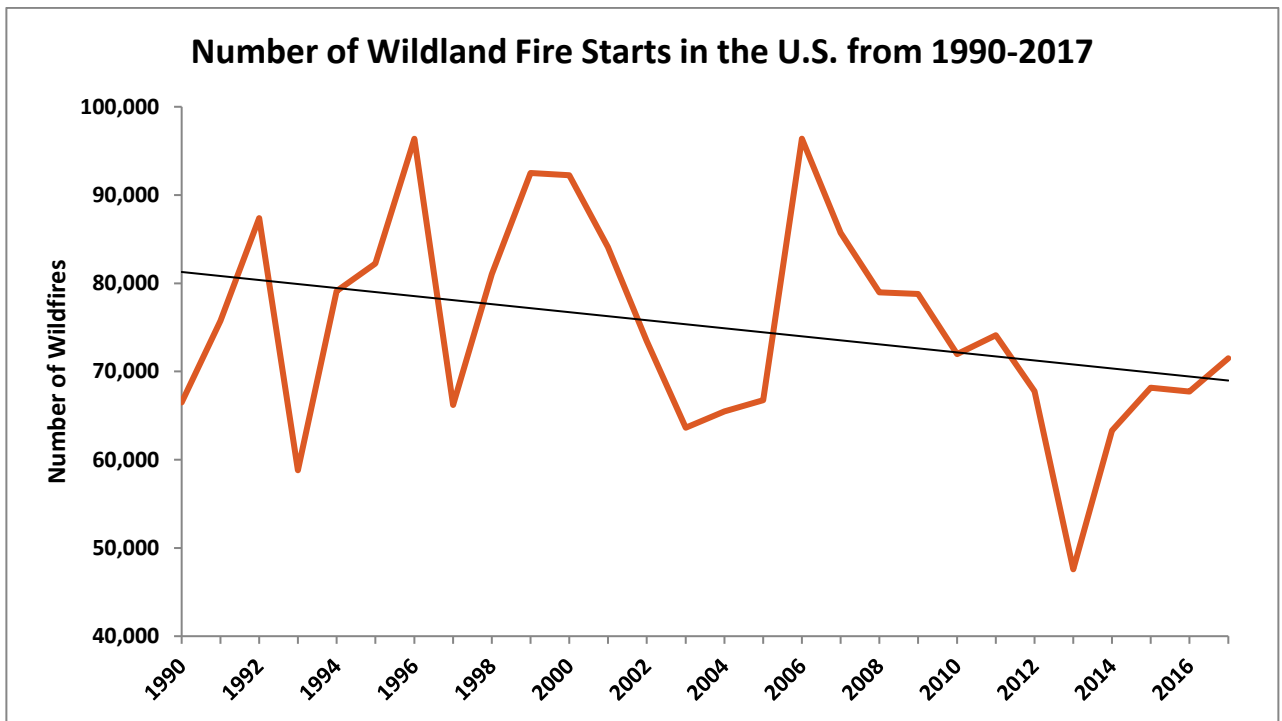


Figure 10) Annual number of wildland fire starts in the United States from 1990 to 2017.

Wildfire Hazard Assessment

Benton County was analyzed using a variety of models, managed on a Geographic Information System (GIS) system. Physical features of the region including roads, streams, soils, elevation, and remotely sensed images were represented by data layers. Field visits were conducted by Benton County Emergency Management personnel and specialists from Northwest Management, Inc. Discussions with area residents and local fire suppression professionals augmented field visits and provided insights into forest health issues and treatment options. This information was analyzed and combined to develop an objective assessment of wildland fire risk in the region.

Historic Fire Regime

Historical variability in fire regime is a conservative indicator of ecosystem sustainability, and thus, understanding the natural role of fire in ecosystems is necessary for proper fire management. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes, the fire return interval (frequency) and fire severity prior to settlement by Euro-Americans, to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

A primary goal in ecological restoration is often to return an ecosystem to a previously existing condition that no longer is present at the site, under the assumption that the site's current condition is somehow degraded or less desirable than the previous condition and needs improvement.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Historical fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

This model uses only the current vegetation types to determine the historic fire regime. Native Americans reportedly burned throughout the county on a regular basis. The vegetation types were much different pre-Euro-American settlement than they are today and believed to be a more grassland dominated landscape.

Using the Fire Regime Group model, fire return intervals and anticipated fire behavior can be mapped for Benton County based on current vegetative cover (Figure 11). Fire return interval describes the amount of time that can be expected to elapse before a given area will burn again and severity describes the duration and intensity at which a fire burns. Just over 93% of Benton County is classified as Fire Regime Groups III and IV which means that most of the county has an expected fire return interval of 35 to 200 years and will burn with low to stand-replacement levels of severity (Table 8). Areas classified as Fire Regime Group III will likely burn with low to mixed severity while areas that are classified as Fire Regime Group IV can be expected to burn with high severity. The remaining area of Benton County either falls into different Fire Regime Groups (2.1% of remaining area) or is non-burnable.

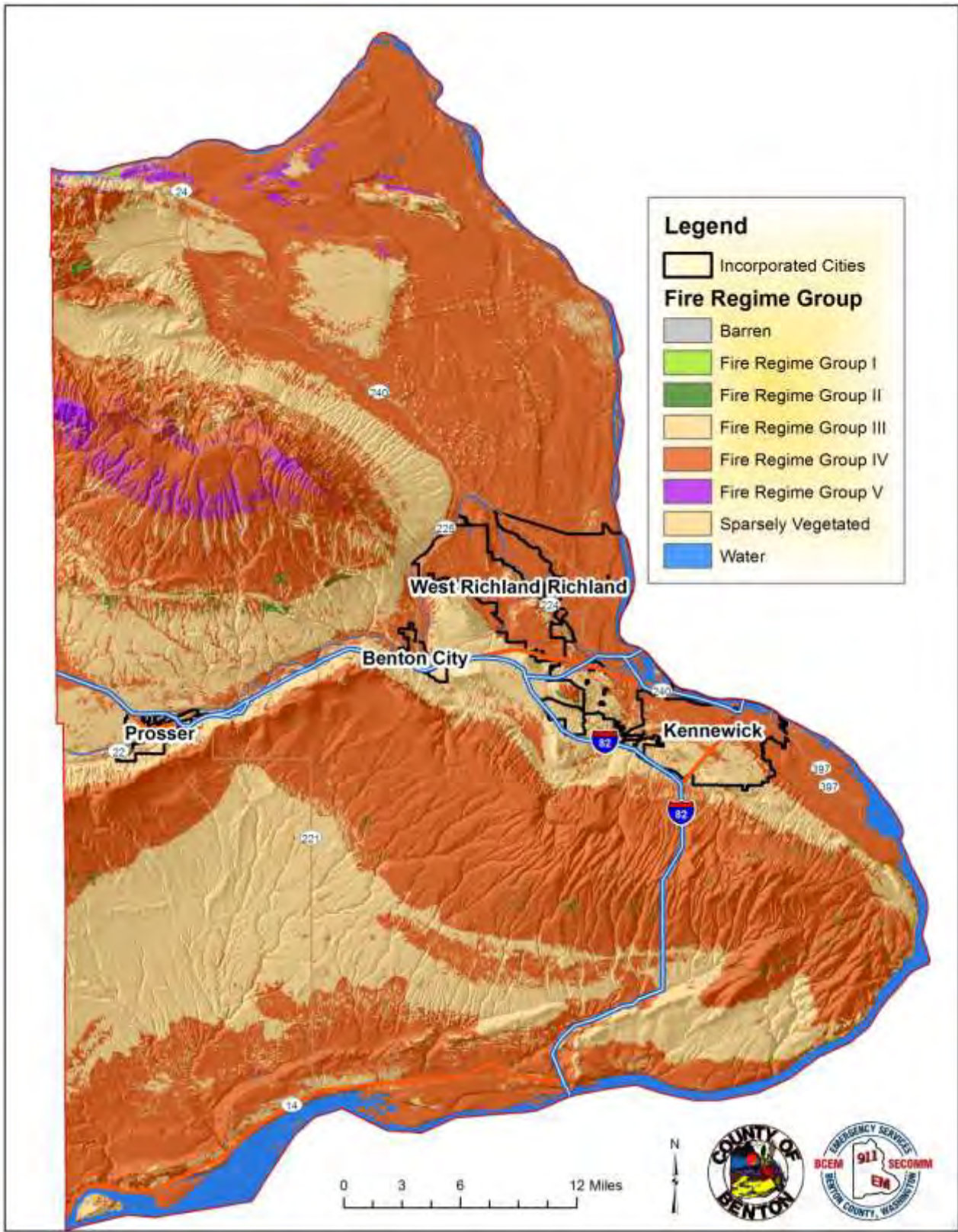


Figure 11) Fire history through the Fire Regime Group dataset. Majority of the County (60%) historically experienced high severity fires on a return interval between 35 and 200 years.

Table 8) Fire Regime Groups for Benton County, WA.

Designation	Description	Acres	% Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	1,216	0.1%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	8,221	0.7%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	372,737	33.1%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	676,879	60.1%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	14,609	1.3%
Water	Water	40,104	3.6%
Barren	Barren	452	0.0%
Sparsely Vegetated	Sparsely Vegetated	12,183	1.1%
Total		1,126,400	100.0%

Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning.^{14, 15} Coarse scale definitions for historic fire regimes have been developed by Hardy et al¹⁶ and Schmidt et al¹⁷ and interpreted for fire and fuels management by Hann and Bunnell.

A fire regime condition class (FRCC) is a classification of the amount of vegetative departure from the historic regime.¹⁸ The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime.^{19,20}

¹⁴ Agee, J. K. Fire Ecology of the Pacific Northwest forests. Oregon: Island Press. 1993.

¹⁵ Brown, J. K. "Fire regimes and their relevance to ecosystem management." *Proceedings of Society of American Foresters National Convention*. Society of American Foresters. Washington, D.C. 1995. Pp 171-178.

¹⁶ Hardy, C. C., et al. "Spatial data for national fire planning and fuel management." *International Journal of Wildland Fire*. 2001. Pp 353-372.

¹⁷ Schmidt, K. M., et al. "Development of coarse scale spatial data for wildland fire and fuel management." General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

¹⁸ Hann, W. J. and D. L. Bunnell. "Fire and land management planning and implementation across multiple scales." *International Journal of Wildland Fire*. 2001. Pp 389-403.

¹⁹ Hardy, C. C., et al. "Spatial data for national fire planning and fuel management." *International Journal of Wildland Fire*. 2001. Pp 353-372.

²⁰ Schmidt, K. M., et al. "Development of coarse scale spatial data for wildland fire and fuel management." General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

An analysis of Vegetation Condition Classes in Benton County shows that 38% of the land is considered to be highly departed from its historic fire regime and associated vegetation and fuel characteristics (Table 9). Just over 12% of the land is moderately departed while less than 8% is classified as low departure. Almost 30% of the land in the county is in agriculture, half of which is non-burnable.

The current Fire Regime Condition Class model shows that almost 60% of Benton County is considered to be departed, most of which is highly departed (Figure 12). A majority of the county is characterized by various shrub species and grasses which primarily include sagebrush, bluebunch wheatgrass, Idaho fescue, and cheat grass. The current structure and species composition of the shrub-steppe ecosystem increases the likelihood that it will burn with greater severity and burn more frequently, particularly as invasive species become a greater component of the shrub-steppe ecosystem in Benton County.

Table 9) Fire Regime Condition Classes for Benton County, WA.

Fire Regime Condition Class	Description	Acres	Percent of Total
Fire Regime Condition Class I	Low Vegetation Departure	86,275	7.7%
Fire Regime Condition Class II	Moderate Vegetation Departure	136,953	12.2%
Fire Regime Condition Class III	High Vegetation Departure	432,679	38.4%
Water	Water	31,786	2.8%
Urban	Urban	42,535	3.8%
Burnable Urban	Burnable Urban	50,073	4.4%
Barren	Barren	358	<1%
Sparsely Vegetated	Sparsely Vegetated	9,560	<1%
Agriculture	Agriculture	166,960	14.8%
Burnable Agriculture	Burnable Agriculture	169,221	15.0%
Total		1,126,400	100.0%

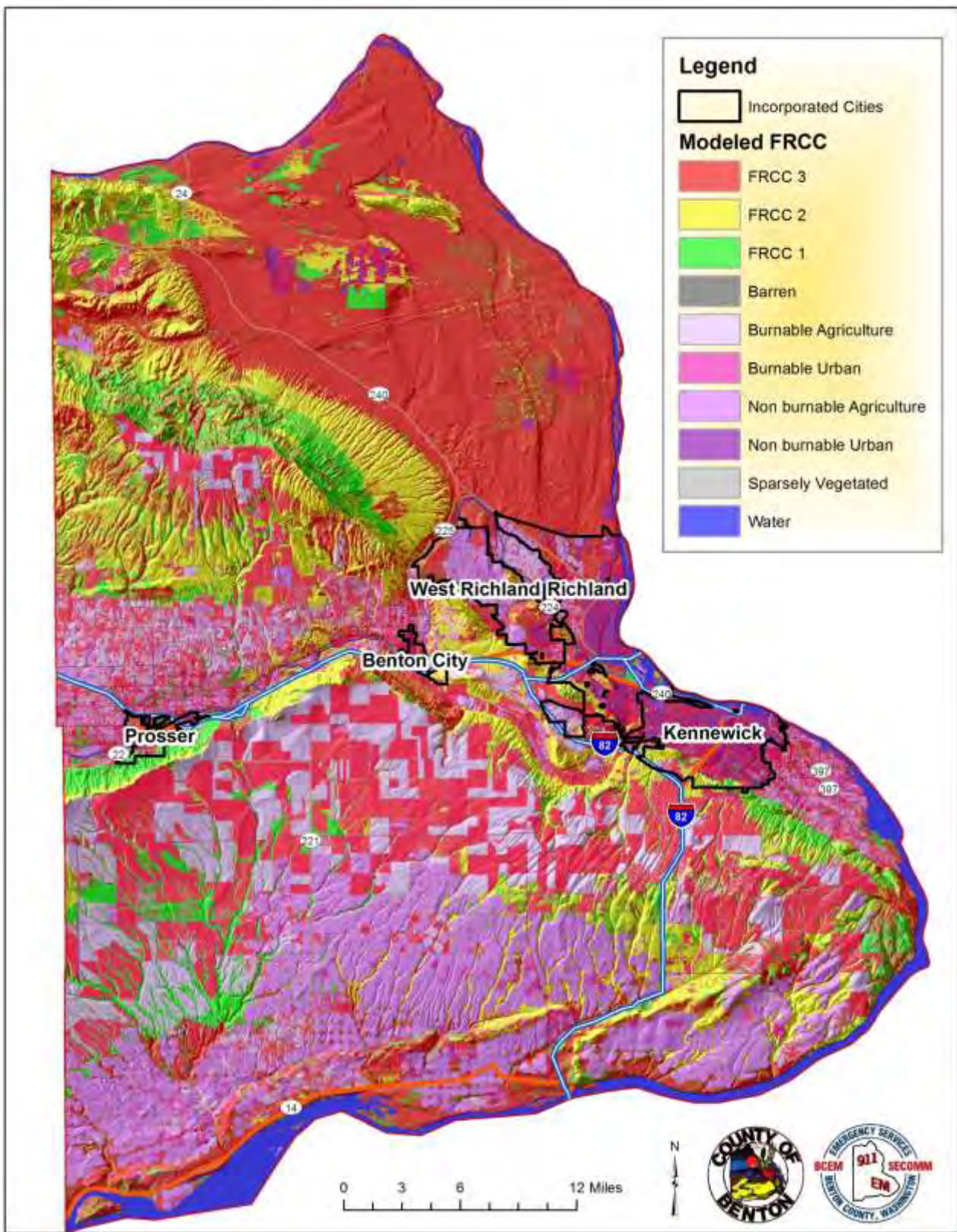


Figure 12) Fire Regime Condition Classes for Benton County, WA.

Wildland Urban Interface

The wildland urban interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the WUI. The WUI refers to areas where wildland vegetation meets urban developments or where forest fuels meet urban fuels such as houses. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the WUI requires the efforts of federal, state, and local agencies and private individuals.²¹ “The role of [most] federal agencies in the WUI includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the WUI is [largely] the responsibility of Tribal, state, and local governments”.²² The role of the federal agencies in Benton County is and will be much more limited. Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures.²³ With treatment, a WUI can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a WUI that is properly treated will be less likely to sustain a fire that enters or originates within it.²⁴

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing existing defensible space, landowners can protect the WUI, the biological resources of the management area, and adjacent property owners by:

- Minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers

²¹ Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.

²² USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: <http://www.fs.fed.us/r3/sfe/fire/urbanint.html>

²³ USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: <http://www.fs.fed.us/r3/sfe/fire/urbanint.html>

²⁴ Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.

(firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;²⁵

- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three WUI conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres; and
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size.

In addition to these classifications detailed in the Federal Register, Benton County has included two additional classifications to augment these categories:

- **Low Density Rural Areas** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries or urban growth boundaries; it is set by very high population densities (more than 7-10 structures per acre).

In summary, the designation of areas by the Benton County planning committee includes:

- Interface Condition: WUI
- Intermix Condition: WUI
- Occluded Condition: WUI
- Low Density Rural Areas: WUI
- High Density Urban Areas: WUI

²⁵ McCoy, L. K., et all. Cerro Grand Fire Behavior Narrative. 2001.

Benton County's wildland urban interface (WUI) is mostly based on population density (Figure 13). Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent density. To graphically identify relative population density across the county, structure locations are used as an estimate of population density. The county's 911 address layer (GIS) was used to identify the locations of possible structures. The resulting output identified the extent and level of population density throughout the county.

In addition, the Benton County planning committee determined that the entire county should be classified under WUI designation due to the rapid rates of spread that commonly occur within the county.

By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as low density WUI (as defined above). This portion of the analysis allows us to "see" where the highest concentrations of structures are located in reference to relatively high risk landscapes, limiting infrastructure, and other points of concern.

The WUI, as defined here, is unbiased and consistent and most importantly – it addresses all of the county, not just federally identified communities at risk. It is a planning tool showing where homes and businesses are located and the density of those structures leading to identified WUI categories. It can be determined again in the future, using the same criteria, to show how the WUI has changed in response to increasing population densities. It uses a repeatable and reliable analysis process that is unbiased.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Benton County Community Wildfire Protection Plan steering committee evaluated a variety of different approaches to determining the WUI for the county and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the federal agencies, it is hoped that it will serve as a planning tool for the county, state and federal agencies, and local fire agencies.

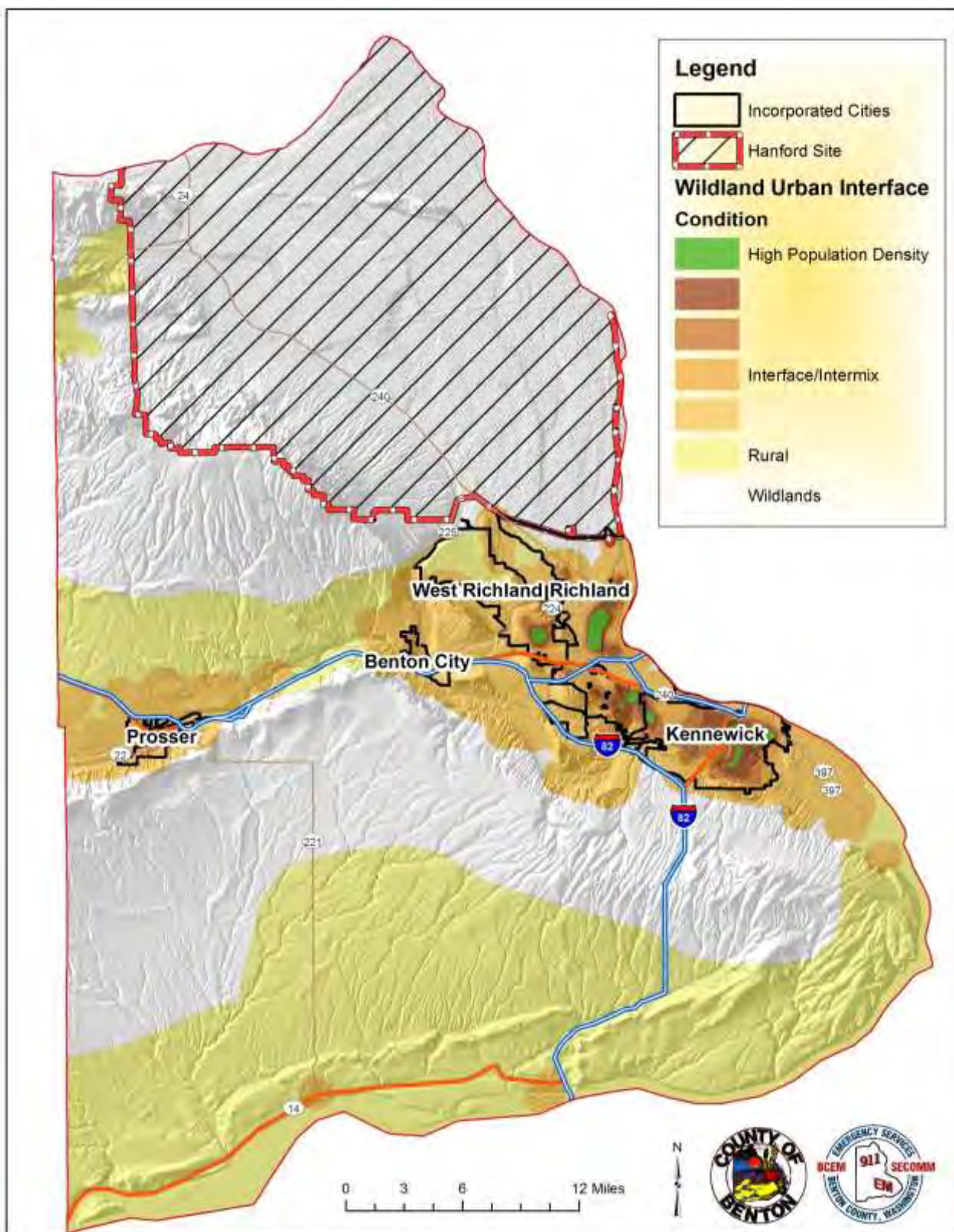


Figure 13) Wildland Urban Interface (WUI) map of Benton County, WA.

Potential WUI Treatments

The definition and mapping of the WUI is the creation of a planning tool to identify where structures, people, and infrastructure are located in reference to each other. This analysis tool does not include a component of fuels risk. There are a number of reasons to map and analyze these two components separately (population density vs. fire risk analysis). Primary among these reasons is the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependent on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest health issues or other concerns.

By examining these two tools separately, the planner is able to evaluate these layers of information to see where the combination of population density overlays areas of high current relative fire risk and then take mitigative actions to reduce the fuels, improve readiness, directly address factors of structural ignitability, improve initial attack success, mitigate resistance to control factors, or (more often) a combination of many approaches.

It should not be assumed that just because an area is identified as being within the WUI, that it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site-specific factors.

It should also not be assumed that WUI designation on national or state forest lands automatically equates to a treatment area. The Forest Service, Bureau of Land Management, and Washington Department of Natural Resources are still obligated to manage lands under their control according to the standards and guides listed in their respective forest plans (or other management plans). The adopted forest plan has legal precedence over the WUI designation until such a time as the forest plan is revised to reflect updated priorities.

Most treatments may begin with a home evaluation, and the implicit factors of structural ignitability (roofing, siding, deck materials) and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands (mapped as yellow) may look closely at access (two ways in and out) and communications through means other than land-based telephones. On the other hand, a subdivision with densely packed homes (mapped as brown – interface areas) surrounded by forests and dense underbrush, may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

Relative Threat Level Mapping

The predicted Wildland Fire Threat layer shown on the map below (Figure 14) was produced by combining weighted data sets that relate to wildfire risk in an additive model. Datasets considered for the model included; fire behavior fuel models, percent slope, aspect, fire protection capabilities, ignition probability, wildland fire rate of spread, wildland fire intensity, precipitation, and population. Each of these data layers was reviewed by members of the steering committee who confirmed whether or not they fairly represented those characteristics of Benton County. Once the layers were compiled the committee reviewed the final threat level map for accuracy. Consequently, the map was assembled using the Fuel Models, Slope, and Aspect layers as maps produced using the other layers tended to understate potential fire threat across the county. Fuel types across the county are light and are relatively homogenous throughout the County. Because of the low variability in fuel types and the relatively even distribution throughout the county, few variables truly impact the likelihood of ignition in Benton County. Table 10 provides more information about the data layers that were used to create the Benton County Relative Threat Level Map.

Table 10) Parameters for Threat Level Mapping exercise. Bolded layers were included in the final version of the Threat Level Map.

Dataset	Source
Fuel Models	Scott and Burgen 40 Fire Behavior Fuel Model from LANDFIRE
Slope	10 Meter Digital Elevation Model (DEM)
Aspect	10 Meter Digital Elevation Model (DEM)
Fire Protection	Benton County Fire Station Points
Ignition Probability	Density of Fire Occurrences
Wildland Fire Rate of Spread	30 Meter FlamMap Rate of Spread Raster
Wildland Fire Intensity	
Precipitation	PRISM Climate Data from Oregon State University
Population	911 Address Points

Risk Categories

Based on analysis of the various modeling tools, existing historical information, and local knowledge, a preliminary assessment of potentially high wildfire risk areas was completed. This assessment prioritized areas that may be at higher risk due to non-native or high fire risk vegetation, fire history profile, high risk fuel models, and/or limited suppression capabilities. This assessment also considered areas that had a high population or other valuable assets requiring protection from the impacts of wildland fires.

Non-native or High Fire Risk Vegetation

Fuel type, or vegetation, plays an important role in determining wildland fire danger. All fuel types can and will burn under the right conditions; however, some fuel types pose more danger than others due to the intensity at which they burn, the horizontal and vertical continuity of burnable material, and firefighters' ability to modify the fuel complex in front of an approaching wildfire. While rangeland or grass fires often spread rapidly, they burn quickly and at a lower intensity than forest fires. Additionally, local farmers and firefighters can often construct fuel breaks with dozers and other equipment relatively quickly. These tactics are not as effective in forested areas or on steep terrain.

Vegetation types that lead to increased wildfire intensity or severity were given a higher threat level rating.

High Risk Fire Behavior

Due to heavy fuel loads, much of the county could experience extreme wildfire behavior characteristics that result in very intense, replacement-level fires. The agriculture/grassland areas will likely experience lower intensity fires with rapid rates of spread, particularly under the influence of wind.

One of the factors contributing to potentially dangerous fire behavior is the preheating of fuels on steep slopes ahead of the actual flame front. Typically, fires spread very rapidly uphill, particularly in grass fuel types. Hot gases rise in front of the fire along the slope face preheating the upslope vegetation and moving a grass fire up to four times faster with flames twice as long as a fire on level ground. This preheating of fuels, or radiant heat, is capable of igniting combustible materials from distances of 100 feet or more.

Areas with a high potential for extreme fire behavior based on Fire Behavior Analysis Tool modeling and local knowledge were given a higher threat level rating. Based on local knowledge, the grass fuel model was given a higher intensity level than it normally would receive due to the vast amounts of available fuel. Although grass fires can generally be controlled relatively easily, fires burning in this fuel type can spread rapidly. Extreme rates of spread coupled with the remote nature of much of the county, can cause significant control issues for local fire districts.

Suppression Capabilities

Fire protection in Benton County is the responsibility of the local fire agencies. The county has six active fire districts, two municipalities, and the Hanford Fire Department with resources available for fire suppression. However, each agency is limited to the resources at hand until help from other agencies can arrive.

Some parts of the county fall under Washington DNR or BLM fire protection responsibility. The Washington DNR and BLM have cooperative agreements with Benton County Fire Districts to provide initial attack on their respective districts. The response times for the DNR and BLM can be several hours or longer due to the logistical challenge of mobilizing both crews and equipment from their respective duty stations.

Population Centers and Developing Areas

Due to the increased human activity within and surrounding Benton County communities, these areas are inherently at a higher risk of ignitions. The perimeter and outskirts of population centers and known developing areas were given a high threat level rating.

High Protection Value

Of the areas and resources at risk to wildfire in Benton County, the planning committee has identified the following areas as *high protection values*. These areas include watersheds, recreation areas, and cultural areas.

- Watersheds: Yakima River Delta Vicinity, Zintel Canyon
- Recreation Areas: Badger Mountain, Rattlesnake Mountain
- Cultural Areas: Rattlesnake Mountain

Field Assessments

In an effort to visually confirm the output of the fuels analyses conducted for this plan, a multi-day field assessment was conducted in Benton County in May of 2018. A natural resource specialist from NMI drove through the county to get a general idea of the prominent fuel types found across Benton County. Select high risk areas, as identified by local fire personnel, featuring different fuel types and fuel loading were also toured. The field assessment started at the north end of Benton County on Highway 24 and continued south to the Tri-Cities area along Highway 240. In the Tri-Cities area, Horn Rapids County Park, W.E. Johnson Park, Bateman Island, and Badger Mountain were assessed as most were considered high risk areas and differed significantly from the rest of the county in regard to fuel types and fuel loading. To complete the overall fuels assessment, the tour of the county included the stretch of Highway 82 from the Tri-Cities to Prosser and then to the western edge of the county on Highway 22. The southern edge of the county was also evaluated by taking Highway 14 from the western most edge of the county to Highway 82 and then traveling north back to the Tri-Cities. See Chapter 5 for more information.

Determination of Relative Threat Level

Following the field assessments, the planning committee began development of the Relative Threat Level model. Risk categories included in the final analysis were fuel models, slope, aspect, wildland fire intensity, precipitation, and population density. The various categories, or layers, were ranked by the committee based on their significance pertaining to causal factors of high wildland fire risk conditions or protection significance. The ranked layers were then analyzed in a geographical information system to produce a cumulative effects map based on the ranking. Following is a brief explanation of the various categories used in the analysis and the general ranking scheme used for each.

- Environmental Factors – slope, aspect and precipitation all can have an enormous impact on the intensity of a wildfire. Therefore, areas with steep slopes, dry aspects, or lesser amounts of precipitation, relative to Benton County as a whole, were given higher threat rankings.
- Vegetation Cover Types – certain vegetation types are known to carry and produce more intense fires than other fuel types. For Benton County, shrub and grass fuel models were given the higher rankings followed by short grass / agriculture, and forest types (shrub understory) fuel models.
- Fire Behavior – areas identified by fire behavior modeling as having high rate of spread potential or high fire intensity were given a higher threat level ranking.
- Populated Areas – these areas were ranked higher due to the presence of human populations, structures, and infrastructure requiring protection from fire.

Each data layer was developed, ranked, and converted to a raster format using ArcGIS 10.x. The data layers were then analyzed in ArcGIS using the Spatial Analyst extension to calculate the cumulative effects of the various threats. This process sums the ranked overlaid values geographically to produce the final map layer. The ranked values were then color coded to show areas of highest threat (red) to lowest threat (dark blue) relative to Benton County.

Relative Threat Level Map

The output of the analysis shows that most of Benton County is at moderate to high risk for wildfire (Figure 14). The northern portion of the county, including the Hanford Site (the area delineated by the purple boundary) and Rattlesnake Mountain, is at high risk of wildfire while the central portion of the county, including the Horse Heaven Hills and the heavily populated urban areas, is at moderate risk. Steeper slopes, south faces, and drainages also received higher threat ratings. Irrigated agricultural areas are at low risk for wildfire.

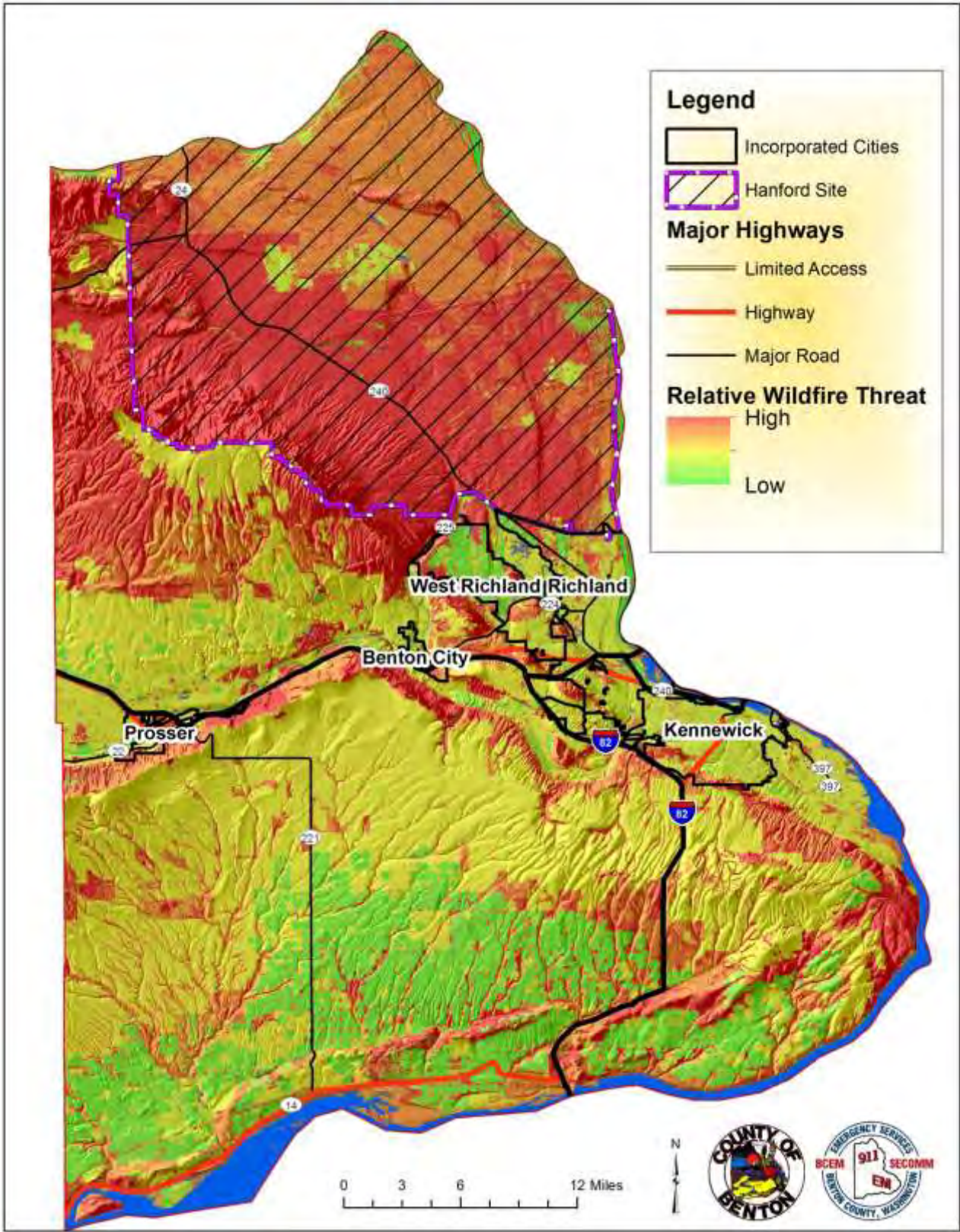


Figure 14) Relative threat level map for Benton County, WA.

Overview of Fire Protection System

A majority of the county has a local fire protection district that covers both structural and wildland fire response. The Washington DNR is responsible for wildland fire protection outside of fire district jurisdictions. Due to the lack of DNR resources in Benton County, the DNR maintains an agreement with Benton County to provide initial attack for the first 12 hours of the operational period.

Local Fire Department and District Summaries

The firefighting resources and capabilities information provided in this section is a summary of information provided by the fire chiefs or representatives of the wildland firefighting agencies listed. Each organization completed a survey with written responses which are summarized here. These synopses indicate their perceptions and information summaries.

Benton County Fire District #1

District Summary

Fire District #1 protects an area of approximately 320 square miles south the cities of Kennewick Richland and West Richland, serving a population of approximately 17,500 residents. Located within the District are heavily populated residential areas, commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently six fire stations strategically located to provide efficient protection. Operating as a combination fire department, District #1 has 13 career staff and 90 dedicated volunteer firefighters, officers, EMT's, First Responders, and support personnel. The equipment utilized by the department is included in the table below. The District average's 1350 calls for service yearly, with 55 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of wheat which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire. Creating fire breaks on lands within the Conservation Reserve Program (CRP) and around residential developments are a couple goals for area fire chiefs. We have had several large fires on CRP lands, wildland areas and areas with significant urban interface concerns due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is part of a County- wide Dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and somewhat temperamental – repeater simulcast micro wave system. Although the system has gone through a major equipment update and fine tuning, the service area due to topography continues to have areas where radio communications between Dispatch and Fire/EMS responders is difficult or impossible.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agricultural burns, tumbleweeds, barbeques and woodstoves. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain more firefighters and EMS personnel.

Cooperative Agreements: The District is part of a mutual aid agreement which includes all fire departments and fire districts within Benton, Franklin and Walla Walla Counties that has developed a dispatch matrix that allows us to put a large amount of resources on an incident in a very short period of time. This has proven to be very successful; we are able to control potentially large incidents from getting out of control and additionally reduce the need to call for State Mobilization Assistance. In addition to the previously identified mutual aid agreement, the District also has cooperative agreements or contracts with; Washington State Department of Natural Resources, Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service and Washington State Fire Marshal's Office. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire district currently provides residents information on the Community Wildfire Protection Program and Firewise literature. The fire district has no current hazard fuel reduction program within the annual operating budget due to budget priorities. An increase in available grant funds would be beneficial to target some of the high hazard fuels reductions areas identified in the county wildfire plan.

Fire Breaks: Changes in the CRP rules that would allow fire breaks down to the dirt without a negative financial impact to the property owner would be beneficial.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression.

Residential and Agricultural Burning: All open burning within the county, is subject to guidelines concerning, size, time, location and permit requirements. County Residents can find the guidelines for non-agricultural open fires by referring to:

<http://bentoncleanair.org/index.php/burning/>

Agricultural burning in the County is regulated by the State Department of Ecology. These burns are subject to specific requirements and are limited by air quality management, weather and hazardous fire conditions. For Specific information on the permitting process, fees and restrictions regarding Agricultural burning in the County please refer to:

<http://bentoncleanair.org/index.php/burning/agricultural-burning/>

Others: As with most volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Apparatus Inventory

Station #	Asset Type	Asset Description
STATION 100	2008 FORD F250	UTILITY, 3/4 TON, EXTENDED CAB, WIDE BOX, 8 FT, PU, 4X4
	2008 FORD F250	UTILITY, STAFF VEHICLE
	2012 FORD F150	UTILITY, STAFF PICKUP 4X4, 3/4 TON
	1989 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	2004 FORD F150	UTILITY, STAFF PICKUP 4X4
	1984 UTILITY TRAILER	UTILITY TRAILER, 18 FT.
	1980 WISCONSIN	EQUIPMENT TRAILER, 16 FT. 6 TON, TILT DECK
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
STATION 110	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4
	1978 CATERPILLAR	DOZER, D5B
	2006 WELLS	CSEPP WELLS UTILITY TRAILER
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, CSEPP
STATION 120	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	1979 GMC	CASCADE/BREATHING AIR, 4X2
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	1984 SHASTA MOTOR HOME	REHABILITATION UNIT, 26 FT.
	1998 ROSEBURY	UTILITY TRAILER, 12 FT, SUPPORT SERVICES
	1998 WELLS CARGO TRAILER	12 FT. UTILITY TRAILER, CSEPP
	2016 RAM 5500, SKEETER	ENGINE, TYPE 5 CREW 4X4, 125 GPM, 400 GAL.
STATION 130	1991 INTERNATIONAL	BRUSH, 125 GPM, 500 GAL. 4X4
	1999 FORD F350	ENGINE, TYPE 6, 125 GPM, 250 GAL 4X4

STATION 140	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, PUMP TEST
STATION 150	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4
STATION 160	2008 FORD F350	UTILITY, STATION SQUAD
	2003 FORD	UTLITY, MAINTENANCE, F3PU
	2001 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	1999 CHEVROLET	UTILITY, SPARE STAFF VEHICLE
	2005 INTERNATIONAL TRACTOR	TRACTOR, TRANSPORT 860/DS
	1970 SHWTZ LOWBOY TRAILER	DOZER TRANSPORT, ___ TON LOWBOY
	1953 PRESSED STEEL	DOZER TRANSPORT, 25 TON LOWBOY
	1980 M35-A2 CARGO	TRUCK, FUEL, 6X6, 2.5 TON
	2008 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X5
	1966 INTERNATIONAL	DOZER, TD 15B
	2015 JOHN DEERE	DOZER 700K LGP
	1993 YAMAHA	ATV, 350, 4X4 BIG BEAR
	1992 PIERCE LANCE	AERIAL, QUINT 105'
	1979 JOHN DEERE	DISK, JOHN DEERE 425
	1993 UTILITY TRAILER	12 FT UTILITY TRAILER
1994 UTILITY TRAILER	TRAILER, ATV, 10'	
1998 ARCTIC CAT	ATV, 400 CC 4X4	
2000 CHEVROLET	ASTRO MINI VAN	
	1999 FREIGHTLINER	TRANSPORT, M915A4, 52000 GVWR
	2006 FREIGHTLINER	THOMAS BUS FS6 REHAB UNIT
	2016 CAN AM, UTV	UTILITY, UTV

Benton County Fire District #2

District Summary

Fire District 2 protects an area of approximately 88 square miles in the City of Benton City and the unincorporated areas surrounding Benton City and lying within Benton County serving a population of approximately 10,000 residents. Located within the district are heavily populated residential areas, some commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently two (2) fire stations strategically located to provide efficient protection. Operating as a combination fire department, District 2 has 5 career staff, 7 residents and 32 dedicated volunteer firefighters, officers, EMT's, Paramedics, and support personnel. The equipment utilized by the department is listed in the table below. The District average's 965 calls for service yearly, with 73 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of open fields, mountains and hills which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high. We have seen numerous large and some catastrophic fires in our district over the years. The largest in 2000 when we lost 53 homes due to a large uncontrolled wildfire that came from the Department of Energy/ALE properties.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire despite histories of large fires threatening their homes. Creating fire breaks on lands within the Conservation Reserve Program (CRP) is one goal for area fire chiefs. We have had several large fires on CRP/open wildlands and Department of Energy properties due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has

some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agriculture, residential burns and land clearing fires. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others, weather and burn bans. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These sometimes often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with; WA DNR, USFW, BLM and in some cases and the USFS. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire District has an agreement with the Department of Energy that also provides assistance to these adjacent lands to Federal ALE, DOE and BLM properties in addition to normal mutual aid. This has proven reliable and helps with some federal shared costs however, the defensible space around the urban areas is not in place due to sensitive conservation areas. Our Fire District for the last two years has instituted and developed a FIREWISE program to our district residents. This has proven to offer some reduction to our wildfire-related calls; however, it does not get much participation to the high majority of our community despite our public campaigns and strong community push. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for staff time is a need of

the fire District to enhance this program and complete structural assessments every two years has proven difficult. We have also teamed up with some local property owners which have receive permission annually to put in fire breaks with our area dozers on areas the butt up against some Urban Interface Areas however, this encompasses a small portion of the exposures.

Fire Breaks: These prove effective in the areas that allow them, many areas restrict fire breaks due to; negative impacts to agriculture, sensitive species, federal properties and private land owners not allowing them on their property. The costs associated with maintaining established fire breaks costs our small fire department thousands of dollars annually and cannot be sustained without some type of financial assistance.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. We have very few areas where we can draw water from in the rural areas due to remoteness and lack of developed water systems.

Residential and Agricultural Burning: All open burning within the county is subject to guidelines concerning, size, time, location and permit requirements from Benton County Clean Air Authority. Moreover, the BCCAA and the local cities have banned back yard burning except for blown in tumbleweeds. This is a two-fold problem. The first is that getting rid of some of the fuel loads reduces the fire potential to sustain burning. The other issue is that burning incorrectly causes numerous out of control fires.

Apparatus Inventory

Fed ID Number: 91-124-0107								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 210: 1304 Dale Street Benton City, WA	CH121	2013	CHEVY TAHOE				Command	Yes
	CH122	2010	FORD EXPEDITION				Command	Yes
	CPT 121	2010	F-250				Command	Yes
	UT 121	2008	F-250				Command	Yes
	D/C121	2012	F-250				Command	Yes
	E1211	2017	HME	800	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1213	1997	E-One	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	L1211	1995	Central States	300	Type 1 Ladder	1500	Structure w/Foam	Yes
	E1251	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1252	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1254	2018	F-550 4x4	400	Type 5 Engine	260	Wildland w/Foam	Yes
	Dozer 1221	2010	John Deere 750K		Type 2 Dozer		Tractor/Bulldozer/disc	Limited
	Transport 1211	2010	Freightliner		Type 1		Transport 50T	Limited
	Dozer Trailer/Fuel	1998	Lowboy	300 gal. fuel	Dozer Trailer			Limited
	Tactical Tender 1211	2017	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	Cascade 121	2012	Scott		Type 1 Air System		High/Low Press	Yes
	Medic 1221	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
	Medic 1222	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
	Medic 1223	2009	Road Rescue		Type 2 Medic		ALS Transport	Yes
Station 220: Whitmore	E1212	2017	HME	800	Type 1 Engine	1500	Structure w/Foam	Yes
	Tactical Tender 1212	2008	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	E1253	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes

Benton County Fire District #4

District Summary

Benton County Fire District 4 (BCFD 4) is a combination fire department protecting just over 52 square miles consisting of the City of West Richland and surrounding county area with a population just under 20,000. The district has a variety of property use types, including significant residential, some light industrial, agricultural (with a large vineyard component), and open area. The interfaces between open and agricultural areas result in a complex zone regarding fire protection. As the building within the district continues, some of the interface areas are becoming more important, as the population and overall exposure continues to increase.

Created in 1954, BCFD 4 currently operates out of two staffed stations. Staffing includes 15 full time firefighters (Fire Chief, Captains, Lieutenants, firefighters), 1 administrative assistant, 25 volunteer firefighters and 13 Logistic and Administrative volunteers. A list of current apparatus is included in the table below.

BCFD 4 responded to an average of about 1320 incidents per year (5-year average), with about 75% of those incidents being emergency medical calls. The remainder of the incidents are for fire related incidents or false alarms. The call volume for BCFD 4 has increased 25% over the past 5 years and continues to increase as more people and business move into the District. Over the past two years, BCFD 4 has seen large swaths of open land change to grape vineyards based on the Red Mountain American Viticultural Area (AVA) and success of several wineries in the area. While large parts of the open land in the Red Mountain AVA has been planted in grapes, there remains large areas outside of the AVA that are not as agriculturally valuable and remain undeveloped. The growth of individual housing on the borders of the open area result in the high potential for wildland/urban interface issues and the associated wild fire risk.

The district has experienced several larger wildland fires, mostly along/over the Red Mountain and Candy Mountain areas. The most recent larger fire was on Candy Mountain resulting in a total area burned of 450 acres and threatening approximately 50 to 75 homes. The cause of the fire was from a mechanical failure of a vehicle along Interstate 82, resulting in the fire burning over the top of Candy Mountain and threatening the homes and impacting trails on the mountain. At the time of the fire (12:30 am), there were no hikers on the mountain trails, minimizing a potentially dangerous situation of hikers in the path of a fast moving wildland fire. Fortunately, with help from neighboring mutual aid fire and police agencies, no homes were damaged or destroyed and there was only one minor injury to a firefighter during the extinguishment of the fire.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire despite histories of large fires threatening their homes. BCFD 4 has worked with homeowners in some areas of the district in implementing the Firewise program as much as possible. The homeowners have worked with the District, but with limited resources only partial success has been observed. Additional resources could be used to help with more effective and complete implementation of the Firewise program.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: The District continues to see a high number of controlled burning activities that are not allowed under the current Benton County Clean Air Authority rules. The types of allowed burning depend upon the urban growth boundaries as well as agricultural use of lands. Many of the residents who have lived in the area for longer, still conduct burning of natural vegetation even though they are inside the urban growth boundary, where this type of burning is not allowed. Efforts to educate the public on the rules continues to be a challenge based on the perceived rural nature of large portions of the District.

Other: As with most combination career/volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain reliable personnel to assist with the variety of responses and other administrative activities that must occur to be a progressive and successful organization.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires

before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with Washington Department of Natural Resources (WADNR), United States Fish and Wildlife (USFW), Bureau of Land Management (BLM) and the United States Forest Service (USFS). The District also participates in a local County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The District attempted to implement the FIREWISE program with some district residents, based on the higher risk areas. This has proven to offer some reduction to our wildfire calls however, participation rates could be much higher with some additional resources. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for additional staff time is needed by the fire District to enhance this program and complete structural assessments every two years and deliver educational materials to potential participants as the population continues to grow and change.

There are additional areas that abut City of West Richland property (specifically the sewer treatment plant) as well as many private homes that have never had a significant fire resulting in large buildup of fuel. The area also has extremely limited access and does pose a significant hazard if wildfire does gain access to the area. Efforts are needed to coordinate fuel reduction or defensible space around this area. This will be challenging, as there are wetlands in the area as well as being adjacent to the Yakima River and associated fish habitat.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. The District has worked with some of the vineyards to establish water supply points at their irrigation ponds, but these are not always a reliable source of water depending upon the time of year and required water use for the vineyards. The District has also worked with the Barker Ranch to identify water supply access points to be developed as the ranch makes improvements to the irrigation and wetland management program. These water supplies allow access to water supplies closer to the threat of wildland fires as identified by landowners, users and the District.

Apparatus Inventory:

Fed ID Number: 91-1317376								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 420: 2604 Bombing Range Road, West Richland, WA 99353	CH141 (UT145)	2013	Ford F-150 Raptor				Command	Yes
	UT141	2017	Chevrolet K2500				Command	Yes
	UT142	2017	Chevrolet Tahoe				Command	Yes
	UT144	2003	Ford Ranger				Command	Yes
	UT146	2014	Ford Explorer				Command	Yes
	DC141 (UT143)	2006	F-250				Command	Yes
	E1412	2001	KME	1000	Type 1 Engine	1250	Structure w/ Foam	Yes
	E1452	2005	F-450 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	E1461	1997	Ford Super Duty 4X4	300	Type 6 Engine	120	Wildland w/Foam	Yes
	E1431	1997	Freightliner / BME	560	Type 3 Engine	1000	Wildland/Structure w/Foam	Yes
	Tactical Tender 1412	2013	Pierce Hawk	2500	Type 1 Tender	500	Pump/Roll/Structure/C AFS	No
	Medic 1422	2016	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Medic 1423	2010	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Rehab 141	2006	F-250				Support	n/a
	Decon 143				Trailer		Support	n/a
Station 410: 1400 Harrington Road, West Richland, WA 99353	E1411	2001	KME	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	Water Tender 1412	2015	Freightliner / Pierce	3000	Type 1 Tender	500	Pump/Roll	Yes
	E1451	2011	F-550 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	BS142	1986	IHC		Type 2 Cascade Air System			No
	Medic 1421	2014	Ford E-450		Type 2 Medic		ALS Transport	Yes
	Rehab 142	2000	Ford E-450				Rehab	n/a

Benton County Fire District #5

District Summary

Benton County Fire District #5 (BCFD#5) is primarily a wildland fire agency with some urban/suburban interface with neighboring agencies. BCFD#5 also responds to vehicle accident and also provides some non-ambulance EMS services. The district operates out of four main stations with approximately twenty volunteers. BCFD#5 personnel are on duty twenty-four hours a day, seven days a week. The district covers an area of approximately 400 square miles.

District Concerns

Residential Growth: BCFD#5 has not seen significant population growth. However, there is growth in the suburban areas on the outer district lines, with housing development expanding into the district.

Communications: BCFD#5 is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire, ems and police, as well as one fire agency from a third county, Walla Walla County. SECOMM has a VHF simulcast and micro wave system utilized by fire agencies, and law enforcement agencies operate on an 800MHz radio system. The VHF radio system is out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

The merger to one dispatch center was recent. With the addition of Franklin County Fire agencies, Pasco Fire Department and Walla Walla Fire District #5, radio traffic has increased. It seems that the number of dispatch staff needs to be increased to handle the increased radio traffic and calls.

Other: BCFD#5 is reliant on neighboring fire agencies for structure fires as well as for ALS services. There is a need to have access to Water Tenders and Type 1 Engines.

Cooperative Agreements: BCFD#5 has mutual aid agreements with neighboring fire agencies. BCFD#5 will implement or renew needed mutual aid agreements.

District Needs

BCFD#5 is experienced, well versed and trained for wildland firefighting, however, better qualifications and experience is needed for structure fires, especially with the increase of housing in high wildfire risk areas. BCFD#5 is reliant on neighboring agencies for structure firefighting. BCFD#5 has a need for updated/appropriate equipment for structural firefighting and protection.

Benton County Fire District #6

District Summary

Benton County Fire District #6 (BCFD6) is located in South East Washington state approximately thirty miles South of the Tri-Cities (Kennewick, Richland and Pasco) area along the scenic Columbia River. Our department consists of: one paid Chief, three paid firefighters, sixteen active duty volunteers, and approximately 15 paid on call firefighter/EMT's, and two support volunteers. BCFD6 has eight personnel trained as EMT-Basic, two Advanced EMT's and two Paramedics. The career staff works 48/96 shift work. Due to the low resident population many of our volunteers live outside of the Fire District. Most are daytime responders and take up to 35 minutes to respond in the evenings. Only ten volunteers live within the District and cover a majority of the calls.

Our department protects 277 square miles of rural land. Our two ambulances service a response area encompassing approximately 490 square miles in two counties. Eighty percent of our total calls for service are medical related. Many were medical/trauma related. Most of those were motor vehicle accidents. Currently, BCFD6 has exceeded our average call volume, for the same time period, as we begin the busy winter MVA season.

The resident population of BCFD6 is approximately one thousand (1,000). However, due to the nature of the industries and abundant farming in our district, the population during the summer time period is much higher and varies throughout the year. Each year we see a drastic increase of traffic on our roadways and major Interstate highways. Although we are rural, our district contains several key facilities and locations that, if affected, could have wide reaching affects for the Western United States. Some of these key areas are: thirty (30) miles of US Fish and Wildlife scenic wildlife preserve along the Columbia River; the US Corps of Engineers McNary Dam; three Bonneville Power Administration high energy transmission lines; Williams Pipeline bulk storage facility containing 2.5 billion cubic feet of natural gas; four major Williams Pipeline high flow transmission lines serving Spokane, Seattle and the West coast; fifteen miles of Interstate 82; twelve miles of State Route 221; thirty miles of State route 14; and hundreds of square miles of cultivated agricultural property including the sixth largest winery in the world, Columbia Crest.

BCFD6 provides ALS/BLS ambulance coverage to two neighboring Fire Districts through an Automatic Aid Agreement (Klickitat County Fire District 10 and Benton County Fire District 5). Since we have only one Paramedic, we are unable to provide full ALS coverage and must revert to BLS coverage when the Paramedic is unavailable. Therefore, we must work closely with our neighboring ALS agencies as well. Mutual aid is received and given to the Tri-Cities area when advanced life support is needed through a Mutual Aid Agreement.

District Concerns

Benton County Fire Protection District 6 is a very rural area with huge commercial target hazards. It is the perfect storm for major infrastructure loss. In 2013 our district experienced a huge event at the Williams Pipeline bulk storage facility that resulted in a \$100 million dollar loss. Our limited budget combined with the State of Washington one percent maximum budget increase law has crippled our small department for many years. As our District valuation increases the tax amount per thousand decreases. Due to our rural location and limited population to draw volunteers, a series of community meetings were held so that the voting public had an opportunity to see, in our current state, we are unable to fight the most basic interior structure fires due to the lack of certified firefighters. BCFD6 also has six seasoned responders that are near retirement age. However, these few volunteers respond to a majority of the calls for service. These precious few members are the “backbone” of our organization and are vital to our continued operation. New volunteers have recently joined our ranks but will require several years of training to be able to take on medical and fire responsibilities.

Benton County Fire Protection District 6 does not enjoy a large donating population. Fundraisers in our economically depressed area do not produce the donations needed to purchase equipment. The tax base and a small amount of ambulance income are all that our Department has to operate on.

The remaining budget priorities are placed on personal protective equipment, maintenance, ensuring apparatus are safe, training firefighters and training EMT's. Several fire stations owned by Benton County Fire District 6 are thirty-five years old and require major repair.

District Needs

The following statements describe the various needs of BCFD #6; some of these items should be considered for future Mitigation Action Items:

- BCFD6 needs weed abatement along the state, federal highways and railways throughout our fire district. The overgrowth and close proximity of combustible vegetation causes multiple large fires every year.
- Personnel need is another issue for BCFD6. The small community to draw from does not provide adequate responders for our area. With our rural location, this can be detrimental to the person in need if we do not have the responders to help.
- Firefighter and EMT training. Due to our rural location it is difficult to get outreach training for firefighter 1, wildland firefighter and Emergency Medical Technician.
- Fire apparatus. With the age of our fleet firefighting apparatus replacement is a concern.

Kennewick Fire Department

Department Summary

The City of Kennewick is fortunate to be situated in an area that offers spectacular views of the Horse Heaven Hills to the south, Rattle Snake Mountain to the west, the Columbia River to the north and the broad plains of the Columbia Basin and Blue Mountains to the east. These natural features are valued because it emphasizes the region's identity with our three rivers (Yakima, Snake and Columbia), the agricultural industry and the desert lying just outside our irrigated boundaries. These features and dry climate provide for wildfire activity throughout a good part of the year. The City of Kennewick Fire Department (KFD) is primarily an urban/suburban fire agency which employs 84 personnel and provides fire suppression, Emergency Medical Services (EMS), fire prevention, investigation and code enforcement, technical rescue, hazardous materials and incident management services to Kennewick citizens as well as to the surrounding community through strong mutual and automatic agreements.

Department Concerns

As stated above KFD is primarily an urban/suburban fire department that deals with all risk incidents. KFD areas of concern are:

Residential Growth: The population of Kennewick has increased significantly since its incorporation as a city in 1904. At the time of the 1910 census, the Kennewick population was 1,219 people. In 2016 the population is 79,120. Using data from the U.S. Census Bureau Kennewick is planning for a population of 112,044 by the year 2037; an increase of nearly 33,000 residents over the next 20 years. This increase in population will increase calls for EMS service which is 80% of the responses that the department handles annually. The additional need for EMS service will have a direct effect on available resources to respond to wildland fires as most fire units are cross staffed with ambulances.

Wildland Urban Interface: The city is bordered to the south by open grass and sage lands. Prevailing winds from the southwest historically push large wildland fire into the city. On August 11th, 2018 one such fire called the Bofer Canyon Fire moved into the City of Kennewick with devastating results. The fire was a result of a road side start off of Highway 82 just south of the Kennewick Exit. Pushed by 30 mph winds the fire hit the Canyon Lakes housing development within minutes making a run to the east through several additional housing developments before being stopped at Olympia Street. The result was the total loss of five homes with four additional damaged homes and several outbuildings lost or damaged. Two citizens sustained minor injuries and the landscape was stripped of all vegetation creating a dust problem throughout the summer and fall months. Additionally, the city has several riparian areas that are wildfire interface problem areas. The city does not have the funding to

provide for a fuels management program for the riparian areas identified as Zintel Canyon, Blackberry Canyon, the riparian area south of 27th & Cascade St., and riparian area 53rd and Washington St., all are Wildland Urban Interface zones.

Communications: KFD is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county). SECOMM has a rather complex and somewhat temperamental VHF simulcast and micro wave system utilized by fire agencies, while Law agencies operate on an 800MHz radio system. The VHF radio system is very out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

Cooperative Agreements: KFD is a signatory to Washington State Fire Mobilization Plan and has a cooperative agreement with the Department of Natural Resources. KFD has mutual aid and automatic aid agreements in place with agencies within Benton, Franklin and Walla Walla counties. As of 2018 KFD did not have a federal cooperative agreement in place which would allow for KFD resources to participate on USFS, USFW, BLM or other federal agencies incidents. A federal agreement should be developed for the 2019 fire season.

Residential Burning: Outdoor burning permissions within the City of Kennewick UGA (urban growth area) are determined based upon the Benton County burning regulations. The City of Kennewick does not allow any outdoor burning (other than blown tumbleweeds) within the UGA. The Benton Clean Air Agency is charged with enforcing burning regulations.

Other: The Kennewick Fire Department provides EMS and structural fire suppression assistance to its surrounding neighboring jurisdictions, while relying heavily on neighboring fire districts and department for assistance in wildfire suppression. KFD also, participates in Incident Management Team (IMT) activities for large wildfires occurring locally, state wide and nationally. As the experienced IMT personnel retire out recruiting and training personnel to fill those positions will be critical in the coming years.

Benton County and the City of Kennewick are encouraged to adopt a regulation requiring “defensible space” for all existing and new construction within the WUI. This process will require a two-fold approach. First, public education through a collaborative partnership with the media, fire departments, and emergency management, and second development and adoption of county ordinances requiring the improvement and maintenance of defensible spaces.

The City of Kennewick should explore a fuels management program mainly within the identified WUI and riparian zones to reduce the risk of wildfire to the community while improving and maintaining ecosystem health.

Department Needs

Firewise-Wildland Urban Interface Defensible Space: An integrated and focused public education program dedicated to wildland fire prevention and protection needs to be developed and implemented throughout the county. This program should include consistent and enforceable burning regulations, information on defensible spaces, and outreach programs through the use of all facets of media, including social media.

Riparian Fuels Management Program: The riparian landscape is the interface between bodies of water such as rivers, streams, and lakes and upland ecosystems. The major riparian areas in Benton County lie along the Columbia and Yakima rivers; however, smaller riparian areas are present along many smaller streams, ponds, and irrigation ditches. Most riparian areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway, vegetation generally resorts back to the typical shrub-steppe or grass fuel types that dominate the county, and within the City of Kennewick abut to mostly residential property creating a wildfire interface problem. The City of Kennewick is in need of a fuels mitigation and vegetation management program within these areas. These riparian areas are full of hazardous fuels, live and dead vegetation that has accumulated and increases the likelihood of unusually large wildland fires. When fire encounters areas of heavy fuel loads (continuous brush, downed vegetation or small trees) it can burn these surface and ladder fuels and may quickly move from a ground fire into a crown fire.

Fuel treatments are intended to lower the risk of catastrophic wildfires by managing vegetation to modify/reduce hazardous fuels. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires. Benefits from fuel treatments include; prevent loss of lives, reduce fire suppression cost, reduce private property losses and protect natural resources (control of unwanted vegetation, including invasive species, improvement of rangeland for livestock grazing, improvement of fish and wildlife habitat, enhancement and protection of riparian areas and wetlands, and improvement of water quality) from devastating wildfire.

Funding for a strategic management and control of wildland vegetation is essential to the safety, health, recreational, and economic wellbeing of Kennewick's citizens.

Pre-Attack or Pre-Incident Planning: The City of Kennewick should begin to employ GIS technology to aid in wildfire pre-incident planning and in the development of pre-attack plans which include zone maps identifying key fire suppression actions. Additionally, dispatch deployment plans should be created to insure rapid deployment of the right type and number of resources to each zone to assist first responders before they arrive on scene and need to request resources.

Contingency Planning: Contingency plans identify high-risk neighborhoods and areas with the potential for large wildland incidents. These plans contain information that may be beneficial to incoming resources, including fuel types, water sources, staging areas and ICP locations.

A map of each high-risk neighborhood also is provided to give users an elevated view of the area and its potential threats.

Richland Fire and Emergency Services

Department Summary

Richland Fire and Emergency Services provide all fire, ambulance, and other emergency services to 54,989 citizens located in 35.72 square miles of Benton County in southeast Washington State. With robust mutual aid agreements, Richland provides and receives assistance during large incidents or times of overwhelming call volumes. Mutual aid partners with automatic aid agreements include Benton County Fire District #4, Hanford Fire Department, Benton County Fire District #1, Kennewick Fire Department, and Pasco Fire Department. In 2016, Richland Fire and Emergency Services responded to 6497 calls for service. As of November 2017, numbers are showing a similar outcome for 2017. Richland currently carries a full-time staff of 63 employees, with 60 of those employees maintaining training and certifications for line firefighting. Response to emergency incidents is carried out from four stations located throughout the city. Each station is staffed 24 hours per day, year-round, with a minimum of three firefighters, including an officer and at least one paramedic. All line personnel trained to NWCG firefighter 2 or above. Each station houses a type 1 structural engine, an advanced life support ambulance, and a specialized apparatus such as wildland engine or aerial apparatus.

City of Richland is a rapidly growing community due in part to its close proximity to the Hanford nuclear reservation where many laboratories and energy related industries provide excellent job and professional growth opportunities. Richland also provides many recreational opportunities, being located at the convergence of the Columbia and Yakima rivers. Over 3 square miles of river are accessible within Richland's boundaries. As Richland continues to grow, homes in the wildland urban interface present additional challenges for fire prevention and suppression. Additionally, many high value laboratories and research facilities are located in north Richland close to Hanford, where there are significant wildland urban interface exposures.

Department Concerns

Richland Fire and Emergency Services has identified several issues which need to be addressed in the immediate future. These issues are serving an aging population, maximizing organizational efficiencies, and serving the growth of the community. Serving the growth of the community requires strengthening wildland urban interface response capabilities.

As Richland grows, more wildland urban interface hazards arise. Additionally, more individuals take part in recreational activities on our local waterways and hiking areas such as Badger Mountain, Amon Canyon, Bateman Island, and the Yakima delta. Improved access for emergency vehicles, in conjunction with identified egress routes from these areas, will help improve safety in the city as well as protect property in the event of wildfire. Plans are being

worked on to achieve these goals, but there will likely be significant expense involved. As with any growth, additional facilities need to be considered, as well as staffing for the facilities. Plans are in place to build additional stations, as well as staff those stations, to ensure the high level of service Richland residents have come to expect. Funding for these additional facilities will be a significant hurdle.

West Benton Fire Rescue

Department Summary

WBFR provides fire, rescue and emergency medical services to an area of 176 square miles located in Western Benton County, including the City of Prosser and Community of Whitstran. This response area is comprised of urban, suburban, rural and wildland is inhabited by 13,300 permanent residents and is split down the middle by the Yakima River. WBFR provides fire protection to the area with 3 paid personnel, 2 seasonal employees and 25 volunteers, answering over 600 calls for service annually.

Department Concerns

Personnel: WBFRs response model relies heavily on Volunteer Firefighters, which make up 85% of our response force. Due to a societal decline in volunteerism and the ever-increasing requirements to be a firefighter, WBFR has found it difficult to increase the depth of the Volunteer ranks. In addition, it is difficult to expand specialized services such as technical rescue and hazardous materials response when so heavily reliant on Volunteer Firefighters.

Rural Property Development: WBFRs response area continues to see development of new single-family residential structures into the Intermix/Interface areas comprised of heavy grass/brush fuels. Many times, fires in the interface/intermix require an extensive amount of resources to provide structure protection as well as being actively engaged in fire suppression. This can cause a large drain on regionally available apparatus.

Communications: With the recent addition of Franklin County and Walla Walla Fire District 5 to our dispatching agency, radio traffic has been extremely busy. Though local repeaters and tactical frequencies used to command individual incidents are plentiful, both the availability of simulcast frequencies to communicate with the dispatcher AND the personnel at the dispatch center to listen to multiple frequencies is lacking.

Vegetation Management: Invasive plant species such as Kocia and Russian thistle, along with cheatgrass, make managing a 5-acre rural residential parcel difficult. Many rural property owners fail to control invasive species which leads to insufficient or non-existent defensible space.

The lack of a State Vegetation Management Program has allowed the cheatgrass and invasive species to grow right up the end edge of Interstate and State Highway road surfaces. Vegetation that has grown up to the edge of a roadway becomes critically dry in the summer months and is easily ignited by discarded smoking material, mechanical problems or traffic accidents and creates traffic hazards due to fire, smoke and responding fire apparatus in the

roadway. WBFR protects thousands of acres of lands that abut under-maintained roadways and spend a considerable amount of time dealing with wildland fires started from roadside ignitions.

Burn Permits: WBFR does not issue burn permits. Burning is limited within the City Limits of Prosser, and surrounding UGA to tumbleweeds. In the rural areas of the response area, Benton County Clean Air Agency sets burning regulations and sets the daily burn decision regarding outdoor burning. Many times, people are unaware about the daily burn decision or the presence of a burn ban.

Fire Inspections: Prosser is home to a vibrant downtown core comprised of 100-year-old multi-story buildings that house restaurants, assembly occupancies, mercantiles, offices and residential units. Fire and Life Safety Inspections came under the authority and responsibility of the City of Prosser in 2015. Proper fire and life safety inspections must be maintained to minimize the occurrences of devastating downtown fire losses.

Other: Relying primarily on Volunteer Firefighters, WBFR sometimes struggles to mount an effective initial response force to incidents, and a large/complex natural cover fire or structure always requires the assistance from neighboring agencies to mitigate. To augment day time response in during the summer months, WBFR hires 2 seasonal employees to complete station tasks and respond on incidents.

The two WBFR fire stations are not staffed around the clock, and calls that occur at night or over the weekend are staffed with personnel responding from home. WBFR must continue to identify ways to decrease “turnout time” to incidents, which includes identifying funding to house responders at the headquarters fires station.

WBFR has begun to identify and install fuel breaks around the WUI to the South of town with our heavy equipment. WBFR will continue to build private landowner relationships and identify areas where fuel breaks will have a positive impact.

Cooperative Agreements: WBFR is a signatory to the Tri-County Master Mutual Aid Agreement which includes all agencies in Benton, Franklin and Walla Walla Counties. Additionally, due to our proximity to Yakima County, WBFR has individual Agreements Yakima County Fire District 5, and with the Cities of Sunnyside, Grandview, Mabton, Toppenish and Yakima when additional apparatus is needed. WBFR also has cooperator agreements with USFWS, DNR and BLM.

Department Needs

- Benton County and the City of Prosser are encouraged to establish and enforce codes requiring defensible space around structures and a concerted effort made to form a County wide community education campaign.

- Additional personnel to staff WBFR with a crew around the clock to reduce turnout time.
- Washington State Department of Transportation reinstatement of a proper vegetation management program to address roadway ignition hazards.
- Identification and implementation of frequencies identified for emergency response and dispatch staffing to support a large multi-county dispatch operation.

Apparatus Inventory

Fed ID #								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 310: 1200 Grant Ave	CH131	2017	Chevrolet Tahoe				Command	Yes
	CT131	2012	Ford F-250				Command	Yes
	CT132	2016	Ford F150				Command	Yes
	UT131	2009	Chevrolet Tahoe				Utility	Yes
	R1341	2005	Braun		Type 4 Rescue		Hvy Rescue	Yes
	E1311	1994	E-One	750	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1313	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1311	2010	E-One	3000	Type 1 Tender	750	Tactical	Yes
	W1312	1986	Ford LTL9000	4500	Type 1 Tender	1000	Water Tender	Yes
	E1352	2000	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	E1351	2009	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	Transport131	1988	White/GMC		Transport		Tractor/Trailer	Yes
	Dozer 1321	1982	Case 1150C		Type 2 Dozer		With Disc	Yes
	ATV131		Polaris 400 4x4		ATV		Swamper	Yes
Station 320: 15802 Rothrock Rd	E1312	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1313	1989	International	2500	Type 1 Tender	250	Tactical Tender	Yes
	E1353	2004	Ford F450	450	Type 5 Engine	150	4x4 Wildland	Yes
	E1363	1988	Chevrolet 3500	250	Type 6 Engine	150	4x4 Wildland	Yes

Washington Department of Natural Resources



District Summary: The Washington Department of Natural Resources (DNR) is the largest on-call fire department in the State with 1,200 permanent and temporary employees that fight fire on more than 12 million acres of private and state-owned forest lands. The DNR's fire protection and safety equipment requirements help local fire districts respond to wildfires. The DNR also works with the National Weather Service to provide the fire weather forecasts and fire precaution levels that firefighters, landowners, and forest industry rely on.

The Washington DNR does not have resources directly assigned to Benton County. The DNR's Northwest Region has 8-10 Type 5 and 6 initial attack engines staffed and available during the fire season in addition to air resources. These resources as well as others statewide are available to Benton County as they are available.

****NOTE: Washington DNR does not respond to structure fires****

Bureau of Land Management



Spokane District Mission Statement: The mission of the Spokane District is to share our unique capability and interest in sustaining the full diversity of natural and cultural landscapes across Washington State and invite their discovery and use. This includes protecting the natural resources, such as water for fish and wildlife; preserving environmental and cultural values on the lands they manage; providing for multiple uses including some commercial activities; and enhancing opportunities for safe and enjoyable outdoor recreation. The Spokane District also assesses energy and mineral resources and works to ensure that their development is in the best interest of the public. Another major responsibility is to ensure consideration of Tribal interests and administration the Department of Interior's trust responsibilities for American Indian Reservation communities.

District Summary: Up through the 1970's, BLM's policy was to divest ownership of all federal public (BLM) lands in the state of Washington. But in 1980, at the height of the Sage Brush Rebellion (a social movement to give control over federal lands to the states and local authorities), Washington voted to have the public lands remain under federal ownership and management. In the 1980 general election, the state put a measure on the ballot asking voters if the state constitution should "be amended to provide that the state no longer disclaim all rights to unappropriated federal public lands." Approximately 60% of the people and the majority in every county voted no, signaling to BLM that there was strong support for continued

federal management of the public lands in the state. Today the Spokane District BLM manages just over 11,000 acres in Benton County for multiple uses, providing wildfire protection, suppression, support, and training for the BLM managed lands and other federal/state/county agencies.

The Spokane District Fire Management Program currently consists of two type-six wildland engines (300 gallons) with two full time Engine Captains, four engine crew members, one ten-person hand crew, one Fuels Technician, Seasonal Dispatcher, Assistant Fire Management Officer (AFMO), and a Fire Management Officer (FMO). The hand crew and one engine are stationed in Spokane at the District office and the other in Wenatchee at the field office. There are approximately 16 other specialist (staff) from across the district that assist the Fire Management Program in wildland and/or prescribed fire efforts. With the District's scattered ownership pattern, the engines are usually on scene after initial attack forces have arrived. Our engines and personnel are available for off District and out of state fire assignments that aide in support, training, and experience.

Fire Protection Issues

The following sections provide a brief overview of the many difficult issues currently challenging Benton County in providing wildland fire safety to citizens. These issues were discussed at length both during the committee process and at the public meetings.

Address Signage

The ability to quickly locate a physical address is critical in providing services in any type of emergency response. Accurate road address and address signage is fundamental to ensuring the safety and security of Benton County residents. Currently, there are numerous areas throughout the county lacking road signs, address markers, or both. Updating signage throughout the county will increase the likelihood that first responders will be able to quickly locate and read posted signs in emergency situations.

Coordination with State and Federal Agencies

Efforts are being created to improve communication between local fire departments and the federal agencies through agreements and sharing communication plans. This presents a problem when there is confusion on who has initial attack responsibilities on federal lands and what restrictions are imposed by the jurisdictional agency responsible for fire protection.

Urban and Suburban Growth

One challenge Benton County faces is the large number of houses in the urban/rural fringe. Since the 1970s, a segment of Washington's growing population has expanded further into traditional rural or resource lands. The "interface" between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design or capability. Benton County has a low number of Firewise Communities; therefore, there are many property owners within the interface that are not aware of the problems and threats they face. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Rural Fire Protection

People moving from mainland urban areas to the more rural parts of Benton County, frequently have high expectations for structural fire protection services. Often, new residents do not realize that the services provided are not the same as in an urban area. The diversity and amount of equipment and the number of personnel can be substantially limited in rural areas. Fire protection may rely more on the landowner's personal initiative to take measures to protect his or her property. Furthermore, subdivisions on steep slopes and the greater number

of homes exceeding 3,000 square feet are also factors challenging fire service organizations. In the future, public education and awareness may play a greater role in rural or interface areas. Great improvements in fire protection techniques are being made to adapt to large, rapidly spreading fires that threaten large numbers of homes in interface areas.

Debris Burning

Local burning of yard debris is highly regulated in Benton County. Permit burns in Benton County are based on the DNR cycle, while burn bans are a locally-based decision determined by fuel moistures (see Fire District Summaries for more information on burning). Some people still burn outside of the designated time frame, and escaped debris fires impose a very high fire risk to neighboring properties and residents. It is likely that regulating this type of burning will always be a challenge for local authorities and fire departments; however, improved public education regarding the county's burning regulations and permit system as well as potential risk factors would be beneficial.

Pre-planning in High Risk Areas

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Benton County, recommended projects cannot all occur immediately, and many will take several years to complete. Thus, developing pre-planning guidelines specifying which and how local fire agencies and departments will respond to specific areas is very beneficial. These response plans should include assessments of the structures, topography, fuels, available evacuation routes, available resources, response times, communications, water resource availability, and any other factors specific to an area. All of these plans should be available to the local fire departments as well as dispatch personnel.

Conservation Reserve Program Fields

Since the introduction of the CRP by the federal government, many formerly crop producing fields have been allowed to return to native grasses. CRP fields are creating a new fire concern all over the west. As thick grasses are allowed to grow naturally year after year, dense mats of dead plant material begin to buildup. Due to the availability of a continuous fuel bed, fires in CRP fields tend to burn very intensely with large flame lengths that often jump roads or other barriers, particularly under the influence of wind. Many landowners and fire personnel are researching allowable management techniques to deal with this increasing problem.

Currently, large blocks of land as well as scattered parcels in Benton County are enrolled in the CRP program. Hundreds of acres of continuous higher fuel concentrations as well as limited access to these areas have significantly increased the potential wildfire risk in these areas. Many CRP landowners are willing to conduct hazardous fuel reduction treatments to lessen the fire risk; however, they are often limited by the regulations of the CRP program.

Due to the difficulties involved with conducting fuel reduction projects on CRP land as well as the enormity of the task in Benton County, the Community Wildfire Protection Plan steering committee has recommended disking fuel breaks adjacent to CRP land wherever possible. The goal is to lower the intensity of a wind-driven CRP fire before it threatens homes and other resources.

Volunteer Firefighter Recruitment and Retention

The rural fire departments in Benton County are predominantly dependent on volunteer firefighters. Each district spends a considerable amount of time and resources training and equipping each volunteer, with the hope that they will continue to volunteer their services to the department for at least several years. One problem that all volunteer-based departments encounter is the diminishing number of new recruits. As populations continue to rise and more and more people build homes in high fire risk areas, the number of capable volunteers has gone down. In particular, many departments have difficulty maintaining volunteers available during regular work day hours (8am to 5pm).

One of the goals of this CWPP is to assist local fire departments and districts with the recruitment of new volunteers and retention of trained firefighters. This is a very difficult task, particularly in small, rural communities that have a limited pool; however, providing departments with funding for training, safety equipment, advertising, and possibly incentive programs will help draw more local citizens into the fire organizations.

Communication

There are several communication issues being addressed in Benton County. Many of the emergency responders have identified areas of poor reception for both radios and cell phones. The lack of communication between responders as well as with central dispatch significantly impairs responders' ability to effectively and efficiently do their job as well as lessens their safety. The conversion to a narrow band communication system exacerbated these issues and will require numerous additional repeaters to be installed. Additionally, the radio system will soon require replacement of the microwave.

For emergency situations, Benton County currently uses CodeRed to keep citizens informed. It is a free program that is an opt-in program that citizens can sign up for if they want to receive notifications.

Communication is a central issue for the planning committee; thus, numerous recommendations targeting the improvement of communications infrastructure, equipment, and pre-planning have been made.

Water Resources

Nearly every fire district involved in this planning process indicated the need to develop additional water resources in several rural areas. Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, which saves valuable time for both structural and wildland fire suppression efforts.

Invasive Species

Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass (*Bromus tectorum*) and other invasive species. Cheatgrass has a very fine structure, tends to accumulate litter, and dries completely in early summer, thus becoming a highly flammable, often continuous fuel.²⁶

Public Wildfire Awareness

As the potential fire risk in the wildland urban interface continues to increase, it is clear that fire service organizations cannot be solely responsible for protection of lives, structures, infrastructure, ecosystems, and all of the intrinsic values that go along with living in rural areas. Public awareness of the wildland fire risks as well as homeowner accountability for the risk on their own property is paramount to protection of all the resources in the wildland urban interface.

The continued development of mechanisms and partnerships to increase public awareness regarding wildfire risks and promoting “do it yourself” mitigation actions is a primary goal of the planning committee as well as many of the individual organizations participating on the committee.

Current Wildfire Mitigation Activities

Many of the county’s fire departments and agencies are actively working on public education and homeowner responsibility by visiting neighborhoods and schools to explain fire hazards to citizens. Often, they hand deliver informative brochures and encourage homeowners to have their driveways clearly marked with their addresses to ensure more rapid and accurate response to calls and better access.

The City of Richland Fire Department has contacted homeowners around the Leslie Canyon Area, to educate them about the fire hazard and actions they can take to make their properties more resistant to fire. Some of these residents have completed work needed. Residents in

²⁶ USDA online database. <http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html#REFERENCES> Accessed December, 2013.

Country Ridge were also contacted and have done work as well. The City of Kennewick is working with residents in the Zintel Canyon area to discuss similar measures. BCFD#1 has made contact with residents in the Triple Vista and Clodfelter areas and the Badger and Dallas Road areas to discuss similar measures.

Firewise

“Over the past century, America’s population has nearly tripled, with much of the growth flowing into traditionally natural areas. These natural, unprotected settings are attracting more residents every year. This trend has created an extremely complex landscape that has come to be known as the wildland urban interface: a set of conditions under which a wildland fire reaches beyond trees, brush, and other natural fuels to ignite homes and their immediate surroundings. Consequently, in nearly all areas of the country, the wildland urban interface can provide conditions favorable for the spread of wildfires and ongoing threats to homes and people. Many individuals move into these landscapes with urban expectations. They may not recognize wildfire hazards or might assume that the fire department will be able to save their home if a wildfire ignites. However, when an extreme wildfire spreads, it can simultaneously expose dozens — sometimes hundreds — of homes to potential ignition. In cases such as this, firefighters do not have the resources to defend every home. Homeowners who take proactive steps to reduce their homes’ vulnerability have a far greater chance of having their homes withstand a wildfire. The nation’s federal and state land management agencies and local fire departments have joined together to empower homeowners with the knowledge and tools to protect their homes through the National Firewise Communities Program. Firewise Communities is designed to encourage local solutions for wildfire safety by involving firefighters, homeowners, community leaders, planners, developers, and others in efforts to design, build, and maintain homes and properties that are safely compatible with the natural environment. The best Firewise approach involves a series of practical steps that help individuals and community groups work together to protect themselves and their properties from the hazard of wildfire. Using at least one element of a Firewise program and adding other elements over time will reduce a homeowner’s and a community’s vulnerability to fire in the wildland/urban interface. Wildland fires are a natural process. Making your home compatible with nature can help save your home and, ultimately, your entire community during a wildfire.”²⁷

²⁷<http://www.firewise.org/Information/Who-is-this-or/Homeowners/~media/Firewise/Files/Pdfs/Booklets%20and%20Brochures/BrochureCommunitiesCompatibleNature.pdf>. Accessed June, 2012.

Fire Adapted Communities (FAC)

“Fire Adapted Communities are neighborhoods located in wildfire-prone areas that can survive wildfire with little or no assistance from firefighters. During a wildfire, FACs reduce the potential for loss of human life and injury, minimize damage to homes and infrastructure and reduce firefighting costs. This program offers information, promotional materials and articles that can be customized for your area. This program also offers videos and a display system that is available for use at community events, meetings, etc.”²⁸

Firebreaks

Fire breaks have been constructed in some areas, such as Rattlesnake Mountain and the Richland Airport. There are fire breaks throughout the county that are maintained on an as-needed basis.

Staff Rides

Some agencies participate in Staff Rides, like to Rattlesnake Mountain, which involve taking agency members to known areas of past fires and reviewing such wildfire factors as terrain and successful tactics, in preparation for future incidents in the same areas.

Public Wildfire Awareness

Some agencies currently post information on social media to teach homeowners about defensible space concepts and strategies.

²⁸ Living with Fire website available at: <http://www.livingwithfire.info/fire-adapted-communities>. Accessed May, 2014.

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Chapter 5: Landscape Risk Assessments

Improving wildfire mitigation efforts on a landscape-level is essential to the success of this plan. A landscape-scale approach to management is one that emphasizes sustainability of entire ecosystems, integrates stakeholder collaboration, and addresses the present and possible future conditions of lands across ownerships. Through application of the “All Hands, All Lands” management, increased collaboration among Federal, state, tribal, and local officials, natural resources managers, and the fire community can improve the efficiency and effectiveness of the overall wildland fire management effort.

The mild climate, abundance of sunshine and low annual precipitation results in an environment that is potentially very prone to wildland fire. Although much of the native grasslands have been converted for agricultural purposes, there are many areas of native vegetation and fallow farm land that cure early in the summer and remain combustible until winter. If ignited, these areas burn rapidly, potentially threatening people, homes, and other valued resources.

Not every acre can be effectively treated to prevent wildland fires, nor can every acre impacted by fire be restored. Setting priorities for prevention, suppression, and restoration is essential to increase the efficiency of operations and the efficacy of treatments. The use of risk-based, landscape-scale assessments help prioritize treatment areas to reduce fire risk as well as set priorities to strategically guide the allocation and pre-positioning of resources for fire suppression.

In order to facilitate a mutual understanding of wildfire risks specific to commonly known areas in the county, the landscape-level wildfire risk assessments in the following sections are based on four predominant landscapes types that exhibit distinct terrain and wildland fuels. The four landscapes identified for the assessments are: grasslands, shrub-steppe, riparian areas, and non-burnable areas. These landscapes, although intermixed throughout the county, exhibit specific fire behavior, fuel types, suppression challenges, and mitigation recommendations that differentiate them from a planning perspective. For this assessment, the 2014 Fire Behavior Fuel Model 40 (FBFM40) was used. For more information, go to www.landfire.com.

Overall Fuels Assessment

The gentle terrain that dominates Benton County facilitates extensive farming and ranching operations. Agricultural fields occasionally serve to fuel a fire after curing; burning in much the same manner as low grassy fuels. Fires in grass and rangeland fuel types tend to burn at relatively low intensities with moderate flame lengths and only short-range spotting. Common suppression techniques and resources are generally quite effective in this fuel type. Homes and

other improvements can be easily protected from direct flame contact and radiant heat through adoption of precautionary measures around structures. Rangelands with a significant shrub component will have much higher fuel loads with greater spotting potential than grass and agricultural fuels. Although fires in agricultural and rangeland fuels may not present the same control problems as those associated with large, high intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not been taken prior to a fire event. Wind driven fires in these fuel types spread rapidly and can be difficult to control. During extreme drought and when pushed by high winds, fires in agricultural and rangeland fuels can exhibit extreme rates of spread, which complicates suppression efforts.

Forest and woodland fuels are mostly present in small canyons and river breaks on sloping terrain less favorable to clearing for agricultural development. Wooded areas tend to be on steep terrain intermingled with grass and shrubs providing an abundance of ladder fuels which lead to horizontal and vertical fuel continuity. These factors, combined with arid and windy conditions characteristic of the river valleys in the region, can result in high intensity fires with large flame length and fire brands that may spot long distances. Such fires present significant control problems for suppression resources and often results in large wildland fires.

Almost half of the acreage (44%) in Benton County is characterized by the GR2 cover type which is defined as a moderately coarse continuous grass with an average depth of about 1 foot (Table 11). Fire spread rate is high and flame lengths are moderate. Over 20% of the county is classified as NB3 which is non-burnable agriculture. Almost 15% of the acreage in Benton County is classified as GS2 which consists of shrubs 1 to 3 feet in height and a moderate grass load. Fire spread rate is high and anticipated flame lengths are moderate. Figure 15 shows the distribution of FBFM40 fuel types in Benton County.

Table 11) Fire Behavior Fuel Models for Benton County, WA.

FBFM40	Acres	% Total	FBFM40	Acres	% Total
NB1	53625.6	4.76%	SH3	11.6	0.00%
NB3	241570.4	21.46%	TU1	985.1	0.09%
NB8	40079.2	3.56%	TU2	16.7	0.00%
NB9	59057.2	5.25%	TU5	26.0	0.00%
GR1	10122.6	0.90%	TL1	0.4	0.00%
GR2	502432.5	44.63%	TL2	851.2	0.08%
GR3	322.9	0.03%	TL3	4906.3	0.44%
GS1	19698.4	1.75%	TL5	2.7	0.00%
GS2	166944.2	14.83%	TL6	24791.3	2.20%
SH1	4.7	0.00%	TL8	14.5	0.00%
SH2	235.9	0.02%	TL9	2.7	0.00%
Total Acres: 1,125,702					

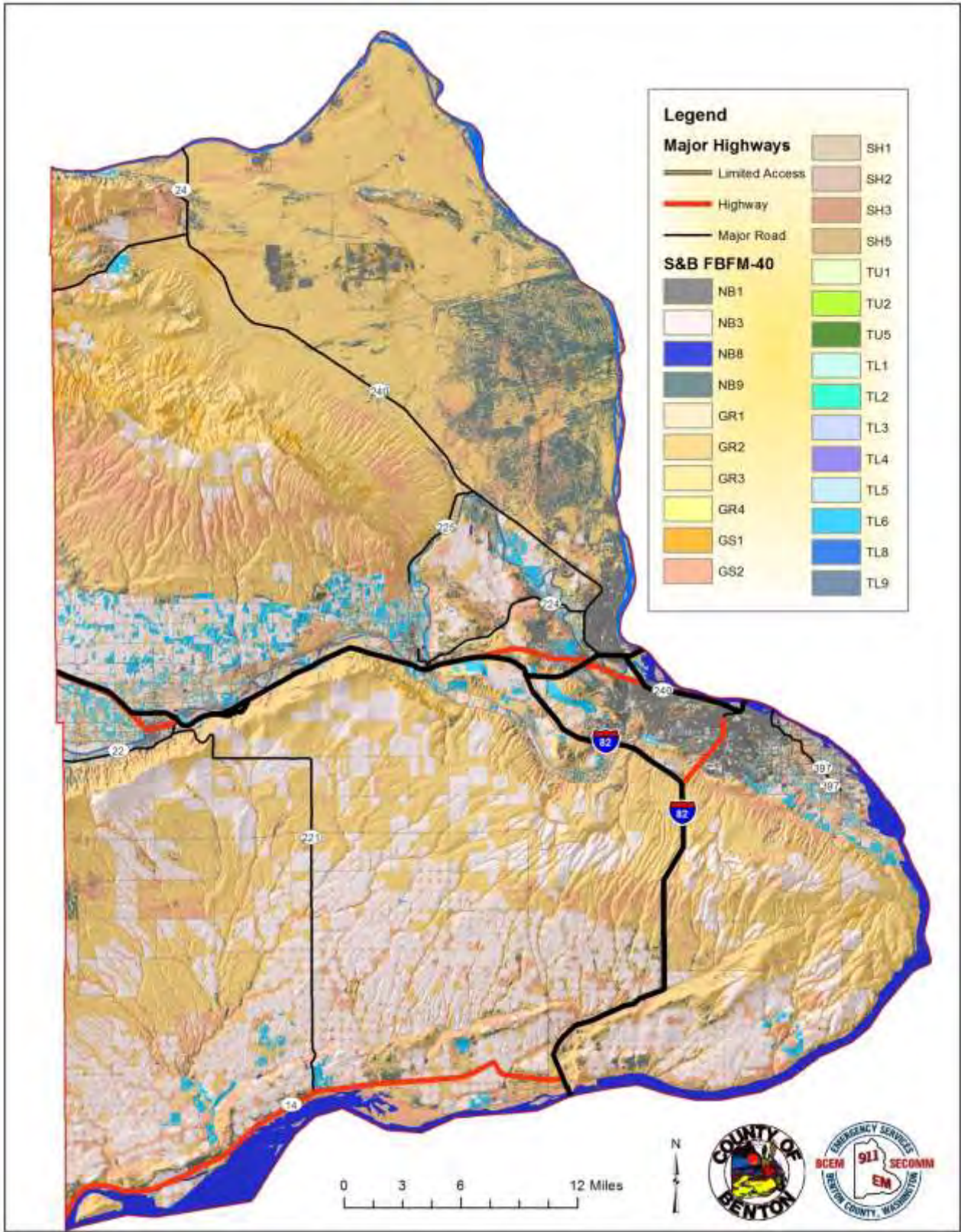


Figure 15) Fire Behavior Fuel Model Map for Benton County, WA.

Overall Mitigation Activities

There are many specific actions that will help improve safety in a particular area; however, there are also many potential mitigation activities that apply to all residents and all fuel types. General mitigation activities that apply to all of Benton County are discussed below while area-specific mitigation activities are discussed within the individual landscape assessments.

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can take many forms. Traditional “Smokey Bear” type campaigns that spread the message passively through signage can be quite effective. Signs that remind people of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires have been effective. Fire danger warning signs posted along access routes remind residents and visitors of the current conditions. It’s impossible to say just how effective such efforts actually are; however, the low costs associated with posting of a few signs is inconsequential compared to the potential cost of fighting a fire.

Burn Permits: Washington State Department of Natural Resources is the primary agency issuing burn permits in forested areas of the state. Washington Department of Ecology (DOE) is the primary agency issuing burn permits for improved property and agricultural lands. All DOE burn permits are subject to fire restrictions in place with WA DNR & local fire protection districts. Washington DNR has a general burning period referred to as “Rule Burn” wherein a written burn permit is not required in low to some moderate fire dangers.

The timeframes for the Rule Burn are from October 16th to June 30th. Washington DNR allows for Rule Burns to be ten-foot (10’) piles of forest, yard, and garden debris. From July 1st to October 15th if Rule Burns are allowed, they are limited to four-foot (4’) piles.

Defensible Space: Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Benton County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Benton County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community.

Evacuation Plans: Development of community evacuation plans are necessary to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event of compromised evacuations. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Accessibility: Also, of vital importance is the accessibility of the homes to emergency apparatus. If a home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways, creating a turnaround area for large vehicles, and ensuring adequate ingress and egress into developments and private properties.

Fuels Reduction: Recreational facilities such as campgrounds and boat launches along the Yakima and Columbia Rivers should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape-proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations in shrublands can be kept to a minimum by periodically conducting thinning or clearing, and possibly controlled burns. Other actions that would reduce the fire hazard would be creating a fire-resistant buffer along roads and power line corridors, strictly enforcing fire-use regulations, and constructing predesignated fire breaks to the last sentence.

Emergency Response: Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Although the agencies in Benton County work closely together, increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

Other Activities: Other specific mitigation activities are likely to include improvement of emergency water supplies, access routes, and management of vegetation along roads and power line right-of-ways. State Building Codes should be revised to provide for more fire-conscious construction techniques such as using fire resistant siding, roofing, and decking in high risk areas. Furthermore, the Army Corps of Engineers can create predesignated fire breaks.

Grassland Landscape Risk Assessment

The grassland landscape is widespread across Benton County and includes native grasslands, invasive annual grasslands, and non-irrigated agricultural lands. According to data compiled by the LANDFIRE program, these areas represent around 45% of Benton County and are most continuous in the northern half of the county. In the southern half of the county, grass fuel types are intermixed more regularly with non-burnable irrigated areas and shrub-steppe landscapes. Stream channels and rocky scablands are interspersed throughout the grasslands. Landownership in this landscape is predominantly private and Federal. The major population centers in Benton County do not fall within this landscape type. However, many smaller communities and rural development are found throughout the grassland landscape, including individual farms, small subdivisions, railroad sidings and grain elevators. Development is widely distributed. New development occurs primarily near communities and along major roads. In nearly all developed areas, structures are in proximity to vegetation that becomes a significant fire risk at certain times of the year. Most of the Hanford Site is classified as grassland.

Wildfire Potential

Fire behavior in the grassland landscape can be modeled using the grass fuel type models defined by Scott and Burgan²⁹. The primary carrier of fire in the grass fuel models is grass. Grass fuels can vary from heavily grazed grass stubble or sparse natural grass to dense grass more than 6 feet tall. Fire behavior varies from moderate spread rate and low flame length in the sparse grass to extreme spread rate and flame length in tall grass. Shrubs, if present, do not affect fire behavior. All grass fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and fire intensity is strong.

Wildfire potential in the grassland landscape is high in the rural farmland and moderate to high in the shrubby draws and waterways, pastures, and scattered patches of scrubland. Virtually all of the populated areas within the grassland landscape face similar challenges related to wildfire control and opportunities for fuels mitigation efforts. Farming and ranching activities have the potential to increase the risk of a human-caused ignition. Large expanses of crops, CRP, rangeland or pasture provide areas of continuous fuels that may threaten homes and farmsteads. Under extreme weather conditions, escaped fires in these fuels could threaten individual homes or a town site; however, this type of fire is usually quickly controlled. Clearings and fuel breaks disrupt a slow-moving wildfire enabling suppression before a fire can ignite heavier fuels. High winds increase the rate of fire spread and intensity of crop and

²⁹ Scott, Joe H. and Burgan, Robert E. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. USDA Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-153. June 2005.

rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event in these areas.

Wildfire risk in the grassland landscape is at its highest during late summer and fall when crops are cured, and daily temperatures are at their highest. A wind-driven fire in agricultural fuels or dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels resulting from the higher productivity of the vegetation. Fields enrolled in the CRP or set aside for wildlife habitat can burn very intensely due to an increased amount of fuel build-up from previous years' growth. Fires in these types of fuels are harder to extinguish completely due to the dense duff layer, often leading to hold over fires that may reemerge at a later date causing additional fire starts.

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are a few bridges in the grassland landscape of Benton County. Bridge load rating signs are mostly in place for the existing bridges and do not impose a limitation to access for firefighting equipment.

Infrastructure

Urban residents throughout most of agricultural landscape area have municipal water systems, which includes a network of public fire hydrants. New development is required by the International Fire Code to have hydrant placement in their development plan. Subdivisions and development outside municipal boundaries typically rely on community water systems or multiple-home well systems.

Above ground, high voltage transmission lines cross the planning area in many directions in corridors cleared of most vegetation, which provides for a defensible space around the power

line infrastructure and may provide a control point for fire suppression, if well maintained. Local public electrical utility lines are both above and below ground traveling through back yards and along roads and highways. Many of these lines are exposed to damage from falling trees and branches. Power and communications may be cut to some of these during a wildfire event.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Potential Mitigation Activities

Mitigation measures needed in the grassland landscape include maintaining a defensible space around structures and access routes that lie adjacent to annual crops and other wildland fuels. Around structures, this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks, fuel tanks, and firewood away from structures. Roads and driveways accessing rural residents may or may not have adequate road widths and turnouts for firefighting equipment depending on when the residences were constructed. Performing road inventories in high risk areas to document and map their access limitations will improve firefighting response time and identify areas in need of enhancement. Primitive or abandoned roads that provide key access to remote areas should also be maintained in such a way that enables access for emergency equipment so that response times can be minimized. Roads can be made more fire resistant by frequently mowing along the edges or spraying weeds to reduce the fuels. Aggressive initial attack on fires occurring along travel routes will help ensure that these ignitions do not spread to nearby home sites. Designing a plan to help firefighters control fires in CRP lands that lie adjacent to agricultural crops would significantly lessen a fire's potential of escaping to the higher value resource. Mitigation associated with this landscape might include installing fuel breaks or plowing a fire-resistant buffer zone around fields and along predesigned areas to tie into existing natural or manmade barriers or implementing a prescribed burning program during lower risk periods.

Maintaining developed drafting sites, increasing access to water from irrigation facilities, and developing other water resources throughout the grassland landscape will increase the effectiveness and efficiency of emergency response during a wildfire.

Shrub-steppe Landscape Risk Assessment

The shrub-steppe landscape is intermixed with the grasslands throughout Benton County, although much of it has been converted to irrigated-farm fields. According to data compiled by the LANDFIRE program, this landscape represents around 16% of Benton County and is most concentrated in the steeper areas north of the Yakima River and along the Columbia River. Typical vegetation found throughout this landscape is grass, mixed shrub and sagebrush with areas of wetlands, cultivated crops, and CRP fields. Landownership is predominantly private. The major population centers in Benton County do not fall within this landscape type. Small communities and rural developments are scattered throughout the shrub-steppe landscape, including individual farms, small subdivisions, railroad sidings and grain elevators. Development is widely distributed. New development occurs primarily near existing communities and along major roads. In nearly all developed areas, structures are in proximity to vegetation that becomes a significant fire risk at certain times of the year.

Wildfire Potential

Fire behavior in the shrub-steppe landscape can be modeled using the grass-shrub and shrub fuel type models defined by Scott and Burgan. The grass-shrub fuel type models represent around 16% of the area in Benton County. The primary carrier of fire in the grass-shrub models is grass and shrubs combined; both components are important in determining fire behavior. All grass-shrub fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub in the fuel model. The grass-shrub models in Benton County are characterized by low to moderate overall fuel loads, shrubs from roughly 1-3 feet high, and grass fuel loads ranging from low to moderate.

Pure shrub fuel type models represent around 0.3% of the area in Benton County. The primary carrier of fire in the shrub fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present. The shrub fuel types in Benton County are clustered in the southern half of the county north of Paterson.

The shrub-steppe landscape has a moderate to high wildfire potential due to its characteristically high occurrence of shrubby fuels mixed with grass, sloping terrain and somewhat limited access. Large expanses of open shrub-steppe vegetation provide a continuous fuel bed that could, if ignited, threaten structures and infrastructure under extreme weather conditions. A wind-driven fire in dry, native shrub-steppe fuel complexes on variable terrain produces a rapidly advancing, very intense fire with large flame lengths, which enables spotting ahead of the fire front.

Wildfire risk in the shrub-steppe landscape is at its highest during late summer and fall when daily temperatures are high, relative humidity is low, herbaceous fuels are cured, and live fuel moistures are at their lowest. Fields enrolled in conservation programs or managed for wildlife habitat are often transitioning from grass-dominated to a shrub-steppe landscape type. Fire intensity in these areas can be high due to increased fuel build-up from previous years' growth. Fires in this fuel type are more difficult to extinguish completely due to a dense layer of organic material at the soil surface. Hot spots can hold-over in this duff layer and may re-ignite at a later date.

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are a few bridges in the shrub-steppe landscape of Benton County. Bridge load rating signs are mostly in place for the existing bridges and do not impose a limitation to access for firefighting equipment.

Infrastructure

Residents living in the populated centers and most subdivisions surrounding the towns have access to municipal water supply systems with public fire hydrants. Outside these areas, development relies on individual, co-op, or multiple-home well systems. Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or

compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Potential Mitigation Activities

Mitigation measures needed in the shrub-steppe landscape include maintaining a defensible space around structures and access routes that lie adjacent to wildland fuels. Around structures this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks and firewood away from structures. Roads and driveways accessing rural development need to be kept clear of encroaching fuels to allow escape and access by emergency equipment. Performing road inventories in high risk areas and documenting and mapping their access limitations will improve firefighting response time and identify areas in need of improvement. Primitive or abandoned roads that provide key access to remote areas should be maintained to allow access for emergency equipment so that emergency response times are minimized. Designing a plan to help firefighters control fires in conservation lands and wildlife habitat areas will significantly lessen a fire's potential of escaping to other areas. Mitigation associated with this landscape might include managed grazing in designated fuel reduction areas, creating fuel breaks, and implementing a prescribed burning program during lower risk periods.

Additional mitigation activities include installing more water storage sites, improving water access from irrigation facilities, and developing other water resources throughout the landscape. This will increase the effectiveness and efficiency of emergency response during a wildfire.

Riparian Areas Risk Assessment

The riparian landscape is the interface between bodies of water such as rivers, streams, and lakes and upland ecosystems. The major riparian areas in Benton County lie along the Columbia and Yakima rivers. Smaller riparian areas are present along many smaller streams, ponds, and irrigation ditches. Most riparian areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway, vegetation generally resorts back to the typical shrub-steppe or grass fuel types that dominate the county. Landownership in this area is mostly private. The major population centers in Benton County have developed near the riparian corridors along the Columbia and Yakima rivers to facilitate access to commercial river transportation. Rural riparian areas tend to be unpopulated.

Wildfire Potential

Fire behavior in the riparian landscape in Benton County can be modeled using the timber litter and timber understory fuel type models defined by Scott and Burgan. According to the LANDFIRE program, timber litter fuel type models represent around 2.6% of the area in Benton County. The primary carrier of fire in timber litter fuel models is dead and down woody fuel. Live fuel, if present, has little effect on fire behavior. Flame lengths and rate of spread in timber litter fuel models is typically/ low to moderate. Timber litter fuel types are mostly concentrated in riparian areas along the Yakima and Columbia Rivers.

Timber understory fuel type models represent just under 0.1% of the area in Benton County. The primary carrier of fire in the timber understory fuel models is forest litter in combination with herbaceous or shrub fuels. Some timber understory fuel models contain live herbaceous fuels and are dynamic, meaning that their live herbaceous fuel load is allocated between live and dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and fire intensity is strong and depends on the relative amount of grass and shrub load in the fuel model. The small areas represented by timber understory fuel types are mixed with timber litter fuels in riparian areas.

The riparian landscape has a moderate to high wildfire potential due to a characteristically high fuel loading, terrain that can produce a chimney effect, high recreation use, and somewhat limited access. Steep walls in narrow draws can contribute to rapid fire spread by funneling wind and fire upstream. Wildfire risk in the riparian area landscape is at its highest during late summer and fall when daily temperatures are high, relative humidity is low, herbaceous fuels are cured, and live fuel moistures are at their lowest.

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are many bridges in the riparian areas of Benton County. The load limits of the bridges in these areas impose access limitations for firefighting equipment. Many have weight restrictions, which are typically posted, and some are in disrepair.

Infrastructure

Recreation activities are often concentrated in riparian areas. Columbia Park, Bateman Island, the Chamna Natural Preserve and the Riverview Natural Preserve are all at least partially in the riparian zone. Educational signs in major recreation areas can assist land managers with educating the public about the risk of wildfire and how to minimize that risk. Providing camp sites and day use areas with fire rings keeps fires contained to specific sites and reduces ignition potential.

Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Potential Mitigation Activities

When live-fuel moisture is low, the high fuel loading and often steep terrain in riparian areas can produce rapidly spreading surface fires. During a wildfire event, recreationists may have little time to evacuate. The use of campfires, fireworks, and other potential ignition sources should be highly regulated during the fire season, especially in areas adjacent to structures and development. Using escape-proof fire rings and barbeque pits at recreational areas, limiting off-road vehicle use to designated trails, and restricting fireworks will help reduce the potential for an ignition.

Non-burnable Areas

Non-burnable “fuel models” represent around 36% of the area in Benton County. In all nonburnable fuel models there is no fuel load – wildland fire will not spread. It is important to delineate nonburnable areas both to maintain mapping consistency and because nonburnable areas frequently define the path of a wildfire and are crucial in establishing safety zones for wildfire suppression efforts. The nonburnable areas in Benton County are a combination of urban areas, irrigated agricultural areas, open water, and bare ground. Nonburnable areas are intermixed throughout the county but are most continuous and heavily concentrated in the southern half of the county and along the Yakima and Columbia Rivers.

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Chapter 6: Mitigation Recommendations

Critical to the process of developing a Community Wildfire Protection Plan and reducing wildfire risk in Benton County is the identification of wildfire mitigation action items and development of a schedule for implementation. The purpose of this section is to identify and prioritize mitigation action items based on input from fire, natural resource, and emergency service personnel. As there are multiple public land management agencies, industrial land owners, and thousands of private landowners in Benton County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across ownerships.

The land management agencies in Benton County, including the Washington Department of Natural Resources, US Fish and Wildlife, the Bureau of Land Management, US Army Corps of Engineers, Department of Energy and Bureau of Reclamation, and private industry are participants in the planning process and have contributed to the development of this plan. When possible, land management/treatment schedules were considered in the planning process in an effort to align and/or coordinate management goals with Benton County.

Through the CWPP, land owners and land managers in Benton County will be able to better incorporate fire-mitigation strategies into the scope of work already being performed. Implementation of action items through existing programs should minimize the costs associated with mitigation projects.

All risk assessments were made based on 2018 conditions. Over time it will be necessary to review and make adjustments to the recommendations made in this plan in order to account for changes in risk and risk factors, total population and population distribution, infrastructure additions and modifications, and any other factors that alter Benton County's susceptibility to wildfire.

The Benton County Wildfire Protection Plan will be reviewed at least annually at meetings convened by the CWPP steering committee, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. Amendments to the plan should be documented and attached to the formal plan as an amendment. Re-evaluation of this plan should be made on the fifth anniversary of its acceptance, and every five years following.

Maintenance and Monitoring

A commitment to monitoring changes in resource conditions to evaluate the effectiveness of different management strategies will improve learning and, through adaptive management, increase the success of wildfire mitigation activities. Monitoring to evaluate the effectiveness of management actions must occur to determine the success of fire prevention, suppression, and

restoration actions. Lessons learned from self-evaluation can be shared and inform changes to correct for ineffective management prescriptions, respond to changes in resource conditions, guide new science and research needs and address changes in management policy and direction. Monitoring and evaluation are an essential part of adaptive management and depends upon timely information, analysis and learning. Strategic application of new management techniques, improved use of risk analysis to set management priorities, and the translation of science and research findings into tools for easy use on the ground to prioritize prevention, suppression, and restoration efforts can help improve the efficacy and efficiency of fire management.

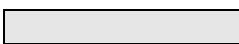
Prioritization of Mitigation Activities

The action items recommended in this chapter were prioritized through a group discussion and voting process. The action items in Tables 6.1 – 6.5 are ranked as “High”, “Moderate”, or “Low” priorities for the county as a whole. The CWPP committee does not want to restrict funding to only those projects that are high priority because what may be a high priority for a specific community may not be a high priority at the county level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying criteria is a necessity for a functional mitigation program at the county and community level.

Policy and Planning Efforts

Wildfire mitigation efforts should be supported by a set of policies and regulations that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

Table 12) Action Items in Safety and Policy.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.1.a: Distribute Firewise-type educational brochures with occupancy permit.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: KFD Prevention Division Support: Kennewick Suppression Crews	





Fire Prevention and Education Projects










The protection of people and structures will be tied together closely because the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire or to a firefighter combating that fire. Many of the recommendations in this section involve education and increasing wildfire awareness among Benton County residents.

Residents and policy makers of Benton County should recognize certain factors that exist today, the absence of which would lead to increased risk of wildland fires in Benton County. The items listed below should be acknowledged and recognized for their contributions to the reduction of wildland fire risks:

Shrub-steppe Management has a significant impact on the fuel composition and structure in Benton County. The shrub-steppe management programs of the Bureau of Land Management, Bureau of Reclamation, and numerous private landowners in the region have led to a reduction of wildland fuels. Furthermore, shrub-steppe systems are dynamic and will never be completely free from risk. Treated areas will need repeated treatments to reduce the risk to acceptable levels in the long term. Recommended treatments include mechanical thinning of shrubs and/or light prescribed burning to reduce fuel loads. Monitoring invasive species in these areas will also be required.

Table 13) Action Items for Fire Prevention, Education, and Mitigation.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.a: Implementation of youth and adult wildfire educational programs.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.b: Distribute educational information regarding construction in high risk wildfire areas.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.c (Kennewick): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: KFD Prevention Division Support: Kennewick suppression crews	
6.2.c (Richland): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.d: Work with area homeowner's associations to foster cooperative approach to fire protection and awareness and identify mitigation needs.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.e: Work with WSU Extension, Master Gardeners, and other existing programs to offer firewise landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.f: Develop a range of public education programs to encourage healthy management of natural resources on private property.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.g: Review State Building Codes and recommend revisions to meet Firewise standards as needed.	CWPP Goal #1, 3, 5, 6, 8, & 9 	Lead: Richland Fire and Emergency Services	
6.2.h (BCFD #1): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	CWPP Goal #1, 6, & 7 	Lead: BCFD #1 Support: Benton County Fire Districts	
6.2.h (Richland): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	CWPP Goal #1, 6, & 7 	Lead: Richland Fire and Emergency Services	
6.2 i (Benton Conservation District): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Benton Conservation District Support: Kennewick Fire Department	
6.2 i (Richland): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Richland Fire and Emergency Services	
6.2.j (Kennewick): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: KFD Prevention Division Support: Kennewick Fire Department	

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.j (Richland): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	CWPP Goal #1, 2, 4, 6, 7, & 9 <div style="border: 1px solid black; height: 15px; width: 100%;"></div>	Lead: Richland Fire and Emergency Services	

Infrastructure Enhancements

Critical infrastructure refers to the communications, transportation, power lines, and water supply that service a region. All of these components are important to central Washington and to Benton County specifically. These networks are, by definition, a part of the wildland urban interface in the protection of people, structures, infrastructure, and unique ecosystems. Without supporting infrastructure, a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and mitigation recommendations.

NOTE: No infrastructure enhancement mitigation action items were identified for the 2018 version of this plan. The table below serves as a place-holder for action items that may be included during future updates of the Benton County CWPP.

Table 14) Action Items for Infrastructure Enhancement.




Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.3.a:	CWPP Goal # <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div>	Lead: Support:	

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Benton County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies and are fully supported by the CWPP steering committee.

The implementation of each action item will rely on either the isolated efforts of the rural fire districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve countywide equity.

Table 15) Action Items for Resource and Capability Enhancements.

Action Item	Goals Addressed (see page 4)	Responsible Organization	Timeline
6.4.a: Enhance radio availability in each district, link to existing dispatch, improve range within the region, and convert to a consistent standard of radio types.	CWPP Goal #1, 6, 8, & 9 	Lead: Richland Fire and Emergency Services	
6.4.b (Kennewick): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: KFD Training Division Support: Kennewick Fire Department	
6.4.b (Richland): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Richland Fire and Emergency Services	

Proposed Project Areas

The following project areas were identified by the CWPP steering committee and from citizens' recommendations during the public meetings (Table 16 and Figure 16). Most of the sites were visited during the field assessment phase. The areas where these projects are located were noted as having multiple factors contributing to the potential wildfire risk to residents, homes, infrastructure, and the ecosystem. Treatments within the project areas will be site specific, but will likely include homeowner education, creation of a wildfire defensible space around structures, fuels reduction, and access corridor improvements. All work on private property will be performed with consent of, and in cooperation with the property owners. Specific site conditions may call for other types of fuels reduction and fire mitigation techniques as well. Defensible space projects may include, but are not limited to thinning, pruning, brush removal, chipping, noncombustible building materials, noncombustible perimeter around structures, and general range health improvements.

The steering committee does not want to restrict funding to only those projects that are high priority because what may be a high priority at the county or agency level may not be a high priority for a specific community. The flexibility to fund a variety of diverse projects based on varying criteria, landowner participation, and available dollars is a necessity for a functional mitigation program at the county and community level.

During the next 5 years, the CWPP Steering Committee will continue to search for opportunities to complete projects. These projects may include point protection program, chipping programs, educational pamphlets, public relations/education, and Fire Danger Rating System signs for specific communities or fire districts.

The Washington Department of Natural Resources, Bureau of Land Management, Conservation District, and/or individual Fire Protection Districts may take the lead on implementation of many of these projects; however, project boundaries were purposely drawn without regard to land ownership in order to capture the full breadth of the potential wildland fire risk. Coordination and participation by numerous landowners will be required for the successful implementation of the identified projects. A map of the Proposed Project Areas is included on the following page.

Table 16) Completed and proposed fuel mitigation projects for Benton County, WA.

ID	Name	Project Type
1	Maintain Existing Disk Line	Fire Line
2	Tie in Dozer line to ridge across Private	Fire Line
3	Continue Dozer Line Construction	Fire Line
4	USFW Line	Fire Line
5	W.E. Johnson	Fuels Treatment
6	USACE Delta public use area	Fuels Treatment
7	USACE Delta public use area	Fuels Treatment
8	USACE	Fuels Treatment
9	USACE	Fuels Treatment
10	Leslie Canyon & Amon Creek BLM	Fuels Treatment
11	BLM	Fuels Treatment
12	Badger Mtn	Fuels Treatment
13	Country Ridge	Fuels Treatment
14	Goose Gap	Fuels Treatment
15	Summit View	Fuels Treatment
16	Badger Canyon	Fuels Treatment
17	Clodfelter	Fuels Treatment
18	Triple Vista	Fuels Treatment
19	Zintel Canyon	Fuels Treatment
20	Seal Springs	Fuels Treatment
21	Blackberry Canyon	Fuels Treatment
22	Prosser, Painted Hills, Priority Areas	Fire Line, Fuels Treatment
23	Dozer line and fuel mitigation	Fuels Treatment
24	DNR Fuels Treatment	Fuels Treatment
25	DOT Hwy Spray Program	Fuels Treatment

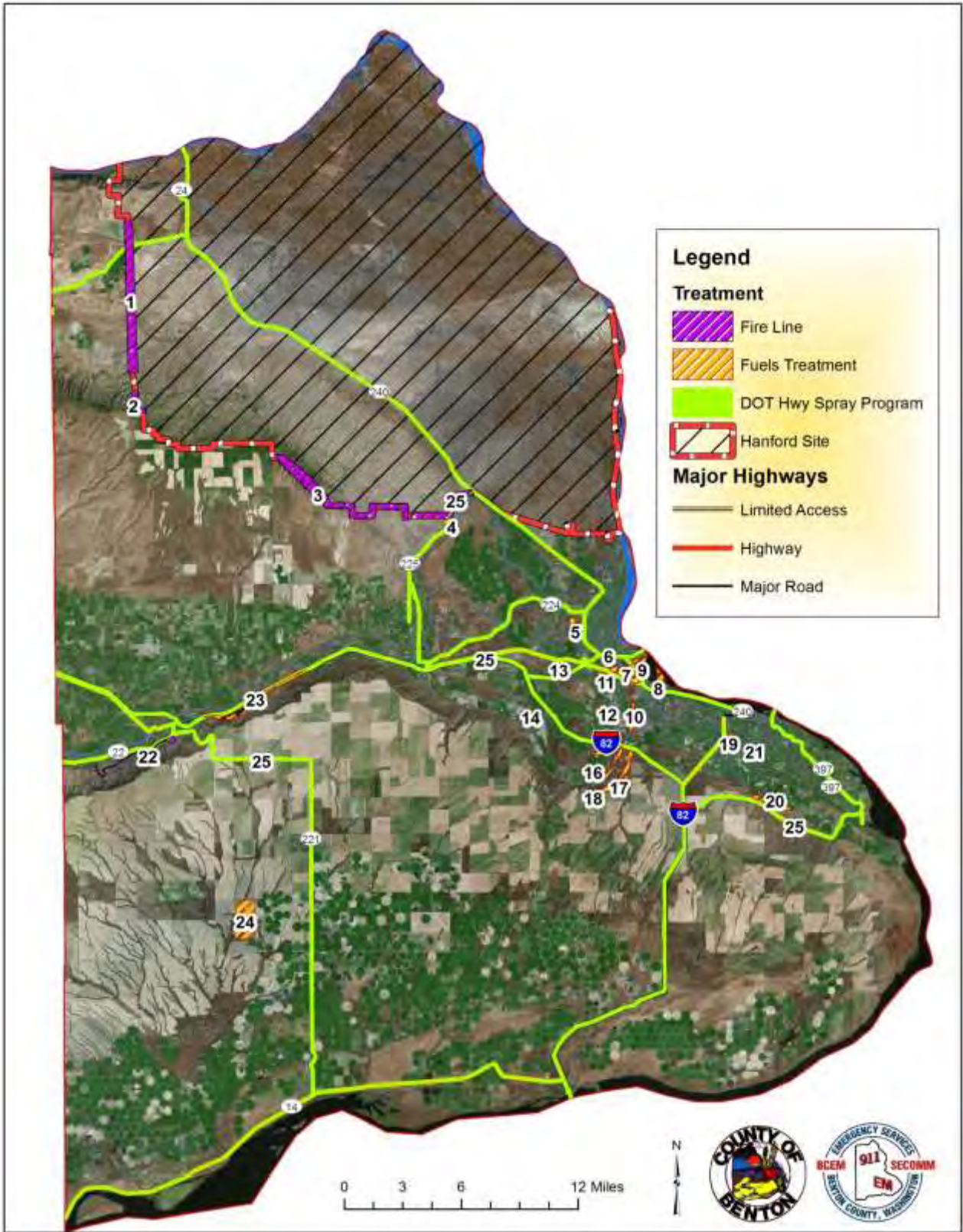


Figure 16) Completed and proposed fuels treatment projects in Benton County, WA.

Representative Fuels Treatment Project Prescriptions

Project Prescription

Homeowners should manage their property with Firewise principles in mind. This means that structures should have a three to five-foot wide strip of non-combustible material around the perimeter of the structure. Shrubs that lie within thirty feet of the structure should be heavily thinned (2.5 times a shrub's height between shrubs or clusters of shrubs). Often, having a trained individual perform assessments throughout a community can help homeowners prioritize fuel treatments around their own residence.

Roadside fuels will be treated to create fuel breaks throughout the community. This will also enable fire apparatus to gain access to structures if needed. This will be achieved through a thirty foot 'buffer' in addition to the road width. The buffer can be created on one side of the road or thirty feet on each side of the road. Roadside treatments should include thinning shrubs to the same standards as mentioned above. Monitor and spray herbicides to reduce invasive weeds along roads and around homes.

A community workshop is another form of education that will benefit the community. The workshop will be scheduled for a weekend that allows as many people to attend as possible. Free lunch and fire safe plant giveaways are a great way to get people to attend. Experts from Bureau of Land Management, Washington Department of Natural Resources, conservation districts, weed boards, consultants, and any others will be invited to attend to provide the homeowners with advice.

Select a property to be a 'demo' for other properties to use as guidance can also be a useful tool in educating a community. The demo property will be in a highly visible location and the property owner should be extremely motivated to maintain the property and provide encouragement to neighbors.

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Appendix 1: State and Federal CWPP Guidance

National Fire Plan

The National Fire Plan (NFP) was developed by the U.S. Departments of Interior and Agriculture and their land management agencies in August 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The NFP addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability. The National Fire Plan continues to provide invaluable technical, financial, and resource guidance and support for wildland fire management across the United States. Together, the USDA Forest Service and the Department of the Interior are working to successfully implement the key points outlined in the National Fire Plan.

Healthy Forests Restoration Act

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

The Healthy Forests Restoration Act (HFRA) seeks to:

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a hazard mitigation plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM programs provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The local hazard mitigation plan requirements for HMGP and PDM eligibility are based on the Disaster Mitigation Act (DMA) of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local hazard mitigation plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA only reviews a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). FEMA reviews the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will not approve it prior to adoption.

A FEMA designed plan is evaluated on its adherence to a variety of criteria:

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation through Existing Programs
- Continued Public Involvement

Appendix 2: Documentation of Participation

Documentation of Committee Participation

October 26, 2017 – Committee Meeting Agenda

A G E N D A	Hazard Mitigation Plan & Community Wildfire Protection Plan Meeting Thursday, October 26th, 2017 1:30 p.m. – 3:30 p.m. Location: Benton County Emergency Management 651 Truman Avenue, Richland WA	
1:30 pm	OPEN – Introductions	Benton Count EM
1:45 pm	GROUP MEETING I. Northwest Management Presentation ✓ Planning Process Powerpoint Presentation ✓ Preparing a HMP/CWPP ✓ Question & Answer – Committee Expectations II. Discuss Mission, Vision, and Goals Statement ✓ Present and Review statements III. Resources and Capabilities ✓ Handout form ✓ Equipment List? ✓ Logos IV. Risk Assessments ✓ Assessment Format ✓ Specific Areas of Concern V. Map Products ✓ Review Examples ✓ Data Availability? ✓ Begin Identifying Projects VI. Meeting Schedule ✓ Timeline ✓ Monthly Meeting Dates ✓ Public Meeting Dates	Northwest Management, Inc.
3:20 pm	OPEN DISCUSSION	Group

Contact List:

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October 26, 2017 - Committee Meeting Sign-In Sheet



Benton County Hazard Mitigation Plan Planning Committee Meeting 10/26/17

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
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Cary Roe	City of Kennewick	Cary.Roe@ci.kennewick.wa.us	509-479 7
Anthony Muni	City of Kennewick	Anthony.muni@ci.kennewick.wa.us	5854386
Karin Howard	Port of Benton	khoward@portofbenton.org	253-3060
Jerrid MacPherson	Benton County	jerrid.macpherson@co.benton.wa.us	786-5612
Matt Blackman	BEEM	m.blackman@bcem.wa.gov	



Hazard Mitigation Plan Meeting with WA-EMD 10/26/17

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
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Deanna Davis	BEEM	ddavis@bcem.wa.gov	509 678-8092
Ron Dunca	BEPPD2/RFD		

December 12, 2017 –Committee Meeting Agenda

A G E N D A	<p>Hazard Mitigation & Community Wildfire Protection Plan Meeting</p> <p>Tuesday, December 12th, 2017</p> <p>11:00 p.m. – 1:00 p.m.</p> <p>Location: Benton County Emergency Management 651 Truman Ave, Richland WA</p>	
11:00 am	OPEN – Introductions	Deanna Davis, Matthew <u>Blackmarr</u>
11:15 am	<p>GROUP MEETING</p> <p>I. Discuss Agenda, and Non-meeting hours ✓ Additional Stakeholders or Committee Members</p> <p>II. Document ✓ Proposed Outline ✓ Capabilities Assessments ✓ Review Hazard Profiles (Previous Plan & State) ✓ Status report</p> <p>III. Press Release</p> <p>IV. Risk Assessments ✓ Review Countywide Wildfire Risk Assessment ✓ Data Needs ✓ HAZUS Data for Flood Analysis</p> <p>V. Public Meetings ✓ Potential Outreach Methods ✓ Dates and Venues ✓ Press Release</p>	Northwest Management, Inc.
12:30 pm	OPEN DISCUSSION	Group

December 12, 2017 – Committee Meeting Sign-In Sheet



Benton County Hazard Mitigation Plan Planning Committee Meeting

December 12, 2017

Name (Please print)	Company/Agency	E-Mail	Phone #
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SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US	942.7587
Jerrad MacPherson	Benton County	jerrad.macpherson@colbenton.wa.us	
Michelle Cooke	Benton County	Michelle.cooke@colbenton.wa.us	



Benton County Hazard Mitigation Plan Planning Committee Meeting

December 12, 2017

Name (Please print)	Company/Agency	E-Mail	Phone #
Lonnice Clark	BCFD #1	Lonnice@BentCo.org	509-737-0911
Anthony Mear	COK	anthony.mear@ci.kennecott.wa.us	509 855 4336
Neil Hines	Kenn Fire Dept	neil.hines@ci.kennecott.wa.us	509 581-4453

December 12, 2017 – Committee Meeting Notes

- 1) Prefer the document organized by jurisdiction.
- 2) Capabilities assessment to follow: how each jurisdiction can respond to hazards, what plans are available, and their resources.

- 3) NMI will only focus on the natural hazards and the County will add in their manmade hazards of interest following the document completion to not infringe on FEMA's direction.
- 4) Is there a way to add flash flooding from localized storms? (also debris that enter irrigation canals and cause overtopping and damage)
- 5) When the wind exceeds 20mph the irrigation district deploys vegetation clearing crews to canals.
- 6) Ice storms and freezing rains impacting powerlines and grid supply throughout the region.
- 7) KID (Kennewick Irrigation Dist.) levy failure and canal lining to mitigate flood hazards for communities and residents. Also, semantics for inclusion of flooding that may occur from dam failure.
- 8) FEMA is completing the HAZUS runs for earthquake hazards for Benton County.
- 9) There are some 9-foot in diameter syphons for Kennewick that would be susceptible to earthquakes and should be included in the FEMA HAZUS modeling.
- 10) LiDAR flood estimation mapping for Benton at 25, 100 and 500-year event elevation levels for county risk discussions only.
- 11) California Ground squirrel or gophers are natural hazards that impact the irrigation canal infrastructure and have led to damage of private property and safety concerns in the past.
- 12) Drought challenges impact the irrigation district curtailment because people begin to use potable water for irrigation when they start getting reduced and then the officers need to be dispatched to uphold the ordinance. If the ordinance is upheld during a drought there is a risk of increased wildfire.
- 13) Need to add some project language for a FIREWISE program funding as they currently do not have an official program and work on an as-available business.
- 14) Fire map has a lot of green area and most of the county that doesn't get irrigation will indeed burn. Comment: the old plan suggested longer fire return intervals because they assumed sagebrush ecosystems....now much of the county area is cheat grass so the return interval is more like 3-5 years.
- 15) Condense the fire section to something simple that says "there is grass there and the wind blows a lot...so when we have a wet spring there is a greater fire danger because the fuels grow, when there is a drought there is often a less critical fire risk because the grass grows less." More of a narrative that supports the graphics that show grass and wind are the main drivers in their risk areas. Have the narrative align with the need for fuel reduction needs and infrastructure, human safety concerns. There are really only localized pockets of sage brush and then Russian Olive along water ways, everything else is grass.

- 16) Identify some "high priority" fuel breaks (roads, tilling, retardant etc.) as these may have a greater value and better importance to the County than just the vegetation condition. There are some areas of the County that need fuel reduction practices as well as identifying the fuel break locations. The "Rattlesnake area" is not a place they are able to treat and currently in the fire modeling we have completed it is skewing the whole heat map. We asked for a general identification of area where risk is the greatest in their experience and for them to make a "fat crayon" map.
- 17) Local TV network to advertise the plan public outreach meeting dates, times and locations. Kelly Mackhart is the contact. Meeting in Prosser, Richland, and Kennewick for the public meeting locations. Use the Utility bill flyers for helping to notice people.

Matt will setup an email, Facebook announcement, and link to the document on the EM webpage. NMI will develop a flyer in .PDF form to post along with the draft document for the public to view in case folks don't want to read the document and would rather just read an overview and see the times, dates and locations of the three public meeting locations.

December 21, 2017 - Chiefs Meeting Sign-In Sheet



Fire Chiefs Meeting (CWPP/HMP)
12/21/2017

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Matthew Blackmarr	BCES	m.blackmarr@bcem.wa.gov	509-572-8066
Deanna Davis	BCES	d.davis@bcem.wa.gov	509-628-8092
Neil Hines	KFD	neil.hines@ci.kennewick.wa.w	509 585-4453
SETH JOHNSON	WBFR	sjohnson@westkentfire-rescue.org	509-830-9532
Paul Hiebert	USFWS		
JOHN JANAK	USFWS	john.janak@fws.gov	509-378-5391
Tom Huntington	RF&ES	thuntington@ci.richland.wa.us	509-942-7795
Scott Clemenson	RF+ES	sclemenson@ci.richland.wa.us	509-999-3574
Jonnie Chob	BCFD #1	Lennie@bcfdem.org	509-937-0911
W. Hines	BCFD #4	whines@bcfd4.org	509-430-7882

- Discussion of wildfire risks w/ local chiefs
- Reviewed maps left by Northwest Management

March 8, 2018 - Committee Meeting Agenda

A G E N D A	<p>Hazard Mitigation & Community Wildfire Protection Plan Meeting</p> <p>Thursday, March 8th, 2018</p> <p>11:00 p.m. – 1:00 p.m.</p> <p>Location: Benton County Emergency Management 651 Truman Ave, Richland WA</p>	
11:00 am	OPEN – Introductions	Deanna Davis,
11:15 am	<p>GROUP MEETING</p> <p>I. Risk Assessment Workshop</p> <ul style="list-style-type: none"> ✓ Review prior plans Mitigation Action Items ✓ Work through risk assessment maps to determine new Mitigation Action Items <p>II. Public Meetings</p> <ul style="list-style-type: none"> ✓ Solidify Outreach Methods ✓ Dates and Venues 	Northwest Management, Inc.
12:30 pm	OPEN DISCUSSION	Group

District Summaries received: BCFD #2 and West Benton Fire Rescue

March 8, 2018 - Committee Sign-In Sheet



Benton County Hazard Mitigation Plan Meeting March 8, 2018

[Handwritten signature]

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Ken Buechler	RFD		578-9321
Bill Mathews	Northwest Management	mathews@nmi2.com	208-941-6409
Adam Herrenbruck	Northwest Management	herrenbruck@nmi2.com	(509) 520-0240
Deanna Davis	BCEM	d.davis@bcps.wa.gov	628-8092
Edward Dumber	BCFD #4	edumber@bcfd4.org	575-5061
Neil Hines	KFD	neil.hines@ci.kennecott.wa.us	535-5136
Louise Clark	BCFD #1	Louise@bcfd1.org	737-0911
Michelle Cooke	Benton County	michelle.cooke@co.benton.wa.us	786-5612
AL Lawson	WAO NR	alan.lawson@clawson.com	509 554 2441
Karen Howard	Port of Benton	karenh@portofbenton.com	375-3060
Charles Freeman	KID	c.freeman@kid.org	460-5422



Benton County Hazard Mitigation Plan Meeting March 8, 2018

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Tia Burbach			509-614-3115
Kyle Kurth	City of Benton City	kkurth@ci.benton-city.wa.us	509-366-3467
Jennel MacPherson	Benton County	jennel.macpherson@co.benton.wa.us	786-5612
Anthony Muni	City of Kennecott	anthony.muni@ci.kennecott.wa.us	(509) 585-4386
Scott Clemenson	Richland Fire + Emergency Services	sclemenson@ci.richland.wa.us	509-999-3524
William Wheeler	BCFD #4	w.wheeler@bcfd4.org	509-430-7447
Seth Johnson	WORP	sjohnson@westportfire.org	509-830-9532

March 8, 2018 –Committee Meeting Minutes

Agenda Item #1 – Introductions

Deanna Davis opened the meeting by introducing Bill Mathews and Adam Herrenbruck, both with NMI. Bill briefly discussed where the plan stands in the update process. He plans to start sending out portions of the plan out, 1-2 chapters at a time, for the committee to review and give feedback.

Another topic Bill brought up was the location of the flood map data. So far NMI has seen the earthquake data sent by the state but has not seen the new flood hazard data. Some members of the committee noted that the data needed might be found at the Army Corps of Engineers or the irrigation district.

Agenda Item #2 – Risk Assessment Workshop

Bill led a review of the mitigation action items that were expressed in previous plans. Using a handout that summarized previous mitigation projects, the committee discussed: 1) are the action items still current (have they been completed or are they still necessary); 2) is there a more specific timeframe for implementation of each action item; and 3) are the details regarding each action item still applicable or specific enough.

Many changes were made to the past action items due to vague language, completed initiatives, or shifts in objectives. The changes recommended by the committee were recorded so they could be incorporated into the updated HMP. Details of some action items were unknown by those present at the meeting. These action items will need to be discussed by the appropriate parties and then the feedback will be sent to Deanna Davis and NMI.

Bill asked the committee members present to consider any new action items they might want to incorporate into the HMP update. The committee discussed adding some initiatives, particularly ones that address landslide and earthquake mitigation. No specific action items were raised by the committee, but some suggestions might be raised over the next few weeks.

Agenda Item #3 – Plan for moving forward (public meetings)

Bill asked the committee how they would like to proceed with the HMP update process, specifically regarding the public meeting portion. It was suggested and agreed upon to hold the public meetings in three different locations throughout the county, on two different days. The locations chosen were Kennewick, Richland and Prosser, but specific venues have not yet been determined. Tentative dates for these meetings are April 25, at 4:00 in Richland and 6:00 in Kennewick and April 26 in Prosser. The exact times and dates will be finalized when venue

availability is determined by Deanna. There will also be a planning committee meeting prior to the first meeting on April 25, at Benton County Emergency Management.

Agenda Item #4 – CWPP Discussion

Bill led the area fire chiefs in a review of the fire hazard risk map, seeking their feedback and corrections. Many recommendations were made and noted and will be incorporated into an updated hazard risk map and hazard vulnerability assessments.

Bill asked if water sources were necessary for inclusion in the hazard risk map. It was determined that the sources should be included in case the information is needed for any future funding.

The next CWPP meeting was scheduled for Wednesday, April 18 from 9:00 a.m. to 11:00 a.m. at Benton County Emergency Management.

March 18, 2018 – Chiefs Meeting Sign-In Sheet



**Benton County Hazard Mitigation Plan
Meeting- CWPP Specific
April 18, 2018**

Name (Please print)	Company/Agency	E-Mail	Phone #
Alan Lawson	WADNR	alan.lawson@dnr.wa.gov	509-859-2641
Lonnie Click	BCFD #1	Lonnie@bcfd1.org	509-737-0911
SETH JOHNSON	WBFR	sjohnson@westlakesfire-rescue.org	509-786-3873
BONNIE BENITZ	BCFD4	bbenitz@bcfd4.org	509-713-9107
Scott Clemenson	RFES	sclemenson@ci.richland.wa.us	509-999-3374
Kyle Kurth	Benton City	KKurth@ci.Benton-City.wa.us	509-366-3467
Anthony Mihal	City of Kennewick	anthony.mihal@ci.kennewick.wa.us	509-585-4586
Neil Huser	City of Kennewick FID	neil.huser@ci.kennewick.wa.us	509-585-4611

July 19th, 2018 –Committee Meeting Agenda

A G E N D A	<p>Hazard Mitigation & Community Wildfire Protection Plan Meeting</p> <p>Thursday, July 19, 2018</p> <p>11:30 p.m. – 1:30 p.m.</p> <p>Location: Benton County Emergency Management 651 Truman Ave, Richland WA</p>	
11:30 am	OPEN – Introductions	Deanna Davis,
11:40 am	<p>GROUP MEETING</p> <p>I. Quick Status Update</p> <p>II. Hazard Mitigation Plan</p> <ul style="list-style-type: none"> ✓ Review draft ✓ Discuss missing pieces and committee comments <p>III. Community Wildfire Protection Plan</p> <ul style="list-style-type: none"> ✓ Review committee draft ✓ Discuss missing components ✓ Threat Level Mapping ✓ Project map review <p>IV. Next Steps</p> <ul style="list-style-type: none"> ✓ Public comment periods ✓ Review process for state and federal review ✓ Timelines for completion 	Northwest Management, Inc.
1:30 pm	OPEN DISCUSSION	Group

July 19th, 2018 - Committee Meeting Sign-In Sheet



Benton County Hazard Mitigation Plan Meeting July 19th 2018

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
* Deanna Davis	BCEM	d.davis@bces.wa.gov	380-4522
Kyle Kurth	Benton City	KKurth@City.Benton-City,WA.us	588-3322
* Scott Clemons	RF+ES	sclemons@ci.richland.wa.us	509-999-3574
Aaron Lambert	City of W. Richland	alambert@westrichland.org	907-5902
SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US	942-7587
* Lori Ferris	BCEM	l.ferris@bces.wa.gov	572-8066
Anthony Muai	Kennecook	anthony.muai@ci.kennecook.wa.us	585-4386
Michelle Cooke	Benton Co.	Michelle.cooke@co.benton.wa.us	509-781-7612
Tina R King	NMI	King@nmi2.com	258-818-3111
* William Wheeler	BCFD4	w.wheeler@bcfd4.org	509-430-7993
* Neil Hines	KFF	neil.hines@ci.kennecook.wa.us	585-4453

* Stayed for CWPP specific planning mtg.

Documentation of Public Involvement

November 15th, 2017 -Press Release to Public

Benton County

Media Release

From: Deanna Davis, Emergency Manager

Date: November 15, 2017

RE: Benton County Natural Hazard Mitigation Plan & Community Wildfire Protection Plan Update

Benton County Set to Update Hazard Risk Plans

Richland, WA. Benton County has launched a project to update the Benton County Natural Hazard Mitigation Plan. This update will include an update of the Benton County Community Wildfire Protection Plan as well. Local agencies and organizations in Benton County have created a committee to complete the required 5-year updates of these documents as part of the FEMA Pre-Disaster Mitigation program and National Fire Plan and Healthy Forests Restoration Act. The project is being funded through a grant from FEMA.

The planning update will include risk analyses, vulnerability assessments, and mitigation recommendations for the hazards of flood, landslide, earthquake, severe weather, wildland fire, and others.

Northwest Management, Inc. has been retained by Benton County to provide risk assessments, hazard mapping, field inspections, interviews, and to collaborate with the planning committee to update the Plans. The committee includes representatives from local communities, rural and wildland fire districts, Washington DNR, Bureau of Land Management, highway districts, area businesses, various Benton County and City departments, and others.

One of the goals of the planning process will be to increase the participating jurisdictions' eligibility for additional grants that will help minimize the risk and potential impact of disaster events. The planning team will be conducting public meetings to discuss preliminary findings and to seek public input on the Plans' recommendations. A notice of the dates and locations of these meetings will be posted in local newspapers. Once completed, the updated draft Plans will also be available for public review and comment.

The first meeting was held on October 26th, located at the Benton County Emergency Management Office at 651 Truman Ave, Richland, Wa 99352. For more information on the Benton County Natural Hazard Mitigation Plan update contact Deanna Davis, Emergency Manager at (509)628-8092, email d.davis@bces.wa.gov

April 18th, 2018 – Press Release: Schedule of Public Meetings



Public meeting comments on Benton County Hazard Mitigation plan:

Wednesday April 25th 4:00 P.M.

Richland Public Library Conference Rm A&B
955 Northgate, Richland WA 99352

Wednesday April 25th 5:00 P.M.

West Benton Fire & Rescue
1200 Grant, Prosser WA 99350

Wednesday April 25th 6:00 P.M.

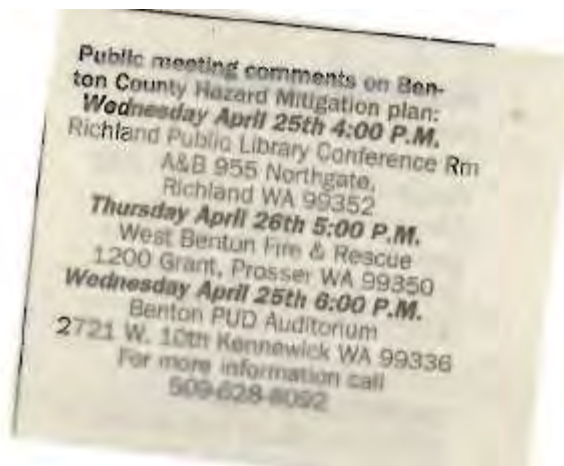
Benton PUD Auditorium
2721 W. 10th Kennewick WA 99336

For more information call 509-628-8092

ADD TO BEGIN ON APRIL 18TH AND END ON APRIL 26TH – ADD CAN RUN IN THE MISC ANNOUCMENTS SECTION.

Contact: Deanna Davis, EM Manager
Benton County Emergency Services
509-628-8092 or cell: 509-380-4522
d.davis@bces.wa.gov

April 18th, 2018 – Newspaper Advertisement for Public Meetings



April 25th and 26th, 2018 - Public Meeting Presentation

*Benton County, Washington
Multi-Hazard Mitigation Plan Update and
Community Wildfire Protection Plan*




Northwest Management, Inc.
Tera King, B.S. and MBA
2333 East Palouse River Drive
Moscow, Idaho 83843
208-883-4488 Telephone

1

Northwest Management, Inc.

- Serving the Western U.S. since 1984
- Main Office in Moscow, Idaho
 - Deer Park and Colville, Washington
 - Helena, Montana
- Natural Resource Consultants



**NORTHWEST
MANAGEMENT, INC.** *Providing a balanced approach to
natural resource management*

2

Purpose of the Plans

- Recognize and Identify Risk Factors
- Reduce the Risk of Loss for Life, Property, Infrastructure, Natural Resources, and Economy
- Map and Prioritize Mitigation Projects
- Provide for Public Awareness

Improve County's Eligibility for Funding Assistance



3


FEMA Multi-Hazard Mitigation Plan

- Flooding
- Landslides
- Wildland Fire
- Severe Weather
- Earthquake
- Volcano




MHMPs are required for all counties.
As of November 1, 2004 by FEMA

4

FEMA Requirements 

- Adoption by Local Government Body
- Multi-Jurisdictional Planning
- Identification of Hazards & Risk Assessment
 - Profiling Hazard Events
 - Mapping Juxtaposition of Hazards, Structures, Infrastructure
 - Potential Dollar Losses to Vulnerable Structures (B/C Analysis)
- Documented Planning Process
- Assessing Vulnerability
- Mitigation Goals
- Analysis of Mitigation Measures
- Monitoring, Evaluating & Updating the Plan (5 year cycles)
- Implementation Through Existing Programs
- Public Involvement

5

Who is on the committee?

<p><u>Adopting Jurisdictions:</u></p> <ul style="list-style-type: none"> • Benton County • Incorporated Cities <ul style="list-style-type: none"> ◦ Benton City ◦ Richland ◦ Kennewick ◦ West Richland ◦ Prosser 	<p><u>Other Committee Members:</u></p> <ul style="list-style-type: none"> • Members of the public and local business operators • Fire Districts • Washington DNR • Port of Benton • US Fish and Wildlife Service • BLM • Irrigation Districts
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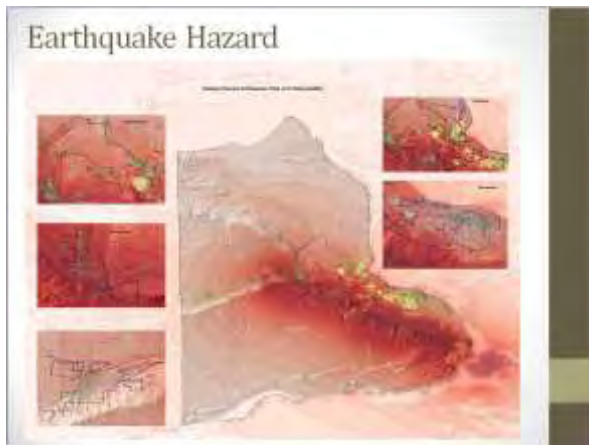
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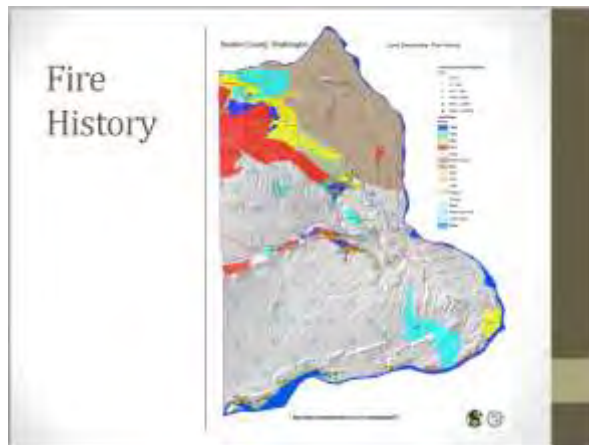
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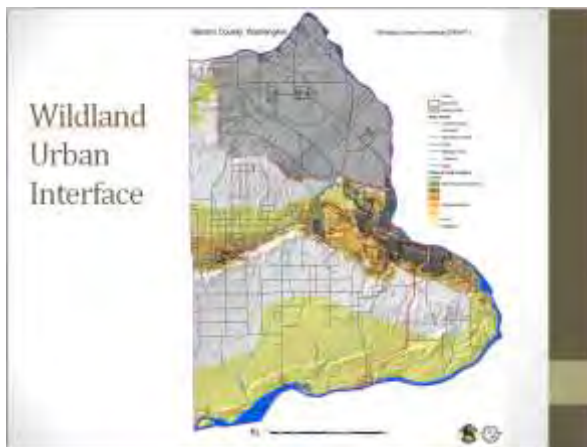
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13

Preparedness

- Emergency Services
- Fire Protection
- Weather Impacts
- Flood Protection/Programs
- Earthquake, Landslide, & Storm Readiness
- Hospital Protection
- Public Works/Highway District Readiness
- Communications

14

Types of Projects

- Defensible Space and Fuels Treatments
- Floodplain Management and Infrastructure Upgrades
- Slope Stabilization
- Studies (e.g. watershed) and Evaluations (e.g. culvert capacity)
- Access Improvements
- Emergency Response Needs
- Policy Issues
- Infrastructure Hardening and Communication Upgrades
- Public Education

15

Public Involvement

- Press Releases and Social Media
- Public Meetings x3
- Public Review of the DRAFT Plan
- Open public adoption hearings

16

Your Input

- Maps on the walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!

Thank you for attending and participating!
Please visit with us.

17

**Benton County, Washington
Multi-Hazard Mitigation Plan Update and
Community Wildfire Protection Plan**

18

Receipt for Public Comment Press Release



Order Confirmation

Customer RICHLAND CITY OF		Payor Customer RICHLAND CITY OF			
Customer Account [REDACTED]		Payor Account [REDACTED]			
Customer Address 505 SWIFT BLVD., MS-09 RICHLAND WA 993523510 USA		Payor Address 505 SWIFT BLVD., MS-09 RICHLAND WA 993523510 USA			
Customer Phone 509-942-7547		Payor Phone 509-942-7547			
Customer Fax 509-942-7397		Customer Email			
Sales Rep ccortez@tricityherald.com		Order Taker ccortez@tricityherald.com			
PO Number	Payment Method Invoice	Blind Box	Tear Sheets 0	Proofs 0	Affidavits 0
Net Amount \$110.37	Tax Amount \$0.00	Total Amount \$110.37	Payment Amount \$0.00	Amount Due \$110.37	
Ad Order Number 0003971913	Order Source	Ordered By Deanna Davis	Special Pricing		
Invoice Text			Promo Type		
Package Buy			Materials		

Ad Order Information

Ad Number 0003971913-01 **Ad Type** TRI-Class Liner **Production Method** AdBooker **Production Notes**

External Ad Number **Ad Attributes** **Ad Released** No **Pick Up**

Ad Size 1 X 10 li **Color**

Product TRI- Tri-City Herald **Placement** 0200 - Announcements **Times Run** 7 **Schedule Cost** \$72.45

Run Schedule Invoice Text Benton County Emergency Service is solic **Position** 0275 - Misc. Announcements

Run Dates 11/27/2018, 11/28/2018, 11/29/2018, 11/30/2018, 12/02/2018, 12/03/2018, 12/04/2018

Product TRI-upsell.tricityherald.com **Placement** 0200 - Announcements **Times Run** 7 **Schedule Cost** \$31.92

Run Schedule Invoice Text Benton County Emergency Service is solic **Position** 0275 - Misc. Announcements

Run Dates 11/27/2018, 11/28/2018, 11/29/2018, 11/30/2018, 12/02/2018, 12/03/2018, 12/04/2018

Product TRI- Tri-City Herald **Placement** Just In - Just In **Times Run** 1 **Schedule Cost** \$6.00

Run Schedule Invoice Text Benton County Emergency Service is solic **Position** Just In - Just In

Run Dates 11/27/2018

Benton County Emergency Service
 is soliciting Public Comment on the
 Benton County Community Wildfire
 Protection Plan, from Nov 2016 - Dec
 7th. Please visit www.bces.wa.gov to
 find a copy of the plan or view a hard
 copy at the Richland Public Library.
 Comments can be sent to
publiccomment@bces.wa.gov
 Questions please call 629 2800.

How to Cite this Document:

This plan was developed by Northwest Management, Inc. under contract with the Bureau of Land Management and Benton County Emergency Management.

Citations:

Nelson, Eric. *Lead Authors*. 2018 Benton County, Washington Community Wildfire Protection Plan. Northwest Management, Inc., Moscow, Idaho. Pp ##.

Nelson, Eric. *Lead Authors*. 2018 Benton County, Washington Community Wildfire Protection Plan Appendices. Northwest Management, Inc., Moscow, Idaho. Pp ##.



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NWManage@consulting-foresters.com

<http://www.Consulting-Foresters.com/>

Signature Pages

This Benton County Community Wildfire Protection Plan Update has been developed in cooperation and collaboration with representatives of the following organizations and agencies:

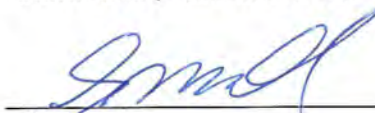
Benton County Board of Commissioners



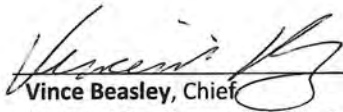
James Beaver,
Benton County Commissioner District #3
Date 12-18-2018



Jerome Delvin,
Benton County Commissioner District #1
Date 12-18-2018



Shon Small
Benton County Commissioner District #2
Date 12-8-2018


Vince Beasley, Chief
Kennewick – Kennewick Fire Department

12/18/18
Date

Appendix N
Benton County Natural Hazard
Mitigation Plan (2019)

Benton County, Washington

Natural Hazard Mitigation Plan 2019 Revision



Benton County Emergency Management

651 Truman Avenue
Richland, WA 99352
(509) 628-2600



Prepared By
Northwest Management, Inc.

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Foreword

Benton County Emergency Services is dedicated to the protection of life, property, economic and environmental resources throughout Benton County. Seeking to inform and educate citizens, provide training and resource coordination and ultimately reduce the vulnerability of Benton County citizens through comprehensive disaster planning and mitigation.

“Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident...however, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.”¹

The **Benton County, Washington Hazard Mitigation Plan** was updated in 2017-19 by the Benton County NHMP planning committee in cooperation with Northwest Management, Inc. of Moscow, Idaho.

This plan satisfies the requirements for a local natural hazard mitigation plan under 44 CFR Part 201.6, in addition this plan fully integrated the processes of FEMA’s Natural Hazard Mitigation Plan with the Community Wildfire Protection Plan as outlined in the Healthy Forest Restoration Act. Full integration was accomplished through the creation of a single committee that through a collaborative process provided oversight and expertise to the entire planning process.



¹ Federal Emergency Management Agency. “Local Multi-Hazard Mitigation Planning Guidance.” July 1, 2008

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Approval Letter from FEMA

This heading is a place holder for the final plan approval letter from FEMA.

Adoption Resolutions

This heading is a place holder for the adoption resolutions that will be signed by each jurisdiction once the plan is approved by FEMA.



Chapter 1: Plan Overview

Overview of this Plan and its Development

This county Hazard Mitigation Plan is the result of analyses, professional cooperation and collaboration, assessments of hazard risks and other factors considered with the intent to reduce the potential for hazards that threaten people, structures, and infrastructure within Benton County, Washington. The Benton County Hazard Mitigation Plan (Hazard Mitigation Plan) was originally approved by Washington Military Department, Emergency Management Division (EMD) and the Federal Emergency Management Agency (FEMA) in 2004. This document serves as an update of the Hazard Mitigation Plan under the Pre-Disaster Mitigation program and will be in effect until 2024. This update will also include the County's Community Wildfire Protection Plan update as a component within the main document. This document assists with the identification and assessment of various potential hazards and helps maintain the County's eligibility for grants and other funding.

The planning team responsible for implementing this project was led by Benton County Emergency Management with assistance from Northwest Management, Inc. Agencies and organizations that participated in the planning process included:

- Benton City
- Benton County
- Benton County Fire District #1
- Benton County Fire District #2
- Benton County Fire District #4
- Benton County Fire District #5
- Benton County Fire District #6
- Bureau of Land Management
- City of Kennewick
- City of Prosser
- City of Richland
- City of West Richland
- Irrigation Districts
- Kennewick Fire Departments
- Port of Benton
- Richland Fire & Emergency Services
- U.S. Fish and Wildlife Services
- West Benton Regional Fire Authority

Planning Philosophy and Goals

Benton County Planning Philosophy

This effort will utilize the best and most appropriate science from all partners and will integrate local and regional knowledge about hazards while meeting the needs of local citizens and the regional economy.

Mission Statement

To make Benton County residents, communities, state agencies, local governments, and businesses less vulnerable to the effects of hazards through the effective administration of hazard mitigation grant programs, hazard risk assessments, wise and efficient infrastructure hardening, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

Jurisdictional Planning and Mitigation Goals

As part of the 2017-19 revision process, each participating jurisdiction in Benton County was asked to develop its own set of planning and mitigation goals to help reflect and keep track of individual priorities and changes in hazard vulnerability over time. During the first planning committee meeting, the group discussed several overall short-term and long-term goals as well as goals for the planning process itself. Members of the committee were given a list of example goals statements and a blank goals worksheet to fill out and return. The goals submitted by each jurisdiction are summarized as follows:

1. The 2017-19 planning process will involve planning for natural hazards of Flood, Earthquake, Landslides, Wildland Fire (Integration of the CWPP), Severe Storms, Volcanos, and Drought, but other hazards may be added during subsequent updates.
2. Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy;
3. Educate communities about the unique challenges of natural hazard preparedness in the county;
4. Reduce the impact of hazard events and potential losses incurred by both public and private residents and entities;
5. Consider land use policies to alleviate potential hazard risks and impacts for future development;
6. Improve enrollment in the National Flood Insurance Program within communities that are at risk to floods through increased outreach and education;
7. Establish mitigation priorities and develop mitigation strategies in Benton County & adopting jurisdictions;
8. Strategically locate and plan infrastructure and risk reduction projects that take into consideration the impacts of natural hazards;

9. Reduce the area of wildland-urban interface (WUI) land burned and losses experienced because of wildland fires where these fires threaten communities in the wildland-urban interface;
10. Provide recommendations for alternative mitigation methods.
11. Meet or exceed the requirements of the National Fire Plan and FEMA Natural Hazard Mitigation Plan and Community Wildfire Protection Plan.

Integration with Other Local Planning Mechanisms

During the development of this Hazard Mitigation Plan, several planning and management documents were reviewed in order to avoid conflicting goals and objectives. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the hazard mitigation objectives outlined in this document. The following narratives help identify and briefly describe some of the existing planning documents and ordinances considered during the development of this plan. This list does not necessarily reflect every plan, ordinance, or other guidance document within each jurisdiction; however, this is a summary of the guidance documents known to and recommended for review by members of the planning committee.

Benton County Comprehensive Plan (2018):

Benton County Comprehensive Plan guides all development within the unincorporated portions of Benton County and addresses the goals and community's values for land use, transportation, infrastructure, housing, economic development, and natural resources.

It is anticipated that the coordination between the Benton County Comprehensive Plan and the Hazard Mitigation Plan will enable the development of resilient communities through land use planning that incorporates the risk assessments conducted in the Hazard Mitigation Plan.

Benton County Comprehensive Emergency Management Plan (2015):

The Benton County Comprehensive Emergency Management Plan (CEMP) establishes the framework for a comprehensive approach to mitigation, planning, response and recovery activities by defining the roles and responsibilities of local government, State and Federal agencies and volunteer organizations.

It is anticipated that the Hazard Mitigation Plan (Hazard Mitigation Plan) & Community Wildfire Protection Plan (CWPP) will support the efforts set forth by the Benton County CEMP. The identification, risk assessments, and vulnerability assessments for each hazard will provide the information to better mitigate and respond to hazards affecting all jurisdictions adopting the Hazard Mitigation Plan.

Benton County Wildfire Protection Plan (2019):

The Benton County's Wildfire Protection Plan identifies the fire risks throughout the County through the collaboration between planning members, stakeholders, and the public to determine areas that need fuel treatments to protect life and property.

Benton County is conducting an integrated approach to the Hazard Mitigation Plan and CWPP processes, review of the existing CWPP was used to record past projects, assess the fire risk to communities of Benton County in 2005 and determine what information was still relevant to the current efforts.

Benton County Flood Hazard Management Plan (Not Adopted):

The Flood Hazard Management Plan was developed in 2001 by a contractor in an effort to identify flooding hazards within Benton County. While not an official planning document the risk analysis and mitigation strategies presented were assessed to determine their applicability to the Benton County Hazard Mitigation Plan update.

Table 1) City and county plans that have been adopted by jurisdictions participating in the Benton County, WA Hazard Mitigation Plan per the capabilities assessments completed by each jurisdiction.

Plan Name / Type of Plan	Benton County	Kennewick	Richland	Prosser	West Richland	Benton City
Comprehensive / Master Plan	Y; 2018	Y; 2017	Y	Y; 2018	Y; 2017	Y; 2017
Capital Improvement Plan	Y; 2017	Y; 2016	Y; 2018	Y; 2018	Y; 2017	Y
Economic Development Plan	Y; 2015	N	N	N	Y; 2017	N
Local Emergency	N/A	Y	Y	Y	N/A	N
Continuity of Operations Plan	N/A	Y; 2015 / 2017	N/A	N	N/A	N
Transportation Plan	Y; 2017	Y; 2008	Y; 2005	Y	Y; 2018	Y
Stormwater Management Plan	N	Y; 2007	Y; 2016	N/A	Y; 2018	N
Community Wildfire Protection Plan	Y; 2019	Y; 2019	Y; 2019	2019	2019	2019

Y: Yes, a plan of the given type has been adopted by the jurisdiction in the year listed.

N: No, a plan of the given type has not been adopted by the jurisdiction listed.

Incorporating Other Plans: Descriptions of the Process by Jurisdiction

This section provides additional details explaining how the hazard mitigation plan will be incorporated into other planning mechanisms, ensuring consistency and efficiency when planning and preparing for natural hazard events. This is also an opportunity to accomplish Mitigation Action Items (MAI) through other plans as well. Mitigation Action Items are projects/initiatives that either reduce risk and/or exposure associated with a given hazard or increase preparedness in post-disaster scenarios. Examples of Mitigation Action Items include modification of building codes to restrict construction in known flood zones and the strategic placement of generators to ensure the continuation of essential services in the event of a power outage.

Benton County

Comprehensive Plan: The Benton County Comprehensive Plan (CP) was adopted in February of 2018 and is reviewed annually. During the annual review process Benton County will identify Mitigation Action Items that can be incorporated into and implemented through the CP. Most of the non-fire Mitigation Action Items will be eligible for inclusion in and implementation through the CP.

Plan URL: <https://www.co.benton.wa.us/pView.aspx?id=1425&catid=45>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- Benton County Flood MAI No. 1

Capital Improvement Plan: The County's Capital Improvement Plan is updated at least every two (2) years prior to the County's biennium budget adoption but can be updated more frequently if the need arises. The Capital Improvement Plan was last updated on November 20, 2018 prior to, but on the same day as the County's biennium budget adoption for 2019-2020. The next update to the Capital Improvement Plan is scheduled for November of 2020.

Economic Development Plan: The Benton County Economic Development Plan was last updated in 2015. The next plan revision and adoption is scheduled for early 2019. During the next plan update, Benton County will identify Mitigation Action Items that can be incorporated into the Economic Development Plan.

Transportation Plan: The Benton County Transportation plan is incorporated in the Comprehensive Plan and was last updated in 2018. Any relevant Mitigation Action Items will be reviewed and incorporated in the Hazard Mitigation Plan at the time of each update. The County also has a Six (6) Year Transportation Improvement Plan or Six (6) Year TIP. The Six (6) Year TIP is updated on an annual basis, typically in the summer or fall, and covers a time period looking ahead six (6) years. The last Six (6) Year TIP (2018-2023) was adopted/updated on June 27, 2017 and amended on August 29, 2017.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

City of Kennewick

Comprehensive Plan: The City of Kennewick Comprehensive Plan was updated and adopted on June 6, 2017. The Comprehensive plan is reviewed annually and during the annual review process, the City of Kennewick will identify Mitigation Action Items that can be incorporated into and implemented through the Comprehensive Plan.

Plan URL: <https://www.go2kennewick.com/249/Comprehensive-Plan-Update>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- Kennewick Flood MAI No. 1
- Kennewick Windstorm MAI No. 1

Capital Improvement Plan: The Capital Improvement plan for the City of Kennewick will be updated in 2020. During the annual review process, the City of Kennewick will identify Mitigation Action Items that can be incorporated into the Hazard Mitigation Plan.

Local Emergency: The City of Kennewick Local Emergency Plan is reviewed every annually and will be updated again in 2019. Any relevant Mitigation Action Items will be reviewed and incorporated into the Hazard Mitigation Plan at the time of each update.

Continuity of Operations Plan: The City of Kennewick Continuity of Operations Plan is reviewed every year and will be updated again in 2019. Any relevant Mitigation Action Items will be reviewed and incorporated into the Hazard Mitigation Plan at the time of each update.

Transportation Plan: The City of Kennewick Transportation Plan is incorporated in the Comprehensive Plan and will be updated again in 2018. Any relevant Mitigation Action Items will be reviewed and incorporated into the Hazard Mitigation Plan at the time of each update.

Stormwater Management Plan: The Stormwater Management Plan is reviewed every 10 years and was last adopted in 2007. During the next update of the plan, the City of Kennewick will identify Mitigation Action Items that can be incorporated in the Hazard Mitigation Plan.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

City of Richland

Comprehensive Plan: The City of Richland Comprehensive Plan was adopted on October 2017 and is amended annually. During the annual review process, the City of Richland will identify Mitigation Action Items that can be incorporated into and implemented through the Comprehensive Plan.

Plan URL: <https://www.ci.richland.wa.us/departments/community-development-services/planning/comprehensive-plan>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- Richland Multi-Hazard MAI 2
- Richland Multi-Hazard MAI 6
- Richland Multi-Hazard MAI 7
- Richland Multi-Hazard MAI 9

Capital Improvement Plan: The Capital Improvement plan for the City of Richland will be updated each year as part of the annual budget adoption. The 2019 CIP will be approved by Council in November 2018. During the annual review process, the City of Richland will identify Mitigation Action Items that can be incorporated into the Hazard Mitigation Plan.

Local Emergency: The City of Richland Local Emergency Plan is reviewed every year. Any relevant Mitigation Action Items will be reviewed and incorporated into the Hazard Mitigation Plan at the time of each update.

Transportation Plan: The City of Richland Transportation Plan is incorporated in the Comprehensive Plan and will be updated again in 2025. Any relevant Mitigation Action Items will be reviewed and incorporated into the Hazard Mitigation Plan at the time of each update.

Stormwater Management Plan: The Stormwater Management Plan is reviewed approximately every 10 years and was last adopted in 2015. During the next update of the plan, the City of Richland will identify Mitigation Action Items that can be incorporated in the Hazard Mitigation Plan.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

City of Prosser

Comprehensive Plan: The City of Prosser Comprehensive Plan was adopted on April 10, 2018 and is amended annually. During the annual review process, the City of Prosser will identify Mitigation Action Items that can be incorporated into and implemented through the Comprehensive Plan.

Plan URL: <https://cityofprosser.com/planning>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- Prosser Multi-Hazard MAI No. 2
- Prosser Flood MAI No. 1
- Prosser Flood MAI No. 2
- Prosser Windstorm MAI 1

Capital Improvement Plan: The Capital Improvement plan for the City of Prosser will be updated in 2019. During the annual review process, the City of Prosser will identify Mitigation Action Items that can be incorporated into the Hazard Mitigation Plan.

Local Emergency: The City of Prosser Local Emergency Plan is reviewed every 6 years and will be updated again in 2020. Any relevant Mitigation Action Items will be reviewed and incorporated in the Hazard Mitigation Plan at the time of each update.

Transportation Plan: The City of Prosser Transportation Plan is incorporated in the Comprehensive Plan and will be updated again in 2019. Any relevant Mitigation Action Items will be reviewed and incorporated in the Hazard Mitigation Plan at the time of each update.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

City of West Richland

Comprehensive Plan: The City of West Richland 20-Year Comprehensive Plan was adopted in 2017 and is amended annually. During the annual review process, the City of West Richland will identify Mitigation Action Items that can be incorporated into and implemented through the Comprehensive Plan.

Plan URL: <http://www.westrichland.org/wpfb-file/2017-comprehensive-plan-adopted-ord-14-17-2-pdf/>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- West Richland Multi-Hazard MAI No. 1
- West Richland Multi-Hazard MAI No. 2
- West Richland Multi-Hazard MAI No. 3
- West Richland Flood MAI No. 1
- West Richland Windstorm MAI No.1

Capital Improvement Plan: The Capital Improvement plan for the City of West Richland will be updated in 2019. During the annual review process, the City of West Richland will identify Mitigation Action Items that can be incorporated into the Hazard Mitigation Plan.

Economic Development Plan: The City of West Richland Economic Development Plan is updated as needed and was last updated in 2013 with no immediate plans to update it as the 20-Year Comprehensive Plan included economic development as an element. During the next plan update, West Richland will identify Mitigation Action Items that can be incorporated into the Economic Development Plan.

Transportation Plan: The City of West Richland Transportation Plan is incorporated in the Comprehensive Plan and will be updated again in 2019. Any relevant Mitigation Action Items will be reviewed and incorporated in the Hazard Mitigation Plan at the time of each update.

Stormwater Management Plan: The Stormwater Management Plan is reviewed every year is not adopted by council but referenced in Municipal Code. During the next update of the plan, the City of West Richland will identify Mitigation Action Items that can be incorporated in the Hazard Mitigation Plan.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

Benton City

Comprehensive Plan: The Benton City Comprehensive Plan (CP) was adopted on August 2017 and is amended annually if needed. During the annual review process Benton City will identify Mitigation Action Items that can be incorporated into and implemented through the CP. Most of the non-fire Mitigation Action Items will be eligible for inclusion in and implementation through the CP but the following will be a priority:

Plan URL: <https://www.ci.benton-city.wa.us/pView.aspx?id=28918&catid=671>

The Following Mitigation Action Items (MAI) will be prioritized during the next plan update:

- Benton City Multi Hazard MAI No. 1
- Benton City Multi Hazard MAI No. 2
- Benton City Flood MAI No. 1
- Benton City Flood MAI No. 5

Capital Improvement Plan: The Capital Improvement plan for Benton City will be updated in 2019. During the annual review process, Benton City will identify Mitigation Action Items that can be incorporated into the Hazard Mitigation Plan.

Transportation Plan: The Benton City Transportation Plan is incorporated in the Comprehensive Plan and will be updated again in 2019. Any relevant Mitigation Action Items will be reviewed and incorporated in the Hazard Mitigation Plan at the time of each update.

Community Wildfire Protection Plan: The Benton County Community Wildfire Protection Plan is updated every 5 years and will be updated next in 2024. The Mitigation Action Items included in the Hazard Mitigation Plan that pertain to wildfire will be carried over and accomplished through the Benton County Community Wildfire Protection Plan.

Guiding Principles

Effective November 1, 2004, a Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. These programs provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local Natural Hazard Mitigation Plan requirements for HMGP and PDM eligibility is based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local Natural Hazard Mitigation Plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

In order to be eligible for project funds under the Flood Mitigation Assistance (FMA) program, communities are required under 44 CFR Part 79.6(d)(1) to have a mitigation plan that addresses flood hazards. On October 31st, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Reg. to incorporate mitigation planning requirements for the FMA program (44 CFR Part 201.6). The revised Local Mitigation Plan Review Crosswalk (October 2011) used by FEMA to evaluate local hazard mitigation plans is consistent with the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by Section 322 of the Disaster Mitigation Act of 2000, the National Flood Insurance Act of 1968, as amended by the National Flood Insurance Reform Act of 2004 and 44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning, inclusive of all amendments through July 1, 2008, was used as the official guide for development of a FEMA-compatible Benton County, Washington Natural Hazard Mitigation Plan.

FEMA will only review a local Natural Hazard Mitigation Plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local Natural Hazard Mitigation Plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption.

A FEMA designed plan will be evaluated on its adherence to a variety of criteria, including:

- Adoption by local governing bodies and multi-jurisdictional plan adoption
- Multi-jurisdictional planning participation and documentation of the planning process
- Identifying hazards and profiling hazard events

- Assessing vulnerability by identifying assets, estimating potential losses, and analyzing development trends
- Multi-jurisdictional risk assessment
- Local hazard mitigation goals and identification, analysis, and implementation of mitigation measures
- Multi-jurisdictional mitigation strategy
- Monitoring, evaluating, and updating the plan
- Implementation through existing programs
- Continued public involvement

United States Government Accountability Office (GAO)

Since 1984, wildland fires have burned an average of more than 850 homes each year in the United States and, because more people are moving into fire-prone areas bordering wildlands, the number of homes at risk is likely to grow. The primary responsibility for ensuring that preventative steps are taken to protect homes lies with homeowners. Although losses from fires made up only 2.2 percent of all insured catastrophic losses from 1991 to 2010, fires can result in billions of dollars in damages.

GAO was asked to assess, among other issues, (1) measures that can help protect structures from wildland fires, (2) factors affecting use of protective measures, and (3) the role technology plays in improving firefighting agencies' ability to communicate during wildland fires.

The two most effective measures for protecting structures from wildland fires are: (1) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where flammable vegetation and other objects are reduced; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows and building materials, surface treatments, sprinklers, and geographic information systems mapping – can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for fire protection. Federal, state, and local governments, as well as other organizations, are attempting to increase property owners' use of protective measures through education, direct monetary assistance, and laws requiring such measures. In addition, some insurance companies have begun to direct property owners in high risk areas to take protective steps.

State and Federal CWPP Guidelines

This Community Wildfire Protection Plan includes compatibility with FEMA requirements for a Hazard Mitigation Plan, while also adhering to the guidelines proposed in the National Fire Plan, and the Healthy Forests Restoration Act (2003). This Community Wildfire Protection Plan has been prepared in compliance with:

- Healthy Forests Restoration Act (2003).

- The Federal Land Assistance, Management and Enhancement (FLAME) Act (2009).
- The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan (December 2006).
- National Cohesive Wildland Fire Management Strategy (March 2011). The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.
- The Federal Emergency Management Agency's Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Multi-Hazard Mitigation Plan.
- National Association of State Foresters – guidance on identification and prioritizing of treatments between communities (2003).

Update and Review Guidelines

Deadlines and Requirements for Regular Plan Reviews and Updates: In order to apply for a FEMA PDM project grant, Tribal and local governments must have a FEMA-approved mitigation plan. Tribal and local governments must have a FEMA-approved mitigation plan in order to receive HMGP project funding for disasters declared on or after November 1, 2004. States and Tribes must have a FEMA-approved Standard or Enhanced Mitigation Plan in order to receive non-emergency Stafford Act assistance (i.e., Public Assistance Categories C-G, HMGP, and Fire Management Assistance Grants) for disasters declared on or after November 1, 2004. State mitigation plans must be reviewed and reapproved by FEMA every three years. Local Mitigation Plans must be reviewed and reapproved by FEMA every five years.

- Plan updates. In addition to the timelines referenced above, the Rule includes the following paragraphs that pertain directly to the update of State and local plans:
 - ✓ §201.3(b)(5) [FEMA Responsibilities] ...Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled....
 - ✓ §201.4(d) Review and updates. [State] Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval...every three years.
 - ✓ §201.6(d) [Local] plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for project grant funding.

Plan updates must demonstrate that progress has been made in the past three years (for State plans), or in the past five years (for local plans), to fulfill commitments outlined in the previously approved plan. This will involve a comprehensive review and evaluation of each section of the plan and a discussion of the results of evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. FEMA will leave to State discretion, consistent with this plan update guidance, the documentation of progress made. Plan updates may validate the information in the previously

approved plan or may involve a major plan rewrite. In any case, a plan update is NOT an annex to the previously approved plan; it must stand on its own as a complete and current plan.

The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Benton County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

National Flood Insurance Program Compliance

Effective October 1, 2008, the Federal Emergency Management Agency (FEMA) will require jurisdictions that participate in the National Flood Insurance Program (NFIP) to link their mitigation strategy with continued compliance with the National Flood Insurance Program. As of 2019, Benton County and all of the jurisdictions within Benton County to include; the City of Richland, City of Kennewick, City of West Richland, City of Prosser and City of Benton City are participating in NFIP and are in good standing. Refer to the letter from the State of Washington Department of Ecology in Appendix D.

The Benton County Hazard Mitigation Plan was originally developed in 2004 following the process outlined by the Disaster Mitigation Act of 2000 as well as the NFIP so that the plan would fully coordinate with and compliment NFIP flood mitigation programs that exist now or may exist in the future within Benton County. To comply with NFIP standards, no development in Benton County to include the City of Richland, City of Kennewick, City of West Richland, City of Prosser or City of Benton City is occurring in designated flood zones and construction projects must be inspected by Planning, Zoning & Building Code Enforcement.

Since January 1, 1978, Benton County and cities within the county have received almost \$1.3 million in NFIP claims for 102 losses as a result of flooding. (Table 2). As defined by the NFIP, there are no “repetitive loss” or “severe repetitive loss” properties located within Benton County’s planning area.

Table 2) Total value of flood insurance claims made since January 1, 1978 by Benton County, WA and communities within Benton County.

Community	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments
Benton City	20	15	0	5	\$211,461.44
Benton County	50	40	0	10	\$674,290.93
Kennewick	4	2	0	2	\$7,288.3
Prosser	1	1	0	0	\$8,154.3
Richland	17	11	0	6	\$175,651.79
West Richland	10	9	0	1	\$207,335.97
Total	102	78	0	24	\$1,284,182.73

Chapter 2: Planning Process

Documenting the Planning Process

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.6(b) and §201.6(c)(1)) for an updated local mitigation plan. This section includes a description of the planning process used to update this plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

The Planning Team

Benton County Emergency Management team led the planning committee efforts alongside the Northwest Management, Inc. team. This team of resource professionals included county and city staff, fire protection districts, State and Federal Agencies:

Deanna Davis	Manager, Benton County Emergency Management
Kyle Kurth	Maintenance Foremen, City of Benton City
Shane O'Neill	Community Development Senior Planner, City of Richland
Scott Clemenson	Captain, Richland Fire Department
Pete Rogalsky	Public Works Director, Richland Public Works
Cary Roe	Public Works Director, City of Kennewick
Anthony Muai	Community Development Senior Planner, City of Kennewick
Neil Hines	Operations Chief, Kennewick Fire Department
Aaron Lambert	Community Development Director, City of West Richland
Steve Zetz	Planning and Economic Development Director, City of Prosser
Kevin Howard	Director of Airports and Operations, Port of Benton
Michelle Cooke	Senior Planner, Benton County
Jerrod MacPherson	Planning Director, Benton County
John Janak	Fire Management Officer, United States Fish & Wildlife Service
Lori Ferris	Emergency Planner, Benton County Emergency Management
Charles Cronk	Supervisory Range Tech, Bureau of Land Management
Lonnie Click	Chief, Benton County Fire District #1
Ron Duncan	Chief, Benton County Fire District #2
Bonnie Benitz	Captain, Benton County Fire District #4
William Whealan	Chief, Benton County Fire District #4
Seth Johnson	Chief, West Benton Fire Rescue
Tera King	Consultant, Northwest Management Inc.
Eric Nelson	Consultant, Northwest Management Inc.
Mark Corrao	Consultant, Northwest Management Inc.

The planning committee met with residents of the county during the community risk assessments and at public meetings. Additionally, the press releases encouraged interested citizens to contact their county Emergency Management coordinator or attend planning committee meetings to ensure that all issues, potential solutions, and ongoing efforts were thoroughly discussed and considered by the committee. When the public meetings were held, several of the committee members were in attendance and shared their support and experiences with the planning process and their interpretations of the results.

The planning philosophy employed in this project included open and free sharing of information with interested parties. Information from federal and state agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between cooperators.

Description of the Planning Process

The Benton County Hazard Mitigation Plan was developed through a collaborative process involving all of the organizations and agencies listed above. The planning effort began by organizing and convening a multijurisdictional planning committee. Following the first meeting in October of 2017 the committee identified other individuals/agencies that should be invited. The planning committee consists of any and all individuals who participated in planning committee meetings. The planning process included seven distinct phases:

1. **Organization of Resources** — Benton County Emergency Management and NMI worked together to develop a comprehensive list of potential participants as well as a project timeline and work plan. The 2017-19 planning committee served as the basis for identifying stakeholders; however, that list was expanded in order to provide a comprehensive review and update of the risk assessments and mitigation strategies during the update process.
2. **Collection of Data** — NMI coordinated with the planning team to gather any new data and information about the extent and periodicity of hazards in Benton County to ensure a robust dataset for making inferences about hazards.
3. **Field Observations and Estimations** — Members of the planning team and NMI conducted field tours to help train and validate risk analyses. The planning team and NMI developed risk models and identified problem areas in order to better understand risks, juxtaposition of structures and infrastructure to risk areas, access, and potential mitigation projects. Many of the analyses used in the previous plan were reviewed and updated to incorporate new hazard vulnerabilities or changes in development. Additionally, several new risk models and analyses were included in the 2018 update process to better represent actual conditions in Benton County.
4. **Mapping** — NMI developed a comprehensive database and map files relevant to pre-disaster mitigation control and mitigation, structures, resource values, infrastructure, risk assessments, and other related data. All of the maps and databases were updated as part of the 2017-18 plan update.
5. **Public Involvement** — Benton County Emergency Management and NMI developed a plan to involve the public from the formation of the planning committee. Using news releases, public meetings, public review of the draft documents, and acknowledgement of the final updated plan by the signatory representatives.
6. **Strategies and Prioritization** — NMI and the planning team representatives worked together to review the risk analyses and develop realistic mitigation strategies. The Benton County Emergency Manager met with representatives from each jurisdiction individually to identify informational needs for the plan and develop a strategy for continued involvement in the planning process.

7. **Drafting of the Report**—NMI drafted a final update report and worked with members of the planning team to review each section, incorporate public comments, proceed with the state and federal review processes, and adopt the final document.

Multi-Jurisdictional Participation

CFR requirement §201.6(a)(4) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans that impact multiple jurisdictions. To be included as an adopting jurisdiction in the Benton County Multi-Hazard Mitigation Plan jurisdictions were required to participate in at least one planning committee meeting or meet with planning team leadership individually, provide a goals statement, submit at least one mitigation strategy, and adopt the final Plan by resolution.

The following is a list of jurisdictions that have met the requirements for an adopting jurisdiction and are thereby included in the Natural Hazard Mitigation Plan:

- Benton County
- Benton City
- City of Kennewick
- City of Prosser
- City of Richland
- City of West Richland

The monthly planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in a combination of the following ways:

- Planning committee leadership attended local government meetings where planning updates were provided, and information was exchanged. Additionally, representatives on the planning committee periodically attended city council meetings to provide municipality leadership with updates on the project and to request reviews of draft material. All of the adopting jurisdictions maintained active participation in the monthly planning committee meetings.
- One-on-one correspondence and discussions between the planning committee leadership and the representatives of the municipalities and special districts was facilitated as needed to ensure understanding of the process, collect data and other information, and develop specific mitigation strategies.
- Public meetings were hosted by the communities of Kennewick, Richland, and Prosser. Each meeting involved representatives of BCEM, NMI, as well as Fire and Rescue personnel.
- Written correspondence was provided at least monthly between the planning committee leadership and the contractor to provide updates to the cooperators on the document's progress, making requests for information, and facilitating feedback from participating jurisdictions. Benton County Emergency Management representatives used an email distribution list of all the stakeholders to announce meetings, distribute meeting minutes, provide draft sections for review, and request information. All of the participating jurisdictions provided comments to the draft document during the data gathering phase as well as during the various committee and public review processes.

Planning Committee Meetings

Benton County Emergency Management solicited participation from each jurisdiction and State and Federal Agencies throughout the county as well as local hazard experts. With the full integration of the Community Wildfire Protection Plan and the Hazard Mitigation Plan processes, local fire districts were also asked to participate in the committee meetings (see *Meeting Sign-in Sheets* section in Appendix C). Throughout the meetings, the committee reviewed the updated plan, aided in the risk and vulnerability analysis, developed public outreach efforts, and determined the best mitigation strategies for each jurisdiction. The planning kickoff meeting was held in October of 2017 with periodic meetings through July 2018 and a final review meeting on January 30th, 2019.

Public Involvement

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases, this led to members of the public providing information and seeking an active role in protecting their communities, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning.

Under the auspices of the Benton County Emergency Management, periodic press releases were submitted to local papers and radio stations and posted on the BCEM websites Facebook page. Additional press releases provided information regarding the public meetings and public comment period including how to find electronic versions of the draft on the BCES Facebook page for review and instructions on how to submit comments through the BCES webpage. A record of published articles regarding the Hazard Mitigation Plan is included in the Appendices.

Public Meetings

Public meetings were held on April 25th, 2018 in Richland and Kennewick and on April 26th, 2018 in Prosser. Committee member leadership presented a PowerPoint overview of the purpose of the plan, risk assessments for each hazard, and mitigation activities that may benefit Benton County. There were map displays to help facilitate open discussion. In total there were at least 2 committee members at each meeting and a total of 4 public participants. See Appendix D for documentation of public meetings.

Documented Review Process

Review and comment on this Plan have been provided through a number of avenues for the committee members as well as for members of the general public. A record of the document's review process has been established through email correspondence, press releases, published articles, meeting minutes, and meeting sign-in sheets.

During regularly scheduled committee meetings in 2017-18, the committee members met to discuss findings, review mapping analysis, and provide written comments on draft sections of the document. During the public meetings attendees observed map analyses, discussed general findings from the risk assessments, and made recommendations on potential project areas.

Sections of the draft Plan were delivered to the planning committee members during the regularly scheduled committee meetings. The completed first draft of the document was presented to the committee in June for full committee review. The committee spent several weeks proofreading and editing sections of draft. Many jurisdictions met individually to review and revise their specific risk assessment and mitigation strategy including the prioritization of action items. Once the committee's review was completed, the draft document was released for public review and comment. The public review period remained open from February 11, 2019 to February 22, 2019.

Plan Maintenance

Evaluating and Updating the Plan

The Benton County Hazard Mitigation Plan will be reviewed on an annual basis by the planning team to determine the effectiveness of mitigation programs, projects, or other related activities, and to reflect changes in land development or programs that may affect mitigation priorities and/or strategies. The plan will be updated every five years. These five-year updates will be delivered to the Washington State Hazard Mitigation Program Manager for review and forwarding to the Federal Emergency Management Agency, Region X Office.

Annual Plan Review

To facilitate the annual plan review process, the Benton County Hazard Mitigation Planning Committee will remain a semi-active group following the formal adoption of this plan and shall be charged with the responsibility of conducting an annual plan review. The Director of the Benton County Emergency Management or his/her designee will be responsible for contacting the chairperson and members of the Benton County Hazard Mitigation Planning Committee and organizing the annual plan review process.

The Benton County Hazard Mitigation Planning Committee will review the current hazard mitigation strategies to determine their relevance to changing situations within Benton County, integrate known changes in State or Federal policy, and ensure mitigation strategies are addressing current and expected conditions.

Following the annual plan review process, the Chairperson of the Benton County Hazard Mitigation Planning Committee, in cooperation with Benton County Emergency Management, will prepare a written report describing: 1) the plan review process; 2) the status of any current mitigation activities or projects; and 3) any deficiencies identified as a result of the plan evaluation. Copies of this report shall be mailed to the governing body of each of the participating jurisdictions each calendar year. Additionally, a copy of this report will be mailed to the Washington State Hazard Mitigation Program Manager each calendar year.

Five-Year Plan Update

Updates to the Benton County Hazard Mitigation Plan shall be conducted on a five-year cycle and shall commence at the direction of the Director of Benton County Emergency Management. Upon such direction, staff from Benton County Emergency Management, in cooperation with the chairperson of the Benton County Hazard Mitigation Planning Committee, will begin the process of updating the plan. It

is advised that during the third annual update the committee should begin the FEMA grant process for updating the plan with the following year (fourth year) used to update the plan. The governing body of each of the participating jurisdictions shall approve the updated plan and a copy of the updated plan shall be submitted to the Washington State Hazard Mitigation Program Manager.

Continued Public Involvement

All participating entities are dedicated to the continued involvement of the public in the hazard mitigation process. The plan will be available on the BCES website with the understanding that questions or comments can be directed to staff at any time. Any formal meetings to discuss the plan will be "advertised" on our website so the public can attend if they wish.

Copies of the Benton County Hazard Mitigation Plan will be kept and made available for public review at the following locations:

- Benton County Emergency Management
- Benton County Emergency Services Website (www.bces.wa.gov)
- Benton County Building Department
- Richland Public Library
- Mid-Columbia Library (Kennewick and West Richland)

Benton County Emergency Management shall be responsible for receiving, tracking, and filing public comments regarding the Benton County Hazard Mitigation Plan. Contact information for Benton County Emergency Management is listed below. A public meeting will be held as a part of the review process as well as the final five-year plan update. Additional meetings may also be held as deemed necessary by the Chairperson of the Benton County Hazard Mitigation Planning Committee. The purpose of these meetings is to provide a public forum so that citizens can express concerns, opinions, or ideas about the Benton County Hazard Mitigation Plan. The Benton County Hazard Mitigation Planning Committee will continue to meet at least annually and be made up of representatives from the participating jurisdictions as well as entities, departments, and agencies involved or impacted by hazard events in Benton County.

Benton County Emergency Management: (509) 628-2600

Chapter 3: Hazard Profiles

Floods

Flooding typically occurs when climate (or weather patterns), geology, and hydrology combine to create conditions where water flows outside of its usual channel onto surrounding lands. In Benton County, geography and climate combine to create chronic seasonal flooding conditions, typically in the winter and spring. In addition to meteorological-related flooding, failure of man-made structures, such as dams and irrigation canals, can also present flood hazards.

Flooding in Benton County typically occurs along the Yakima River. Although flooding has occurred in the past along the Columbia River, a system of dams, including the McNary Dam located along the southern edge of Benton County, now protect most of the developed areas along the Columbia River in Benton County. However, there was flooding and damage that occurred along the Columbia River, in park areas, in May of 2018 due to spring run-off and dams upriver releasing water. In the event of a heavy rain event or rapid snow melt, flash flooding can occur in canyons and gullies. Zintel Canyon, located in Kennewick, presented a flash flood risk to nearby communities until the Zintel Canyon Dam was constructed to mitigate flash flood hazards in December of 1992.

Winter floods are historically the largest in magnitude, although their duration is typically less than one week. The total volume of runoff from winter floods is less than those of spring floods. Spring flooding is usually caused by snowmelt during periods of warm weather and/or rain. Although the magnitude of spring floods is usually less than winter floods, spring flooding can last up to four weeks. The total volumes of runoff experienced during spring floods can be significant.

Two types of flooding primarily affect Benton County: riverine flooding and urban flooding (see descriptions below). In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's (ditch or sewer) capability to remove it.

Definitions

Riverine Flooding: Riverine flooding is over-the-bank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low-velocity sheet flows of water.

Urban Flooding: As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds to the ground and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with

violent force. Benton County's incorporated towns and cities have a relatively high concentration of impermeable surfaces that either collect water or concentrate the flow of water in man-made channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional localized flooding.

Floodplain: A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess floodwater. The floodplain is made up of two sections: the floodway and the flood fringe.

Floodway: The floodway is one of two main sections that make up the floodplain. Floodways are defined for regulatory purposes. Unlike floodplains, floodways do not reflect a recognizable geologic feature. For NFIP purposes, floodways are defined as the channel of a river or stream, and the overbank areas adjacent to the channel. The floodway carries the bulk of the floodwater downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties. The NFIP floodway definition is "the channel of a river or other watercourse and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot." Floodways are not mapped for all rivers and streams but are generally mapped in developed areas.

Flood Fringe: The flood fringe refers to the outer portions of the floodplain, beginning at the edge of the floodway and continuing outward. This is the area where development is most likely to occur, and where precautions to protect life and property need to be taken.

Development: For floodplain ordinance purposes, development is broadly defined to mean "any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations located within the area of special flood hazard." The definition of development for floodplain purposes is generally broader and includes more activities than the definition of development used in other sections of local land use ordinances.

100-Year Flood: The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood.

Base Flood Elevation (BFE): The term "Base Flood Elevation" refers to the elevation (normally measured in feet above sea level) that the base flood is expected to reach. Base flood elevations can be set at levels other than the 100-year flood. Some communities choose to use higher frequency flood events as their base flood elevation for certain activities, while using lower frequency events for others. For example, for the purpose of storm water management, a 25-year flood event might serve as the base flood elevation, while the 500-year flood event may serve as base flood elevation for the tie down of mobile homes. The regulations of the NFIP focus on development in the 100-year floodplain.

Dam Failure Flooding: Loss of life and damage to structures, roads, utilities and crops may result from a dam failure. Economic losses can also result from a lowered tax base and lack of utility profits. These effects would certainly accompany the failure of one of the major dams affecting the Columbia, Snake, or Yakima rivers. Because dam failure can have severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with municipal officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

Background Information

Some of the following information was excerpted or derived from the Benton County Comprehensive Flood Hazard Management Plan (CFHMP) draft from 2001.

Effect of Development on Floods

When structures or fill are placed in the floodway or floodplain, water is displaced. Development raises the river levels by forcing the river to compensate for the space obstructed by the inserted structures and/or fill. When structures or materials are added to the floodway or floodplain and no fill is removed to compensate, serious problems can arise. Floodwaters may be forced away from historic floodplain areas. As a result, other existing floodplain areas may experience floodwaters that rise above historic levels.

Local governments must require engineer certification to ensure that proposed developments will not adversely affect the flood carrying capacity of the Special Flood Hazard Area (SFHA). Displacement of only a few inches of water can mean the difference between no structural damage occurring in a given flood event, and the inundation of many homes, businesses, and other facilities. Careful attention should be given to development that occurs within the floodway to ensure that structures are prepared to withstand base flood events. In highly urbanized areas, increased paving can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively.

Sediment Transport and Deposition

Sediment deposited in the river channel can promote channel migration and reduce the channel's conveyance capacity for high flows. Large quantities of sediment can be moved over short periods during flood events. Sediment deposition occurs where the river becomes flatter or wider, reducing the energy of its flow and thus its sediment transport capacity, its ability to carry sediment downstream. Sediment transport increases and deposition decreases near channel constrictions or areas where flow velocity increases.

Effects of Levees

Levees attempt to keep floodwaters within a designated channel by confining them instead of allowing them to spill over into the floodplain. Levees provide a certain level of protection to floodplain residents; however, they can raise floodwater elevations upstream by creating a backwater effect,

increase flow velocities, reduce side channel fish habitat, increase channel migration, and negate the effects of floodplain storage, leading to greater flood magnitudes downstream.

All levees and berms provide some level of flood protection. Many only protect during low-level, high-frequency floods, such as 1 to 10-year events. Small levees typically fail during significant flood events. In spite of their shortcomings during major floods, many farmers and businesses construct levees to prevent small frequent floods from causing damage by killing crops, eroding banks, and depositing unwanted silt.

The West Richland Levee, located along the inside of a meander curve on the Yakima River, is the only true levee in Benton County. It is operated and maintained by the Benton County Diking District No. 1².

Identification of Flood-Prone Areas

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The NFIP was established in 1968 as a means of providing low-cost flood insurance to the nation's flood-prone communities. The NFIP also reduces flood losses through regulations that focus on building codes and "sound floodplain management". NFIP regulations (44 Code of Federal Regulations [CFR] Chapter 1, Section 60.3) require that all new construction in floodplains must be elevated at or above base flood level. The Washington Building Code requires new construction to be elevated to one foot above the base flood elevation. Communities participating in the NFIP may adopt regulations that are more stringent than those contained in 44 CFR 60.3, but not less stringent.

Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS)

Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements. A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA, which delineates SFHA in communities where NFIP regulations apply. FIRMs are also used by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply.

Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level. In some cases, they also include base flood elevations (BFEs) and areas located within the 500-year floodplain.

Flood Insurance Studies and FIRMs produced for the NFIP provide assessments of the probability of flooding at a given location. FEMA conducted many Flood Insurance Studies in the late 1970s and early 1980s. These studies and maps represent flood risk at the point in time when FEMA completed the

² U.S. Army Corps of Engineers. *Levee System Summary: West Richland-Yakima River Right Bank*, U.S. Army Corps of Engineers. , 2017, <https://www.calvin.edu/library/knightcite/index.php>. Accessed 30 May 2018.

studies. However, it is important to note that not all 100-year or 500-year floodplains have been mapped by FEMA.

FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies and does not incorporate planning for floodplain changes due to new development since the studies were completed. Although FEMA is considering changing that policy, it is optional for local communities. Since the FEMA flood maps were completed for Benton County, man-made and natural changes to the environment have changed the course of many of the rivers and watercourses, as well as their associated floodplain boundaries.

Historical Flood Events

Yakima River Floods: Historically, the most damaging floods in Benton County have been associated with the Yakima River. Benton County is the downstream end-point for the Yakima River drainage, which contains 6,155 sq. miles, or four million acres. The areas along the lower Yakima in Benton County that are particularly susceptible to frequent flooding extend from Benton City downstream through West Richland to the delta where the Yakima empties into the Columbia River. This area is characterized by low lying river bottom lands and ancient river channels which are historically the river's natural floodway and floodplain (Benton County Comprehensive Plan). Since 1970, Benton County has been included within the area of five nationally declared flood disasters, all associated with the Yakima River.

Representative Yakima River flood events are described below (excerpted from the 2001 draft Benton County Comprehensive Flood Hazard Management Plan (CFHMP)³. Additional detail is available in the draft CFHMP.

February 21, 2017 Flood: Above-freezing temperatures initiated snow-melt and heavy rain caused rapid melting and increased runoff across Benton County. Numerous county roads had washouts, erosion, slides and undermining⁴.

May 18, 2011 Flood (Crest: 15.5 ft): The Yakima River at Kiona crested at 15.5 feet on May 18th, which was 2.5 feet above flood stage. The flooding damaged several businesses in Prosser and farmland, roads, businesses, and residential areas from Prosser to Richland, including the Beach RV Park in Benton City and the West Richland Golf Course⁵.

³ Benton County Comprehensive Flood Hazard Management Plan (CFHMP), March 2001. Prepared for Benton County by Tetra Tech/KCM Inc. Note – the CFHMP has not been adopted by Benton County, and therefore is referred to herein as the draft CFHMP. The draft CFHMP provides an excellent source of information on Benton County flood issues, however, it does not represent County policy.

⁴ National Oceanic Atmospheric Administration: Storm Events Database. Accessed May 30, 2017. <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=683393>

⁵ National Oceanic Atmospheric Administration: Storm Events Database. Accessed May 30, 2017. <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=312828>

January 8, 2009 Flood⁶: Heavy rainfall on deep snowpack resulted in excessive runoff and moderate flooding on the Yakima River from Easton, WA to the Columbia River. The Kiona river gage rose to 2.55 feet above flood stage.

February 11, 1996 Flood (Crest: 20.98 ft): The Feb. 11, 1996 flood is the fourth largest flood on record, it was a winter flood caused by warm weather and rainfall on top of a significant snowpack. The flood affected most of the Yakima River basin. In Benton County, Benton City, West Richland, and Richland were affected the most. Parts of Benton City were evacuated. In West Richland, two of three routes leading to Hanford and the Tri-Cities were cut off (the east approach to the Van Giesen Street Bridge and the south span of the Old Twin Bridges were inundated). Total damages were estimated at \$11,363,448 (damages from the City of West Richland not included). Note: The crest of this flood may have been 3-6 inches higher than what is listed.

December 2, 1995 Flood (Crest: 15.88 ft): This flood was a winter flood caused by unusually warm temperatures and rainfall. Benton City, West Richland, and Richland received the brunt of the flood impacts in Benton County. Trailers were moved to higher ground from the Beach Trailer Park in Benton City. West Richland evacuated residents in the Twin Bridges area and from a neighborhood northwest of the golf course, which flooded. Lowland areas surrounding Richland reported severe damage, with several houses surrounded by water. Several roads were closed, and both the Twin Bridges and Pederson Road outside of West Richland sustained damage.

November 27, 1990 Flood (Crest: 14.36 ft): This was a relatively minor winter flood also caused by high temperatures and rainfall occurring upstream. Losses were fairly minor, although approximately 40 residents within the floodplain around Benton City and West Richland were evacuated.

January 18, 1974 Flood (Crest: 18.65 ft): The January 1974 flood is the fifth largest flood on record, caused by a combination of warm weather, rainfall, and ice jams. Flood damage was extensive, and affected Prosser, Benton City, West Richland, and Richland. It was reported that 145 homes countywide had standing water at depths of 2 to 10 feet. A County Commissioner estimated total damages to roads and bridges as exceeding \$175,000. Many roads were closed, including SR 22 and SR 221 between Patterson and Prosser, SR 224 from Kiona to the SR 240 junction in Richland, Horn Road between Benton City and Hanford, SR 24, and others.

December 23, 1933 Flood (Crest: 21.57 ft): The December 23, 1933 flood is the largest Yakima River flood on record. Although a winter flood caused by warm weather and heavy rains, the flood was of unusually long duration. The Yakima River had a rate of rise of six feet per day and remained out of bank for a total of 12 days. Low-lying areas around Benton City were the hardest hit, with the river near SR 224 reportedly one to two miles wide. Residents were evacuated by boat. Richland was cut off by the

⁶ National Oceanic Atmospheric Administration: Storm Events Database. Accessed June 5, 2018, <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=141623>

flood except for long-distance detours, as the flood closed the SR 224 bridge and the Twin Bridges (then known as Grosscup Road). Newspaper accounts report damage to dikes, irrigation structure, highways, and loss of numerous livestock and outbuildings. The County Commissioners estimated damage to county roads at \$6,300 (1933 dollars). The damage estimate did not include replacement costs for the Twin Bridges, which was washed out entirely. As a result of this flood, an extensive system of levees and flood control structures was implemented in Yakima County by the federal government, greatly reducing the threat of future floods of such magnitude for Benton County.

Columbia River Floods: Flooding has occurred in the past along the Columbia River. A flood in May 1948 inundated much of Kennewick as well as transportation routes along the river. Property damage in Benton and Franklin counties totaled \$702,000 – a significant amount for the time. The most recent high-water event on the Columbia crested on June 12, 1997 at a peak flow of around 447,000 cfs outflow recorded at Priest Rapids Dam. On May 14, 2018 flow on the Columbia River reached approximately 413,000 cfs as a result of a release of water from Priest Rapids Dam. The event caused some damage to parks in Richland and Kennewick. However, these events are infrequent as Benton County, particularly the Cities of Richland and Kennewick, is now protected by dam systems along the Columbia River, including the McNary Dam.

Other County Floods: In January 1997, several small streams tributary to the Columbia River in the southern half of Benton County flooded. The flooding was caused by heavy rainfall in the lowlands that melted accumulated snow. County roads were washed out, reportedly due to inadequate sizing of roadside ditches and culverts, as well as debris and sediment blocking many structures. Total damage was estimated at \$359,660 (draft CFHMP).



Wildfire

Definitions

Structure Fire: A fire of accidental or human-caused origin that results in the uncontrolled destruction of homes, businesses, and other structures in populated, urban or suburban areas.

Wildland Fire: A fire of exposure or human-caused origin that results in the uncontrolled destruction of forests, field crops and grasslands.

Wildland-Urban Interface: A fire of natural or human-caused origin that occurs in or near forest or grassland areas where isolated homes, subdivisions, and small communities are also located.

Wildland Fire Characteristics

In general, wildland fire behavior describes how fire reacts to available fuels, local topography, and current weather conditions. The relationships between these three components are dynamic; changing one condition can often exacerbate the affects that the other conditions have on fire behavior. As such, fire behavior is often modeled as a triangle with fuels, topography, and weather serving as the three sides (Figure 1). Understanding the relationships between the fire behavior components has important implications for not only managing an active wildfire but also mitigating wildfire risk. Since fuel is the only component that can be managed directly, management decisions regarding fuel types and fuel loading across the landscape need to be made based on characteristics that are inherent of the region; climate and topography. Strategic fuel breaks, conservation and restoration of native species, and prescribed burns are examples of management activities that can reduce wildfire risk and simplify the process of assessing potential wildfire behavior.

A brief description of each of the fire behavior elements follows in order to illustrate their effect on fire behavior.

Weather

Fire behavior is largely influenced by weather conditions. Wind, moisture levels, temperature, and relative humidity are all factors that determine the rates and which fuels dry and vegetation cures. The ignition potential of fuels is also determined by these factors; weather patterns and trends can be analyzed to determine how likely or easily a certain fuel type will ignite and if a fire will be sustained. Once started, the behavior of a wildfire is further determined by atmospheric stability and local and regional weather. As temperature, wind speed, wind direction, precipitation, storm systems, and prevailing winds all influence fire behavior, weather is the most difficult component of the fire triangle to predict and interpret. As observed in the Yarnell Hill fire in Arizona that killed 19 firefighters, a storm

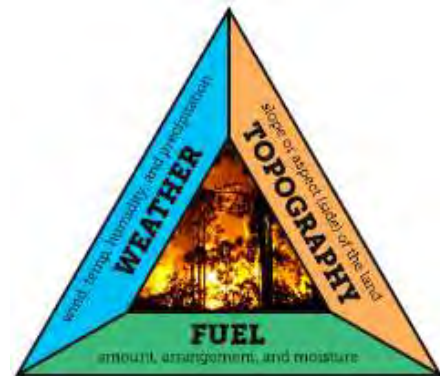


Figure 1) Fire Behavior Triangle
(learn.weatherstem.com)

cell can cause a flaming front to change direction abruptly, 90 degrees in the case of the Yarnell Hill fire, and rapidly accelerate up to speeds of 10 to 15 mph.

Topography

Fires burning in similar fuel types will burn differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influences vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. In General, north slopes tend to be cooler, wetter, more productive sites. This typically results in heavy fuel accumulations, high fuel moistures, lower rates of curing for fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun and therefore have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. The combination of light fuels and dry sites leads to fires that typically display the highest rates of spread. These slopes also tend to be on the windward side of mountains which means they tend to be “available to burn” for a greater portion of the year. Slope also plays a significant role in the rate of spread of a fire as fuels upslope from the flaming front are subjected to preheating which means that they readily combust as the fire draws closer. The preheating process is exacerbated as slope increases which results in greater rates of spread and increased flame lengths. Therefore, steep slopes with a south –southwest aspect generally promote intense fire behavior due to dry fuels and the likelihood of predominant, westerly winds.⁷

Fuels

In the context of wildfire, fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest-floor litter, conifer needles, and buildings are all examples of fuel types. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content, and continuity and arrangement all have an effect on fire behavior. In general, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. Fine fuels, those with high surface to volume ratios, are considered the primary carriers of surface fire. As fuel size increases, the rate of spread tends to decrease due to a decrease in the surface to volume ratio. Fires in large fuels generally burn at a slower rate but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control.⁸

Fuels are classified by diameter as that has important implications for fuel moisture retention. The smaller the diameter, the more quickly the moisture content of a given fuel type changes while larger diameter fuels take longer to change. In terms of fire potential on the landscape and fire suppression, the amount of time that is required for a fuel type to become volatile is critical which is why instead of referring to fuels by size, they are referred to as either one hour, ten-hour, 100 hour, or 1000 hour fuels.

⁷ Auburn University website https://fp.auburn.edu/fire/topos_effect.htm. Accessed December 2016

⁸ Gorte, R. 2009. Congressional Research Service, Wildfire Fuels and Fuel Reduction.

This method of classifying fuels describes the amount of time required for a particular fuel's status to change from non-combustible to combustible as a result of altered moisture levels in the surrounding environment.

Wildfire Hazards

In the 1930s, wildfires consumed an average of 40 to 50 million acres per year in the contiguous United States, according to US Forest Service estimates. By the 1970s, the average acreage burned had been reduced to about 5 million acres per year. Accounting for the substantial reduction in burned acreage was an increase in fire suppression efforts and development of firefighting equipment and strategy. Since 1970, about 3.5 million acres burn annually in the western U.S. The 2014 wildfire season set a new record for 31 days at Preparedness Level (PL) 5 and had one of the largest wildfires in Washington History, the Carlton Complex at 256,108 acres. There was a total of 425,136 acres consumed in the state of Washington.

The potential volatility of a fire season can be predicted from winter snowfall, snowpack longevity, spring temperatures, and total precipitation. When winter snowfall is limited and snowpack melts early due to warm spring temperatures, conditions begin to favor fire activity as fine fuels dry out and spring storms generate lightning and high winds. Additionally, human activity increases in natural areas and recreation areas in warm weather months; typically, April through October in the Columbia River Basin. This increases the likelihood of a human-caused ignition, particularly in natural areas where fuels are abundant, that could result in a wildfire, threatening both populated areas and natural resources.

Fire History

Historically, most plant communities in the state of Washington were fire-adapted and burned at fairly regular intervals. Frequent, low intensity fires limited fuel accumulation across the landscape and contributed to the distribution of native, fire-adapted plant communities. In contrast to modern day conditions, fire return intervals (the amount of time between fires in a defined area) were shorter but fires burned with less intensity. Shorter return intervals between fire events often resulted in less dramatic changes in plant species composition. Across the landscape, fires typically burned 1 to 50 years apart in a given area with most fire returning between 5 and 20 years. With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation communities different in composition, structure, and age. Native plant communities in this region developed under the influence of fire. These adaptations to fire are evident at the species, community, and ecosystem levels.

Fire history for Benton County is largely unknown, but large fires that have occurred since the 1980's are well document and have been mapped. Local knowledge suggests that Native Americans did historically perform burns which played an important role in shaping the vegetation throughout the county. The Bureau of Land Management is helping to fund future research to further map fire history in central Washington through fire scars and charcoal deposits. Although this data is not available for the development of this document, it should be available for a future update of this plan.

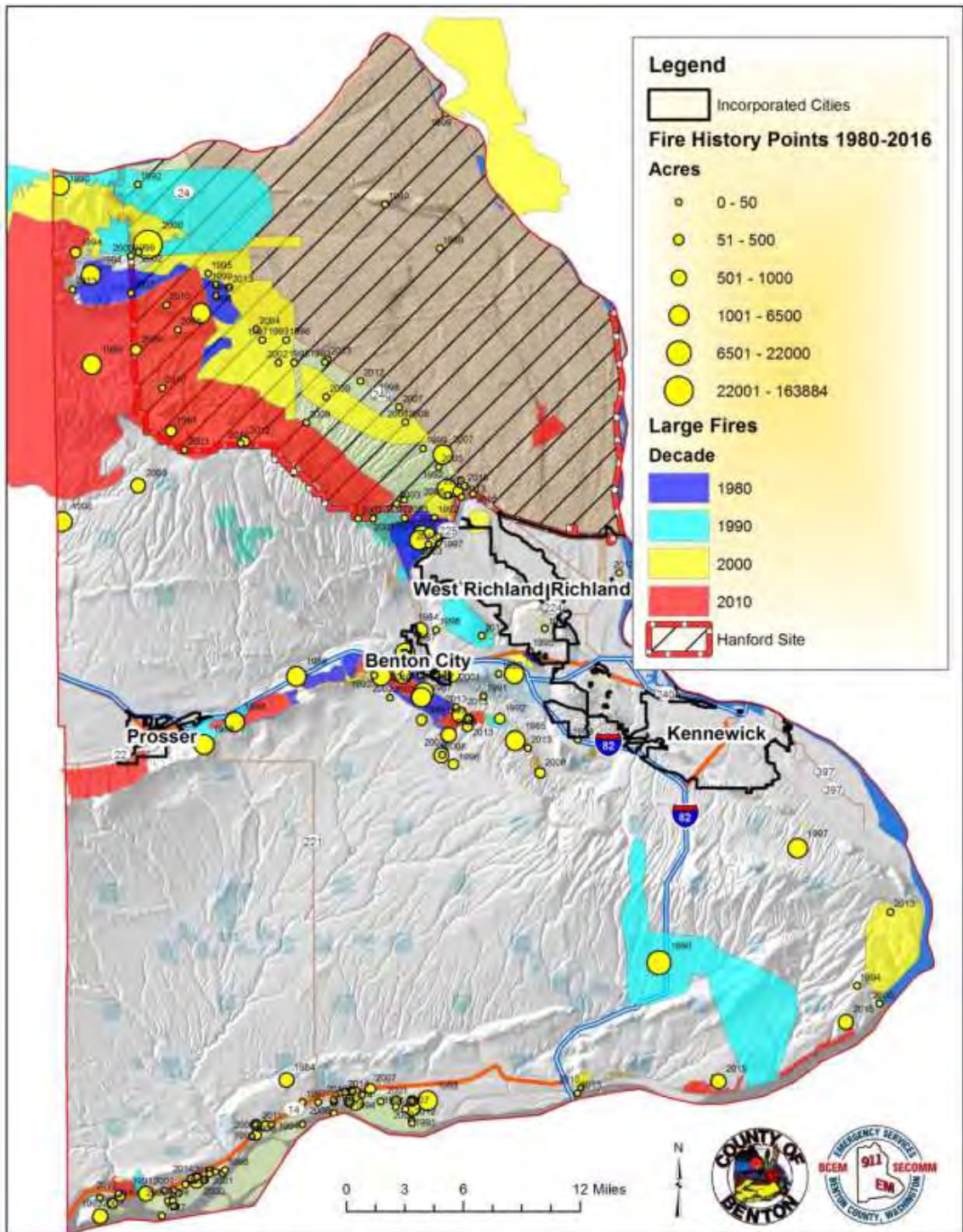


Figure 2) Fires by decade and acreage for Benton County, WA.

Since 1980, fire activity has largely been concentrated in the northern third of Benton County as well as the slopes of the Horse Heaven Hills along the south side of I-82 and in the Badger Mountain area. Numerous small fires have also occurred along at the southern end of the county along the Columbia River (Figure 2). Looking at Figure 2, it appears that most of wildfires that have occurred in Benton County were in proximity to road systems or recreational areas which would support that most fires were human-caused. Ignition causes are displayed in Figure 3 in the Wildfire Ignition Profile section. Historical fires at least 1000 acres in size that have occurred in Benton County since 1980 are summarized in Table 3. Benton County has had six wildfires between 10,000-99,000 acres and two that were 100,000 acres or larger. The 24 Command fire that occurred in 2000 was the largest wildfire in Benton County since 1980. It burned upwards of 192,000 acres and came within two miles of the radioactive waste storage tanks located at the Hanford Site. Most recently was the Bofer Fire that started on August 8th, 2018. It started along the highway and destroyed five homes and damaged four others.

Table 3) History of wildfires 300 acres in size or larger for Benton County, WA since 1981. Acres denoted with an asterisk (*) were taken from wildfire GIS layers.

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Horse Heaven Hills	1981	Unknown	5,440		BLM
SR395 (HWY14/27 th)	6/26/1981	Unknown	600	BC#1	Tri City Herald
Rancho Reata	6/27/1981	Unknown	900	BC#1	Tri City Herald
Silver Dollar	7/1/1981	Unknown	25,600	HFD	Tri City Herald
Candy Mountain #1	7/25/1981	Unknown	3000	BC#4	Tri City Herald
Keene (Hwy 12)	7/28/1981	Human	700	BC#4	Tri City Herald
Coyote Canyon (Clodfelter)	8/4/1981	Welder / Grinder	500	BC#1	Tri City Herald
1981 -TOTAL ACRES			36,740		
Yakima Ridge	1982	Unknown	26,880		
1982 -TOTAL ACRES			26,880		
Meals (Yellepit)	7/9/1985	Unknown	2,000	BC#1	Tri City Herald
Badger Canyon	7/21/1985	Unknown	3,000	BC#1	Tri City Herald
1985 -TOTAL ACRES			5,000		
Chandler	1986	Natural	1,207	BC#2 (?)	BLM
Jump Off Joe	8/24/1986	Unknown	500	BC#1	Tri City Herald
Goose Gap (182)	9/4/1986	Controlled Burn	500	BC#1	Tri City Herald
1986 -TOTAL ACRES			2,207		
Drilling	1987	Human	3,190		
Benton	1987	Human	2,070		BLM

Trinity & Horne	9/3/1987	Unknown	2,150	BC#2	Tri City Herald
Nine Mile (Lower Blair)	9/1/1987	Human	900	BC#1	Tri City Herald
1987 -TOTAL ACRES			8,310		
Gibbon	1988	Human	1,320		BLM
Candy Mountain	7/1/1988	Exhaust Sparks	650	BC#4	Tri City Herald
1988 -TOTAL ACRES			1970		
Ely (53 rd)	8/19/1989	Lightning	300	KFD	Tri City Herald
1989 -TOTAL ACRES			300		
Locust Grove (I-82)	7/30/1990	Lightning	30,000	BC#1	Tri City Herald
Emerson	1990	Natural	3,700		BLM
Nake	1990	Human	1,345		BLM
Wilkerson Ranch	8/1/1990	Unknown	3,500	BC#1	Tri City Herald
1990 -TOTAL ACRES			38,545		
Coline	1991	Human	767*		
1991 -TOTAL ACRES			767*		
Webber 2	1992	Unknown	323*		
Edwards (Locust)	6/26/1992	Exhaust Pipe	1,200	BC#1	Tri City Herald
Jump Off Joe	7/4/1992	Fireworks		BC#1	
Flat Top	7/19/1992	Controlled Burn (?)	400	BC#4	Tri City Herald
1992 -TOTAL ACRES			1,600		
McNary Dam	6/7/1993	Unknown	400	BC#1/BC#6	Tri City Herald
Ely (53 rd ; Inspiration Point)	7/11/1993	Unknown	2,000	KFD	Tri City Herald
Candy Mountain	7/21/1993	Unknown	300	BC#4	Tri City Herald
Red Mountain (Ruppert)	11/3/1993	Unknown	2,000	BC#4	Tri City Herald
1993 -TOTAL ACRES			4,700		
Cold Creek (Silver Dollar)	7/22/1994	Unknown	11,520	HFD	Tri City Herald
Johnson Butte (Bateman)	7/28/1994	Unknown	1,500	BC#1	Tri City Herald
Badger Canyon (Triple Vista, Clodfelter)	8/15/1994	Unknown	2,000	BC#1	Tri City Herald
1994 -TOTAL ACRES			15,020		
North of Plymouth	8/7/1995	Unknown	500	BC#6	Tri City Herald
1995 -TOTAL ACRES			500		
Silver Dollar	1996	Unknown	1,094*		BLM
Appaloosa	1996	Unknown	2,687*	RFD (?)	BLM
Ayers Road	1996	Unknown	7,000	BC#1	Ch. Click

Red Mountain	7/30/1996	Unknown	2,000	BC#4	Tri City Herald
Cold Creek	1996	Unknown	58,000	HFD	Tri City Herald
1996 -TOTAL ACRES			70,781		
Corral Canyon	1997	Unknown	1,313*	BC#2	BLM
Meals (Hover)	7/31/1997	Lightning (?)	750	BC#1	Tri City Herald
Hover (Ayers)	8/14/1997	Equipment (?)	1,500	BC#1	Tri City Herald
Olympia St. Fire (Oly & 73 rd)	8/26/1997	Unknown	6,000	BC#1/KFD	Tri City Herald
1997 -TOTAL ACRES			9,563		
Coyote Canyon (Clodfelter)	1998	Unknown	500	BC#1	Tri City Herald
Prosser View Point (SR 221)	7/7/1998	Human	3,880	BC#3(WBFD) / BC#5	Tri City Herald
I-82 (Yakitat)	7/8/1998	Unknown	2,000	WBFR/BC#2	Tri City Herald
Rattlesnake Mtn. West of Hanford	7/28/1998	Lightning	6,000	HFD	Tri City Herald
1998 -TOTAL ACRES			12,380		
Command 24	2000	Human / Car Accident	192,000	HFD, BC#2, US F&W	BLM
2000 -TOTAL ACRES			192,000		
Rt 4 N/Rt 1	6/1/2001	Lightning	1,250	HFD	State Fire Marshal's Office
Candy Mountain	6/18/2001	Unknown	750	BC#4	State Fire Marshal's Office
Ayers Rd	7/12/2001		4,000	BC#1	State Fire Marshal's Office
2001 -TOTAL ACRES			6,000		
Hwy 24	2002	Human	4,800		BLM
McBee	2002	Unknown	1,771*		BLM
Nine Canyon (Holtziner Farms)	6/12/2002	Debris Burning / Torch	600	BC#1	State Fire Marshal's Office
(Hinzerling N of Prosser (?))	7/13/2002	Lightning	1,200	BC#3 (WBFR)	State Fire Marshal's Office
Johnson Butte	7/16/2002	Unknown	1,200	BC#1	State Fire Marshal's Office
Ayers (Meals)	7/28/2002	Unknown	400	BC#1	State Fire Marshal's Office
2002 -TOTAL ACRES			9,971		
Horn Rapids Fire	2003	Unknown	1,227*		BLM
Shooting Range	2003	Human	1,391		BLM
(12510 E Kennedy Rd)	6/30/2003	Equipment	300	BC#2	State Fire Marshal's Office

(MP 9 SR 225)	7/16/2003	Unknown	1,750	BC#2	State Fire Marshal's Office
(32203 Clodfelter Rd)	10/12/2003	Unknown	3,000	BC#1	State Fire Marshal's Office
2003 -TOTAL ACRES			7,668		
(MP 118 I-82)	7/14/2004	Unknown	700	BC#1	State Fire Marshal's Office
(MP 118 I-82)	8/26/2004	Unknown	700	BC#1	State Fire Marshal's Office
2004 -TOTAL ACRES			1,400		
Lincoln Grade	5/26/2005	Unknown	300	BC#6	State Fire Marshal's Office
Painted Hills (1415 Scenic)	5/26/2005	Incendiary / Model Rocket	1,000	Prosser FD (WBFR)	State Fire Marshal's Office
Hammer Command	6/17/2005	Incendiary / Blasting Agent	1,270	Hanford FD	State Fire Marshal's Office
Kirk (Meals)	7/25/2005	Unknown	3,500	BC#1	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@1400)	Unknown	500	BC#6	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@2000)	Unknown	500	BC#6	State Fire Marshal's Office
MP 86 I-82	8/15/2005	Unknown	600	BC#4	State Fire Marshal's Office
MP 87 I-82	8/19/2005	Equipment	1500	BC#3 (WBFR)	State Fire Marshal's Office
2005 -TOTAL ACRES			9,170		
Les Blair	2007	Unknown	7,038*	BC#1	BLM
Wautoma (SR 241)	8/16/2007	Unknown	67,303*	Hanford FD	BLM
Milepost 17	2007	Unknown	6,453*		BLM
(SR 225)	5/12/2007	Shooting	2,500	BC#2	State Fire Marshal's Office
(Harrington / Twin Bridges / Berto)	6/13/2007	Equipment	400	BC#4	State Fire Marshal's Office
(MP 126 I-82)	6/16/2007	Unknown	3,000	BC#6	State Fire Marshal's Office
(MP 126 I-82)	6/17/2007	Unknown	2,000	BC#6	State Fire Marshal's Office
(MP 88 I-82)	6/25/2007	Unknown	400	Hanford FD	State Fire Marshal's Office
(Hover Rd)	7/2/2007	Unknown	740	BC#1	State Fire Marshal's Office
McBee	7/13/2007	Natural	4,000	BC#2	State Fire Marshal's Office

(Finley Rd/Lower Les Blair)	7/29/2007	Equipment	3,000	BC#1	State Fire Marshal's Office
(Meals/Gamefarm (?))	8/4/2007	Incendiary	300	BC#1	State Fire Marshal's Office
2007 -TOTAL ACRES			97,134		
(I-82 / Beck EB)	6/30/2008	Natural	450	BC#1	State Fire Marshal's Office
(Hammer Training Facility)	8/8/2008	Lightning	549	Hanford FD	State Fire Marshal's Office
(Jump Off Joes Near West Powerlines)	8/15/2008	Unknown	1,200	BC#1	State Fire Marshal's Office
2008 -TOTAL ACRES			2,199		
(38714 W Oie)	6/9/2009	Unknown	2,000	BC#2	State Fire Marshal's Office
(SR 397 / Nine Canyon)	6/29/2009	Equipment	586	BC#1	State Fire Marshal's Office
Dry Creek Complex	8/21/2009	Natural	48,931*	HFD / BC#1 (Multiple)	BLM
2009 -TOTAL ACRES			51,517		
	8/6/2010		1,164	Hanford FD	State Fire Marshal's Office
FFTF	8/18/2010		1,265	Hanford FD	State Fire Marshal's Office
(Lower Blair W of Nine Canyon)	8/21/2010	Natural	542	BC#1	State Fire Marshal's Office
(Jump Off Joe?)	8/21/2010	Natural	1,200	Hanford FD	State Fire Marshal's Office
(Ayers/Meals)	8/26/2010	Equipment	500	BC#1	State Fire Marshal's Office
2010 -TOTAL ACRES			4,671		
(Finley Rd./E. Kirk)	7/20/2011	Other	1300	BC#1	State Fire Marshal's Office
(Finley Rd./Albright)	7/22/2011	Explosives	1300	BC#1	State Fire Marshal's Office
	8/2/2011	Equipment	400	Hanford FD	State Fire Marshal's Office
(Meals/Ayers)	8/6/2011	Equipment	400	BC#1	State Fire Marshal's Office
(Ownes/HWY 397)	8/12/2011	Other	400	BC#1	State Fire Marshal's Office
2011 -TOTAL ACRES			3,800		
(SR 241 MP 24)	7/19/2012	Human	4,515	Hanford FD	BLM
(56205 E. Badger Rd.)	7/19/2012	Natural	400	BC#1	State Fire Marshal's Office

(38507 E. Ridge Crest Dr.)	8/13/2012	Equipment	300	BC#4	State Fire Marshal's Office
(SR 397)	8/17/2012	Other	305	BC#1	State Fire Marshal's Office
(Beck Rd.)	9/16/2012	Other	400	BC#1	State Fire Marshal's Office
2012 -TOTAL ACRES			5,920		
(106207 E 297 PR SE / Clodfelter)	6/11/2013	Other	750	BC#1	State Fire Marshal's Office
	6/17/2013	Natural	500	BC#1 (ST 160 Area)	State Fire Marshal's Office
Kelandren Dr.	8/6/2013	Electrical Distribution	350	BC#3 (WBFR)	State Fire Marshal's Office
Les Blair	8/9/2013	Unknown	11,000	BC#1	State Fire Marshal's Office
2013 -TOTAL ACRES			12,600		
132016 E. Locust Grove Rd.	5/27/2014	Equipment	310	BC#1	State Fire Marshal's Office
26604 Badger Rd.	7/6/2014	Unknown	600	BC#1	State Fire Marshal's Office
(182 EB MP 87)	7/15/2014	Other	2,100	BC#3 (WBFR)	State Fire Marshal's Office
(182 MP 126)	7/23/2014	Unknown	500	BC#1	State Fire Marshal's Office
(ST 62 (?))	8/20/2014	Natural	500	KFD	State Fire Marshal's Office
2014 -TOTAL ACRES			4,010		
Clodfelter	2015	Unknown	485	BC#1	CH Click
(Meals/Ayers)	6/5/2018	Undetermined	485	BC#1 & BC#3 (WBFR)	State Fire Marshal's Office
(143504 Finley / Spaw Canyon)	6/27/2015	Other	2800	BC#1	State Fire Marshal's Office
(SR 397/OLY/I-82)	7/12/2015	Undetermined	350	BC#1	State Fire Marshal's Office
(182 / MP88)	10/10/2015	Other	460	BC#3 (WBFR)	State Fire Marshal's Office
2015 -TOTAL ACRES			4,580		
McBee Command	7/14/2016	Shooting	5,000	BC#2 & WBFR	State Fire Marshal's Office
327255 E SR 397	7/13/2016	Other	400	BC#1	State Fire Marshal's Office
Bennett Rd.	7/30/2016	Other	12,800	WBFR	State Fire Marshal's Office

Range 12	7/30/2016	Shooting	175,491	Multiple	BLM
South Ward Gap	7/31/2016		7,000	WBFR	State Fire Marshal's Office
2016 -TOTAL ACRES			198,691		
Silver Dollar	7/2/2017	Unknown	15,000	HFD (?)	Inciweb
Candy Mountain	9/8/2017	Other	450	BC#4	Fire Marshall
2017 -TOTAL ACRES			15,450		
Rt 4 South	2018	Lightning	2,800	Hanford FD	Hanford FD
Les Blair	6/4/2018	Railroad Maintenance	875	BC#1	BC#1
Easterday	6/22/2018	Power pole malfunction	1,000	BC#1	BC#1
Shooting Range	6/25/2018	Shooting	500	BC#2 / USFWS	BC#2
Montecito Fire (Kelandren)	6/27/2018	Possible Electrical Fire	1,877	WBFR	WBFR
Weber Canyon	7/13/2018	Shooting or fireworks	300	BC#2 & BLM (?)	BC#2
Locust Grove	7/21/2018	Farm Equipment	2,275	BC#1	BC#1
Bofer	8/11/2018	Human	5,000	BC#1 / KFD	BC#1
Wagon Wheel	9/1/2018	Electrical Distribution and Squirrel	4,000	BC#2	BC#2
2018 -TOTAL ACRES			18,627		

Wildfire Ignition Profile

Detailed records of wildfire ignitions and extents from the Washington Department of Natural Resources (DNR) and Bureau of Land Management (BLM) have been analyzed. In interpreting these data, it is important to keep in mind that the information represents only the lands protected by the agency specified and may not include all fires in areas covered only by local fire departments or other agencies. Because the data that was used was only a subset and did not contain all ignitions from 1983 to 2016, it seemed reasonable to assume that the ratio of ignition causes could be a fair representation of average annual fire activity in Benton County.

From 1983 to 2016, almost 7,700 acres burned per year in Benton County (Table 4). The majority of fires that occurred were related to human activity, 83% of total ignitions per year on average, while others originated naturally, or the source of ignition was unknown (Figure 3). The greatest number of acres burned in a single year in Benton County occurred during the 2000 fire season with just over 164,000 acres burned.

Table 4) Number and type of ignitions and acreage burned by wildfire from 1983 to 2016 in Benton County, Wa. Due to uncertainty over the dataset, only the ratio of ignition causes is presented in the table while actual ignition count values are omitted.

Cause	Percent of Total Ignitions by Cause	Total Acreage	Avg. Annual Acreage Burned
Human	83%	216,891	6,379
Natural	15%	39,764	1,170
Unknown	2%	5,029	148
Total	100%	261,684	7,697

Based on the agencies' combined datasets specific to Benton County, there has been an increase in the number of ignitions occurring annually within Benton County and, based on data provided by Benton County, an increase in acreage burned annually since 1983.

The increasing trend observed in annual acreage burned by wildfire in Benton County (Figure 4) matches the national trend (Figure 7). One factor that likely explains the trend is the extensive grassland fuel type found throughout most of Benton County and the increasing component of cheat grass and other invasive species found across the landscape. Fuel loading and distribution across the landscape is largely dependent on spring precipitation. Increased fuel loads and greater fuel continuity often mean that the potential for wildfire and more severe fire behavior also increases. Cheat grass and other invasive species have almost certainly spread and become a greater component of grassland landscapes in Benton County since 1983. Cheat grass changes the fire regime of native plant communities by altering fire behavior and reducing fire return intervals. As cheat grass becomes a greater component of grasslands in Benton County, any infested areas will burn more often, and more acreage will likely burn before a fire is suppressed. This may also explain the increase in the number of annual fire starts occurring in Benton County since 1983 (Figure 5) which is the opposite of the national trend which indicates a decrease in the number of fire starts occurring each year (Figure 8). As population, vehicle traffic, and human activity increase in Benton County an increased number of fire-starting events should be expected.

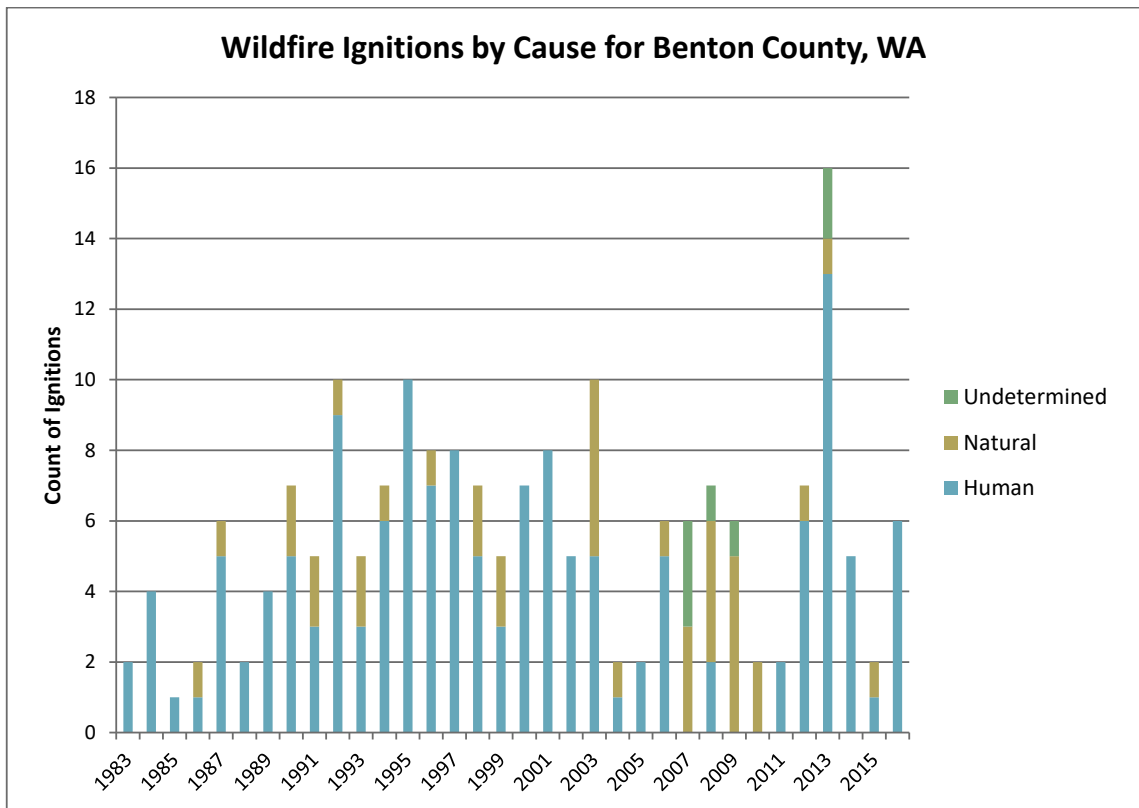


Figure 3) Number of wildfire ignitions by cause for Benton County, Washington from 1983 to 2016.

The data reviewed above provides a general picture regarding the level of wildland-urban interface fire risk within Benton County. There are several reasons why the fire risk may be even higher than suggested above, especially in developing wildland urban interface areas.

- 1) Large fires may occur infrequently, but statistically they will occur. One large fire could significantly change the statistics. In other words, 40 years of historical data may be too short to capture large, infrequent wildland fire events.
- 2) The level of fire hazard depends profoundly on weather patterns. A several year drought period would substantially increase the probability of large wildland fires in Benton County. For smaller areas, with grass, brush and small trees, a much shorter drought period of a few months or less would substantially increase the fire hazard.
- 3) The level of fire hazard in WUI areas is likely significantly higher than for wildland areas as a whole due to the greater risk to life and property. The probability of fires starting in interface areas is much higher than in wildland areas because of the higher population density and increased activities. Many fires in the WUI are not recorded in agency datasets because the local fire department responded and successfully suppressed the ignition without mutual aid assistance from the state or federal agencies.

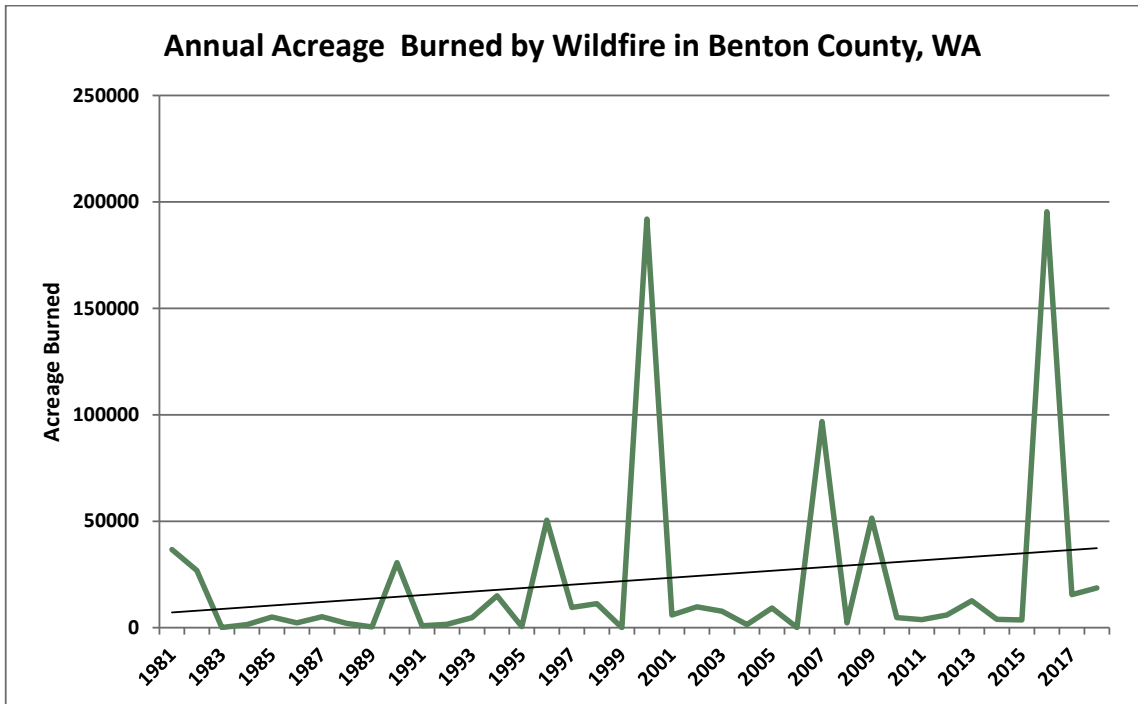


Figure 4) Acreage burned annually by wildfire in Benton County, WA from 1983 to 2016.

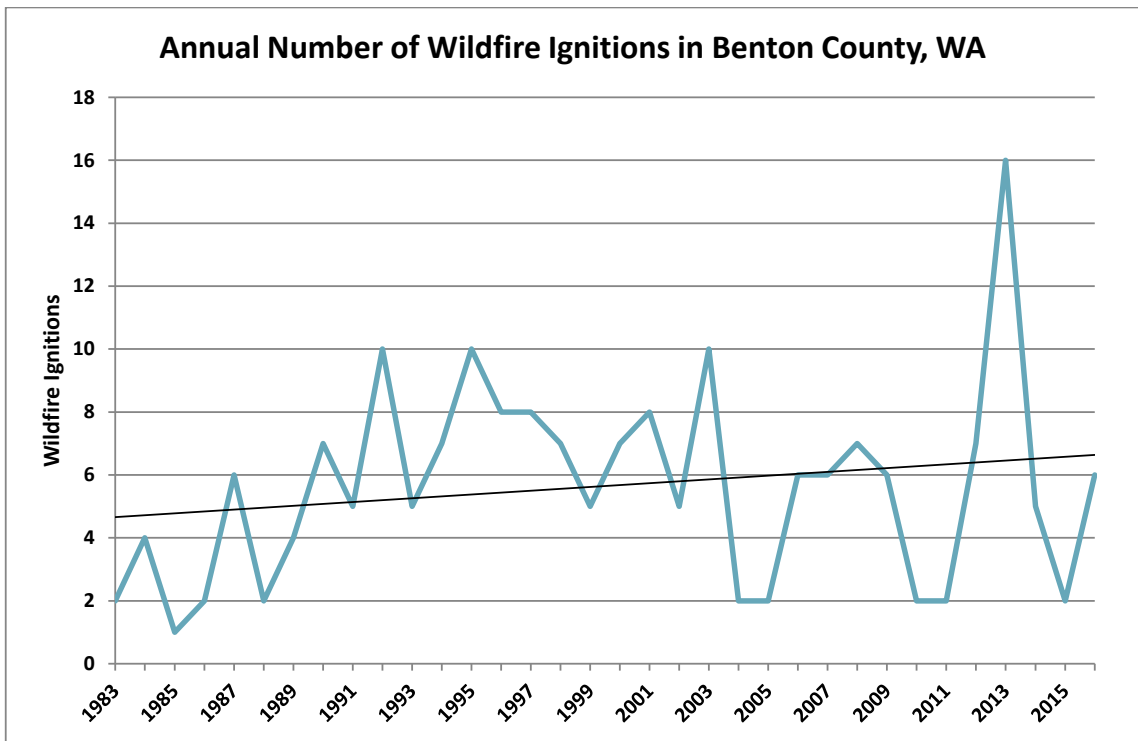


Figure 5) Annual number of wildfire ignitions in Benton County, WA from 1983 to 2016.

Wildfire Extent Profile

The National Interagency Fire Center and the National Incident Coordination Center maintains records of fire costs, extent, and related data for the entire nation. The number of wildland fire starts, total acreage burned, and annual cost to control figures were created using data from end-of-year reports compiled by all wildland fire agencies after each fire season. The agencies include the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, Forest Service, and all state agencies.

Across the west, wildfires have been increasing in extent and cost of control (Figure 6). Even though the number of fires that occur annually has decreased since 1990 (Figure 8), the total number of acres burned has increased (Figure 7). Over the last few decades summers have become warmer and drier; this trend has had significant implications for the severity of recent fire seasons, particularly in areas where decades of fire suppression have resulted in overstocked stands and heavy fuel loading. However, the inverse relationship between total number of fires and total acres burned can likely be attributed to a few other factors as well. Fire awareness programs have likely reduced the number of fire starts per season by making the public more cognizant of the impacts of wildfire and therefore more diligent when recreating or working in high risk areas. While in addition to recent climate trends, the increase in acreage burned each year can partially be attributed to changes in wildland firefighting tactics and emphasis on safety. In some situations, fire management teams are electing to intentionally burn additional acreage with a back-burn operation or let the fire burn itself out or burn to a point where it can be contained with a greater level of assurance and under safer conditions.

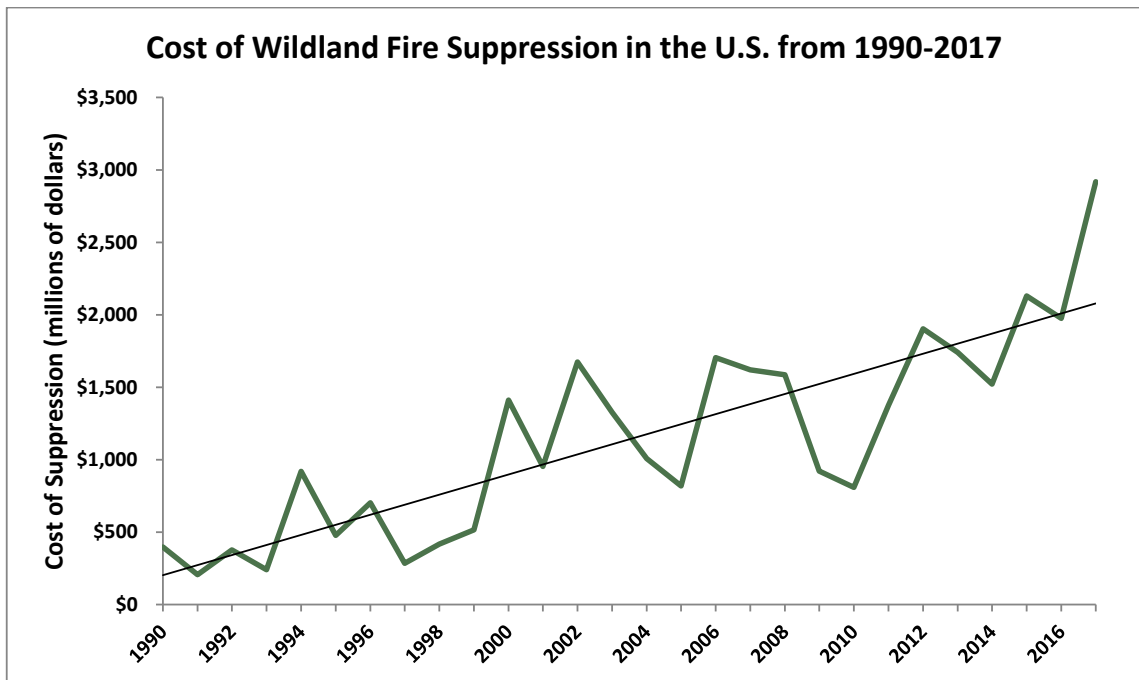


Figure 6) Annual cost of wildland fire suppression in the United States from 1990 to 2017. Values were not adjusted for inflation.

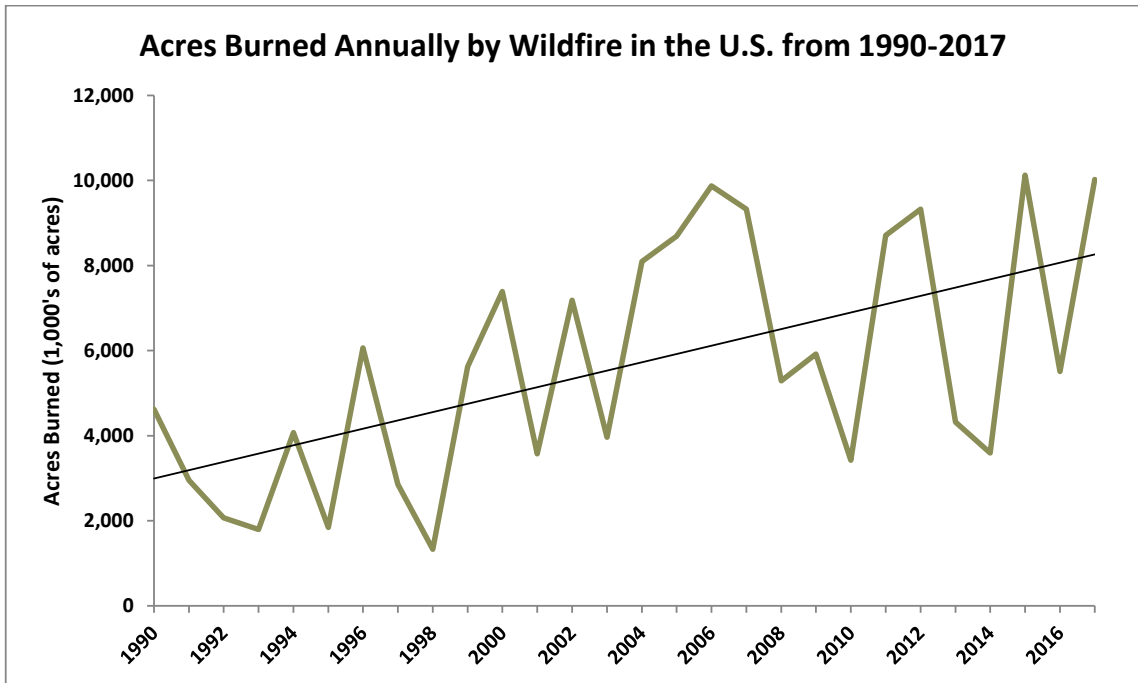


Figure 7) Annual acreage burned as a result of wildfire in the United States from 1990 to 2017.

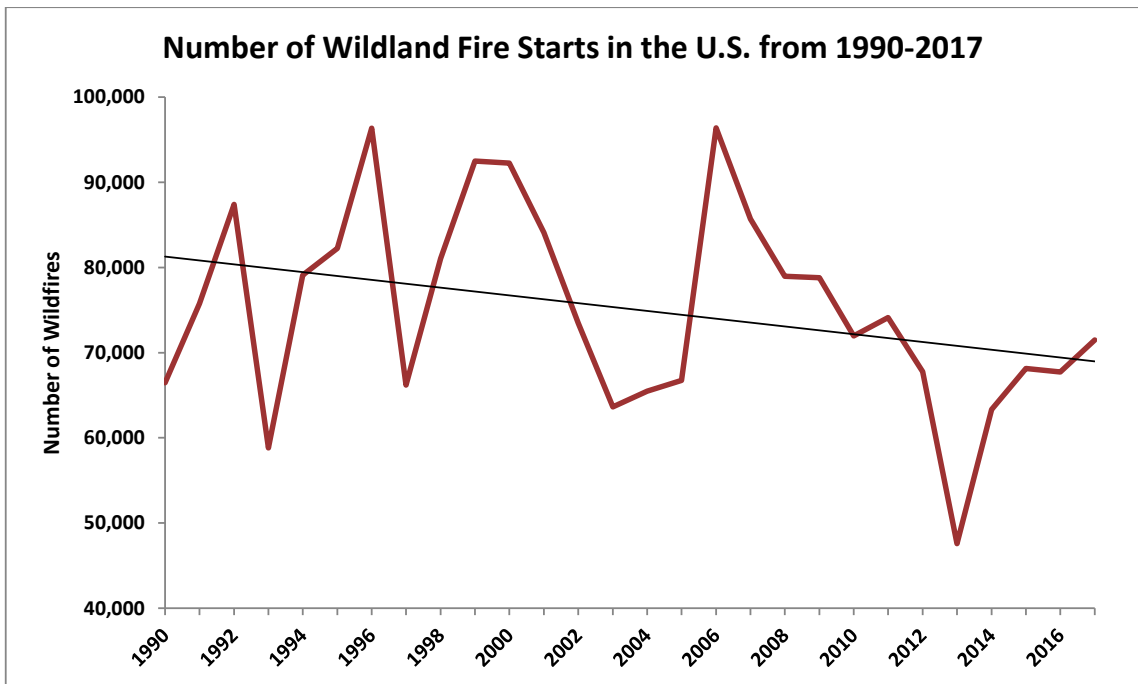


Figure 8) Annual number of wildland fire starts in the United States from 1990 to 2017.

The trends displayed in these figures are likely to continue into future fire seasons. Particularly as fire seasons extend earlier and later into the year and conditions become more volatile at the hottest and driest times of the year. As populations continue to increase and the WUI expands, more people, structures, and infrastructure will be exposed to wildfire risks which continue to increase the value of fire planning and fire mitigation work.

The fire suppression agencies in Benton County respond to numerous wildland fires each year, but few of those fires grow to a significant size. According to national statistics, only 2% of all wildland fires escape initial attack. However, that 2% accounts for the majority of fire suppression expenditures and threatens lives, properties, and natural resources. These large fires are characterized by a size and complexity that require special management organizations drawing suppression resources from across the nation. These fires create unique challenges to local communities by their quick development and the scale of their footprint.

Wildfire Hazard Assessment

Benton County was analyzed using a variety of models, managed on a Geographic Information System (GIS) system. Physical features of the region including roads, streams, soils, elevation, and remotely sensed images were represented by data layers. Field visits were conducted by Benton County Emergency Management personnel and specialists from Northwest Management, Inc. Discussions with area residents and local fire suppression professionals augmented field visits and provided insights into forest health issues and treatment options. This information was analyzed and combined to develop an objective assessment of wildland fire risk in the region.

Historic Fire Regime

Historical variability in fire regime is a conservative indicator of ecosystem sustainability, and thus, understanding the natural role of fire in ecosystems is necessary for proper fire management. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes, the fire return interval (frequency) and fire severity prior to settlement by Euro-Americans, to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

A primary goal in ecological restoration is often to return an ecosystem to a previously existing condition that no longer is present at the site, under the assumption that the site's current condition is somehow degraded or less desirable than the previous condition and needs improvement.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Historical fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to

maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

This model uses only the current vegetation types to determine the historic fire regime. Native Americans reportedly burned throughout the county on a regular basis. The vegetation types were much different pre-Euro-American settlement than they are today and believed to be a more grassland dominated landscape.

Using the Fire Regime Group model, fire return intervals and anticipated fire behavior can be mapped for Benton County based on current vegetative cover (Figure 9). Fire return interval describes the amount of time that can be expected to elapse before a given area will burn again and severity describes the duration and intensity at which a fire burns. Just over 93% of Benton County is classified as Fire Regime Groups III and IV which means that most of the county has an expected fire return interval of 35 to 200 years and will burn with low to stand-replacement levels of severity (Table 5). Areas classified as Fire Regime Group III will likely burn with low to mixed severity while areas that are classified as Fire Regime Group IV can be expected to burn with high severity. The remaining area of Benton County either falls into different Fire Regime Groups (2.1% of remaining area) or is non-burnable.

Table 5) Fire Regime Groups for Benton County, WA.

Designation	Description	Acres	% Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	1,216	0.1%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	8,221	0.7%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	372,737	33.1%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	676,879	60.1%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	14,609	1.3%
Water	Water	40,104	3.6%
Barren	Barren	452	0.0%
Sparsely Vegetated	Sparsely Vegetated	12,183	1.1%
Total		1,126,400	100.0%

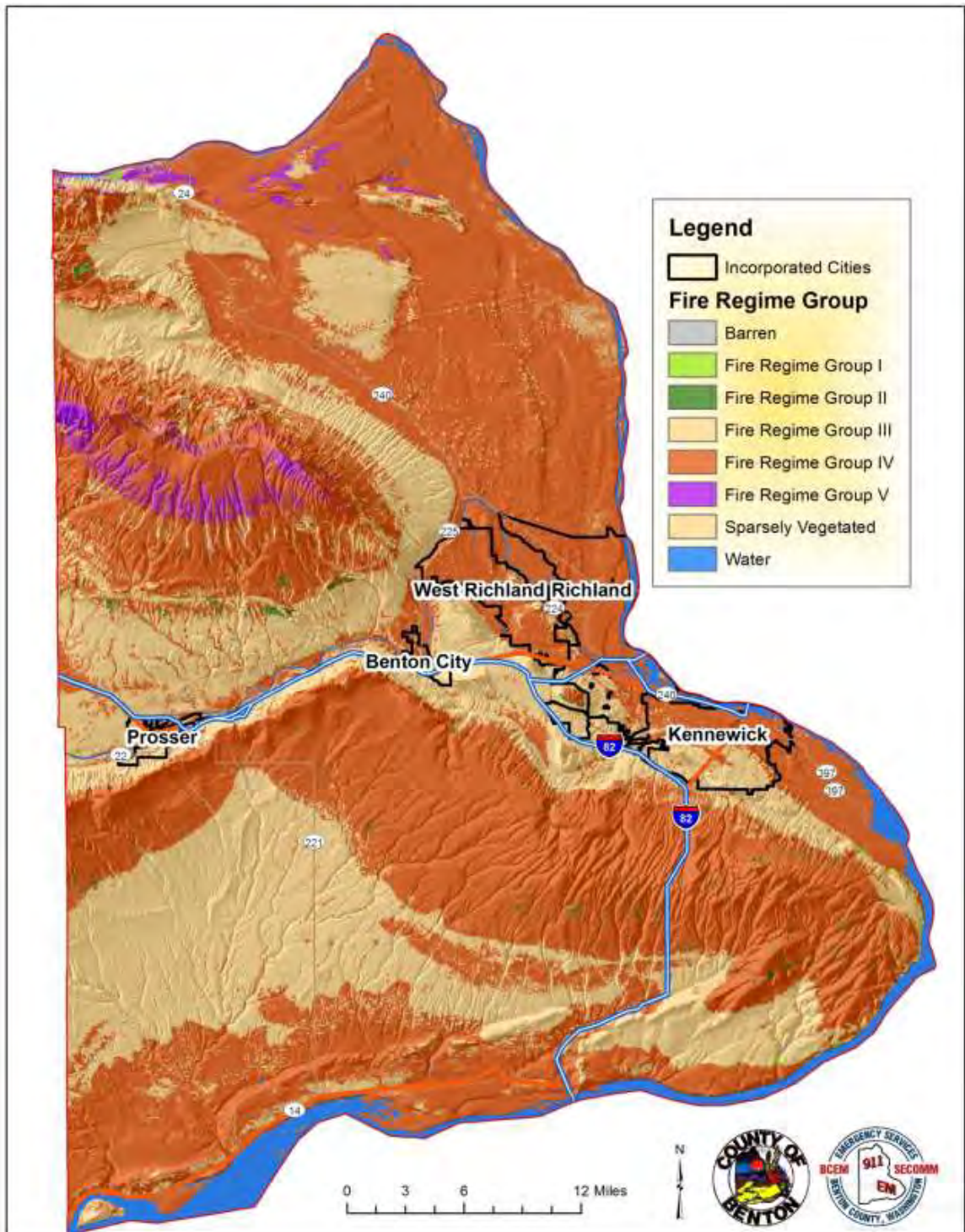


Figure 9) Fire history through the Fire Regime Group dataset. Majority of the County (60%) historically experienced high severity fires on a return interval between 35 and 200 years.

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Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning.⁹

¹⁰ Coarse scale definitions for historic fire regimes have been developed by Hardy et al¹¹ and Schmidt et al¹² and interpreted for fire and fuels management by Hann and Bunnell.

A fire regime condition class (FRCC) is a classification of the amount of vegetative departure from the historic regime.¹³ The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime.^{14,15} The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

An analysis of Fire Regime Condition Class in Benton County shows that 38% of the land is considered to be highly departed from its historic fire regime and associated vegetation and fuel characteristics (Table 6). Just over 12% of the land is moderately departed while less than 8% is classified as low departure. Almost 30% of the land in the county is in agriculture, half of which is non-burnable.

The current Fire Regime Condition Class model shows that almost 60% of Benton County is considered to be departed, most of which is highly departed (Figure 10). A majority of the county is characterized by various shrub species and grasses which primarily include sagebrush, bluebunch wheatgrass, Idaho fescue, and cheat grass. The current structure and species composition of the shrub-steppe ecosystem increases the likelihood that it will burn with greater severity and burn more frequently, particularly as invasive species become a greater component of the shrub-steppe ecosystem in Benton County.

⁹ Agee, J. K. *Fire Ecology of the Pacific Northwest forests*. Oregon: Island Press. 1993.

¹⁰ Brown, J. K. "Fire regimes and their relevance to ecosystem management." *Proceedings of Society of American Foresters National Convention*. Society of American Foresters. Washington, D.C. 1995. Pp 171-178.

¹¹ Hardy, C. C., et al. "*Spatial data for national fire planning and fuel management.*" *International Journal of Wildland Fire*. 2001. Pp 353-372.

¹² Schmidt, K. M., et al. "*Development of coarse scale spatial data for wildland fire and fuel management.*" General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

¹³ Hann, W. J. and D. L. Bunnell. "Fire and land management planning and implementation across multiple scales." *International Journal of Wildland Fire*. 2001. Pp 389-403.

¹⁴ Hardy, C. C., et al. "*Spatial data for national fire planning and fuel management.*" *International Journal of Wildland Fire*. 2001. Pp 353-372.

¹⁵ Schmidt, K. M., et al. "*Development of coarse scale spatial data for wildland fire and fuel management.*" General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

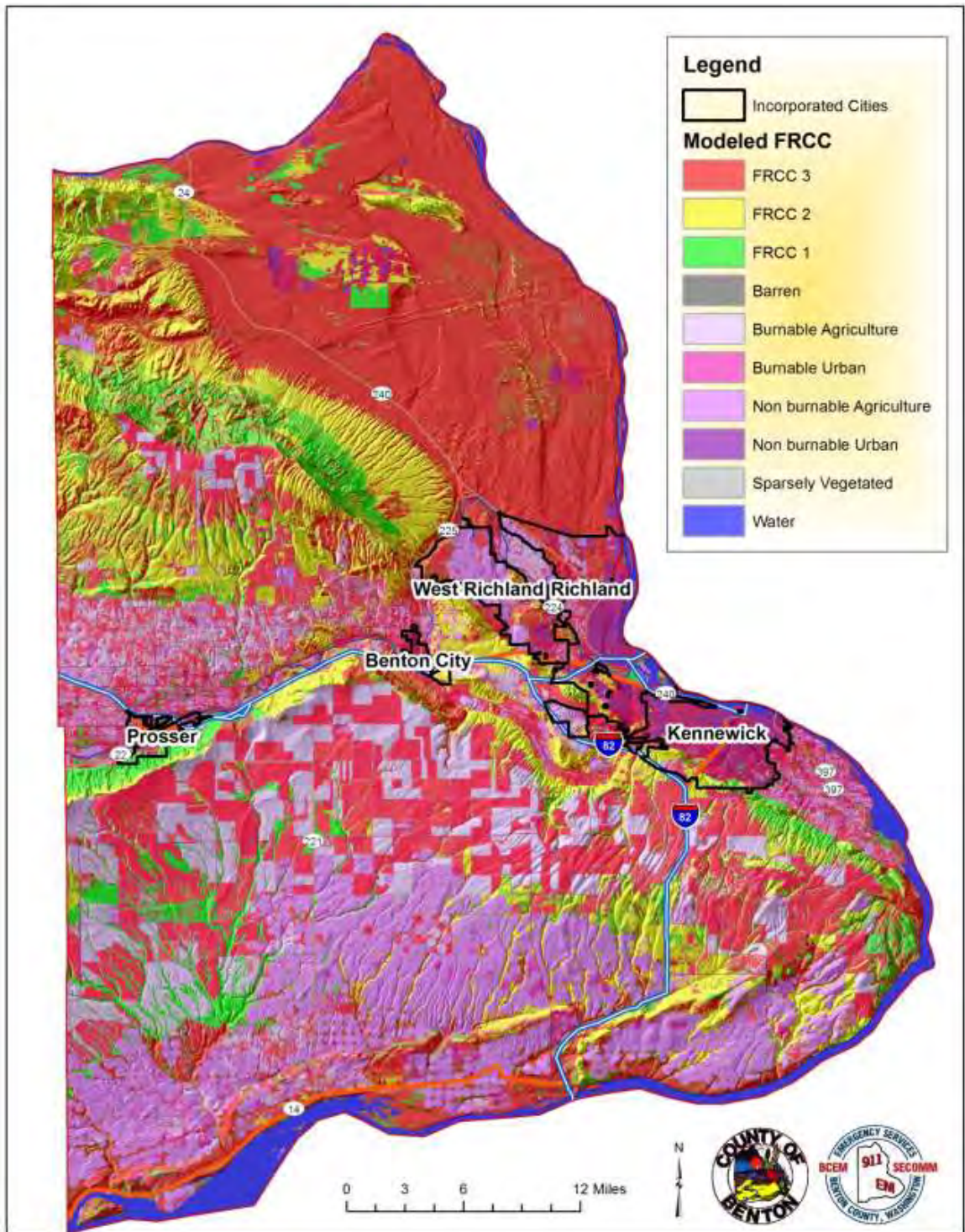


Figure 10) Fire Regime Condition Classes for Benton County, WA.

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Table 6) Fire Regime Condition Classes for Benton County, WA.

Fire Regime Condition Class	Description	Acres	Percent of Total
Fire Regime Condition Class I	Low Vegetation Departure	86,275	7.7%
Fire Regime Condition Class II	Moderate Vegetation Departure	136,953	12.2%
Fire Regime Condition Class III	High Vegetation Departure	432,679	38.4%
Water	Water	31,786	2.8%
Urban	Urban	42,535	3.8%
Burnable Urban	Burnable Urban	50,073	4.4%
Barren	Barren	358	<1%
Sparsely Vegetated	Sparsely Vegetated	9,560	<1%
Agriculture	Agriculture	166,960	14.8%
Burnable Agriculture	Burnable Agriculture	169,221	15.0%
Total		1,126,400	100.0%

Wildland Urban Interface

The wildland urban interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the WUI. The WUI refers to areas where wildland vegetation meets urban developments or where forest fuels meet urban fuels such as houses. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the WUI requires the efforts of federal, state, and local agencies and private individuals.¹⁶ “The role of [most] federal agencies in the WUI includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the WUI is [largely] the responsibility of Tribal, state, and local governments”.¹⁷ The role of the federal agencies in Benton County is and will be much more limited. Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures.¹⁸ With treatment, a WUI can provide

¹⁶ Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.

¹⁷ USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: <http://www.fs.fed.us/r3/sfe/fire/urbanint.html>

¹⁸ USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: <http://www.fs.fed.us/r3/sfe/fire/urbanint.html>

firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a WUI that is properly treated will be less likely to sustain a crown fire that enters or originates within it.¹⁹

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing existing defensible space, landowners can protect the WUI, the biological resources of the management area, and adjacent property owners by:

- Minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;²⁰
- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three WUI conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres; and
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size.

In addition to these classifications detailed in the Federal Register, Benton County has included two additional classifications to augment these categories:

¹⁹ Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.

²⁰ McCoy, L. K., et al. Cerro Grand Fire Behavior Narrative. 2001.

- **Low Density Rural Areas** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries or urban growth boundaries; it is set by very high population densities (more than 7-10 structures per acre).

In summary, the designation of areas by the Benton County planning committee includes:

- Interface Condition: WUI
- Intermix Condition: WUI
- Occluded Condition: WUI
- Low Density Rural Areas: WUI
- High Density Urban Areas: WUI

Benton County’s wildland urban interface (WUI) is mostly based on population density (Figure 11). Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent density. To graphically identify relative population density across the county, structure locations are used as an estimate of population density. The county’s 911 address layer (GIS) was used to identify the locations of possible structures. The resulting output identified the extent and level of population density throughout the county.

In addition, the planning committee determined that the entire county should be classified under WUI designation due to the rapid rates of spread that commonly occur within the county.

By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as low density WUI (as defined above). This portion of the analysis allows us to “see” where the highest concentrations of structures are located in reference to relatively high-risk landscapes, limiting infrastructure, and other points of concern.

The WUI, as defined here, is unbiased, consistent, and, most importantly, it addresses all of the county, not just federally-identified communities at risk. It is a planning tool showing the locations and density of homes and businesses, information that is used to develop WUI categories. It can be determined again in the future, using the same criteria, to show how the WUI has changed in response to increasing population densities. It uses a repeatable and reliable analysis process that is unbiased.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Benton County Community Wildfire Protection Plan steering committee evaluated a variety of different approaches to determining the WUI for the county and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the federal agencies, it is hoped that it will serve as a planning tool for the county, state and federal agencies, and local fire districts.

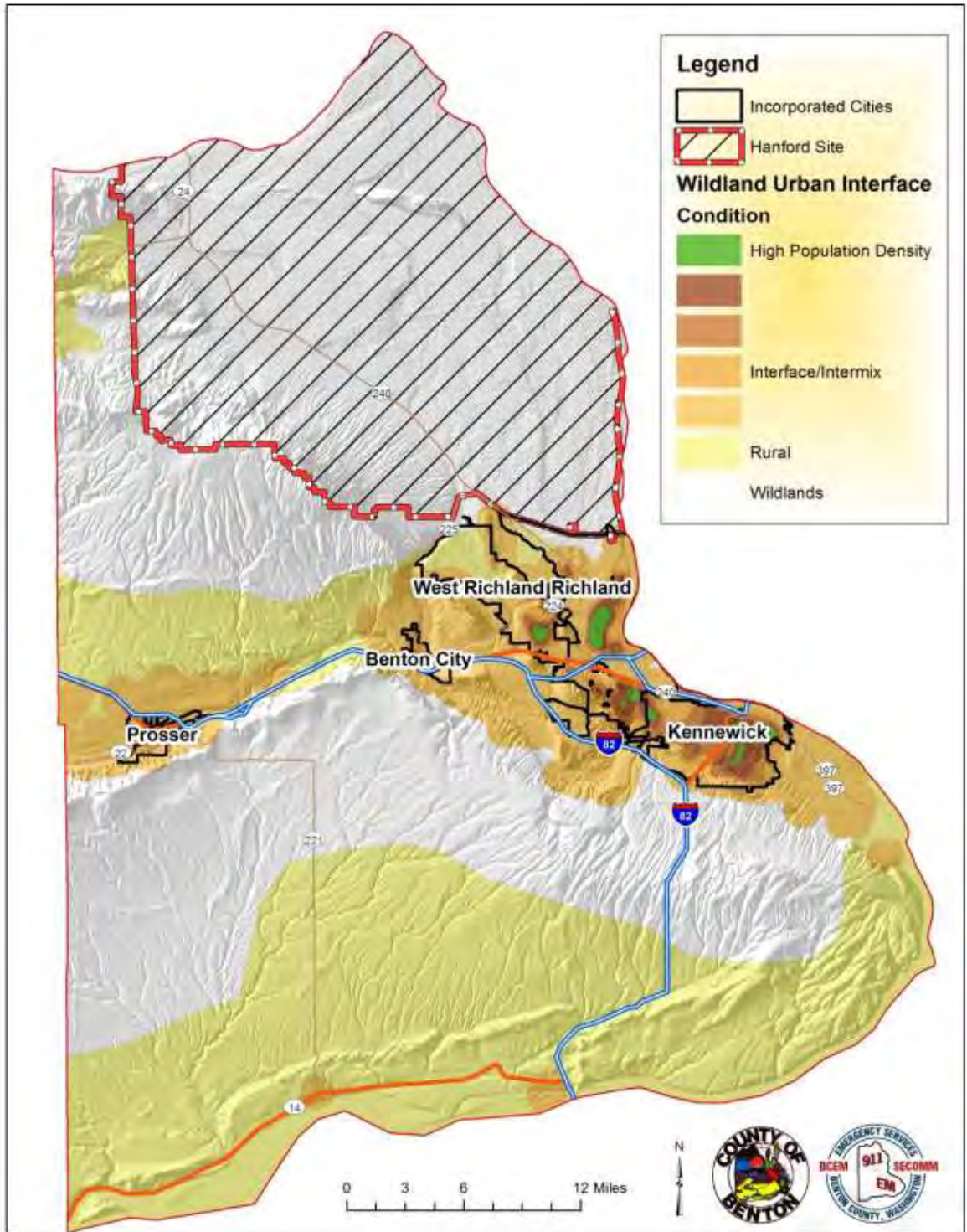


Figure 11) Wildland Urban Interface (WUI) map of Benton County, WA.

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Potential WUI Treatments

The definition and mapping of the WUI is the creation of a planning tool to identify where structures, people, and infrastructure are located in reference to each other. This analysis tool does not include a component of fuels risk. There are a number of reasons to map and analyze these two components separately (population density vs. fire risk analysis). Primary among these reasons is the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependent on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest health issues or other concerns.

By examining these two tools separately, the planner is able to evaluate these layers of information to see where the combination of population density overlays areas of high current relative fire risk and then take mitigative actions to reduce the fuels, improve readiness, directly address factors of structural ignitability, improve initial attack success, mitigate resistance to control factors, or (more often) a combination of many approaches.

It should not be assumed that just because an area is identified as being within the WUI, that it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site-specific factors.

It should also not be assumed that WUI designation on national or state forest lands automatically equates to a treatment area. The Forest Service, Bureau of Land Management, and Washington Department of Natural Resources are still obligated to manage lands under their control according to the standards and guides listed in their respective forest plans (or other management plans). The adopted forest plan has legal precedence over the WUI designation until such a time as the forest plan is revised to reflect updated priorities.

Most treatments may begin with a home evaluation, and the implicit factors of structural ignitability (roofing, siding, deck materials) and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands (mapped as yellow) may look closely at access (two ways in and out) and communications through means other than land-based telephones. On the other hand, a subdivision with densely packed homes (mapped as brown – interface areas) surrounded by forests and dense underbrush, may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

Relative Threat Level Mapping

The predicted Wildland Fire Threat layer shown on the map below was produced by combining weighted data sets that relate to wildfire risk in an additive model. Datasets considered for the model included; fire behavior fuel models, percent slope, aspect, fire protection capabilities, ignition probability, wildland fire rate of spread, wildland fire intensity, precipitation, and population. Each of these data layers was reviewed by members of the steering committee who confirmed whether or not they fairly represented those characteristics of Benton County. Once the layers were compiled the committee reviewed the final threat level map for accuracy. Consequently, the committee opted to remove the wildland fire rate of spread, wildland fire intensity, precipitation, and population layers as they tended to reduce the level of fire risk in areas where it is considered to be higher. Table 7 provides more information about the data layers that were used to create the Benton County Relative Threat Level Map.

Table 7) Parameters for Threat Level Mapping exercise. Bolded layers were included in the final version of the Threat Level Map.

Dataset	Source
Fuel Models	Scott and Burgen 40 Fire Behavior Fuel Model from LANDFIRE
Slope	10 Meter Digital Elevation Model (DEM)
Aspect	10 Meter Digital Elevation Model (DEM)
Fire Protection	Benton County Fire Station Points
Ignition Probability	Density of Fire Occurrences
Wildland Fire Rate of Spread	30 Meter FlamMap Rate of Spread Raster
Wildland Fire Intensity	
Precipitation	PRISM Climate Data from Oregon State University
Population	911 Address Points

Risk Categories

Based on analysis of the various modeling tools, existing historical information, and local knowledge, a preliminary assessment of potentially high wildfire risk areas was completed. This assessment prioritized areas that may be at higher risk due to non-native or high fire risk vegetation, fire history profile, high risk fuel models, and/or limited suppression capabilities. This assessment also considered areas that had a high population or other valuable assets requiring protection from the impacts of wildland fires.

Non-native or High Fire Risk Vegetation

Fuel type, or vegetation, plays an important role in determining wildland fire danger. All fuel types can and will burn under the right conditions; however, some fuel types pose more danger than others due to the intensity at which they burn, the horizontal and vertical continuity of burnable material, and firefighters' ability to modify the fuel complex in front of an approaching wildfire. While rangeland or grass fires often spread rapidly, they burn quickly and at a lower intensity than forest fires. Additionally,

local farmers and firefighters can often construct fuel breaks with dozers and other equipment relatively quickly. These tactics are not as effective in forested areas or on steep terrain.

Vegetation types that lead to increased wildfire intensity or severity were given a higher threat level rating.

High Risk Fire Behavior

Due to heavy fuel loads, much of the county could experience extreme wildfire behavior characteristics that result in very intense, replacement-level fires. The agriculture/grassland areas will likely experience lower intensity fires with rapid rates of spread, particularly under the influence of wind.

One of the factors contributing to potentially dangerous fire behavior is the preheating of fuels on steep slopes ahead of the actual flame front. Typically, fires spread very rapidly uphill, particularly in grass fuel types. Hot gases rise in front of the fire along the slope face preheating the upslope vegetation and moving a grass fire up to four times faster with flames twice as long as a fire on level ground. This preheating of fuels, or radiant heat, is capable of igniting combustible materials from distances of 100 feet or more.

Areas with a high potential for extreme fire behavior based on Fire Behavior Analysis Tool modeling and local knowledge were given a higher threat level rating. Based on local knowledge, the grass fuel model was given a higher intensity level than it normally would receive due to the vast amounts of available fuel. Although grass fires can generally be controlled relatively easily, fires burning in this fuel type can spread rapidly. Extreme rates of spread coupled with the remote nature of much of the county, can cause significant control issues for local fire districts.

Suppression Capabilities

Fire protection in Benton County is the responsibility of the local fire agencies. The county has six active fire districts, two municipalities, and the Hanford Fire Department with resources available for fire suppression. However, each agency is limited to the resources at hand until help from other agencies can arrive.

Some parts of the county fall under Washington DNR or BLM fire protection responsibility. The Washington DNR and BLM have cooperative agreements with Benton County Fire Districts to provide initial attack on their respective districts. The response times for the DNR and BLM can be several hours or longer due to the logistical challenge of mobilizing both crews and equipment from their respective duty stations.

Population Centers and Developing Areas

Due to the increased human activity within and surrounding Benton County communities, these areas are inherently at a higher risk of ignitions. The perimeter and outskirts of population centers and known developing areas were given a high threat level rating.

High Protection Value

Of the areas and resources at risk to wildfire in Benton County, the planning committee has identified the following areas as *high protection values*. These areas include watersheds, recreation areas, and cultural areas.

- Watersheds: Yakima River Delta Vicinity, Zintel Canyon
- Recreation Areas: Badger Mountain, Rattlesnake Mountain
- Cultural Areas: Rattlesnake Mountain
- Nine Canyon Wind Project
- Communication Sites (Jump off Joe, Rattlesnake, Inspiration Point, Badger)
- Power Transmission lines and poles (Benton REA and Benton PUD)

Field Assessments

In an effort to visually confirm the output of the fuels analyses conducted for this plan, a multi-day field assessment was conducted in Benton County in May of 2018. A natural resource specialist from NMI drove through the county to get a general idea of the prominent fuel types found across Benton County. Select high risk areas, as identified by local fire personnel, featuring different fuel types and fuel loading were also toured. The field assessment started at the north end of Benton County on Highway 24 and continued south to the Tri-Cities area along Highway 240. In the Tri-Cities area, Horn Rapids County Park, W.E. Johnson Park, Bateman Island, and Badger Mountain were assessed as most were considered high risk areas and differed significantly from the rest of the county in regard to fuel types and fuel loading. To complete the overall fuels assessment, the tour of the county included the stretch of Highway 82 from the Tri-Cities to Prosser and then to the western edge of the county on Highway 22. The southern edge of the county was also evaluated by taking Highway 14 from the western most edge of the county to Highway 82 and then traveling north back to the Tri-Cities. See Chapter 5 for more information.

Determination of Relative Threat Level

Following the field assessments, the planning committee began development of the Relative Threat Level model. Risk categories included in the final analysis were fuel models, slope, aspect, wildland fire intensity, precipitation, and population density. The various categories, or layers, were ranked by the committee based on their significance pertaining to causal factors of high wildland fire risk conditions or protection significance. The ranked layers were then analyzed in a geographical information system to produce a cumulative effects map based on the ranking. Following is a brief explanation of the various categories used in the analysis and the general ranking scheme used for each.

- Environmental Factors – slope, aspect and precipitation all can have an enormous impact on the intensity of a wildfire. Therefore, areas with steep slopes, dry aspects, or lesser amounts of precipitation, relative to Benton County as a whole, were given higher threat rankings.
- Vegetation Cover Types – certain vegetation types are known to carry and produce more intense fires than other fuel types. For Benton County, shrub and grass fuel models were given

the higher rankings followed by short grass / agriculture, and forest types (shrub understory) fuel models.

- Fire Behavior – areas identified by fire behavior modeling as having high rate of spread potential or high fire intensity were given a higher threat level ranking.
- Populated Areas – these areas were ranked higher due to the presence of human populations, structures, and infrastructure requiring protection from fire.

Each data layer was developed, ranked, and converted to a raster format using ArcGIS 10.x. The data layers were then analyzed in ArcGIS using the Spatial Analyst extension to calculate the cumulative effects of the various threats. This process sums the ranked overlaid values geographically to produce the final map layer. The ranked values were then color coded to show areas of highest threat (red) to lowest threat (dark blue) relative to Benton County.

Relative Threat Level Map

The output of the analysis shows that most of Benton County is at moderate to high risk for wildfire (Figure 12). The northern portion of the county, including the Hanford Site (the area delineated by the purple boundary) and Rattlesnake Mountain, is at high risk of wildfire while the central portion of the county, including the Horse Heaven Hills and the heavily populated urban areas, is at moderate risk. Steeper slopes, south faces, and drainages also received higher threat ratings. Irrigated agricultural areas are at low risk for wildfire.



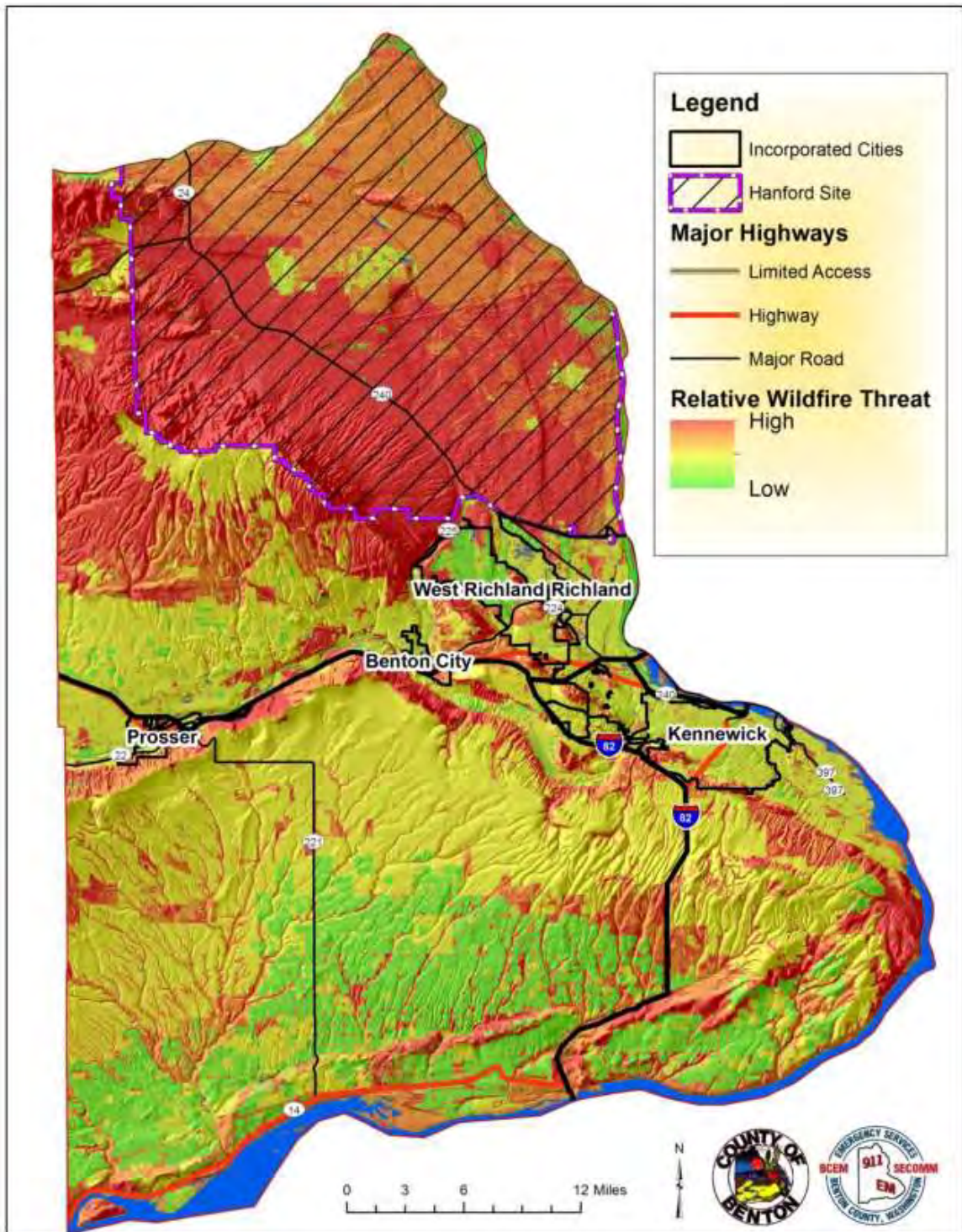


Figure 12) Relative threat level map for Benton County, WA.

Overview of Fire Protection Systems

A majority of the county has a local fire protection district that covers both structural and wildland fire response. The Washington DNR is responsible for wildland fire protection outside of fire district jurisdictions. Due to the lack of DNR resources in Benton County, the DNR maintains an agreement with Benton County to provide initial attack for the first 12 hours of the operational period.

Local Fire Department and District Summaries

The firefighting resources and capabilities information provided in this section is a summary of information provided by the fire chiefs or representatives of the wildland firefighting agencies listed. Most organizations completed a survey with written responses. Survey responses were used to create department and district profiles which may include descriptions of jurisdictions, current staffing, department/district resources, concerns, and needs, and an equipment inventory list.



Benton County Fire District #1

District Summary

Fire District #1 protects an area of approximately 320 square miles south the cities of Kennewick Richland and West Richland, serving a population of approximately 17,500 residents. Located within the District are heavily populated residential areas, commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently six fire stations strategically located to provide efficient protection. Operating as a combination fire department, District #1 has 13 career staff and 90 dedicated volunteer firefighters, officers, EMT's, First Responders, and support personnel. The equipment utilized by the department is included in the table below. The District average's 1350 calls for service yearly, with 55 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of wheat which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire. Creating fire breaks on lands within the Conservation Reserve Program (CRP) and around residential developments are a couple goals for area fire chiefs. We have had several large fires on CRP lands, wildland areas and areas with significant urban interface concerns due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is part of a County- wide Dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and somewhat temperamental – repeater simulcast micro wave system. Although the system has gone through a major equipment update and fine tuning, the service area due to topography continues to have areas where radio communications between Dispatch and Fire/EMS responders is difficult or impossible.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agricultural burns, tumbleweeds, barbeques and woodstoves. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain more firefighters and EMS personnel.

Cooperative Agreements: The District is part of a mutual aid agreement which includes all fire departments and fire districts within Benton, Franklin and Walla Walla Counties that has developed a dispatch matrix that allows us to put a large amount of resources on an incident in a very short period of time. This has proven to be very successful; we are able to control potentially large incidents from getting out of control and additionally reduce the need to call for State Mobilization Assistance. In addition to the previously identified mutual aid agreement, the District also has cooperative agreements or contracts with; Washington State Department of Natural Resources, Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service and Washington State Fire Marshal's Office. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire district currently provides residents information on the Community Wildfire Protection Program and Firewise literature. The fire district has no current hazard fuel reduction program within the annual operating budget due to budget priorities. An increase in available grant funds would be beneficial to target some of the high hazard fuels reductions areas identified in the county wildfire plan.

Fire Breaks: Changes in the CRP rules that would allow fire breaks down to the dirt without a negative financial impact to the property owner would be beneficial.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression.

Residential and Agricultural Burning: All open burning within the county, is subject to guidelines concerning, size, time, location and permit requirements. County residents can find the guidelines for non-agricultural open fires by referring to:

<http://bentoncleanair.org/index.php/burning/>

Agricultural burning in the County is regulated by the State Department of Ecology. These burns are subject to specific requirements and are limited by air quality management, weather and hazardous fire conditions. For Specific information on the permitting process, fees and restrictions regarding Agricultural burning in the County please refer to:

<http://bentoncleanair.org/index.php/burning/agricultural-burning/>

Others: As with most volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Apparatus Inventory

Table 8) Benton County Fire District #1 apparatus inventory.

Station #	Asset Type	Asset Description
STATION 100	2008 FORD F250	UTILITY, 3/4 TON, EXTENDED CAB, WIDE BOX, 8 FT, PU, 4X4
	2008 FORD F250	UTILITY, STAFF VEHICLE
	2012 FORD F150	UTILITY, STAFF PICKUP 4X4, 3/4 TON
	1989 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	2004 FORD F150	UTILITY, STAFF PICKUP 4X4
	1984 UTILITY TRAILER	UTILITY TRAILER, 18 FT.
	1980 WISCONSIN	EQUIPMENT TRAILER, 16 FT. 6 TON, TILT DECK
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
STATION 110	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4
	1978 CATERPILLAR	DOZER, D5B
	2006 WELLS	CSEPP WELLS UTILITY TRAILER
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, CSEPP
STATION 120	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	1979 GMC	CASCADE/BREATHING AIR, 4X2
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	1984 SHASTA MOTOR HOME	REHABILITATION UNIT, 26 FT.
	1998 ROSEBURY	UTILITY TRAILER, 12 FT, SUPPORT SERVICES
	1998 WELLS CARGO TRAILER	12 FT. UTILITY TRAILER, CSEPP
2016 RAM 5500, SKEETER	ENGINE, TYPE 5 CREW 4X4, 125 GPM, 400 GAL.	
STATION 130	1991 INTERNATIONAL	BRUSH, 125 GPM, 500 GAL. 4X4
	1999 FORD F350	ENGINE, TYPE 6, 125 GPM, 250 GAL 4X4
STATION 140	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, PUMP TEST
STATION 150	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4

STATION 160	2008 FORD F350	UTILITY, STATION SQUAD
	2003 FORD	UTILITY, MAINTENANCE, F3PU
	2001 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	1999 CHEVROLET	UTILITY, SPARE STAFF VEHICLE
	2005 INTERNATIONAL TRACTOR	TRACTOR, TRANSPORT 860/DS
	1970 SHWITZ LOWBOY TRAILER	DOZER TRANSPORT, ___ TON LOWBOY
	1953 PRESSED STEEL	DOZER TRANSPORT, 25 TON LOWBOY
	1980 M35-A2 CARGO	TRUCK, FUEL, 6X6, 2.5 TON
	2008 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X5
	1966 INTERNATIONAL	DOZER, TD 15B
	2015 JOHN DEERE	DOZER 700K LGP
	1993 YAMAHA	ATV, 350, 4X4 BIG BEAR
	1992 PIERCE LANCE	AERIAL, QUINT 105'
	1979 JOHN DEERE	DISK, JOHN DEERE 425
	1993 UTILITY TRAILER	12 FT UTILITY TRAILER
	1994 UTILITY TRAILER	TRAILER, ATV, 10'
1998 ARCTIC CAT	ATV, 400 CC 4X4	
2000 CHEVROLET	ASTRO MINI VAN	
	1999 FREIGHTLINER	TRANSPORT, M915A4, 52000 GVWR
	2006 FREIGHTLINER	THOMAS BUS FS6 REHAB UNIT
	2016 CAN AM, UTV	UTILITY, UTV

Benton County Fire District #2

District Summary

Fire District 2 protects an area of approximately 88 square miles in Benton City and the unincorporated areas surrounding Benton City and lying within Benton County serving a population of approximately 10,000 residents. Located within the district are heavily populated residential areas, some commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently two (2) fire stations strategically located to provide efficient protection. Operating as a combination fire department, District 2 has 5 career staff, 7 residents and 32 dedicated volunteer firefighters, officers, EMT's, Paramedics, and support personnel. The equipment utilized by the department is listed in the table below. The District average's 965 calls for service yearly, with 73 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of open fields, mountains and hills which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high. We have seen numerous large and some catastrophic fires in our district over the years. The largest in 2000 when we lost 53 homes due to a large uncontrolled wildfire that came from the Department of Energy/ALE properties.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire despite histories of large fires threatening their homes. Creating fire breaks on lands within the Conservation Reserve Program (CRP) is one goal for area fire chiefs. We have had several large fires on CRP/open wildlands and Department of Energy properties due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agriculture, residential burns and land clearing fires. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others, weather and burn bans. Provide education to agricultural producers on Washington State Department

of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These sometimes often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with; WA DNR, USFW, BLM and in some cases and the USFS. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire District has an agreement with the Department of Energy that also provides assistance to these adjacent lands to Federal ALE, DOE and BLM properties in addition to normal mutual aid. This has proven reliable and helps with some federal shared costs however, the defensible space around the urban areas is not in place due to sensitive conservation areas. Our Fire District for the last two years has instituted and developed a FIREWISE program to our district residents. This has proven to offer some reduction to our wildfire-related calls; however, it does not get much participation to the high majority of our community despite our public campaigns and strong community push. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for staff time is a need of the fire District to enhance this program and complete structural assessments every two years has proven difficult. We have also teamed up with some local property owners which have receive permission annually to put in fire breaks with our area dozers on areas the butt up against some Urban Interface Areas however, this encompasses a small portion of the exposures.

Fire Breaks: These prove effective in the areas that allow them, many areas restrict fire breaks due to; negative impacts to agriculture, sensitive species, federal properties and private land owners not allowing them on their property. The costs associated with maintaining established fire breaks costs our small fire department thousands of dollars annually and cannot be sustained without some type of financial assistance.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. We have very few areas where we can draw water from in the rural areas due to remoteness and lack of developed water systems.

Residential and Agricultural Burning: All open burning within the county is subject to guidelines concerning, size, time, location and permit requirements from Benton County Clean Air Authority. Moreover, the BCCAA and the local cities have banned back yard burning except for blown in tumbleweeds. This is a two-fold problem. The first is that getting rid of some of the fuel loads reduces the fire potential to sustain burning. The other issue is that burning incorrectly causes numerous out of control fires.



Apparatus Inventory

Table 9) Benton County Fire District #2 apparatus inventory.

Fed ID Number: 91-124-0107								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 210: 1304 Dale Street Benton City, WA	CH121	2013	CHEVY TAHOE				Command	Yes
	CH122	2010	FORD EXPEDITION				Command	Yes
	CPT 121	2010	F-250				Command	Yes
	UT 121	2008	F-250				Command	Yes
	D/C121	2012	F-250				Command	Yes
	E1211	2017	HME	800	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1213	1997	E-One	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	L1211	1995	Central States	300	Type 1 Ladder	1500	Structure w/Foam	Yes
	E1251	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1252	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1254	2018	F-550 4x4	400	Type 5 Engine	260	Wildland w/Foam	Yes
	Dozer 1221	2010	John Deere 750K		Type 2 Dozer		Tractor/Bulldozer/disc	Limited
	Transport 1211	2010	Freightliner		Type 1		Transport 50T	Limited
	Dozer Trailer/Fuel	1998	Lowboy	300 gal. fuel	Dozer Trailer			Limited
	Tactical Tender 1211	2017	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	Cascade 121	2012	Scott		Type 1 Air System		High/Low Press	Yes
	Medic 1221	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
	Medic 1222	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
Medic 1223	2009	Road Rescue		Type 2 Medic		ALS Transport	Yes	
Station 220: Whitmore	E1212	2017	HME	800	Type 1 Engine	1500	Structure w/Foam	Yes
	Tactical Tender 1212	2008	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	E1253	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes

Benton County Fire District #4

District Summary

Benton County Fire District 4 (BCFD 4) is a combination fire department protecting just over 52 square miles consisting of the City of West Richland and surrounding county area with a population just under 20,000. The district has a variety of property use types, including significant residential, some light industrial, agricultural (with a large vineyard component), and open area. The interfaces between open and agricultural areas result in a complex zone regarding fire protection. As the building within the district continues, some of the interface areas are becoming more important, as the population and overall exposure continues to increase.

Created in 1954, BCFD 4 currently operates out of two staffed stations. Staffing includes 15 full time firefighters (Fire Chief, Captains, Lieutenants, firefighters), 1 administrative assistant, 25 volunteer firefighters and 13 Logistic and Administrative volunteers. A list of current apparatus is included in the table below.

BCFD 4 responded to an average of about 1320 incidents per year (5-year average), with about 75% of those incidents being emergency medical calls. The remainder of the incidents are for fire related incidents or false alarms. The call volume for BCFD 4 has increased 25% over the past 5 years and continues to increase as more people and business move into the District. Over the past two years, BCFD 4 has seen large swaths of open land change to grape vineyards based on the Red Mountain American Viticultural Area (AVA) and success of several wineries in the area. While large parts of the open land in the Red Mountain AVA has been planted in grapes, there remains large areas outside of the AVA that are not as agriculturally valuable and remain undeveloped. The growth of individual housing on the borders of the open area result in the high potential for wildland/urban interface issues and the associated wild fire risk.

The district has experienced several larger wildland fires, mostly along/over the Red Mountain and Candy Mountain areas. The most recent larger fire was on Candy Mountain resulting in a total area burned of 450 acres and threatening approximately 50 to 75 homes. The cause of the fire was from a mechanical failure of a vehicle along Interstate 82, resulting in the fire burning over the top of Candy Mountain and threatening the homes and impacting trails on the mountain. At the time of the fire (12:30 am), there were no hikers on the mountain trails, minimizing a potentially dangerous situation of hikers in the path of a fast-moving wildland fire. Fortunately, with help from neighboring mutual aid fire and police agencies, no homes were damaged or destroyed and there was only one minor injury to a firefighter during the extinguishment of the fire.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to

withstand a wildland fire despite histories of large fires threatening their homes. BCFD 4 has worked with homeowners in some areas of the district in implementing the Firewise program as much as possible. The homeowners have worked with the District, but with limited resources only partial success has been observed. Additional resources could be used to help with more effective and complete implementation of the Firewise program.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: The District continues to see a high number of controlled burning activities that are not allowed under the current Benton County Clean Air Authority rules. The types of allowed burning depend upon the urban growth boundaries as well as agricultural use of lands. Many of the residents who have lived in the area for longer, still conduct burning of natural vegetation even though they are inside the urban growth boundary, where this type of burning is not allowed. Efforts to educate the public on the rules continues to be a challenge based on the perceived rural nature of large portions of the District.

Other: As with most combination career/volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain reliable personnel to assist with the variety of responses and other administrative activities that must occur to be a progressive and successful organization.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with Washington Department of Natural Resources (WADNR), United States Fish and Wildlife (USFW), Bureau of Land Management (BLM) and the United States Forest Service (USFS). The District also participates in a local County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The District attempted to implement the FIREWISE program with some district residents, based on the higher risk areas. This has proven to offer some reduction to our wildfire calls however, participation rates could be much higher with some additional

resources. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for additional staff time is needed by the fire District to enhance this program and complete structural assessments every two years and deliver educational materials to potential participants as the population continues to grow and change.

There are additional areas that abut City of West Richland property (specifically the sewer treatment plant) as well as many private homes that have never had a significant fire resulting in large buildup of fuel. The area also has extremely limited access and does pose a significant hazard if wildfire does gain access to the area. Efforts are needed to coordinate fuel reduction or defensible space around this area. This will be challenging, as there are wetlands in the area as well as being adjacent to the Yakima River and associated fish habitat.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. The District has worked with some of the vineyards to establish water supply points at their irrigation ponds, but these are not always a reliable source of water depending upon the time of year and required water use for the vineyards. The District has also worked with the Barker Ranch to identify water supply access points to be developed as the ranch makes improvements to the irrigation and wetland management program. These water supplies allow access to water supplies closer to the threat of wildland fires as identified by landowners, users and the District.



Apparatus Inventory

Table 10) Benton County Fire District #4 apparatus inventory.

Fed ID Number: 91-1317376								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 420: 2604 Bombing Range Road, West Richland, WA 99353	CH141 (UT145)	2013	Ford F-150 Raptor				Command	Yes
	UT141	2017	Chevrolet K2500				Command	Yes
	UT142	2017	Chevrolet Tahoe				Command	Yes
	UT144	2003	Ford Ranger				Command	Yes
	UT146	2014	Ford Explorer				Command	Yes
	DC141 (UT143)	2006	F-250				Command	Yes
	E1412	2001	KME	1000	Type 1 Engine	1250	Structure w/ Foam	Yes
	E1452	2005	F-450 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	E1461	1997	Ford Super Duty 4X4	300	Type 6 Engine	120	Wildland w/Foam	Yes
	E1431	1997	Freightliner / BME	560	Type 3 Engine	1000	Wildland/Structure w/Foam	Yes
	Tactical Tender 1412	2013	Pierce Hawk	2500	Type 1 Tender	500	Pump/Roll/Structure/C AFS	No
	Medic 1422	2016	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Medic 1423	2010	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Rehab 141	2006	F-250				Support	n/a
Decon 143				Trailer		Support	n/a	
Station 410: 1400 Harrington Road, West Richland, WA 99353	E1411	2001	KME	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	Water Tender 1412	2015	Freightliner / Pierce	3000	Type 1 Tender	500	Pump/Roll	Yes
	E1451	2011	F-550 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	BS142	1986	IHC		Type 2 Cascade Air System			No
	Medic 1421	2014	Ford E-450		Type 2 Medic		ALS Transport	Yes
	Rehab 142	2000	Ford E-450				Rehab	n/a

2019 Revision

Benton County Fire District #5

District Summary

Benton County Fire District #5 (BCFD#5) is primarily a wildland fire agency with some urban/suburban interface with neighboring agencies. BCFD#5 also responds to vehicle accident and also provides some non-ambulance EMS services. The district operates out of four main stations with approximately twenty volunteers. BCFD#5 personnel are on duty twenty-four hours a day, seven days a week. The district covers an area of approximately 400 square miles.

District Concerns

Residential Growth: BCFD#5 has not seen significant population growth. However, there is growth in the suburban areas on the outer district lines, with housing development expanding into the district.

Communications: BCFD#5 is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire, ems and police, as well as one fire agency from a third county, Walla Walla County. SECOMM has a VHF simulcast and micro wave system utilized by fire agencies, and law enforcement agencies operate on an 800MHz radio system. The VHF radio system is out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

The merger to one dispatch center was recent. With the addition of Franklin County Fire agencies, Pasco Fire Department and Walla Walla Fire District #5, radio traffic has increased. It seems that the number of dispatch staff needs to be increased to handle the increased radio traffic and calls.

Other: BCFD#5 is reliant on neighboring fire agencies for structure fires as well as for ALS services. There is a need to have access to Water Tenders and Type 1 Engines.

Cooperative Agreements: BCFD#5 has mutual aid agreements with neighboring fire agencies. BCFD#5 will implement or renew needed mutual aid agreements.

District Needs

BCFD#5 is experienced, well versed and trained for wildland firefighting, however, better qualifications and experience is needed for structure fires, especially with the increase of housing in high wildfire risk areas. BCFD#5 is reliant on neighboring agencies for structure firefighting. BCFD#5 has a need for updated/appropriate equipment for structural firefighting and protection.



Benton County Fire District #6

District Summary

Benton County Fire District #6 (BCFD6) is located in South East Washington state approximately thirty miles South of the Tri-Cities (Kennewick, Richland and Pasco) area along the scenic Columbia River. Our department consists of: one paid Chief, three paid firefighters, sixteen active duty volunteers, and approximately 15 paid on call firefighter/EMT's, and two support volunteers. BCFD6 has eight personnel trained as EMT-Basic, two Advanced EMT's and two Paramedics. The career staff works 48/96 shift work. Due to the low resident population many of our volunteers live outside of the Fire District. Most are daytime responders and take up to 35 minutes to respond in the evenings. Only ten volunteers live within the District and cover a majority of the calls.

Our department protects 277 square miles of rural land. Our two ambulances service a response area encompassing approximately 490 square miles in two counties. Eighty percent of our total calls for service are medical related. Many were medical/trauma related. Most of those were motor vehicle accidents. Currently, BCFD6 has exceeded our average call volume, for the same time period, as we begin the busy winter MVA season.

The resident population of BCFD6 is approximately one thousand (1,000). However, due to the nature of the industries and abundant farming in our district, the population during the summer time period is much higher and varies throughout the year. Each year we see a drastic increase of traffic on our roadways and major Interstate highways. Although we are rural, our district contains several key facilities and locations that, if affected, could have wide reaching affects for the Western United States. Some of these key areas are: thirty (30) miles of US Fish and Wildlife scenic wildlife preserve along the Columbia River; the US Corps of Engineers McNary Dam; three Bonneville Power Administration high energy transmission lines; Williams Pipeline bulk storage facility containing 2.5 billion cubic feet of natural gas; four major Williams Pipeline high flow transmission lines serving Spokane, Seattle and the West coast; fifteen miles of Interstate 82; twelve miles of State Route 221; thirty miles of State route 14; and hundreds of square miles of cultivated agricultural property including the sixth largest winery in the world, Columbia Crest.

BCFD6 provides ALS/BLS ambulance coverage to two neighboring Fire Districts through an Automatic Aid Agreement (Klickitat County Fire District 10 and Benton County Fire District 5). Since we have only one Paramedic, we are unable to provide full ALS coverage and must revert to BLS coverage when the Paramedic is unavailable. Therefore, we must work closely with our neighboring ALS agencies as well. Mutual aid is received and given to the Tri-Cities area when advanced life support is needed through a Mutual Aid Agreement.

District Concerns

Benton County Fire Protection District 6 is a very rural area with huge commercial target hazards. It is the perfect storm for major infrastructure loss. In 2013 our district experienced a huge event at the Williams Pipeline bulk storage facility that resulted in a \$100 million-dollar loss. Our limited budget combined with the State of Washington one percent maximum budget increase law has crippled our

small department for many years. As our District valuation increases the tax amount per thousand decreases. Due to our rural location and limited population to draw volunteers, a series of community meetings were held so that the voting public had an opportunity to see, in our current state, we are unable to fight the most basic interior structure fires due to the lack of certified firefighters. BCFD6 also has six seasoned responders that are near retirement age. However, these few volunteers respond to a majority of the calls for service. These precious few members are the “backbone” of our organization and are vital to our continued operation. New volunteers have recently joined our ranks but will require several years of training to be able to take on medical and fire responsibilities.

Benton County Fire Protection District 6 does not enjoy a large donating population. Fundraisers in our economically depressed area do not produce the donations needed to purchase equipment. The tax base and a small amount of ambulance income are all that our Department has to operate on.

The remaining budget priorities are placed on personal protective equipment, maintenance, ensuring apparatus are safe, training firefighters and training EMT's. Several fire stations owned by Benton County Fire District 6 are thirty-five years old and require major repair.

District Needs

The following statements describe the various needs of BCFD #6; some of these items should be considered for future Mitigation Action Items:

- BCFD6 needs weed abatement along the state, federal highways and railways throughout our fire district. The overgrowth and close proximity of combustibile vegetation causes multiple large fires every year.
- Personnel need is another issue for BCFD6. The small community to draw from does not provide adequate responders for our area. With our rural location, this can be detrimental to the person in need if we do not have the responders to help.
- Firefighter and EMT training. Due to our rural location it is difficult to get outreach training for firefighter 1, wildland firefighter and Emergency Medical Technician.
- Fire apparatus. With the age of our fleet firefighting apparatus replacement is a concern.



Kennewick Fire Department

Department Summary

The City of Kennewick is fortunate to be situated in an area that offers spectacular views of the Horse Heaven Hills to the south, Rattle Snake Mountain to the west, the Columbia River to the north and the broad plains of the Columbia Basin and Blue Mountains to the east. These natural features are valued because it emphasizes the region's identity with our three rivers (Yakima, Snake and Columbia), the agricultural industry and the desert lying just outside our irrigated boundaries. These features and dry climate provide for wildfire activity throughout a good part of the year. The City of Kennewick Fire Department (KFD) is primarily an urban/suburban fire agency which employs 94 personnel and provides fire suppression, Emergency Medical Services (EMS), fire prevention, investigation and code enforcement, technical rescue, hazardous materials and incident management services to Kennewick citizens as well as to the surrounding community through strong mutual and automatic agreements.

Department Concerns

As stated above KFD is primarily an urban/suburban fire department that deals with all risk incidents. KFD areas of concern are:

Residential Growth: The population of Kennewick has increased significantly since its incorporation as a city in 1904. At the time of the 1910 census, the Kennewick population was 1,219 people. In 2018 the population is 81,850. Using data from the U.S. Census Bureau Kennewick is planning for a population of 112,044 by the year 2037; an increase of just over 30,000 residents over the next 20 years. This increase in population will increase calls for EMS service which is 80% of the responses that the department handles annually. The additional need for EMS service will have a direct effect on available resources to respond to wildland fires as most fire units are cross staffed with ambulances.

Wildland Urban Interface: The city is bordered to the south by open grass and sage lands. Prevailing winds from the southwest historically push large wildland fire into the city. On August 11th, 2018 one such fire called the Bofer Canyon Fire moved into the City of Kennewick with devastating results. The fire was a result of a road side start off of Highway 82 just south of the Kennewick Exit. Pushed by 30 mph winds the fire hit the Canyon Lakes housing development within minutes making a run to the east through several additional housing developments before being stopped at Olympia Street. The result was the total loss of five homes with four additional damaged homes and several outbuildings lost or damaged. Two citizens sustained minor injuries and the landscape was stripped of all vegetation creating a dust problem throughout the summer and fall months. Additionally, the city has several riparian areas that are wildfire interface problem areas. The city does not have the funding to provide for a fuels management program for the riparian areas identified as Zintel Canyon, Blackberry Canyon, the riparian area south of 27th & Cascade St., and riparian area 53rd and Washington St., all are Wildland Urban Interface zones.

Communications: KFD is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county). SECOMM has a rather complex and somewhat temperamental VHF simulcast and micro wave system utilized by fire agencies,

while Law agencies operate on an 800MHz radio system. The VHF radio system is very out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

Cooperative Agreements: KFD is a signatory to Washington State Fire Mobilization Plan and has a cooperative agreement with the Department of Natural Resources. KFD has mutual aid and automatic aid agreements in place with agencies within Benton, Franklin and Walla Walla counties. As of 2018 KFD did not have a federal cooperative agreement in place which would allow for KFD resources to participate on USFS, USFW, BLM or other federal agencies incidents. A federal agreement should be developed for the 2019 fire season.

Residential Burning: Outdoor burning permissions within the City of Kennewick UGA (urban growth area) are determined based upon the Benton County burning regulations. The City of Kennewick does not allow any outdoor burning (other than blown tumbleweeds) within the UGA. The Benton Clean Air Agency is charged with enforcing burning regulations.

Other: The Kennewick Fire Department provides EMS and structural fire suppression assistance to its surrounding neighboring jurisdictions, while relying heavily on neighboring fire districts and department for assistance in wildfire suppression. KFD also, participates in Incident Management Team (IMT) activities for large wildfires occurring locally, state wide and nationally. As the experienced IMT personnel retire out recruiting and training personnel to fill those positions will be critical in the coming years.

Benton County and the City of Kennewick should adopt a regulation requiring “defensible space” for all existing and new construction within the WUI. This process will require a two-fold approach. First, public education through a collaborative partnership with the media, fire departments, and emergency management, and second development and adoption of county ordinances requiring the improvement and maintenance of defensible spaces.

The City of Kennewick should explore a fuels management program mainly within the identified WUI and riparian zones to reduce the risk of wildfire to the community while improving and maintaining ecosystem health.

Department Needs

Firewise-Wildland Urban Interface Defensible Space: An integrated and focused public education program dedicated to wildland fire prevention and protection needs to be developed and implemented throughout the county. This program should include consistent and enforceable burning regulations, information on defensible spaces, and outreach programs through the use of all facets of media, including social media.

Riparian Fuels Management Program: The riparian landscape is the interface between bodies of water such as rivers, streams, and lakes and upland ecosystems. The major riparian areas in Benton County lie along the Columbia and Yakima rivers; however, smaller riparian areas are present along many smaller streams, ponds, and irrigation ditches. Most riparian areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway,

vegetation generally resorts back to the typical shrub-steppe or grass fuel types that dominate the county, and within the City of Kennewick abut to mostly residential property creating a wildfire interface problem. The City of Kennewick is in need of a fuels mitigation and vegetation management program within these areas. These riparian areas are full of hazardous fuels, live and dead vegetation that has accumulated and increases the likelihood of unusually large wildland fires. When fire encounters areas of heavy fuel loads (continuous brush, downed vegetation or small trees) it can burn these surface and ladder fuels and may quickly move from a ground fire into a crown fire.

Fuel treatments are intended to lower the risk of catastrophic wildfires by managing vegetation to modify/reduce hazardous fuels. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires. Benefits from fuel treatments include; prevent loss of lives, reduce fire suppression cost, reduce private property losses and protect natural resources (control of unwanted vegetation, including invasive species, improvement of rangeland for livestock grazing, improvement of fish and wildlife habitat, enhancement and protection of riparian areas and wetlands, and improvement of water quality) from devastating wildfire.

Funding for a strategic management and control of wildland vegetation is essential to the safety, health, recreational, and economic wellbeing of Kennewick's citizens.

Pre-Attack or Pre-Incident Planning: The City of Kennewick should begin to employ GIS technology to aid in wildfire pre-incident planning and in the development of pre-attack plans which include zone maps identifying key fire suppression actions. Additionally, dispatch deployment plans should be created to insure rapid deployment of the right type and number of resources to each zone to assist first responders before they arrive on scene and need to request resources.

Contingency Planning: Contingency plans identify high-risk neighborhoods and areas with the potential for large wildland incidents. These plans contain information that may be beneficial to incoming resources, including fuel types, water sources, staging areas and ICP locations.

A map of each high-risk neighborhood also is provided to give users an elevated view of the area and its potential threats.



Richland Fire and Emergency Services

Department Summary

Richland Fire and Emergency Services provide all fire, ambulance, and other emergency services to 54,989 citizens located in 35.72 square miles of Benton County in southeast Washington State. With robust mutual aid agreements, Richland provides and receives assistance during large incidents or times of overwhelming call volumes. Mutual aid partners with automatic aid agreements include Benton County Fire District #4, Hanford Fire Department, Benton County Fire District #1, Kennewick Fire Department, and Pasco Fire Department. In 2018, Richland Fire and Emergency Services responded to 6,764 calls for service. Richland currently carries a full-time staff of 63 employees, with 60 of those employees maintaining training and certifications for line firefighting. Response to emergency incidents is carried out from four stations located throughout the city. Each station is staffed 24 hours per day, year-round, with a minimum of three firefighters, including an officer and at least one paramedic. All line personnel trained to NWCG firefighter 2 or above. Each station houses a type 1 structural engine, an advanced life support ambulance, and a specialized apparatus such as wildland engine or aerial apparatus.

City of Richland is a rapidly growing community due in part to its close proximity to the Hanford nuclear reservation where many laboratories and energy related industries provide excellent job and professional growth opportunities. Richland also provides many recreational opportunities, being located at the convergence of the Columbia and Yakima rivers. Over 3 square miles of river are accessible within Richland's boundaries. As Richland continues to grow, homes in the wildland urban interface present additional challenges for fire prevention and suppression. Additionally, many high value laboratories and research facilities are located in north Richland close to Hanford, where there are significant wildland urban interface exposures.

Department Concerns

Richland Fire and Emergency Services has identified several issues which need to be addressed in the immediate future. These issues are serving an aging population, maximizing organizational efficiencies, and serving the growth of the community. Serving the growth of the community requires strengthening wildland urban interface response capabilities.

As Richland grows, more wildland urban interface hazards arise. Additionally, more individuals take part in recreational activities on our local waterways and hiking areas such as Badger Mountain, Amon Canyon, Bateman Island, and the Yakima delta. Improved access for emergency vehicles, in conjunction with identified egress routes from these areas, will help improve safety in the city as well as protect property in the event of wildfire. Plans are being worked on to achieve these goals, but there will likely be significant expense involved. As with any growth, additional facilities need to be considered, as well as staffing for the facilities. Plans are in place to build additional stations, as well as staff those stations, to ensure the high level of service Richland residents have come to expect. Funding for these additional facilities will be a significant hurdle.

West Benton Fire Rescue

Department Summary

WBFR provides fire, rescue and emergency medical services to an area of 176 square miles located in Western Benton County, including the City of Prosser and Community of Whitstran. This response area is comprised of urban, suburban, rural and wildland is inhabited by 13,300 permanent residents and is split down the middle by the Yakima River. WBFR provides fire protection to the area with 3 paid personnel, 2 seasonal employees and 25 volunteers, answering over 600 calls for service annually.

Department Concerns

Personnel: WBFRs response model relies heavily on Volunteer Firefighters, which make up 85% of our response force. Due to a societal decline in volunteerism and the ever-increasing requirements to be a firefighter, WBFR has found it difficult to increase the depth of the Volunteer ranks. In addition, it is difficult to expand specialized services such as technical rescue and hazardous materials response when so heavily reliant on Volunteer Firefighters.

Rural Property Development: WBFRs response area continues to see development of new single-family residential structures into the Intermix/Interface areas comprised of heavy grass/brush fuels. Many times, fires in the interface/intermix require an extensive amount of resources to provide structure protection as well as being actively engaged in fire suppression. This can cause a large drain on regionally available apparatus.

Communications: With the recent addition of Franklin County and Walla Walla Fire District 5 to our dispatching agency, radio traffic has been extremely busy. Though local repeaters and tactical frequencies used to command individual incidents are plentiful, both the availability of simulcast frequencies to communicate with the dispatcher AND the personnel at the dispatch center to listen to multiple frequencies is lacking.

Vegetation Management: Invasive plant species such as Kocia and Russian thistle, along with cheatgrass, make managing a 5-acre rural residential parcel difficult. Many rural property owners fail to control invasive species which leads to insufficient or non-existent defensible space.

The lack of a State Vegetation Management Program has allowed the cheatgrass and invasive species to grow right up the end edge of Interstate and State Highway road surfaces. Vegetation that has grown up to the edge of a roadway becomes critically dry in the summer months and is easily ignited by discarded smoking material, mechanical problems or traffic accidents and creates traffic hazards due to fire, smoke and responding fire apparatus in the roadway. WBFR protects thousands of acres of lands that abut under-maintained roadways and spend a considerable amount of time dealing with wildland fires started from roadside ignitions.

Burn Permits: WBFR does not issue burn permits. Burning is limited within the City Limits of Prosser, and surrounding UGA to tumbleweeds. In the rural areas of the response area, Benton County Clean Air Agency sets burning regulations and sets the daily burn decision regarding outdoor burning. Many times, people are unaware about the daily burn decision or the presence of a burn ban.

Fire Inspections: Prosser is home to a vibrant downtown core comprised of 100-year-old multi-story buildings that house restaurants, assembly occupancies, mercantile, offices and residential units. Fire and Life Safety Inspections came under the authority and responsibility of the City of Prosser in 2015. Proper fire and life safety inspections must be maintained to minimize the occurrences of devastating downtown fire losses.

Other: Relying primarily on Volunteer Firefighters, WBFR sometimes struggles to mount an effective initial response force to incidents, and a large/complex natural cover fire or structure always requires the assistance from neighboring agencies to mitigate. To augment day time response in during the summer months, WBFR hires 2 seasonal employees to complete station tasks and respond on incidents.

The two WBFR fire stations are not staffed around the clock, and calls that occur at night or over the weekend are staffed with personnel responding from home. WBFR must continue to identify ways to decrease “turnout time” to incidents, which includes identifying funding to house responders at the headquarters fires station.

WBFR has begun to identify and install fuel breaks around the WUI to the South of town with our heavy equipment. WBFR will continue to build private landowner relationships and identify areas where fuel breaks will have a positive impact.

Cooperative Agreements: WBFR is a signatory to the Tri-County Master Mutual Aid Agreement which includes all agencies in Benton, Franklin and Walla Walla Counties. Additionally, due to our proximity to Yakima County, WBFR has individual Agreements Yakima County Fire District 5, and with the Cities of Sunnyside, Grandview, Mabton, Toppenish and Yakima when additional apparatus is needed. WBFR also has cooperator agreements with USFWS, DNR and BLM.

Department Needs

- Benton County Building Department and the City of Prosser establishing and enforcing codes requiring defensible space around structures and a concerted effort made to form a County wide community education campaign.
- Additional personnel to staff WBFR with a crew around the clock to reduce turnout time.
- Washington State Department of Transportation reinstatement of a proper vegetation management program to address roadway ignition hazards.
- Identification and implementation of frequencies identified for emergency response and dispatch staffing to support a large multi-county dispatch operation.

Apparatus Inventory

Table 11) West Benton Fire Rescue apparatus inventory.

Fed ID #								
Address	Unit #	Year	Make	Tank Size	Type	GPM	Other Information	Available for Mob.
Station 310: 1200 Grant Ave	CH131	2017	Chevrolet Tahoe				Command	Yes
	CT131	2012	Ford F-250				Command	Yes
	CT132	2016	Ford F150				Command	Yes
	UT131	2009	Chevrolet Tahoe				Utility	Yes
	R1341	2005	Braun		Type 4 Rescue		Hvy Rescue	Yes
	E1311	1994	E-One	750	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1313	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1311	2010	E-One	3000	Type 1 Tender	750	Tactical	Yes
	W1312	1986	Ford LTL9000	4500	Type 1 Tender	1000	Water Tender	Yes
	E1352	2000	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	E1351	2009	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	Transport131	1988	White/GMC		Transport		Tractor/Trailer	Yes
	Dozer 1321	1982	Case 1150C		Type 2 Dozer		With Disc	Yes
ATV131		Polaris 400 4x4		ATV		Swamper	Yes	
Station 320: 15802 Rothrock Rd	E1312	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1313	1989	International	2500	Type 1 Tender	250	Tactical Tender	Yes
	E1353	2004	Ford F450	450	Type 5 Engine	150	4x4 Wildland	Yes
	E1363	1988	Chevrolet 3500	250	Type 6 Engine	150	4x4 Wildland	Yes

Washington Department of Natural Resources



District Summary: The Washington Department of Natural Resources (DNR) is the largest on-call fire department in the State with 1,200 permanent and temporary employees that fight fire on more than 12 million acres of private and state-owned forest lands. The DNR's fire protection and safety equipment requirements help local fire districts respond to wildfires. The DNR also works with the National Weather Service to provide the fire weather forecasts and fire precaution levels that firefighters, landowners, and forest industry rely on.

The Washington DNR does not have resources directly assigned to Benton County. The DNR's Northwest Region has 8-10 Type 5 and 6 initial attack engines staffed and available during the fire season in addition to air resources. These resources as well as others statewide are available to Benton County as they are available.

****NOTE: Washington DNR does not respond to structure fires.****

Bureau of Land Management



Spokane District Mission Statement: The mission of the Spokane District is to share our unique capability and interest in sustaining the full diversity of natural and cultural landscapes across Washington State and invite their discovery and use. This includes protecting the natural resources, such as water for fish and wildlife; preserving environmental and cultural values on the lands they manage; providing for multiple uses including some commercial activities; and enhancing opportunities for safe and enjoyable outdoor recreation. The Spokane District also assesses energy and mineral resources and works to ensure that their development is in the best interest of the public. Another major responsibility is to ensure consideration of Tribal interests and administration the Department of Interior's trust responsibilities for American Indian Reservation communities.

District Summary: Up through the 1970's, BLM's policy was to divest ownership of all federal public (BLM) lands in the state of Washington. But in 1980, at the height of the Sage Brush Rebellion (a social movement to give control over federal lands to the states and local authorities), Washington voted to have the public lands remain under federal ownership and management. In the 1980 general election, the state put a measure on the ballot asking voters if the state constitution should "be amended to provide that the state no longer disclaim all rights to unappropriated federal public lands." Approximately 60% of the people and the majority in every county voted no, signaling to BLM that there was strong support for continued federal management of the public lands in the state. Today the Spokane District BLM manages just over 11,000 acres in Benton County for multiple uses, providing wildfire protection, suppression, support, and training for the BLM managed lands and other federal/state/county agencies.

The Spokane District Fire Management Program currently consists of two type six wildland engines (300 gallons) with two full time Engine Captains, four engine crew members, one ten-person hand crew, one Fuels Technician, Seasonal Dispatcher, Assistant Fire Management Officer (AFMO), and a Fire Management Officer (FMO). The hand crew and one engine are stationed in Spokane at the District

office and the other in Wenatchee at the field office. There are approximately 16 other specialist (staff) from across the district that assist the Fire Management Program in wildland and/or prescribed fire efforts. With the District's scattered ownership pattern, the engines are usually on scene after initial attack forces have arrived. Our engines and personnel are available for off District and out of state fire assignments that aide in support, training, and experience.



Fire Protection Issues

The following sections provide a brief overview of the many difficult issues currently challenging Benton County in providing wildland fire safety to citizens. These issues were discussed at length both during the committee process and at the public meetings.

Address Signage

The ability to quickly locate a physical address is critical in providing services in any type of emergency response. Accurate road address and address signage is fundamental to ensuring the safety and security of Benton County residents. Currently, there are numerous areas throughout the county lacking road signs, address markers, or both. Updating signage throughout the county will increase the likelihood that first responders will be able to quickly locate and read posted signs in emergency situations.

Coordination with State and Federal Agencies

Efforts are being created to improve communication between local fire departments and the federal agencies through agreements and sharing communication plans. This presents a problem when there is confusion on who has initial attack responsibilities on federal lands and what restrictions are imposed by the jurisdictional agency responsible for fire protection.

Urban and Suburban Growth

One challenge Benton County faces is the large number of houses in the urban/rural fringe. Since the 1970s, a segment of Washington's growing population has expanded further into traditional rural or resource lands. The "interface" between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires. Benton County has a low number of Firewise Communities; therefore, there are many property owners within the interface that are not aware of the problems and threats they face. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Rural Fire Protection

People moving from urban areas to the more rural parts of Benton County, frequently have high expectations for structural fire protection services. Often, new residents do not realize that the services provided are not the same as in an urban area. The diversity and amount of equipment and the number of personnel can be substantially limited in rural areas. Fire protection may rely more on the landowner's personal initiative to take measures to protect his or her property. Furthermore, subdivisions on steep slopes and the greater number of homes exceeding 3,000 square feet are also factors challenging fire service organizations. In the future, public education and awareness may play a greater role in rural or interface areas. Great improvements in fire protection techniques are being made to adapt to large, rapidly spreading fires that threaten large numbers of homes in interface areas.

Debris Burning

Local burning of yard debris is highly regulated in Benton County. Permit burns in Benton County are based on the DNR cycle, while burn bans are a locally-based decision determined by fuel moistures (see

Fire District Summaries for more information on burning). Some people still burn outside of the designated time frame, and escaped debris fires impose a very high fire risk to neighboring properties and residents. It is likely that regulating this type of burning will always be a challenge for local authorities and fire departments; however, improved public education regarding the county's burning regulations and permit system as well as potential risk factors would be beneficial.

Pre-planning in High Risk Areas

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Benton County, recommended projects cannot all occur immediately, and many will take several years to complete. Thus, developing pre-planning guidelines specifying which and how local fire agencies and departments will respond to specific areas is very beneficial. These response plans should include assessments of the structures, topography, fuels, available evacuation routes, available resources, response times, communications, water resource availability, and any other factors specific to an area. All of these plans should be available to the local fire departments as well as dispatch personnel.

Conservation Reserve Program Fields

Since the introduction of the CRP by the federal government, many formerly crop producing fields have been allowed to return to native grasses. CRP fields are creating a new fire concern all over the west. As thick grasses are allowed to grow naturally year after year, dense mats of dead plant material begin to buildup. Due to the availability of a continuous fuel bed, fires in CRP fields tend to burn very intensely with large flame lengths that often jump roads or other barriers, particularly under the influence of wind. Many landowners and fire personnel are researching allowable management techniques to deal with this increasing problem.

Currently, large blocks of land as well as scattered parcels in Benton County are enrolled in the CRP program. Hundreds of acres of continuous higher fuel concentrations as well as limited access to these areas have significantly increased the potential wildfire risk in these areas. Many CRP landowners are willing to conduct hazardous fuel reduction treatments to lessen the fire risk; however, they are often limited by the regulations of the CRP program.

Due to the difficulties involved with conducting fuel reduction projects on CRP land as well as the enormity of the task in Benton County, the Community Wildfire Protection Plan steering committee has recommended disking fuel breaks adjacent to CRP land wherever possible. The goal is to lower the intensity of a wind-driven CRP fire before it threatens homes and other resources.

Volunteer Firefighter Recruitment and Retention

The rural fire departments in Benton County are predominantly dependent on volunteer firefighters. Each district spends a considerable amount of time and resources training and equipping each volunteer, with the hope that they will continue to volunteer their services to the department for at least several years. One problem that all volunteer-based departments encounter is the diminishing number of new recruits. As populations continue to rise and more and more people build homes in high

fire risk areas, the number of capable volunteers has gone down. In particular, many departments have difficulty maintaining volunteers available during regular work day hours (8am to 5pm).

One of the goals of this CWPP is to assist local fire departments and districts with the recruitment of new volunteers and retention of trained firefighters. This is a very difficult task, particularly in small, rural communities that have a limited pool; however, providing departments with funding for training, safety equipment, advertising, and possibly incentive programs will help draw more local citizens into the fire organizations.

Communication

There are several communication issues being addressed in Benton County. Many of the emergency responders have identified areas of poor reception for both radios and cell phones. The lack of communication between responders as well as with central dispatch significantly impairs responders' ability to effectively and efficiently do their job as well as lessens their safety. The conversion to a narrow band communication system exacerbated these issues and will require numerous additional repeaters to be installed. Additionally, the radio system will soon require replacement of the microwave.

For emergency situations, Benton County currently uses CodeRed to keep citizens informed. CodeRed is an opt-in notification program that is free for citizens.

Communication is a central issue for the planning committee; thus, numerous recommendations targeting the improvement of communications infrastructure, equipment, and pre-planning have been made.

Water Resources

Nearly every fire district involved in this planning process indicated the need to develop additional water resources in several rural areas. Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, which saves valuable time for both structural and wildland fire suppression efforts.

Invasive Species

Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass (*Bromus tectorum*) and other invasive species. Cheatgrass has a very fine structure, tends to accumulate litter, and dries completely in early summer, thus becoming a highly flammable, often continuous fuel.²¹

²¹ USDA online database.

<http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html#REFERENCES> Accessed December, 2013.

Public Wildfire Awareness

As the potential fire risk in the wildland urban interface continues to increase, it is clear that fire service organizations cannot be solely responsible for protection of lives, structures, infrastructure, ecosystems, and all of the intrinsic values that go along with living in rural areas. Public awareness of the wildland fire risks as well as homeowner accountability for the risk on their own property is paramount to protection of all the resources in the wildland urban interface.

The continued development of mechanisms and partnerships to increase public awareness regarding wildfire risks and promoting “do it yourself” mitigation actions is a primary goal of the planning committee as well as many of the individual organizations participating on the committee.



Current Wildfire Mitigation Activities

Many of the county's fire departments and agencies are actively working on public education and homeowner responsibility by visiting neighborhoods and schools to explain fire hazards to citizens. Often, they hand deliver informative brochures and encourage homeowners to have their driveways clearly marked with their addresses to ensure more rapid and accurate response to calls and better access.

The City of Richland Fire Department has contacted homeowners around the Leslie Canyon Area, to educate them about the fire hazard and actions they can take to make their properties more resistant to fire. Some of these residents have completed work needed. Residents in Country Ridge were also contacted and have done work as well. The City of Kennewick is working with residents in the Zintel Canyon area to discuss similar measures. BCFD#1 has made contact with residents in the Triple Vista and Clodfelter areas and the Badger and Dallas Road areas to discuss similar measures.

Firewise

“Over the past century, America’s population has nearly tripled, with much of the growth flowing into traditionally natural areas. These natural, unprotected settings are attracting more residents every year. This trend has created an extremely complex landscape that has come to be known as the wildland urban interface: a set of conditions under which a wildland fire reaches beyond trees, brush, and other natural fuels to ignite homes and their immediate surroundings. Consequently, in nearly all areas of the country, the wildland urban interface can provide conditions favorable for the spread of wildfires and ongoing threats to homes and people. Many individuals move into these landscapes with urban expectations. They may not recognize wildfire hazards or might assume that the fire department will be able to save their home if a wildfire ignites. However, when an extreme wildfire spreads, it can simultaneously expose dozens — sometimes hundreds — of homes to potential ignition. In cases such as this, firefighters do not have the resources to defend every home. Homeowners who take proactive steps to reduce their homes’ vulnerability have a far greater chance of having their homes withstand a wildfire. The nation’s federal and state land management agencies and local fire departments have joined together to empower homeowners with the knowledge and tools to protect their homes through the National Firewise Communities Program. Firewise Communities is designed to encourage local solutions for wildfire safety by involving firefighters, homeowners, community leaders, planners, developers, and others in efforts to design, build, and maintain homes and properties that are safely compatible with the natural environment. The best Firewise approach involves a series of practical steps that help individuals and community groups work together to protect themselves and their properties from the hazard of wildfire. Using at least one element of a Firewise program and adding other elements over time will reduce a homeowner’s and a community’s vulnerability to fire in the

wildland/urban interface. Wildland fires are a natural process. Making your home compatible with nature can help save your home and, ultimately, your entire community during a wildfire.”²²

Fire Adapted Communities (FAC)

“Fire Adapted Communities are neighborhoods located in wildfire-prone areas that can survive wildfire with little or no assistance from firefighters. During a wildfire, FACs reduce the potential for loss of human life and injury, minimize damage to homes and infrastructure and reduce firefighting costs. This program offers information, promotional materials and articles that can be customized for your area. This program also offers videos and a display system that is available for use at community events, meetings, etc.”²³

Firebreaks

Fire breaks have been constructed in some areas, such as Rattlesnake Mountain and the Richland Airport. There are fire breaks throughout the county that are maintained on an as-needed basis.

Staff Rides

Some agencies participate in Staff Rides, like to Rattlesnake Mountain, which involve taking agency members to known areas of past fires and reviewing such wildfire factors as terrain and successful tactics, in preparation for future incidents in the same areas.

Public Wildfire Awareness

Some agencies currently post information on social media to teach homeowners about defensible space concepts and strategies.

²²

<http://www.firewise.org/Information/Who-is-this-or/Homeowners/~media/Firewise/Files/Pdfs/Booklets%20and%20Brochures/BrochureCommunitiesCompatibleNature.pdf>. Accessed June, 2012.

²³ Living with Fire website available at: <http://www.livingwithfire.info/fire-adapted-communities>. Accessed May, 2014.

Drought

The term 'drought' is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance: water-supply reservoirs empty, wells dry up, and crop damage ensues. The severity of the drought is gauged by the degree of moisture deficiency, its duration, and the size of the area affected. If the drought is brief, it is known as a dry spell, or partial drought. A partial drought is usually defined as more than 14 days without appreciable precipitation, whereas a drought may last for years.

Definitions

Washington has a statutory definition of drought, consisting of two parts:

1. An area has to be experiencing or projected to experience a water supply that is below 75 percent of normal.
2. Water users within those areas will likely incur undue hardships as a result of the shortage.

Background Information

Drought is a normal, recurrent feature of climate. It occurs in virtually all climate zones, but its characteristics vary significantly from one region to another. Drought is a temporary occurrence; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate. A drought is therefore different from a dry climate.

Droughts tend to be more severe in some areas than in others. Catastrophic droughts generally occur at latitudes of about 15°-20°, in areas bordering the permanently arid regions of the world. In North America, archaeological studies of Native Americans and statistics derived from long term agricultural records show that six or seven centuries ago whole areas of the Southwest were abandoned by the indigenous agriculturists because of repeated droughts and were never reoccupied. The statistics indicate that roughly every 22 years—with a precision of three to four years—a major drought occurs in the United States, most seriously affecting the Prairie and midwestern states.

A drought directly or indirectly affects all people and all areas of the state. A drought can result in farmers not being able to plant crops or the failure of the planted crops. Table 12 shows how drought is classified by severity and which impacts/consequences can be expected at different levels of severity. This results in loss of work for farm workers and those in related food processing jobs. Other water or electricity-dependent industries commonly shut down all or a portion of their facilities, resulting in further layoffs. A drought can spell disaster for recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies) and for landscape and nursery businesses because people will not invest in new plants if water is not available to sustain them. Additionally, with much of Washington's energy coming from hydroelectric plants, a drought can mean more expensive electricity from other resources than dams and probably higher electric bills.

Historical Drought Events

The State's most severe drought episode occurred in 1977, when many of the current records for low precipitation, snow accumulation (e.g. snowpack), and stream flow totals were set. The more recent 2001 drought turned out to be the second-worst drought year in state-recorded history. By mid-March 2001, most of Washington was suffering a water supply deficit. Federal, state and local officials worried that low river flows would disrupt state energy production. Dwindling water supplies put various threatened and endangered fish species at risk. The state also experienced severe economic strain on its agricultural, municipal and industrial sectors due to the drought. In 2015, 44% of Washington was declared a drought emergency area, including Benton County. By May of 2015 one fifth of the state's rivers and streams were at record lows. By August 85% of the state was categorized as "extreme drought", also including Benton County.

In the last century, there have been a number of drought episodes in eastern Washington, including several that have lasted for more than a single season, such as the dry periods between 1928-32 and 1992-94. The primary effects of these droughts have been economic – affecting agriculture and the population in general due to energy curtailments. The worst national drought in 50 years affected at least 35 states during the summer of 1988. In some areas the lack of rainfall dated back to 1984. In 1988, rainfall totals over the mid-west, Northern Plains and the Rockies were 50 percent to 85 percent below normal. Crops and livestock died, and some areas were affected by desertification. Forest fires began over the Northwest and by autumn, 4,100,000 acres had been destroyed.

Table 12) Drought severity index from U.S. Drought Monitor Weekly Drought Map (noaa.gov).

Description	Possible Impacts
Abnormally Dry	Going into drought: short-term dryness slows growth of crops/pastures. Coming out of drought: some lingering water deficits; crops/pastures not fully recovered.
Moderate Drought	Some damage to crops/pastures; streams, reservoirs, or wells are low with some water shortages developing or imminent; voluntary water-use restrictions requested.
Severe Drought	Crop/pasture losses are likely; water shortages are common and water restrictions are imposed.
Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions.
Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.

Severe Weather

Severe storms are a serious hazard that can and do affect the Pacific Northwest on a regular basis. Due to Washington's complex landscape and influence from the Pacific Ocean, severe storms have varying degrees of impact on different portions of the state. Although Washington sees relatively few damaging storms in comparison with the rest of the nation, severe weather still poses a significant hazard to both state and local communities.

Definitions and Background Information

High Winds: Sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration, not caused by thunderstorms. In Washington State, extreme sustained wind velocities can be expected to reach 50 mph at least once in two years; 60 to 70 mph once in 50 years; and 80 mph once in 100 years. The National Climatic Data Center (NCDC) has recorded 82 high or strong wind events with wind speeds greater than 30 knots since 1950. The 2014 Washington State Enhanced Hazard Mitigation Plan identified Benton County as being vulnerable to severe high wind events.

Severe Thunderstorm: A thunderstorm that produces a tornado, winds of at least 58 mph (50 knots), and/or hail at least 1 inch in diameter. A thunderstorm with wind equal to or greater than 40 mph (35 knots) and/or hail at least ½ inches in diameter is defined as approaching severe. Thunderstorms with lightning, heavy rain, hail, and high winds are frequent occurrences in Benton County and its neighboring counties from late April through September. The spring storms are generally the result of local convection. They develop fairly quickly, dissipate rapidly, and generally cause small amounts of localized damage, if any. The NCDC has recorded 48 Thunderstorm Wind events in Benton County since 1950.

Tornado: A violently rotating column of air, usually pendant to a cumulonimbus (type of cloud), with circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud rotating noise. On a local scale, it is the most destructive of all atmospheric phenomena. Since 1956, only four tornadoes have been recorded in Benton County, the most recent occurred in 2015. None of these tornadoes were large enough to receive a Fujita tornado intensity rating.

Heavy Snow: This generally means: a snowfall accumulating to 4" or more in depth in 12 hours or less or a snowfall accumulating to 6" or more in depth in 24 hours or less. The NCDC has recorded 14 heavy snows events in Benton County since 1950.

Lightning: A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud. Lightning strikes are fairly common during summer storms and are known to start fires and damage property, such as what happened in August of 2009 when lightning strikes started the Dry Creek Complex fire.

Hail: Showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud. The NCDC has recorded 13 hail events in Benton County since 1950.

None of these events caused significant property damage or included widespread occurrence of hailstones larger than 1 inch in diameter.

Winter storm: A storm with significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation. Heavy snowfall is 4 inches or more in a 12-hour period, or 6 or more inches in a 24-hour period in non-mountainous areas; and 12 inches or more in a 12-hour period or 18 inches or more in a 24-hour period in mountainous areas. The NCDRC has recorded 4 winter storm events in Benton County since 1950.

Historical Weather Events

From 1956 to 2017, 152 Presidential Disaster declarations were made for Washington State, 43 of which were related to severe weather. Of these 43 events, 12 directly impacted Benton County.²⁴

Table 13) Presidential Disaster declarations made for Benton County between 1956 and 2017.

FEMA Disaster #	Year	Extent	Incident Title
137	1962	Statewide	SEVERE STORMS
185	1964	Benton County	HEAVY RAINS & FLOODING
414	1974	Benton County	SEVERE STORMS, SNOWMELT & FLOODING
492	1975	Benton County	SEVERE STORMS & FLOODING
545	1977	Benton County	SEVERE STORMS, MUDSLIDES, & FLOODING
852	1990	Benton County	SEVERE STORMS & FLOODING
1100	1996	Benton County	HIGH WINDS, SEVERE STORMS AND FLOODING
1159	1997	Benton County	SEVERE WINTER STORMS, LAND & MUDSLIDES, FLOODING
3037	1977	Benton County	DROUGHT
1817	2009	Benton County	SEVERE WINTER STORM, LANDSLIDES, MUDSLIDES, AND FLOODING
1825	2009	Benton County	SEVERE WINTER STORM AND RECORD AND NEAR RECORD SNOW
4309	2017	Benton County	SEVERE WINTER STORMS, FLOODING

²⁴FEMA Data Visualization: Disaster Declarations for States and Counties. Accessed 1/23/18 <https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties>:

Earthquake

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Background Information

More than 1,000 earthquakes occur in the Washington State annually. Washington has a record of at least 20 damaging earthquakes during the past 125 years. Large earthquakes in 1946, 1949, and 1965 killed 15 people and caused more than \$200 million (1984 dollars) in property damage. Most of these earthquakes occurred in western Washington but several, including the 1872 Lake Chelan earthquake which is one of the largest earthquakes on record for the State of Washington, occurred east of the Cascade crest. Because of the potential for another earthquake with a magnitude similar to that of the Lake Chelan quake, researchers are currently attempting to map and understand the seismic potential of the fault systems in eastern and central Washington. One geologic feature that is of particular concern in central Washington is the Wallula Fault Zone which runs through Benton County. Some researchers believe that the fault could produce a 7.5 magnitude earthquake which could cause substantial surface cracking, soil liquefaction, and damage to infrastructure in local communities.

In addition to locating and mapping fault lines in Washington, researchers are also attempting to predict when earthquakes will occur. Earthquake histories spanning thousands of years from Japan, China, Turkey, and Iran show regional patterns of large earthquake reoccurrence on the order of hundreds or thousands of years. Unfortunately, Washington's short historical record (starting about 1833) is inadequate to sample its earthquake record. Using a branch of geology called paleoseismology to extend the historical earthquake record, geologists have found evidence of large, prehistoric earthquakes in areas with no documentation of large historic events, suggesting that most of the state may be at risk (Walsh *et al.* 2006).

Definitions

Cascadia Subduction Zone Earthquakes: the result of geologic processes producing stresses in the earth. In the Pacific Northwest, oceanic crust is being pushed beneath the North American continent along a major boundary parallel to the coast of Washington and Oregon. The boundary called the "Cascadia Subduction Zone" lies about 50 miles offshore and extends from the middle of Vancouver Island in British Columbia past Washington and Oregon to northern California. The interaction of these two "plates" produces three primary types of earthquakes:

- **Deep or Benioff Zone Earthquakes:** These earthquakes occur within the subducting Juan de Fuca plate at depths of 15 to 60 miles, although the largest events typically occur at depths of about 25 to 40 miles. They may produce events with magnitudes exceeding 9.0.
- **Subduction Zone (Interplate) Earthquakes:** These earthquakes occur along the interface between tectonic plates. Scientists have found evidence of great-magnitude earthquakes along the Cascadia Subduction Zone. These earthquakes are very powerful, with a magnitude of 8 to 9 or greater; they have occurred at intervals ranging from as few as about 100 years to as long as

1,100 years. Subduction zone earthquakes are particularly dangerous in that they produce strong ground motions and in nearly all cases, damaging tsunamis.

- **Shallow or crustal Earthquakes:** These earthquakes occur in the earth's crust within the upper part of the North American plate. Crustal earthquakes are shallow earthquakes, typically within the upper 5 or 10 miles of the earth's surface and some ruptures may reach the surface.

Olympic-Wallowa Lineament (OWL): An approximately 500-km-long topographic feature of the landscape oblique to the Cascadia plate boundary, extending from Vancouver Island, British Columbia, to Walla Walla, Washington²⁵. The OWL is a zone that features numerous fault lines that may be able to produce earthquakes.

Yakima Fold-and-Thrust Belt: The Yakima Fold-and-Thrust Belt is a major fault line that is a part of the OWL and incorporates many of the ridges in Benton County; it extends from the Blue Mountains in the east to the western Washington Faults to the west. The folds in the basalt are interpreted as being forced up by compressional faults in rigid crust beneath the basalt; these faults may be earthquake sources²⁶. Compressional forces in the Earth's crust have created the ridges that are prominent in the Columbia river basin.

Wallula Fault Zone: An integral feature of the Olympic-Wallowa Lineament and the Yakima Fold and Thrust Belt, it is a prominent northwest-striking fault zone that extends from near Milton-Freewater, OR to near Kennewick, WA.

Ground Shaking: the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking (strong motion) depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Ground shaking generally decreases with distance from the earthquake source (attenuation), but locally can be much higher than adjacent areas, due to amplification (an increase in strength of shaking for some range of frequencies).

Amplification: occurs where earthquake waves pass from bedrock into softer geologic materials such as sediments. Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

²⁵ B. L. Sherrod, R. J. Blakely, J. P. Lasher, A. Lamb, S. A. Mahan, F. F. Foit and E. A. Barnett
Active faulting on the Wallula fault zone within the Olympic-Wallowa Lineament, Washington State, USA
Geological Society of America Bulletin (May 2016) 128 (11-12): 1636-1659

²⁶ Yeats, Robert S. "Living With Earthquakes In The Pacific Northwest." *Pressbooks*, Oregon State University Press,
<https://openoregonstate.pressbooks.pub/earthquakes/>. Accessed 30 May 2018.

Liquefaction: occurs when water-saturated sands, silts, or (less commonly) gravels are shaken so violently that the grains rearrange and the sediment loses strength, begins to flow out as sand boils (also called sand blows or volcanoes), or causes lateral spreading of overlying layers.

Historical Earthquake Events

Washington is situated at a convergent continental margin, the collisional boundary between two tectonic plates (Figure 13). The Cascadia subduction zone, which is the convergent boundary between the North America plate and the Juan de Fuca plate, lies offshore, stretching from northernmost California to southernmost British Columbia. The two plates are converging at a rate of about 3-4 centimeters per year (about 2 inches per year); in addition, the northward-moving Pacific plate is pushing the Juan de Fuca plate north, causing complex seismic strain to accumulate. Earthquakes are caused by the abrupt release of this slowly accumulated strain.

Intraplate, or Benioff zone, earthquakes occur within the subducting Juan de Fuca plate at depths of 15 to 60 miles, although the largest events typically occur at depths of about 25 to 40 miles. The largest recorded event was a magnitude 7.1 on the Richter scale, the Olympia quake in 1949. Other significant Benioff zone events include the magnitude 6.8 Nisqually earthquake of 2001, the magnitude 5.8 Satsop earthquake in 1999, and the magnitude 6.5 Seattle-Tacoma earthquake in 1965. Strong shaking lasted about 20 seconds in the 1949 Olympia earthquake and about 15 to 20 seconds during the 2001 Nisqually earthquake. Since 1900, there have been five earthquakes in the Puget Sound basin with measured or estimated magnitude of 6.0 or larger, and one of magnitude 7. The approximate rate for earthquakes similar to the 1965 magnitude 6.5 Seattle-Tacoma event and the 2001 Nisqually event is once every 35 years. The approximate reoccurrence rate for earthquakes similar to the 1949 magnitude 7.1 Olympia earthquake is once every 110 years.

Subduction zone, or interplate, earthquakes occur along the interface between tectonic plates. Scientists have found evidence of great magnitude earthquakes along the Cascadia Subduction Zone. These earthquakes were very powerful (magnitude 8 to 9 or greater) and occurred about every 400 to 600 years. This interval, however, has been irregular, as short as 100 years and as long as 1,100 years. The last of these great earthquakes struck Washington in 1700.

Shallow crustal earthquakes occur within about 20 miles of the surface. Recent examples occurred near Bremerton in 1997, near Duvall in 1996, off Maury Island in 1995, near Deming in 1990, near North Bend in 1945, just north of Portland in 1962, and at Elk Lake on the St. Helens seismic zone (a fault zone running north-northwest through Mount St. Helens) in 1981. These earthquakes ranged in magnitude from 5 to 5.5. Scientists believe that the state's largest crustal earthquake, the 1872 quake near Lake Chelan, was shallow and may be the state's most widely felt earthquake. The 1936 magnitude 6.1 quake near Walla Walla, another significant Eastern Washington earthquake, was also shallow. Recurrence rates for earthquakes on surface faults are unknown; however, four magnitude 7.0 or greater events occurred during the past 1,100 years, including two since 1918 on Vancouver Island.

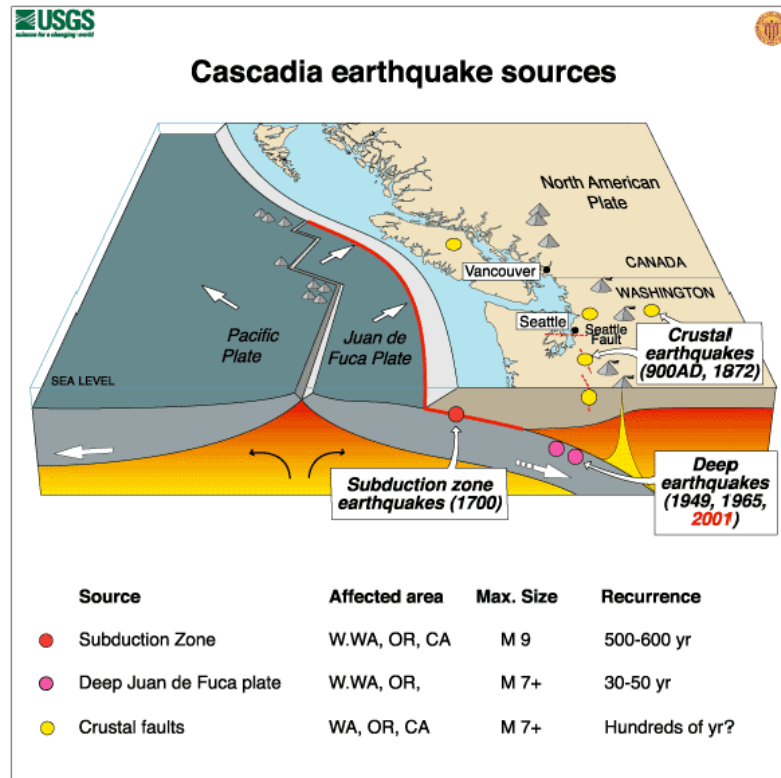


Figure 13) Diagram of tectonic plate subduction zone along the Pacific Coast.

Surface faults can also produce multiple earthquakes in rapid succession called swarms. Residents of Spokane strongly felt a swarm of earthquakes in 2001; the largest earthquake in the swarm had a magnitude of 4.0. The Spokane earthquakes were very shallow, with most events located within a few miles of the surface. The events occurred near a suspected fault informally called the Latah Fault; however, the relation between the fault and the swarm is uncertain. Geologists have mapped the Spokane area, but none confirmed the presence of major faults that might be capable of producing earthquakes. State geologists continue to investigate the geology and earthquake risk near Spokane.

Recently, residents of Benton County experienced swarms of smaller earthquakes that occurred north of Richland at Wooded Island in 2009 and southeast of Prosser in 2000. The largest earthquake to occur in the Wooded Island swarm had a magnitude of 3.0, and collectively, the swarm was accompanied by 35 mm of surface deformation was detected with satellite interferometry (InSAR)²⁷.

²⁷ Blakely, Richard J., Brian L. Sherrod, Craig S. Weaver, Alan C. Rohay, and Ray E. Wells. "Tectonic setting of the Wooded Island earthquake swarm, eastern Washington." *Bulletin of the Seismological Society of America*, vol. 102, no. 4, <https://pubs.er.usgs.gov/publication/70042555>. Accessed 30 May 2018.

Elsewhere in Eastern Washington, geologists have uncovered evidence of a number of surface faults; however, they have not yet determined how active the faults are, nor determined the extent of the risk these faults pose to the public. A few examples of major faults and fault systems in Eastern Washington that could produce damaging earthquakes in the Columbia River Basin include Toppenish Ridge (which appears to have been the source of two earthquakes with magnitudes of 6.5 to 7.3 in the past 10,000 years (EMD 2004)), the Yakima Fold-and-Thrust belt (Figure 14 shows a cross section of the Yakima Fold-and-Thrust belt and the relationship between some of the prominent ridges in the Columbia River Basin and the location of fault lines.), and the Wallula fault zone. As technology evolves, geologists will continue to gain a better understanding of how Eastern Washington fault systems work and their potential to produce earthquakes.

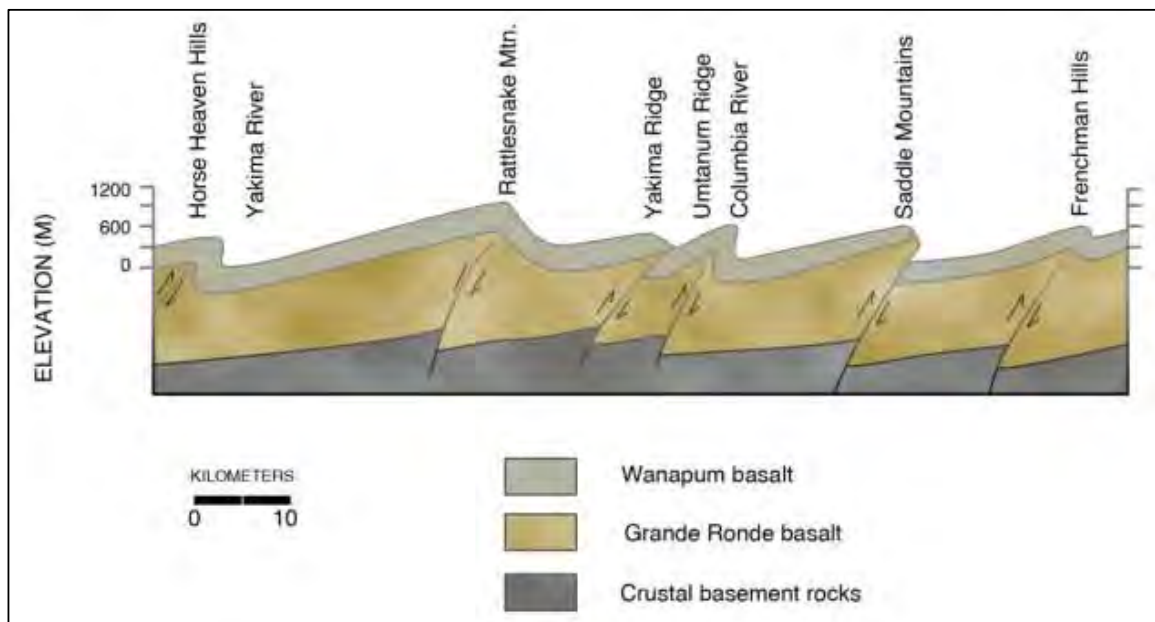


Figure 14) Geologic cross section across Yakima Fold Belt west of Hanford Reservation. South is to the left (taken from *Living With Earthquakes In The Pacific Northwest*).

Seismic activity is a frequent occurrence in the Pacific Northwest as an extensive network of fault lines runs throughout the region. While tectonic plate subduction zones can produce large, devastating earthquakes along the Pacific coast, smaller faults found in the eastern part of the region tend to produce small to moderate earthquakes (Figure 15 shows the epicenters of all Washington earthquakes that occurred between 1872 and 2011). Most earthquakes that occur in eastern Washington are gentle enough that they go unnoticed by affected populations.

Between 1969 and 2018, almost 4,200 earthquakes occurred within or just outside of the Benton County boundary with the largest concentrations of earthquakes having occurred in the northwest corner of the county and in the vicinity of Wooded Island in the Columbia River (Figure 16; due to the limitations of the area-selection feature of the Pacific Northwest Seismic Network mapping tool, areas outside of Benton County were included in the historical earthquake mapping exercise and analysis).

Magnitude 0.9 earthquakes are the mode of the dataset and represent approximately 8.9% of all earthquakes that occurred in the area selected for analysis. Only about 0.4% of earthquakes had a magnitude greater than 3.0 with the highest magnitude earthquake reaching 3.9 (Table 14). Figure 17 shows the distribution of earthquakes that have occurred in the analysis-area; almost 85% of the earthquakes in the dataset were magnitude 0.3 to 1.7.

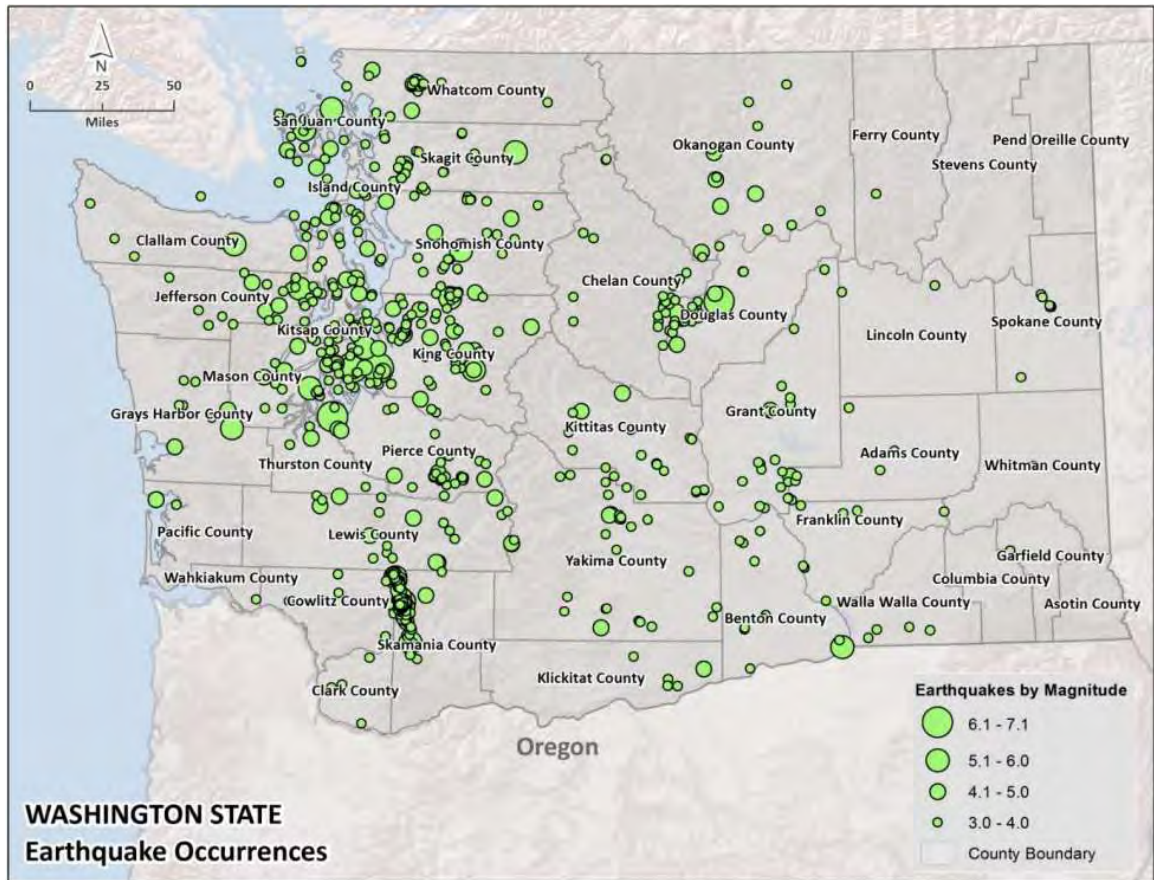


Figure 15) Historic Earthquake Epicenters with Magnitudes of 3.0 or Greater (1872 -2011) (Washington State Department of Natural Resources).

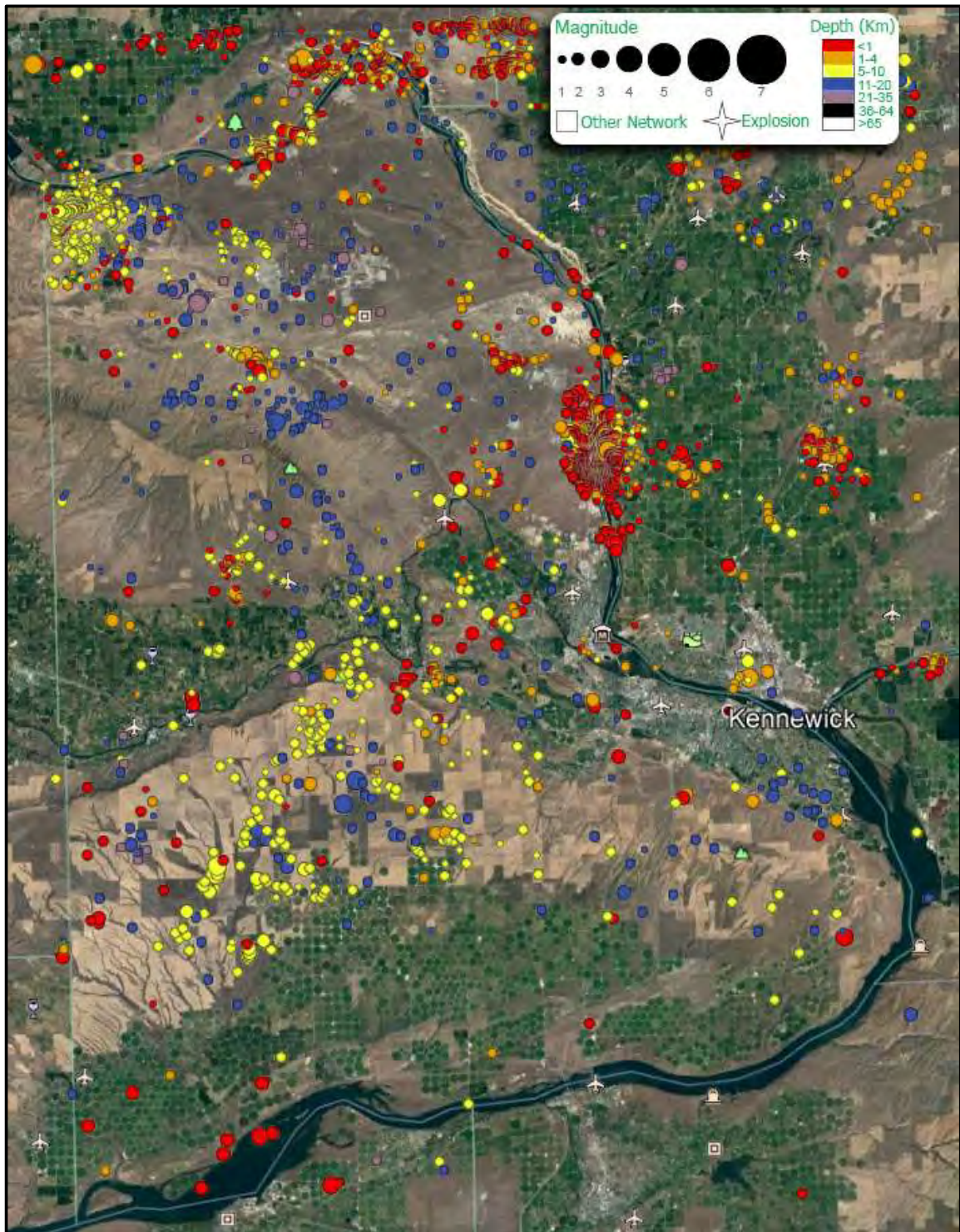


Figure 16) Historic earthquakes on record in and in proximity to Benton County, WA. Map was created using the Pacific Northwest Seismic Network mapping tool and Google Earth.

2019 Revision

Table 14) Count of earthquakes by magnitude that occurred in proximity to or within Benton County, WA from 1969 to 2018. Table was created using data from the Pacific Northwest Seismic Network.

Magnitude	Count	Magnitude	Count	Magnitude	Count
-0.9	1	0.7	318	2.2	38
-0.8	2	0.8	314	2.3	35
-0.6	1	0.9	373	2.4	11
-0.5	4	1.0	294	2.5	13
-0.4	6	1.1	293	2.6	15
-0.3	16	1.2	249	2.7	10
-0.2	10	1.3	262	2.8	8
-0.1	25	1.4	201	2.9	5
0.0	23	1.5	164	3.1	4
0.1	40	1.6	142	3.2	3
0.2	71	1.7	102	3.3	4
0.3	109	1.8	98	3.4	3
0.4	171	1.9	74	3.7	1
0.5	242	2.0	58	3.8	2
0.6	317	2.1	48	3.9	1
Total Number of Earthquakes: 4,181					

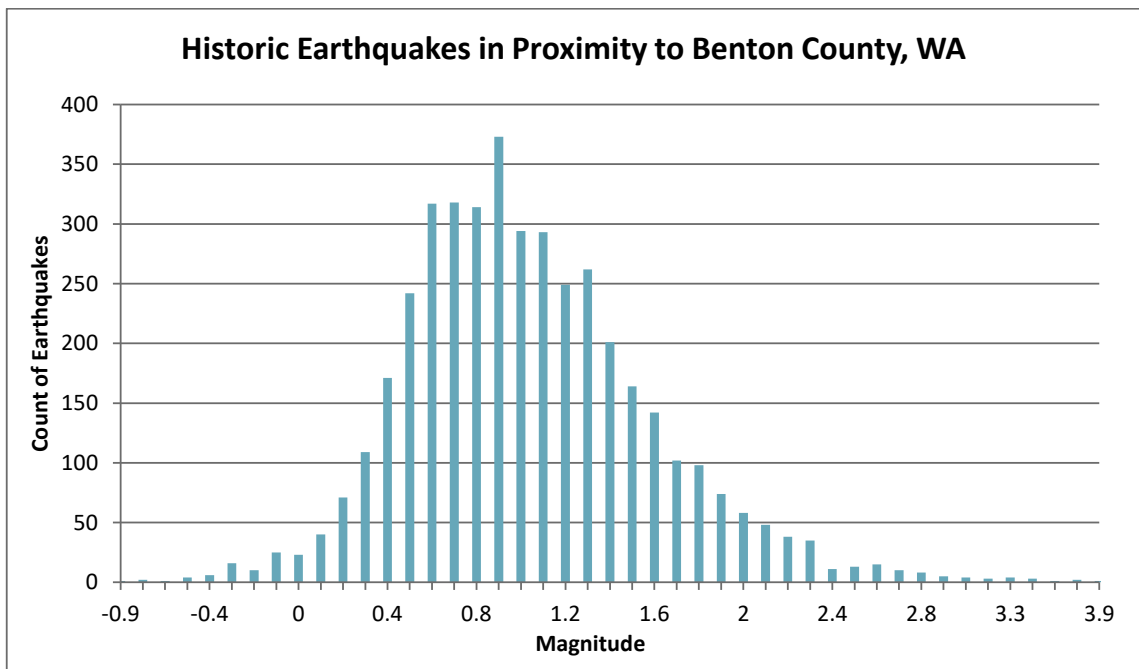


Figure 17) Count of earthquakes by magnitude that occurred in proximity to or within Benton County, WA from 1969 to 2018. Figure was created using data from the Pacific Northwest Seismic Network.

Landslide

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Landslide is a general term for a wide variety of down slope movements of earthen materials that result in the perceptible downward and outward movement of soil, rock, and vegetation under the influence of gravity. Some landslides are rapid, occurring in seconds, whereas others may take hours, weeks, or even longer to develop. Although landslides usually occur on steep slopes, they can also occur in areas of low relief. Movement can occur through falls, topples, slides, and flows.

Definitions

The following are common classifications of landslides as defined by Varnes in 1978, taking into account modifications made by Cruden and Varnes in 1996.^{28,29}

Fall: A fall starts with the detachment of soil or rock from a steep slope along a surface on which little or no shear displacement takes place. The material then descends mainly through the air by falling, bouncing, or rolling.

Topple: Toppling is the forward rotation out of the slope of a mass of soil or rock about a point or axis below the center of gravity of the displaced mass. Toppling is sometimes driven by gravity exerted by material upslope of the displaced mass and sometimes by water or ice in cracks in the mass.

Slide: A slide is a downslope movement of soil or rock mass occurring dominantly on the surface of rupture or on relatively thin zones of intense shear strain.

Flow: A **flow** is a spatially continuous movement in which surfaces of shear are short-lived, closely spaced, and usually not preserved. The distribution of velocities in the displacing mass resembles that in a viscous liquid. The lower boundary of displaced mass may be a surface along which appreciable differential movement has taken place or a thick zone of distributed shear.

²⁸ Varnes, D. J. 1978. Slope movement types and processes. In: Special Report 176: Landslides: Analysis and Control (Eds: Schuster, R. L. & Krizek, R. J.). Transportation and Road Research Board, National Academy of Science, Washington D. C., 11-33.

²⁹ Cruden, D.M., Varnes, D.J., 1996, Landslide Types and Processes, Special Report , Transportation Research Board, National Academy of Sciences, 247:36-75

Background Information

Landslides can occur naturally or be triggered by human-related activities. Naturally-occurring landslides can occur on any terrain, given the right condition of soil, moisture content, and the slope's angle. They are caused from an inherent weakness or instability in the rock or soil combined with one or more triggering events, such as heavy rain, rapid snow melt, flooding, earthquakes, vibrations, and other natural causes. Other natural triggers include the removal of lateral support through the erosive power of streams, glaciers, waves, and longshore and tidal currents; through weathering, wetting, drying, and freeze-thaw cycles in surficial materials; or through land subsidence or faulting that creates new slopes.

Washington State has six landslide provinces, each with its own characteristics; Benton County is part of the Columbia Basin province. Landslides in this province include slope failures in bedrock along the soil interbeds and in the overlying catastrophic flood sediments and loess deposits. Bedrock slope failures are most common in the form of very large deep-seated translational landslides, deep-seated slumps or earth flows; a triggering mechanism appears to be over-steepening of a slope or removal of the toe of a slope by streams or the catastrophic glacial floods. These landslides usually move along sediment interbeds within the Columbia River Basalts. Major landslide problems occurred during the relocation of transportation routes required by the filling of the reservoir behind the John Day Dam and in the highly erosive and weak loessal soils of southeastern Washington. Rockfall occurs in the oversteepened rock slopes left behind by the erosion of the catastrophic floods along SR 730 and 14.

Irrigation in the Columbia Basin compounds landslide problems. For example, irrigation near Pasco has increased drainage and landslide problems ten-fold since 1957. Reactivations of relict and dormant deep-seated landslide complexes have occurred in the bluffs along the Columbia River upstream of Richland.

Stream and riverbank erosion, road building or other excavation can remove the toe or lateral slope and exacerbate landslides. Seismic or volcanic activity often triggers landslides as well. Urban and rural living with excavations, roads, drainage ways, landscape watering, and agricultural irrigation may also disturb the solidity of landforms, triggering landslides. In general, any land use changes that affects drainage patterns or that increase erosion or change ground-water levels can augment the potential for landslide activity.

Land stability cannot be absolutely predicted with current technology. The best design and construction measures are still vulnerable to slope failure. The amount of protection, usually correlated to cost, is proportional to the level of risk reduction. Debris and vegetation management is integral to prevent landslide damages. Corrective measures help but can often leave the property vulnerable to risk.



The following characteristics may be indicative of a landside hazard area:

- Bluff retreat caused by sloughing of bluff sediments, resulting in a vertical bluff face with little vegetation
- Pre-existing landside area
- Tension or ground cracks along or near the edge of the top of a bluff
- Structural damage caused by settling and cracking of building foundations and separation of steps from the main structure
- Toppling, bowed or jack-sawed trees
- Gullying and surface erosion
- Mid-slope ground water seepage from a bluff face

By studying the effects of landslides in slide prone areas we can plan for the future. More needs to be done to educate the public and to prevent development in vulnerable areas. WAC 365-190-080 states that geologically hazardous areas pose a threat to the health and safety of citizens when incompatible development is sited in areas of significant hazard. Some hazards can be mitigated by engineering, design, or construction so that risks are acceptable. When technology cannot reduce the risk to acceptable levels, building in hazardous areas should be avoided.³⁰

Historical Landslide Events

Significant landslide events (those resulting in disasters) are rare, but several have been recorded in the State, including the 2014 Oso mudslide that killed 43 people and destroyed 49 homes or other structures. Major landslide events had a significant impact on transportation, communities, and natural resources in 1977, 1979, 1986, 1989, 1997, 1998, 2006 (x2), 2007 (x2), 2009, and 2014. Greater detail on each landslide event can be found in the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan.

Landslides commonly occur on slopes and in areas where they have taken place before. Historically, most areas of Washington State have experienced landslides. Areas that have been most active in the recent past includes several stretches of the Interstate 5 corridor, the U.S. 101 Highway corridor along the Pacific Coast from Astoria, Oregon to Olympia, in the Cascades, Olympics, and Blue Mountains, the Puget Sound coastal bluffs, the Columbia River Gorge, the banks of Lake Roosevelt, and the Prosser to Benton City section of Interstate 82. The Prosser landslide is included in the Washington DNR list of significant deep-seated landslides to occur between 1984 and 2014. The Prosser landslide occurred in 1986/1987 during the construction of I-82; it is the only "significant" landslide to occur in Benton County.

³⁰ Canning, Douglas J. "Geologically Hazardous Areas". Shorelands and Environmental Assistance Program. Washington Department of Ecology. Olympia, Washington.

Volcano

Much of the information below was excerpted or derived from past Benton County HMPs or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Washington State has five major volcanoes – composite volcanoes – in the Cascade Range. These are, from north to south, Mount Baker, Glacier Peak, Mount Rainier, Mount St. Helens, and Mount Adams.

Definitions

Volcano: A vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior. Over time, accumulation of these erupted products on the earth's surface creates a volcanic mountain.

Composite Volcano: A steep-sided, often symmetrical cone constructed of alternating layers of lava flows, ash, and other volcanic debris. Composite volcanoes tend to erupt explosively and pose considerable danger to nearby life and property.

Background Information

An explosive eruption from a composite volcano blasts solid and molten rock fragments (tephra) and volcanic gases into the air with tremendous force. The largest rock fragments (bombs) usually fall back to the ground within 2 miles of the vent. Small fragments (less than about 0.1 inch across) of volcanic glass, minerals, and rock (ash) rise high into the air, forming a huge, billowing eruption column.

Eruption columns can grow rapidly and reach more than 12 miles above a volcano in less than 30 minutes, forming an eruption cloud. The volcanic ash in the cloud can pose a serious hazard to aviation. Ash related engine failures have led to restriction on travel through ash clouds. Following the eruption of Eyjafjallajökull in 2010, which disrupted one of the busiest airways in the world, over 100,000 flights were cancelled, leading to billions in economic losses.³¹ During the 56 years between 1953 and 2009 there were 94 occasions when aircraft encountered ash, with 79 of those incidents caused some degree of engine damage and 26 resulted in significant engine damage.³²

Large eruption clouds can extend hundreds of miles downwind, resulting in ash fall over enormous areas; the wind carries the smallest ash particles the farthest. Ash from the May 18, 1980 eruption of Mount St. Helens, WA fell over an area of 22,000 square miles in the Western United States. The impacts in Benton County were primarily from the ash fallout. In Eastern Washington, crop losses were estimated to be \$100 million and some dairy farmers had to dump their milk. Transportation was disrupted and some motorists were stranded.

³¹ Morton, M.C., 2017. "Of airplanes and ash clouds: What we've learned since Eyjafjallajökull." Earth. Available online at: <https://www.earthmagazine.org/article/airplanes-and-ash-clouds-what-weve-learned-eyjafjallaj%C3%B6kull>

³² Guffanti, M., et al., 2010. "Encounters of Aircraft with Volcanic Ash Clouds: A Compilation of Known Incidents, 1953–2009." USGS Data Series 545, ver. 1.0, 12 p., Available online at: <http://pubs.usgs.gov/ds/545>

Volcanoes emit gases during eruptions. Even when a volcano is not erupting, cracks in the ground allow gases to reach the surface through small openings called fumaroles. More than ninety percent of all gas emitted by volcanoes is water vapor (steam), most of which is heated ground water. Other common volcanic gases are carbon dioxide, sulfur dioxide, hydrogen sulfide, hydrogen, and fluorine. Sulfur dioxide gas can react with water droplets in the atmosphere to create acid rain, which causes corrosion and harms vegetation. Carbon dioxide is heavier than air and can be trapped in low areas in concentrations that are deadly to people and animals. Fluorine, which in high concentrations is toxic, can be adsorbed onto volcanic ash particles that later fall to the ground. The fluorine on the particles can poison livestock grazing on ash-coated grass and also contaminate domestic water supplies.³³

While there are numerous volcanos of concern in the U.S. (Table 15), the volcanoes of the Cascade Range, which stretches from northern California into British Columbia, have produced more than 100 eruptions, most of them explosive, in just the past few thousand years. However, individual Cascade volcanoes can lie dormant for many centuries between eruptions, and the great risk posed by volcanic activity in the region is therefore not always apparent. When Cascade volcanoes do erupt, high-speed avalanches of hot ash and rock (pyroclastic flows), lava flows, and landslides can devastate areas 10 or more miles away; and huge mudflows of volcanic ash and debris, called lahars, can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions can disrupt human activities hundreds of miles downwind, and drifting clouds of fine ash can cause severe damage to jet aircraft even thousands of miles away. Erupting Cascade volcanoes are more prone than other U.S. volcanoes to explosive volcanic activity, resulting in pyroclastic flows. These are hot, often incandescent mixtures of volcanic fragments and gases that sweep along close to the ground at speeds up to 450 mph.

Table 15) List of active volcanos of Highest Priority and High Priority within the U.S., Source: USGS.

Region	Highest Priority	High Priority
Alaska	Akutan, Amak, Amukta, Bogoslof, Cleveland, Fourpeaked, Kasatochi, Kiska, Makushin, Recheshnoi, Redoubt, Seguam, Vsevidof, Yantarni, Yunaska	Black Peak, Chignagak, Churchill, Dana, Douglas, Dutton, Edgumbe, Hayes, Kaguyak, Kupreanof, Spurr, Wrangell
Washington	Glacier Peak, Mount Baker, Mount Ranier, Mount St. Helens	Mount Adams
Oregon	Crater Lake, Mount Hood, Newberry, Three Sisters	
California	Lassen Volcanic Center, Mount Shasta	Clear Lake, Mono-Inyo Craters, Mono Lake Volcanic Field, Medicine Lake
Wyoming		Yellowstone

³³ Myers, Bobbie, et al. "What are Volcano Hazards?" U.S. Geological Survey. Vancouver, Washington. July 2004.

Because the population of the Pacific Northwest is rapidly expanding, the volcanoes of the Cascade Range in Washington, Oregon, and northern California are some of the most dangerous in the United States. Although Cascade volcanoes do not often erupt (on average, about two erupt each century), they can be dangerous because of their violently explosive behavior, their permanent snow and ice cover that can fuel large volcanic debris flows (lahars), and their proximity to various critical infrastructure, air routes, and populated areas.³⁴

Historical Volcano Events

The Pacific Coast lies along the Ring of Fire which has produced 22 of the 25 largest volcanic eruptions over the last roughly 11,000 years³⁵. The USGS studies and monitors many of the active volcanos in Washington State. Studies have shown that Glacier Peak has erupted an estimated 5 times in the last 13,000 years, likewise. Figure 18 highlights the activity of each volcano along the Cascade Mountains for the past 4000 years. While not a common occurrence eruption from the Cascade Volcanos occur, on average, two every century.

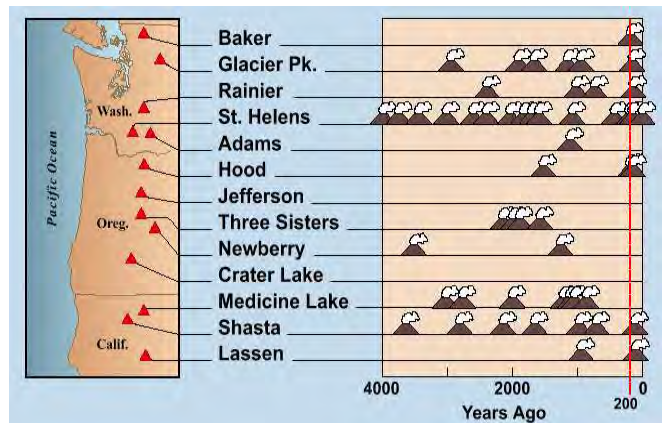


Figure 18) History of volcanic activity in the Pacific Northwest

The Cascade Range has more than a dozen potentially active volcanoes. Cascade volcanoes tend to erupt explosively, and on average two eruptions occur per century—the most recent were at Mount St. Helens, Washington (1980–86 and 2004–8), and Lassen Peak, California (1914–17). On May 18, 1980, after 2 months of earthquakes and minor eruptions, Mount St. Helens, Washington, exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption because public officials had been alerted to the danger by U.S. Geological Survey (USGS) and other scientists. To help protect the Pacific Northwest's rapidly expanding population, USGS scientists at the Cascades Volcano Observatory in Vancouver, Washington, monitor and assess the hazards posed by the region's volcanoes.³⁶

³⁴ Dzurisim, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997.

³⁵ Oppenheimer, Clive. 2011. Eruptions that Shook the World. University of Cambridge.

³⁶ Dzurisim, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997.

Chapter: 4 Community Profiles and Risk Assessments

The purpose of this chapter is to link the unique qualities, features, and characteristics of each jurisdiction to local and regional natural hazards. Each community profile includes relevant information about demographics, infrastructure, commerce, industry, natural resources, and geography and identifies any community-components that are of particular interest, especially as they relate to natural hazards. Following the community profile is a risk and vulnerability assessment that summarizes the probability of a given natural hazard event affecting a jurisdiction, the potential impacts that a natural hazard event could have on a jurisdiction, and which community-components are at risk.

Jurisdictional Risk and Vulnerability Rating

The Benton County Comprehensive Emergency Management Plan assigns a rating to the “Probability and Risk” associated with each of the seven profiled hazards.

This rating system was reviewed by the committee and is included in the 2018 update, along with additional analysis on the history of hazard events, probability of future events, potential hazard impacts, resource values that are at risk, and input from the community.

The terms “High”, “Moderate”, and “Low” are used to rate each hazard for “Probability”, “Vulnerability” and “Risk” in Benton County. A definition for each category is listed below. The Risk rating is a combination of Probability and Vulnerability associated with the hazard.

Probability: The probability of an occurrence happening in Benton County, sometimes without the regard to hazard history.

High	Probability of occurrence at least one chance in the next 1 to 10 years
Moderate	Probability of occurrence at least one chance in the next 10 to 25 years
Low	Probability of occurrence at least once chance in the next 25 to 50 years

Vulnerability: The potential effect a hazard could have on the percentage of people and property within an area in Benton County.

High	25% or higher of population and property being affected by the hazard
Moderate	5% to 10% of population and property being affected by the hazard
Low	Less than 5% of population and property affected by the hazard

Risk: Risk is an estimate of the combination of Probability of occurrence and Vulnerability.

High	Strong potential for a disaster of major proportions occurring in the next 1 to 10 years
Moderate	Moderate potential for a disaster of less than major proportions occurring in the next 10 to 25 years
Low	Little potential for a disaster occurring during the next 25 to 50 years

Benton County Profile

Location

Benton County is located in south-central Washington in the middle of the Columbia Basin. The Columbia River forms the county's northern, eastern, and southern boundaries, forming an arc some 120 miles long. Benton County is bordered to the west by Yakima and Klickitat counties, to the north by Grant County, to the east by Franklin and Walla Walla counties, and to the south by two Oregon counties, Umatilla and Morrow. Benton County covers an area of 1,722 square miles. The highest elevation in the County is 3,629 feet, located in the Rattlesnake Mountains north of Prosser. The lowest elevation is 265 feet, found near Plymouth along the north bank of the Columbia River. The Yakima River flows from west to east through the middle of the County. The Yakima, Snake, and Walla Walla rivers join the Columbia River within 30 miles of each other along Benton County's eastern border near Sacajawea State Park.

Incorporated cities and towns in Benton County include Benton City, Kennewick, Prosser, Richland, and West Richland. Most of the unincorporated areas of the County are rural areas with low-density agriculture-based land use. However, there are also several distinct unincorporated communities, including Paterson, Plymouth, Finley, and Whitstran. Benton County was created in 1905 from the eastern portions of Yakima and Klickitat Counties. Prosser is the County seat.

Of the county's five incorporated communities, Prosser, Benton City, and West Richland are located adjacent to the Yakima River, Richland is at the confluence of the Yakima and the Columbia Rivers, and Kennewick borders the Columbia River downstream of Richland. Richland and Kennewick, together with Pasco (across the Columbia River in Franklin County) are all located on the banks of Lake Wallula, created after the construction of the McNary Dam. These cities are collectively referred to as the Tri-Cities due to their interlocking economic dependence and their geographic proximity to each other. The unincorporated community of Finley lies to the southeast along the Columbia River, just outside of Kennewick. Elevations for all of the communities are in the 300 to 700 feet above sea level range. The two unincorporated communities of Plymouth and Paterson border the Columbia River at the county's southern border below McNary Dam. Elevations of Plymouth and Paterson are 300 and 400 feet, respectively.

The Columbia River was historically an important fishery and its associated lowlands used as wintering ground by several Native American tribes including the Umatilla, Wallowa, Wanapum, Nez Perce, and Yakama tribes. Permanent settlement of the region accelerated in the 1890s when infrastructure was completed that allowed irrigation of the arid shrub-steppe lands in the area. This, along with the completion of the Dalles-Celilo Canal in 1915, which first connected the Tri Cities to the Pacific Ocean, turned Benton County into an important agricultural center. In 1942 the U.S. Army Corps of Engineers, Manhattan District selected the northern part of the county as the location of the Hanford Nuclear

Site³⁷; a key facility for the development of nuclear weapons during World War II. In the 1950's, the Washington Public Power Supply System (WPPSS) was created to ensure that the rising demand for energy in the northwest would be met through the construction of multiple energy-producing facilities. Located within the Hanford Site, the Columbia Generating Station was constructed in 1970 as a part of WPPSS³⁸; it is currently operated by Energy Northwest. These nuclear and energy production projects had significant impacts on the economic development of Benton County due to the increasing workforce in the northwest.

Benton County is currently one of the top ten agricultural counties in Washington, based on the total value of all agricultural products (crop and livestock). The area produces carrots, onions, potatoes, wheat, barley, oats, apples, grapes, and cherries. In addition to crop production, there is a significant food-processing industry in the Tri-Cities. Area plants produce French fries, grape juice, baby carrot sticks, and other foods. Winter wheat is the dominant crop cover. Washington State University Irrigated Agriculture Research and Extension Center, one of the world's largest irrigated experiment stations, is located in Benton County approximately four miles north of Prosser. In recent years the wine industry has become a rapidly growing segment of the agriculture industry, with many new wineries opening. The state's largest winery, Columbia Crest, is located at Paterson.

The Tri-Cities area of Benton County is a major transportation hub for the Pacific and Inland Northwest. The Tri-Cities are served by Interstate Highway 82, which connects the Tri-Cities directly to the three nearby transcontinental Interstate Highways, I-84, I-90 and I-5. Several Federal Highways and multiple State Highways service the area. Additionally, Tri-Cities offers mainline rail freight service by both Burlington Northern Santa Fe and Union Pacific Railroads and is the only major metropolitan and major manufacturing area between the Cascade and Rocky Mountains offering this level of service by these two major national rail carriers. The Columbia-Snake River System connects the region to the Pacific Ocean and allows the transport of commodities to locations throughout the world. Barge service is available through the Port of Benton.

³⁷Gibson, Elizabeth. "Benton County - Thumbnail History." History Link, 9 Mar. 2004, www.historylink.org/File/5671. Accessed 31 May 2018.

³⁸Wilma, David. "Washington Public Power Supply System." History Link, 10 July 2003, www.historylink.org/File/5482. Accessed 31 May 2018.



Climate

Benton County is located in the central part of the Columbia Basin, which has a landform surrounded by mountain ranges that have a pronounced effect on the region's climate. The following are characteristics of the climate as summarized in Benton County's Comprehensive Plan (1998; source National Weather Service):

Geomorphology and Weather

- The Cascade Range to the west obstructs easterly flows of moist air into the basin.
- The Rocky Mountain Range and ranges in southern British Columbia protect the basin from the more severe winter storms.
- Occasionally an outbreak of severely cold weather will penetrate into the basin for damaging spring or fall freezes.
- The County experiences strong seasonal winds associated with rapidly moving weather systems

Sunshine and Growing Season

- The growing season is approximately 185 days from mid-April to mid-October.
- The percent of possible sunshine each month is 20-30 percent in winter, 50-60 percent in spring, and 80-85 percent in mid-summer.
- The number of clear days each month increases from about 5 in winter to 20 in summer.

Temperature

- Dry with mild winters and warm sunny summers, cool summer nights.
- Summer temperatures in the warmest summer months can exceed 90°F from 26 to 77 days with nights dropping to 50°F, day time temperatures can exceed 103°F for about four days in two out of ten summers.
- Winter afternoon temperatures range from 35° to 45°F with night time readings at 20° to 30°F, minimum temperatures can be 60°F or lower on four nights in two out of ten winters, afternoons remain below freezing on about one third of all January days.
- The region can experience sustained low temperatures. In 1949-50, night time winter temperatures were less than 0°F on 18 nights, minus 15°F or lower on seven nights, and minus 23°F on one night (sustained cold temperatures were also experienced January-February 1996).
- Warm winters do occur - in 1957-58, the lowest temperature was 19°F.
- Number of days with maximum temperatures below freezing ranges from 2 to 46.

Moisture and Precipitation

- Mean annual precipitation is from 5 to 10 inches, with from 10 to 15 inches in discrete areas on the Horse Heaven and Rattlesnake hills.
- Approximately 70 percent of precipitation occurs between November and April averaging one inch per month as either rain or snow in mid-winter months.
- There can be 3 to 6 weeks at a time in mid-summer with no measurable precipitation.

Storms and Weather Events

- Thunderstorms typically occur on 10 to 15 days between March and October, usually accompanied by light rainfall, but hail and heavy showers can occur.
- Winter season snowfall has ranged from less than ½ inch (1957-58) to 44 inches (1915- 16), accumulations have ranged from 4 inches to 21 inches (February 1916).
- Snow cover can melt rapidly as a result of rain or warm Chinook winds.
- Severe winter and spring flooding of the lower Yakima River can occur as a result of snowmelt and/or river icing conditions, such as occurred in December 1995 and February 1996.

Soils and Geology

The soils in Benton County are generally suitable for both agriculture and structural development, with localized areas of constraint relating to slope, geo-hydrology or pockets of sandy soils and fines. Soils are very susceptible to wind and water erosion once stripped of their natural cover. However, in undisturbed condition the indigenous shrub steppe and bunch grass vegetative cover is adapted to hold basin soils in place. When stripped of natural cover, prevention of erosion requires the application of deliberate and aggressive management techniques (Benton County Comprehensive Plan).

Generally, with some notable localized exceptions, the addition of water and fertilizer to soils anywhere in Benton County will result in productive agriculture. The principal exceptions are on steep erosive slopes, in pockets of very sandy soils, or where near surface basalt formations are accompanied by thin soils and poor hydrologic conditions.

Benton County is located in the central Columbia Plateau where two of the most catastrophic geologic events in earth history took place: enormous outpourings of basaltic lava flows 17.5 to 6 million years ago and giant glacial outburst floods up to 12 thousand years ago. These and related events produced the local landscape, where the Earth's youngest basalt plateau was swept by the largest documented floods in geologic history.

The northern and eastern parts of the County are part of the Pasco Basin and the southern part of the County is part of the Umatilla Basin. These basins are two of several regional structural and topographic, sediment-filled basins within the Columbia Plateau. The County is underlain by the Miocene-age Columbia River Basalt Group, a thick sequence of flood basalts that covers more than 63,000 square miles of eastern Washington, western Idaho, and northeastern Oregon. The sediments overlying the basalts include the Pliocene Ringold Formation (interlayered deposits of sand, silt, clay and gravel exposed in the White Bluffs along the Columbia River), glaciofluvial deposits of the Pleistocene Hanford formation (unconsolidated gravel, sand and silt deposits), and Holocene surficial deposits composed of windblown silt and sand and gravelly alluvium along the rivers.

The basalt sequence is over 10,000 ft thick within the downwarped Pasco Basin. Sedimentary interbeds of the Ellensburg Formation separate basalt flows and flow units especially in the upper part of the basalt sequence. Folding and faulting of the basalts under north-south compression was contemporaneous with the eruption of the basalt flows. This deformation produced the anticlinal ridges of the Yakima Fold Belt (e.g., Rattlesnake Mountain, Horse Heaven Hills and others). The fold ridges are

characterized by gently dipping southern limbs and steeply dipping northern limbs that are cut by thrust or high-angle reverse faults that trend parallel to the ridges.

Deformation of these folds continued from the Miocene to the Pleistocene, and perhaps into the present. Geologic evidence of young faulting has been found on Gable Mountain at the Hanford Site and near Wallula Gap along the Rattlesnake-Wallula alignment (RAW) (Reidel and others, 1994). As of the update of this plan, the OWL, RAW, Yakima Fold and Thrust Belt, and the Wallula fault zone are recognized as some of the major faults and fault systems in eastern Washington. These faults and fault systems will be included in the evaluation of seismic hazards for Benton County.

Land Ownership

The data used in this section was taken from the 2010 BLM land ownership database. Local government property (i.e. county) is likely included in the Private ownership category. The majority of ownership, approximately 67%, within Benton County is private (Table 16). Federal ownerships account for 27% of the land base with the Hanford Site encompassing the largest portion with over 194,000 acres and the U.S. Fish & Wildlife Service and Bureau of Land Management accounting for the remaining 105,470 acres. Less than 6% of Benton County is owned by the state. Figure 19 shows the distribution of land ownership in Benton County.

Land use in Benton County is predominately for agricultural purposes. According to the 2012 Census of Agriculture, approximately 703,505 acres of privately-owned land is classified as agricultural which is just over 94% of all private land and just over 63% of the total area of Benton County. Of the 703,505 acres classified as agriculture about 74% is cropland and 16% is pastureland.

Table 16) Land ownership in Benton County, WA

Entity	Acres	Percent Coverage
BLM	11,020	1%
COE	54	<1%
Federal (DOD)	194,450	17%
FWS	98,220	9%
Private	746,948	67%
State	45,782	4%
State Fish & WL	5,812	1%
State Parks	612	<1%
Water	10,329	1%
Total	1,113,227	100%

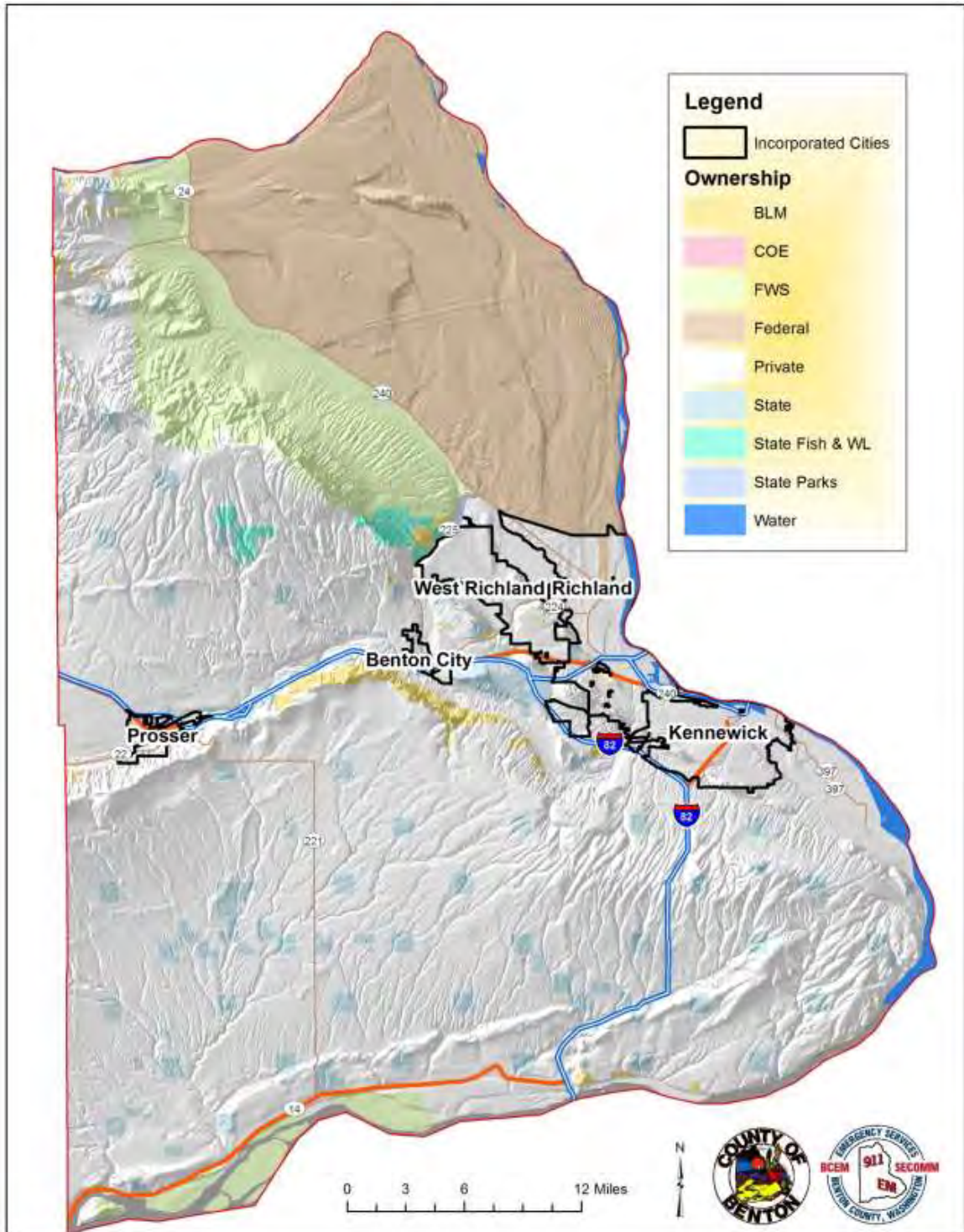


Figure 19) Land ownership in Benton County, WA.

Population and Demographics

Benton County was created by the Washington State Legislature on March 8, 1905. The county government consists of an elected County Commission, consisting of three full time County Commissioners. The Commissioners are elected to four-year terms in a general election. Each commissioner represents a district determined by population boundaries. Other elected county officials include: Assessor, Auditor, Clerk, Coroner, Prosecuting Attorney, Treasurer, Sheriff, and Superior Court and District Court judges.

The U.S. Census Bureau, Census of 2010 reported Benton County's population at 175,171 – a 23 percent increase since 2000 (Table 17). The 2018 population was estimated to be 197,420. The median age was 35.6, with approximately 72.8 percent of the county population 18 years and over. Approximately 82.4 percent of the population is White and 18.7 percent Hispanic or Latino. The Census reports there are 27,726 residents (17.9 percent) who speak a language other than English at home, including 6.4 percent (8,391 people 5 years and over) who speak English less than “very well.” Spanish is the language other than English most often spoken at home by 20,551 residents (13.3 percent). Of those speaking Spanish at home, 10,234, or 5.8 percent of Benton County's population, speak English less than “very well.”

Table 17) Historical and estimated current populations for communities in Benton County, WA from 1960 to2016.

	1960	1970	1980	1990	2000	2010	2018*
Benton County	62,070	67,540	109,440	112,560	142,475	175,171	197,420
Benton City	1,210	1,070	1,980	1,806	2,624	3,038	3,405
Kennewick	14,244	15,212	32,397	42,155	54,693	73,917	81,850
Prosser	2,763	2,954	3,896	4,476	4,838	5,714	6,125
Richland	23,548	26,290	33,587	32,315	38,708	48,054	55,320
West Richland	1,347	1,107	2,935	3,962	8,385	11,181	15,320
*2018 population estimated based on 2010 census							

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for Benton County can be found in Appendix B.

Development Trends

The Following is excerpted from Chapters 3.7 and 3.8 in the 2018 Benton County Comprehensive Plan:

Population growth in Benton County from 2011 to 2016 grew at a rate reflective of the slow growth in the nation's economy, the improved national economy of 2017 has provided a rebound in growth reminiscent of the growth in 2009. Figure 3-2 reflects the population trend in the last 10 years in Benton County.

The latest population projections from OFM, using the "high" series estimates, indicate that Benton County can expect a population increase of 86,609 over the next 20 years. This will result in a year 2037 population of 280,109, which is an increase of 45 percent over the current population of 193,500. The County will review the future growth trends and adjust population projections if necessary.

Approximately 18 percent of the total County population, or 35,085 people (OFM 2017), reside in the unincorporated area of Benton County. The 20-year OFM projection also indicates the unincorporated County population will grow to 53,220 persons in 2037. This will add 18,135 additional people in the next 20 years who are projected to seek housing in unincorporated areas of the County between now and the year 2037. This growth represents a 52 percent increase over the current rural population. Table 18 indicates the population estimates in Benton County and the unincorporated areas of the County.

Table 18) 20-year population estimates for Benton County, WA (OFM 2017).

Year	Population in Unincorporated Benton County	Total Population in Benton County
2017	35,085	193,500
2037 Projection	53,220	280,109
20 Year Increase	18,135	86,609

At an estimated 2.7 residents per household, the increased population in unincorporated Benton County would require approximately 6,716 new homes in the next 20 years. This growth will be accommodated mostly in the Urban lands of the UGAs, Rural Transition areas, and Rural Remote areas. Some growth will also take place in the Rural Community Centers and Rural Resource areas.

There are currently 78,952 acres designated for the rural residential uses within the four rural land use designations of Benton County (outside of Hanford and the agricultural areas).

A land capacity analysis on vacant and existing units in the Rural Transition land (1 du/acre) and Rural Remote land (1 du/5 acre) indicates adequate land supply to accommodate future housing demand. However, additional growth is also anticipated to occur in the Rural Community Centers and Urban areas. Table 19 indicates potential allocation of future population in these two land use categories:

Table 19) Potential allocation of future population per land use category

Land Use	New Units
Urban	134
Rural Transition	1,142
Rural Remote	5,652
Rural Community Centers	34
Total	6,961

1) Does not include UGAs.

2) Lot size is determined by minimum lot size requirements; i.e., how many units are allowed per given acreage.

Benton County Hazard Annex

Flood Profile

Local Event History

In recent history, the most damaging floods in Benton County have been associated with the Yakima River. Benton County is the downstream end-point for the Yakima River drainage, which contains 6,155 sq. miles, or four million acres. The areas along the lower Yakima in Benton County especially vulnerable to relatively frequent flooding extend from Benton City downstream through West Richland to the delta where the Yakima empties into the Columbia River. This area is characterized by low lying river bottom lands and ancient river channels which are historically the river's natural floodway and floodplain. Since 1970, Benton County has been included within the area of five nationally declared flood disasters, all associated with the Yakima River. The history of flooding in Benton County is summarized in Table 20.

Table 20) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.
1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	
5-Jun-13	20900	13.1	5	

13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

Although floods can happen at any time during the year, there are typical seasonal patterns for flooding in Washington State, based on the variety of natural processes that cause floods:

- Heavy rainfall on wet or frozen ground, before a snow pack has accumulated, typically cause fall and early winter floods.
- Rainfall combined with melting of the low-elevation snow pack typically cause winter and early spring floods. Of particular concern is the so-called Pineapple Express, a warm and wet flow of subtropical air originating near Hawaii which can produce multi-day storms with copious rain and very high freezing levels.
- Late spring floods in Eastern Washington result primarily from melting of the snow pack.
- Thunderstorms typically cause flash floods during the summer in Eastern Washington; on rare occasions, thunderstorms embedded in winter-like rainstorms cause flash floods in Western Washington.

The 2001 draft of the CFHMP identified several areas in Benton County that are more prone to flooding than other areas:

1. Major flood damage is typically caused by high-magnitude winter floods. Eighteen of the 24 largest Yakima River floods were winter floods.
2. Flood related damages have been concentrated in the low-lying areas between Benton City and the Richland-West Richland area.
3. Flooding problems in the Horse Heaven Hills are relatively infrequent but can cause significant wide spread damage to county roads when flash floods occur.
4. Flood problems that have occurred repeatedly include the following:
 - a. Inundation of property and homes along Byron Road near the river west of Prosser and excessive erosion of the road.
 - b. Inundation of property and roads south of Babs Avenue in Benton City and low-lying areas north (downstream) of town.
 - c. Inundation of roads, homes and property, farmland and grazing pastures in the Richland-West Richland area, extending from the Twin Bridges south to Sunset Memorial Gardens and W. E. Johnson Park.

The Columbia River features an extensive network of dams and dikes that regulate and control the flow of water. Since the Columbia River crosses international borders, water level and water flow are

determined and agreed upon by the United States and Canada. Given the control mechanisms and international cooperative agreements in place, flooding events on the Columbia River are rare but can and have occurred. In May of 2018, the volume of water moving downstream from Canada exceeded the capacity of dams below Benton County which resulted in flooding along the riverfront areas in Richland and Kennewick.

In the event of a heavy rain event or rapid snow melt, flash flooding can occur in canyons and gullies. Zintel Canyon, located in Kennewick, presented a flash flood risk to nearby communities until the Zintel Canyon Dam was constructed to mitigate flash flood hazards.

Based on the above information, the likelihood of occurrence of a major flood hazard on the Yakima River within the five-year planning cycle is **HIGH**. The likelihood of occurrence of a major flood hazard on the Columbia River or of a major flash flood within the five-year planning cycle is **LOW**, with the exception of the Columbia Park area in Kennewick, which has a **MEDIUM** likelihood of occurrence of a flood hazard.

Impacts of Flooding

The National Flood Insurance Program defines flood as, “A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:

- Overflow of inland or tidal waters; or
- Unusual and rapid accumulation or runoff of surface waters from any source; or
- Mudflow (liquid and flowing mud moving across surface); or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.”

Floods cause loss of life and damage to structures, crops, land, flood control structures, transportation infrastructure (roads and bridges) and utilities. Floods also cause erosion and landslides (including mudslides or mudflows) and can transport debris and toxic products that cause secondary damage. Flood damage in Washington State exceeds damage by all other natural hazards. There have been 32 Presidential Major Disaster Declarations for floods in Washington State from 1956 through July 2012. Every county has received a Presidential Disaster Declaration for flooding. While not every flood creates enough damage to merit a declaration, most are severe enough to warrant intervention by local, state or federal authorities.

Flooding of the Columbia River, although considered of low likelihood of occurrence, could inundate some transportation routes (road and railroad) and low-lying areas of Finley. Disruptions to the transportation system could negatively affect the local economy.

Development Trends

As both population and demand for development are projected to increase for Benton County, it should be expected that Benton County will have more infrastructure at risk during a flood event. Land use

planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

Values of Resources at Risk

A qualitative risk analysis was conducted based on local knowledge of past flood events, the likelihood of future flooding, and the types, quantity, and relative value of development (and potential damage) within the floodplain (Figure 20).

Benton County has 641 structures, 26 of which are government owned structures, in flood zones totaling over \$98 million (Table 21 and Table 22). As all structures fall within either A, AE, or AH flood zones, there is a 1% chance that they be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage (Table 23). For structures that fall within A flood zones, no analysis has been performed to determine flood depths or base flood elevations. Structures that fall into flood zone AH will likely experience a flood depth of 1 to 3 feet.

At present, there are limited flood control protection devices in operation or planned in the lower Yakima River. Levees exist on both banks of the Yakima River at its mouth. Additionally, a levee has been constructed on the south bank from the Van Giesen Street Bridge downstream for approximately one mile. The likely trend is for the frequency and magnitude of floods within the lower reaches of the Yakima River to increase as the upper water shed continues to urbanize and its natural storage capacity is diminished. Flooding in the Yakima River valley could cause property and infrastructure damage, evacuation of residents, and contamination of wells.

Table 21) Total number and total value of appraised structures in designated flood zones in Benton County, WA (includes only unincorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
A	144	\$ 20,136,800.00
AE	343	\$ 58,928,100.00
AH	154	\$ 19,422,790.00
Total	641	\$ 98,487,690.00

Table 22) Total number and total value of appraised Government structures in designated flood zones in Benton County, WA (includes only unincorporated government structures).

Flood Zones	Appraised Gov't Struct.	Value of Appraised Gov't Struct.
A	23	\$ 3,995,800.00
AE	3	\$ 268,680.00
Total	26	\$ 4,264,480.00



Figure 20) National Flood Insurance Program flood zone map of Benton County, WA.

2019 Revision

Table 23) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.



Drought Profile

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Local Event History

Through analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. Benton County experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage from drought. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

Using historical information, it is reasonable to expect that at least some parts of Benton County will experience drought conditions in roughly 25 of the next 100 years resulting in a **MODERATE** probability rating. This does not specify when or how severe the drought conditions will be, nor does it fully incorporate any future effects of possible climate change.

Drought is difficult to predict for Benton County but there are resources that attempt to forecast droughts, seasonal drought conditions, and climatic patterns. The National Integrated Drought Information System (NIDIS) is one interagency program, sponsored by the National Oceanic Atmospheric Administration (NOAA), that is mandated to "...coordinate and integrate drought research, building upon existing federal, tribal, state, and local partnerships in support of creating a national drought early warning information system."³⁹

NIDIS is a central hub for various types of information relating to drought. Some resources NIDIS utilizes include the United States Drought Monitor and NOAA's U.S. Seasonal Drought Outlook. Another resource is the National Interagency Fire Center's Significant Wildland Fire Potential Outlook, which examines national wildland fire risks. The U.S. Seasonal Drought Outlook expresses drought tendency over a given period. This outlook depicts large-scale trends by examining short and long-range forecasts, and current and expected conditions.

³⁹ "Drought.gov". National Integrated Drought Information System. www.drought.gov.

Impacts of Drought

Drought can have a widespread impact on the environment and the economy, depending upon its severity, although it typically does not result in loss of life or damage to real property, as do other natural disasters. The National Drought Mitigation Center at the University of Nebraska-Lincoln uses three categories to describe likely drought impacts:

- Agricultural – Drought threatens crops that rely on natural precipitation.
- Water supply – Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard – Drought increases the threat of wildfires from dry conditions in forest and rangelands.

Impacts of severe drought pose little direct threat to infrastructure, buildings, and human lives, but secondary effects may be felt due to losses in income and jobs, and disruptions in commerce. A drought can result in farmers not being able to plant crops or the failure of the planted crops. This results in loss of work for farm workers and those in related food processing jobs. Other water or electricity-dependent industries commonly shut down all or a portion of their facilities, resulting in further layoffs. A drought can spell disaster for recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies), for landscape and nursery businesses because people will not invest in new plants if water is not available to sustain them, and dwindling water supplies put various threatened and endangered fish species at risk as well.

Drought threatens the supply of electricity in the state of Washington. Hydroelectric power plants generated nearly three-quarters of the electricity produced in Washington State in 2000. When supplies of locally generated hydropower shrink because of drought, utilities seek other sources of electricity, which can drive up prices even as supply is reduced. Unlike most disasters, droughts occur slowly but may last a long time. On average, the nationwide annual economic impacts of drought – between \$6 billion and \$8 billion annually in the United States – are greater than the impacts of any other natural hazard.

Drought also affects groundwater sources, but generally not as quickly as surface water supplies, although groundwater supplies generally take longer to recover. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry; shallow wells are more susceptible than deep wells. About 16,000 drinking water systems in Washington State get water from the ground; these systems serve about 5.2 million people. Drought also impacts the irrigation district curtailments in Benton County. People begin to use potable water for irrigation purposes when they are restricted from using their primary source resulting in the involvement of law enforcement to uphold the ordinance. Limiting irrigation also increases fire risk in Benton County.

The state's EHMP identifies Benton County as one of nine counties most at-risk and vulnerable to drought. This is based on Benton County meeting specific criteria, such as a history of drought conditions, an economy heavily-reliant on agriculture, significant acreage of irrigated farmland, and above average population growth for the state.

Development Trends

As both population and demand for development are projected to increase for Benton County, an increase in water usage in Benton County should be expected as well. With increased pressure on water sources, it is likely that Benton County will become more sensitive to drought conditions and will likely have to implement water conservation practices sooner during a period of drought. Increased fire risk associated with drought conditions may also make additional development vulnerable to wildfire.

Value of Resources at Risk

At the time of the 2012 USDA Census of Agriculture, or Ag Census, there were 1,509 farms in Benton County, totaling 703,505 acres of land. This is up 11% from the 2007 Ag Census, but the market value of products sold during that five-year period rose much more significantly. The 2007 Ag Census reported the market value of products sold at \$525,918,000 while in 2012 it was reported at \$923,163,000 – a 76% increase. Farmland was designated for the following uses in 2012: 73.8% of all farmland was used as cropland, 16.3% was pastureland, while 9.9% was designated as “other uses”.

In 2012 Benton County ranked third in the state of Washington in total market value of agricultural products sold and ranked number 38th nationally out of 3,077 counties. Among individual commodities, Benton County was second in the state of Washington in revenue from “vegetables, melons, potatoes, and sweet potatoes,” (valued at more than \$257 million, ranking 12th nationally) and fourth in revenue from “fruits, tree nuts, and berries” (valued at more than \$324 million, ranking 18th nationally).

The 2012 Ag Census reported Benton County ranked second in the state in acres used for both potatoes and “vegetables harvested” at 33,697 acres and 83,081 acres respectively. Benton County is also a national leader in those categories, fifth in potato acreage and seventh in vegetable acreage.

People could pay more for water if utilities increase their rates. With much of Washington’s energy coming from hydroelectric plants, a drought can mean more expensive electricity from other resources than dams and probably higher electric bills. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts.



Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

Benton County experiences a routine cycle of wildfires. Attempts are made to minimize impacts on the community. However, in doing so, many resources are required at high cost. Recently, Benton County Fire District #1 had a fire that totaled \$137,000 in suppression costs and the fire caused \$2 million dollars in damage. ***Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.*** The largest wildfire was the 24 Command fire that occurred in 2000 and burned upwards of 192,000 acres. The following is a summary of the fire from the 24 Command Fire Burned Area Emergency Rehabilitation Plan by the U.S. Fish and Wildlife Service and the U.S. Department of Energy:

The 24 Command Fire (also known as the Two Forks Fire and the SR 24 MP 36 Fire) began at about 1330 hours on Tuesday, June 27, 2000, as the result of a fatal motor vehicle accident on State Route (SR) 24, about 2 miles west of the intersection with SR 240. The lands in the vicinity are managed as the Arid Lands Ecology Reserve (ALE) and the Hanford Reach National Monument by the US Fish and Wildlife Service, under permit from the US Department of Energy. Driven by high winds and temperatures and low humidity, the fire quickly spread over the next two days and consumed 163,884 acres of Federal, state, and private lands. The fire also burned 11 residences and a number of other structures in and around Benton City. Burned acreage included: US Fish and Wildlife Service - 78,732 acres; Department of Energy-Hanford Site - 60,254 acres; private lands - 20,225 acres; State - 3,633 acres; Bureau of Land Management - 980 acres; and McGee Ranch and Riverlands.

Probability of Future Occurrence

Benton County's dry climate and vast grassland areas makes it very susceptible to large wildfires. While wildland, wildland urban-interface (WUI), and roadside and vehicle-related fires do occur in Benton County on a regular basis during the warm summer months, these fires are typically very small and are usually contained and extinguished with existing personnel and equipment. However, large fires have occurred in the recent past and the WUI situation continues to become more complex as the county's population grows.

Those persons living in interface areas are most vulnerable to wildland or WUI fires. Within Benton County, approximately 60% of the land is classified as Fire Regime Group IV meaning that a longer fire return interval is expected for most of the county, but it will likely burn with severity. Additionally, the existing cover type for just over 43% of the county is classified as grasses and forbs. Covered with light, flashy fuels and having a higher proportion of invasive species, these areas are particularly vulnerable to wildland or WUI fires. The potential for large wildland fires in Benton County can be termed as **MODERATE** but over short periods of hot, dry weather the potential can quickly change to **HIGH**. Risk assessments should be accomplished using the national standard NFPA-299 for standardization of the

risk potential. Irrigated farmlands, improved fire spotting techniques, better equipment, and trained personnel are major factors in the relatively small average number of wildland fires that have occurred in the county annually.

On average, Benton County receives 7.75 inches of precipitation annually, but the dry climate of the Columbia River Basin and the frequent occurrence of strong, dry winds can cause fuels to cure quickly and become more prone to ignition. Additionally, high summer temperatures coupled with seasonal low rainfall amounts can result in summer drought conditions. These conditions are reached more often than the public perceives which can place Benton County at higher risk for human-caused wildfire. However, the likelihood of a large, catastrophic fire can be reduced through the implementation of fuel treatments and fuel breaks, habitat restoration projects, and public education and outreach related to safe recreational practices and residential fire mitigation programs such as Firewise.

Impacts of Wildfire Events

Should a wildland fire or WUI fire occur, the impacts of the fire would vary greatly with the size and location of the fire, the weather, and time of year. While it is unlikely that a major wildland or WUI fire would seriously impact Benton County as a whole, large wildfires are possible, and have occurred recently, due to continuous light, flashy fuels that are found throughout the county.

Immediate impacts to Benton County could potentially include loss of homes and property, loss of life, closed roads or extensive traffic-backups, displaced citizens who were evacuated or cannot access their homes, poor visibility from smoke, public confusion and concern, disrupted utilities or other municipal services, high volume of 911 emergency response calls, etc. Longer-term impacts could include limited or restricted vehicle access to at-risk areas, high volumes of emergency response vehicles, increased presence of emergency personnel, lingering concern or worry from the public, heavy smoke / prolonged smoke exposure, etc.

In the event of a large wildland or wildland-urban interface fire, additional resources could be requested through activation of the Tri-County Fire Mutual Aid Agreement, Southeastern Washington Regional Fire Mobilization Plan and/or the Washington State Fire Mobilization Plan in addition to other state and federal fire resources.

While there have always been people that have built homes in undeveloped areas, the number of people that are doing so has increased significantly in recent years as community populations and demand for development increases. As secluded lots with natural features have become more popular and communities expand, both individual homeowners and neighborhoods have encroached on natural, undeveloped areas that have higher risk of wildfire occurrence. These interface areas are becoming more numerous in Benton County and put both lives and property at increased wildfire risk.

Should a large wildland or WUI fire occur in Benton County, the effects of such an event would not be limited to just the loss of valuable rangeland, wildlife habitat, and recreational areas. The loss of large amounts of vegetation on steep slopes of watersheds would increase the risk of landslides and mudslides during the winter months and the depositing of large amounts of mud and debris in streams, rivers, and irrigation channels could threaten valuable fish habitat and watershed usage for many years.

In addition, the loss of crops and grazing land could significantly impact the agricultural industry in Benton County for a few years or more.

If a significant portion of the business area has been affected, the loss to the community can be overwhelming. Reduction of payrolls, infrastructure and long-term layoffs during recovery from a large fire could have a serious impact on the buying power of a large sector of the population. A long-term business closure could also have a large impact to the community's tax base.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As population and demand for development increase, Benton County will likely become more vulnerable to wildland fire due to the desire to live in and resulting expansion of the wildland-urban interface.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

At risk resources vary greatly depending on the location of the wildfire and the values of these resources can be far reaching and difficult to quantify.

The agricultural sector of the economy carries extensive values that a wildfire would put at immediate risk if the incident was in proximity to agricultural lands or facilities. Personal property, especially in the wildland-urban interface, consists of a wide range of values that would be at risk during a wildfire event. Response to any wildfire, especially a major one, would likely put stress on many support industries, critical infrastructure, and emergency response personnel and facilities within the county.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.



Severe Weather Profile

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plan's or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Local Event History

Severe storms, especially severe wind storms are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.
- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- On October 3rd, 1990, due to blowing dust, two chain-reaction accidents occurred on I-82, in Benton County, south of Kennewick, involving 26 vehicles. One person was killed and at least a dozen were injured. Again, in August of 2014, due to blowing dust, another accident involving more than 50 cars occurred in the same area, on I-82 near Locust Grove. At least 26 people had minor injuries.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.
- On May 19, 2006 a storm formed from convection in southern Morrow County in the late afternoon and eventually dissipated in Franklin County in the early evening. There was little lightning, if any. This storm included 90+ mph winds, localized medium hail, and localized heavy rains. Several homes in Kennewick were damaged when the runoff overflowed the gutters and flowed through garages flooding lower floors with one to three feet of water. The high winds caused significant damage to pulp wood groves in Morrow and Franklin counties.
- On August 20, 2009 a storm formed near the Oregon-Washington border in southern Benton County and traveled north beyond Grant County. There was little precipitation and a significant amount of lightning. The storm ignited fires from southwest Benton County across the Hanford Site and into counties farther north. There was no advanced warning of the approaching storm; it produced numerous lightning strikes and ignited many fires. Two of the Benton County fires burned together to form the Dry Creek Complex, resulting in the mobilization of a Washington State Type 2 Incident Management Team and a multi-day response
- On 05/21/2015, there was a tornado in Benton County that caused \$20,000 in damage.
- In February 2017 a severe storm produced heavy snow and rain that resulted in flooding and eventually led to a FEMA Major Disaster Declaration.

- In June of 2017 a severe storm produced more than 300 lightning strikes in the area with winds exceeding 68 mph. Lightning struck a house in Richland resulting in a house fire.

Probability of Future Occurrence

The probability of Benton County experiencing a severe weather event on an annual basis is very high. On record, there have been 43 thunderstorm and high wind events that were reported in Benton County, Washington between January 1st, 1950 and May 31st, 2003. In addition, there were four dust storms, three funnel cloud sightings, and one tornado in 1956.

Wind events in Benton County are often associated with winter storms during winter months and thunderstorms during the warmer months but can also occur without additional storm influences. The most damaging wind events, those with high winds speeds and long durations, typically occur over the winter months which is when most wind events are expected to occur. Strong winds generated by thunderstorms and microbursts are the second most common type of strong winds in Benton County. These storms have produced recorded sustained winds of 64 mph with wind gusts as high as 67 mph during the months of April, May, June, July, and August. Thunderstorm and microburst winds are relatively short-lived but can still cause significant localized damage.

A major winter storm hazard event has been determined to have a **MODERATE** likelihood of occurrence in Benton County. Storms with severe winds, such as ice storms and dust storms, occur on an infrequent basis and are considered to pose a **LOW** risk.

Tornadoes are relatively rare, but the conditions for a funnel cloud to form are reported in Benton County several times each year. Nevertheless, based on the historical record of tornadoes in this area, the probability of a small tornado occurring in Benton County is **LOW**. The probability of a higher magnitude tornado occurring in this area is **VERY LOW**.

Impacts of Severe Weather Events

When a strong windstorm strikes a community, it leaves behind a distinctive trail. Trees toppled over on buildings and cars, downed power lines crisscrossing the roads, and widespread power outages are a few of the signs that a windstorm has struck. After such an event, it can take communities days, weeks, or longer to return to normal activities. In addition to costly structural damages, windstorms can cause injury or even death.

Windstorms have the ability to cause damage over 100 miles from the center of storm activity. Isolated wind phenomena in the mountainous regions have more localized effects. Winds impacting walls, doors, windows, and roofs, may cause structural components to fail. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. The effects of winds are magnified in the upper levels of multi-story structures. As positive and negative forces impact the building's protective envelope (doors, windows, and walls), the result can be roof or building component failures and considerable structural damage.

Winter storms are deceptive killers. Many of the deaths that occur are indirectly related to the actual storm, including deaths resulting from traffic accidents on icy roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to the cold. Property is at risk due to flooding and landslides resulting from heavy snow melt. Trees, power lines, telephone lines, and television and radio antennas can be impacted by ice, wind, snow, and falling trees and limbs. Saturated soil can cause trees to lose their ability to stand and fall on houses, cars, utilities, and other property. Similarly, if streets are icy, it is difficult for emergency personnel to travel and may pose a secondary threat to life if police, fire, and medical personnel cannot respond to calls. Common winter storm hazards are as follows:

- **Roads and Bridge:** Snow and ice events resulting in icy road conditions can lead to major traffic accidents. Roads blocked by fallen trees during a windstorm may have tragic consequences for people who need access to emergency services. The ability to travel after a natural hazard event is a priority issue for residents, organizations, and providers of essential services such as hospitals and utilities.
- **Power Lines:** Historically, falling trees can be a major cause of power outages resulting in interruption of services and damaged property. In addition, falling trees can bring electric power lines down, creating the possibility of lethal electric shock. Snow and ice can also damage utility lines and cause prolonged power outages. Rising population growth and new infrastructure in the City creates a higher probability for damage to occur from severe winter storms as more life and property are exposed to risk.
- **Water Lines:** The most frequent water system problem related to cold weather is a break in cast iron mainlines. Breaks frequently occur during severe freeze events, as well as during extreme cooling periods during the months of October, November, and December. Another common problem during severe freeze events is the failure of commercial and residential water lines. Inadequately insulated potable water and fire sprinkler pipes can rupture and cause extensive damage to property.

Vulnerability to severe storm hazards is a function of location, type of human activity, use, and frequency of storm events. The effects of severe storms on people and structures can be lessened by total avoidance of flood hazard areas or by restricting, prohibiting, or imposing conditions on hazard zone activity. Local governments can reduce flooding, landslides and wind effects through land-use policies and regulations. Individuals can reduce their exposure to hazards by educating themselves on the past history of a site and by making inquiries to planning and engineering departments of local governments. In addition, it is highly advised to consult the professional services of an engineering geologist, geotechnical engineer, or a civil engineer, who can properly evaluate a site, built or un-built.

Development Trends

Despite a steady increase in population and fluctuating demand for development, the vulnerability of Benton County to severe storms has not changed. Adherence to building codes and community preparedness will help to minimize the impact of a severe storm on Benton County.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Benton County. Damage to roofs by heavy snow accumulations depends on the moisture content of the

snow and the structural characteristics of the buildings. In general, snow in this region tends to have low moisture content because of the low temperatures and arid environment. Additionally, due to the lack of significant topographic features, the wind tends to blow much of the snow accumulation away.

Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on Benton County residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events; however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food.

Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Benton County schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow-covered roads. In the event of severe weather, all households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

Thunderstorms do occur within Washington affecting all counties, but usually are localized events. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. The loss potential from flash flooding caused by severe thunderstorms can be significant in Benton County. Particularly as winds in excess of 20 mph tend to blow debris into irrigation canals which can cause overtopping and damage. In order to mitigate the risk of flooding, the irrigation district deploys vegetation clearing crews to canals when winds exceed 20 mph.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structure and other personal property as well as to the extensive agricultural development in Benton County. Potential losses to agriculture can be disastrous. They can also be very localized; thus, individual farmers can have significant losses, but the event may not drastically affect the economy of the County. Furthermore, crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Federal and state aid is available for County's with declared hail disasters resulting in significant loss to local farmers as well as the regional economy. Homeowners in Benton County rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

Earthquake Profile

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Communities in western Washington, particularly those in the Puget Sound Basin and along the Pacific coast, are most at risk from earthquakes. Some counties in eastern Washington, including Benton County, are also vulnerable. While most earthquakes occur in western Washington, earthquake hazards are significant east of the Cascades to approximately the Columbia River.

Because of the infrequency of such devastating events, there is a **LOW** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of Benton County should such an earthquake occur.

It is impossible to forecast earthquakes given our existing technology, but scientists can estimate general probability based on historic occurrences and location among other factors. The size of a fault segment, the stiffness of rocks, and the amount of accumulated strain energy combine to control the magnitude and timing of earthquakes. Fault segments most likely to break can be identified where faults and plate motions are well known. Geologists have uncovered evidence of a number of surface faults in eastern Washington; however, they have not yet determined how active the faults are, nor determined the extent of the risk they pose to communities. One fault, Toppenish Ridge (located west of Benton County), appears to have been the source of two earthquakes with magnitudes of 6.5 to 7.3 in the past 10,000 years. A number of faults within Benton County have been mapped and potential seismic activity has been modeled (Figure 21).

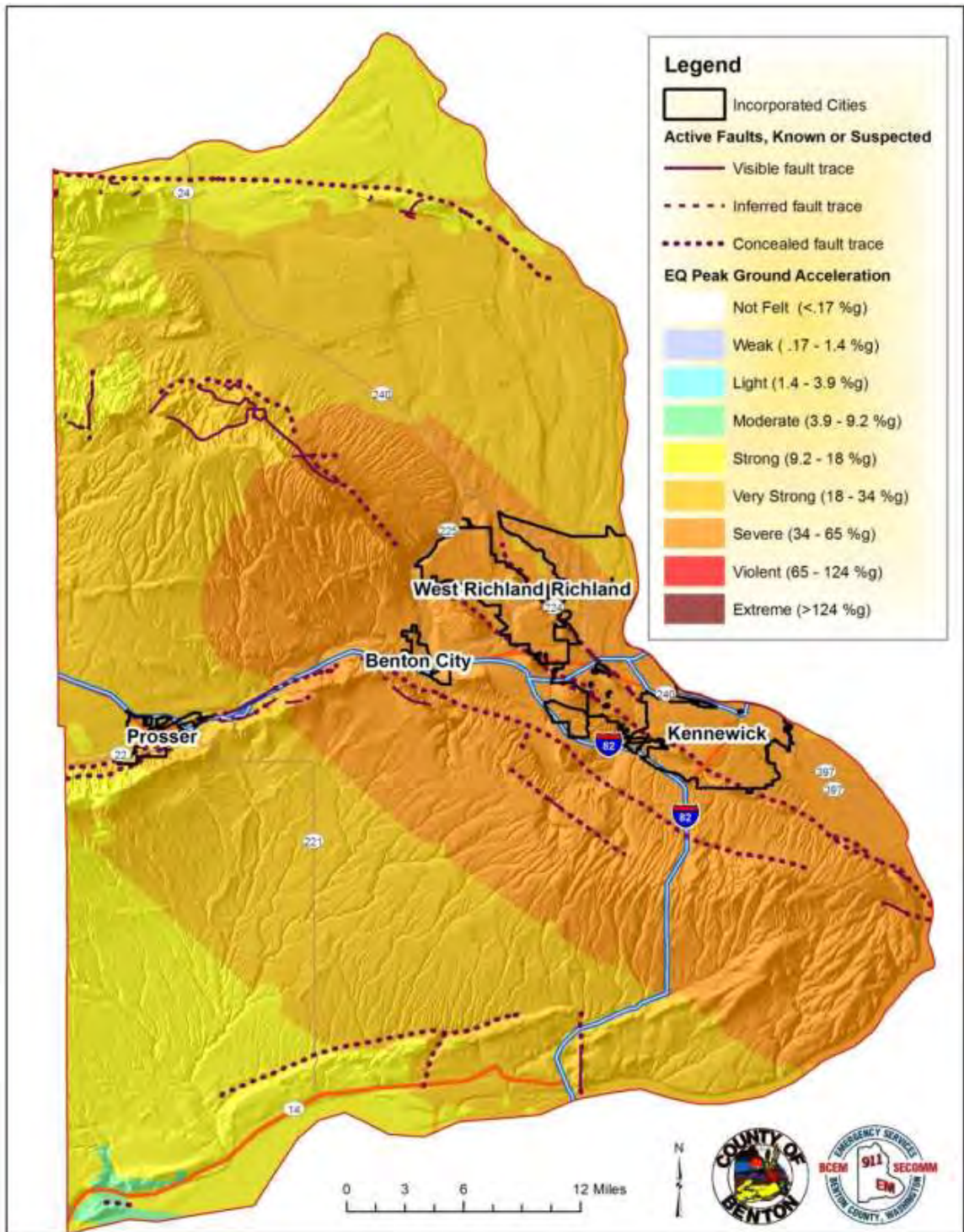


Figure 21) Peak ground acceleration for earthquakes occurring in the vicinity of Benton County.

Faults and fault systems in the Pacific Northwest are complex and are currently being studied. Even with the number of studies that have been conducted to date, additional research will be required before scientists are able to forecast when any particular fault in Washington State will break. The following studies, in addition to those mentioned previously on the Lake Chelan and Milton-Freewater earthquakes, have been conducted recently, or are still underway, and have provided critical information about faults and fault systems in Eastern Washington:

- **In-text Citation: Sherrod et al. (2016)**
- *Active faulting on the Wallula fault zone within the Olympic-Wallowa Lineament, Washington State, USA*
 - B. L. Sherrod, R. J. Blakely, J. P. Lasher, A. Lamb, S. A. Mahan, F. F. Foit and E. A. Barnett
 - Geological Society of America Bulletin (May 2016) 128 (11-12): 1636-1659
 - The authors of the study mapped past earthquakes that occurred in the Wallula Fault zone. The structure and past earthquake activity of the Wallula fault zone are important because of nearby infrastructure which includes communities within the Columbia River basin.
- **In-text Citation: Blakely et al. (2012)**
- *Tectonic setting of the Wooded Island earthquake swarm, eastern Washington*
 - Richard J. Blakely, Brian L. Sherrod, Craig S. Weaver, Alan C. Rohay, and Ray E. Wells
 - Bulletin of the Seismological Society of America 2012
 - "...a swarm of ~1500 shallow (~1 km deep) earthquakes...occurred in 2009 on the Hanford site, Washington. Epicenters were concentrated in a 2 km² area near Wooded Island in the Columbia River. The largest earthquake (M 3.0) had first motions consistent with slip on a northwest-striking reverse fault. The swarm was accompanied by 35 mm of vertical surface deformation (as) seen in satellite interferometry (InSAR)."
- **In-text Citation: Blakely et al. (2011)**
- *Connecting the Yakima fold and thrust belt to active faults in the Puget Lowland, Washington*
 - Richard J. Blakely, Brian L. Sherrod, Craig S. Weaver, Ray E. Wells, Alan C. Rohay, Elizabeth A. Barnett, Nichole E. Knepprath
 - Journal of Geophysical Research: Solid Earth
 - "We postulate possible tectonic connections between the YFTB in eastern Washington and active faults of the Puget Lowland. We suggest that faults and folds of Umtanum Ridge extend northwestward through the Cascade Range and merge with the Southern Whidbey Island and Seattle faults near Snoqualmie Pass 35 km east of Seattle. Recent earthquakes ($M_w \leq 5.3$) suggest that this confluence of faults may be seismically active today."

The findings of these studies have implications for nearby communities including those located in Benton County. They will be referenced in subsequent sections as critical infrastructure within Benton County and the seismic hazards associated with nearby faults are further detailed. For additional information, the studies can be found online (some may require a fee for access to the publication).

Impacts of Earthquakes

Earthquakes cause damage by strong ground shaking and by the secondary effects of ground failures, tsunamis, and seiches. The strength of ground shaking generally decreases with distance from the earthquake source. Shaking can be much higher when soft soils amplify earthquake waves. West Seattle and downtown Olympia are examples where amplification repeatedly has occurred, and ground shaking was much stronger than in other nearby areas. Ground failures caused by earthquakes include fault rupture, ground cracking, lateral spreading, slumps, landslides, rock falls, liquefaction, localized uplift and subsidence. Faults often do not rupture through to the surface. Unstable or unconsolidated soil is most at risk. Any of these failures will affect structures above or below them. Large and disastrous landslides can often result from an earthquake. Soil liquefaction describes a phenomenon whereby a saturated soil substantially loses strength and stiffness in response to an applied stress like an earthquake's ground shaking, causing it to behave like a liquid. Liquefaction can cause building foundations to fail and low-density structures such as underground fuel tanks and pilings to float.

The Nisqually Earthquake that took place on February 28, 2001 near Seattle caused extensive damage to communities along the Pacific coast. Depending on the location of the epicenter and the magnitude of an earthquake, Benton County may be able to expect some of the same types of damage that occurred in coastal communities after the Nisqually earthquake. A summary of the damage is as follows:

- Two studies by the University of Washington funded by the National Science Foundation estimated the quake caused \$1.5 billion in damages to nearly 300,000 households and that 20% of small businesses in the region affected by the quake had a direct physical loss and 60% experienced productivity disruptions.
- Structures damaged included office buildings, residences, schools, hospitals, airport facilities and churches -many damaged structures were closed for various lengths of time following the earthquake.
- Structural damage was primarily concentrated in older, unreinforced masonry buildings built before 1950, with some damage reported to wood-frame structures and reinforced concrete structures.
- In general, new buildings and buildings that had recently been seismically upgraded typically displayed good structural performance, but many still sustained non-structural damage.
- The capital building in Olympia was severely damaged. The dome of the 74-year-old building sustained a deep crack in its limestone exterior and damage to supporting columns. There was non-structural damage which occurred throughout the building.
- Lifeline systems generally performed well during the event.
- Water utilities reported minor structural damages; a number of wells in Eastern Washington reportedly went dry.
- A gas-line leak caused a fire and explosion when two maintenance workers were resetting an earthquake valve at a correctional facility near Olympia.
- Seattle City Light reported 17,000 customer power outages, and Puget Sound Energy reported 200,000 customers without power, but power was restored to most customers within a day.
- The volume of calls placed immediately after the earthquake overloaded landline and wireless communication systems.

- Seattle-Tacoma International Airport closed immediately because its control tower was disabled. King County Airport (Boeing Field) suffered serious cracking and gaps on the runway due to soil liquefaction and lateral spreading.
- While the area's overall road network remained functional, many highways, roads, and bridges were damaged. Several state routes and local roadways closed due to slumping and pavement fractures. Two local bridges closed due to significant damage.
- The state's dams fared well during the earthquake. Dams controlled or regulated by the Federal Energy Regulatory Commission, the Bureau of Reclamation, or the U.S. Army Corps of Engineers, were not damaged.

Damage to residential structures came in a variety of forms, from severe mudslide destruction of entire homes to breakage of replaceable personal property. The study indicates that structural damage to roofs, walls and foundations accounted for nearly two-thirds of losses, followed by chimney damage, and damages to nonstructural elements and household contents. Anecdotal evidence suggests that the impacts of the Nisqually earthquake extended to Benton County as two wells at the north end of the county were reported to have been damaged.

There are a number of faults located within Benton County that have the potential to produce damaging earthquakes. Figure 21 shows the locations of different faults within Benton County as well as peak ground acceleration for the fault that passes through Kennewick and West Richland and extends under further northwest along a line that includes Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain. The fault, which is a part of the Wallula fault zone, could potentially produce a 7.5 magnitude earthquake but it is more likely to be close to 5.5 (Sherrod et al 2016). In the event that the fault does produce an earthquake, peak ground acceleration in the Kennewick/Richland area could be severe while the rest of the county could experience strong to very strong ground shaking. A scenario based on a 7.5 magnitude earthquake produced by this fault is included in the Washington Earthquake Risk Assessment that was done for each jurisdiction. It is referred to as the Rattlesnake Wallula Fault scenario in the analyses.

The epicenter is not indicated in Figure 21, but the Wooded Island earthquake swarm of that occurred in 2009 produced multiple earthquakes at the Hanford Site. The largest quake recorded a magnitude of 3.0 (Blakely et al. 2012). The fault that produced the Wooded Island swarm could produce future earthquakes. The potential peak ground acceleration for said fault is unknown but the intensity of future earthquakes has implications for the Hanford Site in particular due to its proximity to Wooded Island.

Additional research has also revealed connectivity between faults in the Puget Lowland area and the Yakima Fold and Thrust Belt (Blakely et al. 2011). This finding suggests that seismic activity on the west coast of Washington could have implications for eastern Washington and potential seismic activity from faults found east of the Cascade Mountain range.

Critical Infrastructure in Benton County

The number of buildings and critical infrastructure near an earthquake epicenter is a major factor in determining the severity of the impacts from the earthquake. Benton County contains critical infrastructure that could theoretically be damaged by an earthquake event, thus causing further disaster

or detrimental impacts. Road overpasses, bridges, rail lines, high-volume traffic areas, fuel storage facilities, fuel pipelines, natural gas pipelines, and river transportation systems are some of the elements of infrastructure within Benton County that might be affected during an earthquake event. Additionally, damage to medical facilities, schools, businesses, and other high-occupation infrastructure could escalate threats to human life and have negative impacts on the local economy.

Through advancements in satellite and laser imagery, researchers now have a better understanding of fault systems in Washington State and the hazards that they present. Considering that most major transportation, water, and energy-related infrastructure was designed and built when central Washington was thought to be at little to no risk of an earthquake, new information collected by researchers is raising concern about the ability of older infrastructure to withstand severe ground shaking from earthquakes with “local” epicenters. Particularly quakes from the fault that produced the Wooded Island swarm as well as the Wallula fault zone. The stability of key infrastructure within Benton County has recently been and will continue to be evaluated for potential earthquake scenarios:

Bridges: In the event of an earthquake, bridges could potentially be damaged. Should a bridge become unpassable, first responders may not be able to respond to emergency situations in a timely manner and citizens may have escape routes cutoff. According to the local Washington State Department of Transportation manager, the primary bridges have been built to resist the effects of earthquakes. Also, all overpasses located along the I-182/US 12 and US 395 corridors are maintained by the state. The bridges listed below are state-maintained bridges in Benton County:

Cable Bridge (US 397)
Interstate 182 Bridge
Vernita Bridge (SR 24)

Blue Bridge (US 395)
Benton City – Kiona Bridge (SR 225)
Pasco-Kennewick/Finley railroad bridge

Dams: There is only one major dam located in Benton County. The McNary Dam is located on the Columbia River near Umatilla, OR and is owned by the U.S. Army Corps of Engineers so there are regulatory requirements for inspections and emergency planning. According to USACE response management officials, a loss of the McNary pool would pose some economic impact to Benton County.

Dam failure up the Columbia and Snake Rivers (for example, Grand Coulee and Dworshak, respectively) during an earthquake could cause significant damage in Benton County. In an effort to evaluate dams on the Columbia River, the Seismic Hazard Assessment for Mid-Columbia Dams report prepared by The US Army Corps of Engineers analyzes the impacts an earthquake may have on Columbia River dams. As mentioned previously, major dams on the Columbia River were constructed before earthquakes were considered to be a significant hazard in central Washington. Columbia River Dams are currently being assessed and some may be retrofitted with updates intended to increase structural stability during an earthquake.

The Hanford Site⁴⁰: Currently being stored at the Hanford Site is 56 million gallons of radioactive waste from cold war era nuclear weapons production. Still in progress is a multi-billion dollar effort to clean-up all radioactive material at The Hanford Site. This includes dismantling and disposing building materials that were exposed to radioactive material and the disposal of radioactive material itself. Considering the quantity of nuclear waste still present at the Hanford Site and that the clean-up effort is a multi-decadal project, prolonged exposure to potential earthquakes is a concern. Additionally, most of the original structures on the Hanford Site, including the underground storage tanks that currently hold liquid nuclear waste, were constructed during World War II before earthquakes were considered to be a significant hazard in Central Washington. In light of new research about faults in central Washington, the Hanford Sitewide Probabilistic Seismic Hazard Analysis, prepared by Pacific Northwest National Laboratory, was conducted from 2012 to 2014 in an effort to summarize earthquake hazards at the Hanford Site.

Energy Northwest Columbia Generating Station⁴¹: The Columbia Generating Station is a nuclear power plant that was constructed within the Hanford Site. There are several reports, including the Columbia Generating Station Seismic Hazard and Screening report, that analyze the Columbia Generating Station's susceptibility to earthquakes and NRC Commissioner Allison M. Macfarlane has stated that "The NRC continues to conclude that CGS has been designed, built, and operated to safely withstand earthquakes likely to occur in its region."

Developmental Trends

Both population and demand for development are projected to increase for Benton County. With additional development and infrastructure, Benton County will become more vulnerable to Earthquake hazards. However, land use planning, adherence to and development of building codes, seismically sound engineering, and community preparedness will help to minimize the impact of an earthquake on Benton County.

Value of Resources at Risk

Benton County is likely to experience ground shaking from future earthquakes in the Pacific Northwest and western U.S. as it has in the past. A local shallow crustal earthquake (e.g. on the RAW or Horse Heaven Hills faults) similar to the July 15, 1936 Milton-Freewater earthquake (M=5.75) may even result in local ground failures. Forecasting the amount of damage that could occur during an earthquake and estimating potential losses in dollars is difficult as water, sewer, and natural gas pipelines, roads, power lines and infrastructure, buildings, and private property are all located within the county and are all vulnerable to earthquakes. However, there are a number of models that attempt to model and quantify

⁴⁰ <http://www.tri-cityherald.com/news/local/hanford/article203465329.html>

⁴¹ <https://www.energy-northwest.com/ourenergyprojects/Columbia/Documents/Columbia%20Generating%20Station%20Seismic%20Safety%20Fact%20Sheet.pdf>

damage from different earthquake scenarios. According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$14 to \$360 million in damages in unincorporated areas (Table 24). Of the 743 structures that were included in the different analyses, up to 1,069 structures were lost in the Rattlesnake Wallula Fault scenario totaling more than \$359 million.

Table 24) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for unincorporated areas of Benton County, WA. Total number of structures and total value of structures used in the analyses are included below the table.

Benton County (unincorporated areas) Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$14,066,440	0.2%
M7.4 Rattlesnake Wallula Fault	\$359,661,031	5.9%
M7.1 Horse Heaven Hills Fault	\$259,935,341	4.3%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	743	4.1%
Total number of structures identified in analyses:		18,114
Total value of all structures and structure content:		\$6,089,395,221

Landslide Profile

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Figure 22 shows the locations of known historic landslides. Most have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

Probability of Future Occurrence

Within the Columbia River Basin, a series of ancient seeping lava flows and subsequent flooding events from Lake Missoula (a prehistoric glacial lake) left behind soil deposits in the Columbia Basin that are highly susceptible to erosion. These loose, failure-prone soils are further capped by wind-blown sands, silts, and clays (known as loess). Consequently, landslides are a concern in the Columbia Basin as they can be triggered naturally by the process of erosion or by human activities such as the excavation of a toe slope. Irrigation in the Columbia Basin compounds the provinces landslide problems. For example, irrigation near Pasco has increased drainage and landslide problems ten-fold since 1957. Reactivations of relict and dormant deep-seated landslide complexes have occurred in the bluffs along the Columbia River upstream of Richland. Areas specific to Benton County that have been most active in the recent past include the Columbia River Gorge and the Prosser to Benton City section of Interstate 82 (yellow areas on Figure 22).

Benton County is vulnerable to landslide hazards under the proper conditions, especially in the steeper slope areas (red areas on Landslide Risk map; Figure 22). Several factors, such as rainfall levels, vegetation cover, soil depth and geology, affect the stability of slopes which, in general, become potentially less stable as slope-steepness increases. This is becoming more of a concern as it relates to new construction in the county. In response to market conditions, competition among competing land uses, and as higher income households target view lots on slopes and ridges, new residential developments in Benton County are increasingly occupying the more geologically complex terrain. These are the areas that present problems associated with slope instability and erosion, especially those in excess of 15 percent slope as identified by The Benton County Planning Department.

Based on historical evidence, there is a **MODERATE** probability of a destructive landslide occurring in Benton County. Because of the infrequency of landslide events occurring in populated areas of Benton

County, there is a **LOW** risk associated with this hazard during the majority of the year with the risk increasing to **MODERATE** during the times when irrigation systems are up and operating; typically mid-March through the end of October.

Impacts of Landslides

Landslides are downhill movements of rock, debris, or soil mass that vary in size depending on the geology and the initial cause of the slide. Because they can happen suddenly and without warning, landslides can injure or kill, destroy structures such as homes, businesses, and public buildings, interrupt infrastructure such as transportation or utilities. Landslides can even impact the environment by disturbing or covering aquatic or other habitat or directly killing plants and animals.

Natural processes can cause landslides or re-activate historical landslide sites. The removal or undercutting of shoreline-supporting material along bodies of water by currents and waves produces countless small slides each year. Seismic tremors can trigger landslides on slopes historically known to have landslide movement. Earthquakes can also cause additional failure (lateral spreading) that can occur on gentle slopes. Landslides are particularly common along stream banks. The incidence of landslides and their impacts on people can be exacerbated by human activities. Grading for road construction and development can increase slope steepness. Grading and construction can decrease the stability of a hill slope by adding weight to the top of the slope, removing support at the base of the slope, and increasing water content. Other human activities effecting landslides include: excavation, irrigation, drainage and groundwater alterations, and changes in vegetation. Locations at risk from landslides include areas with one or more of the following conditions:

- On or close to steep hills
- Steep road-cuts or excavations
- Existing landslides or places of known historic landslides (such sites often have evidence of past movement such as tilted trees, cracks in the ground, and irregular-surfaced ground)
- Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.

Due to the unique problems inherent in development in steeply sloping areas, special care must be exercised in the planning and development of such areas. Benton County's Comprehensive Plan Land Use Map identifies lower rural densities for steeply sloping areas and the Critical Areas Protection Ordinance applies performance standards to development within these areas. While not prohibiting development, the ordinance does require that the nature and severity of the hazard be identified and that the siting, design and engineering for development directly respond to the identified hazards, so that long term structural integrity can be reasonably assured (Benton County Comprehensive Plan).

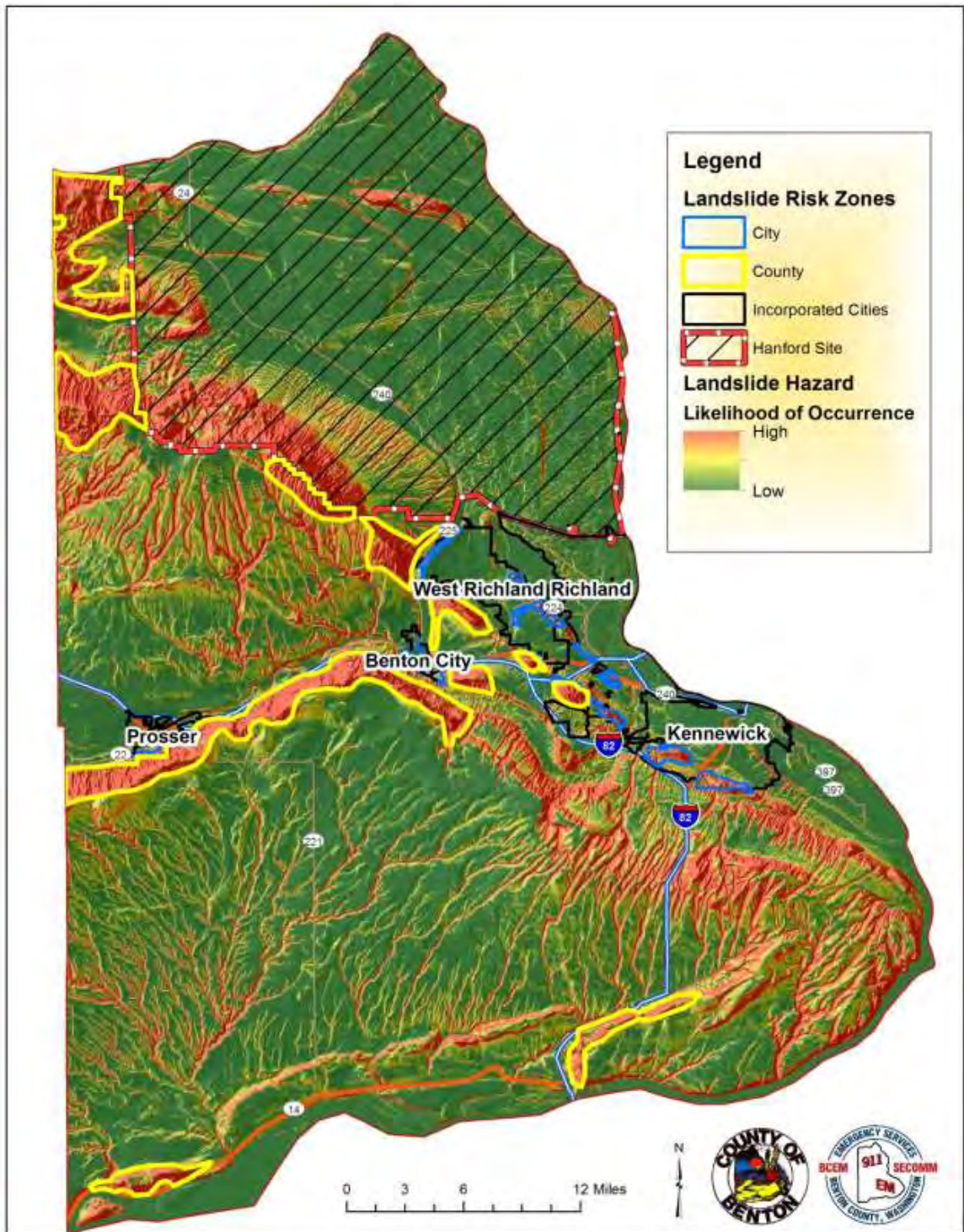


Figure 22) Landslide risk areas and historic landslides for Benton County, WA.

Developmental Trends

With a steady increase in population and overall increase in demand for development, the vulnerability of Benton County to landslides has changed. New housing developments are more frequently placed on sloped terrain that poses a risk of landslides. In particular, homes constructed on the toe slope of the Horse Heaven Hills and those constructed on the shoulder and toes slopes of the fault ridges (Badger Mountain for example) are considered to be at high risk. Refer to the Landslide sections for each jurisdiction for more information. Land use planning, adherence to building codes, and community preparedness will help to minimize the impact of a landslide on Benton County.

Value of Resources at Risk

Resources most at risk in a land movement event include infrastructure, economy, and personal and municipal property. These values vary significantly throughout the county. Most of the value associated with these resources is located in and near the cities of Richland and Kennewick as they are the hubs for commerce, industry, and transportation, and because they combine to make up the largest residential area.

Benton County has 2931 structures in designated high-risk landslide zones. These structures have an appraised value totaling just under \$698 million (Table 25). Of these structures, around 26% are in unincorporated areas of Benton County. The majority (98%) of structures in high risk landslide zones are classified as residential.

Table 25) Number and value of appraised structures in designated high-risk landslide zones in Benton County, WA. This table includes both municipal jurisdictions and unincorporated areas of Benton County as well as structure use classifications.

Jurisdiction and Building Type	Number of Appraised Structures	Value of Appraised Structures
Unincorporated	777	\$141,875,560.00
Agricultural	1	\$970.00
Commercial	10	\$551,450.00
Industrial	2	\$238,470.00
Residential	764	\$141,084,670.00
Benton City	56	\$4,998,830.00
Industrial	1	\$605,920.00
Residential	55	\$4,392,910.00
Kennewick	847	\$231,341,920.00
Agricultural	4	\$1,212,650.00
Commercial	6	\$839,970.00
Residential	837	\$229,289,300.00
Prosser	190	\$34,925,450.00
Commercial	8	\$775,430.00
Residential	182	\$34,150,020.00
Richland	610	\$195,407,840.00

Agricultural	2	\$894,970.00
Commercial	6	\$1,404,180.00
Residential	602	\$193,108,690.00
West Richland	451	\$89,406,610.00
Commercial	14	\$1,552,040.00
Residential	437	\$87,854,570.00
Total	2931	\$697,956,210.00



Volcano Profile

Much of the information below was excerpted or derived from past Benton County Hazard Mitigation Plans or from the Washington Military Department's Washington State Enhanced Hazard Mitigation Plan (EHMP).

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanoes that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

The Pacific Ring of Fire, whose perimeter includes the Cascades, has produced 22 of the 25 largest volcanic eruptions over the last roughly 11,000 years. The USGS studies and monitors many of the active volcanoes in Washington State. Studies have shown that Glacier Peak has erupted an estimated five times in the last 13,000 years; likewise Mount St. Helens last eruption on May 18, 1980 demonstrated that the Volcanoes within the Cascade Mountain Range are still active, and they will erupt again. While not a common occurrence, there are, on average, two eruptions in the Cascade Mountain Range every 100 years. The map below (Figure 22) indicates that there is a 1 in 1,000 to 1 in 10,000 chance every year that either some or all jurisdictions in Benton County will receive 10 centimeters (approximately 4 inches) of ash fall from a volcanic eruption. The annual probability that Benton County will receive any ash fall during an eruption is much higher. It should be noted that probabilities of occurrence are influenced by size and duration of an eruption, the point of eruption, prevailing wind direction and wind speed, and other weather factors.



Figure 23) Probability map of at least 10.0 cm of ash accumulating as a result of a Mount St. Helens eruption.

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure, and the environment in Benton County would be serious though not necessarily catastrophic. Therefore,

there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcanic Events

The volcanoes of the Cascade Range have produced more than 100 eruptions, most of them explosive, over the past few thousand years. Considering that individual Cascade volcanoes can lie dormant for many centuries between eruptions, the short- and long-range threats posed by volcanic activity are not always conspicuous. Pyroclastic flows, lava flows, and landslides can devastate areas 10 or more miles away and lahars can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions can disrupt human activities hundreds of miles downwind and drifting clouds of fine ash can cause severe damage to jet aircraft thousands of miles away. Erupting Cascade volcanoes are more prone than other U.S. volcanoes to explosive volcanic activity and present a unique and devastating set of hazards to communities that are in range. Because the population of the Pacific Northwest is rapidly expanding, the volcanoes of the Cascade Range in Washington, Oregon, and northern California are some of the most dangerous in the United States. Although Cascade volcanoes only erupt twice per century on average, they can be extremely dangerous as they tend to explode violently, feature permanent snow and ice cover that can melt rapidly and fuel large lahars, and are in proximity to important infrastructure, air routes, and populated areas of varying size and development.

Considering the proximity of Benton County to the Cascade Mountain Range, the greatest risk posed to the communities of Benton County during an explosive volcanic eruption would be ash fall. Volcanic ash is a mixture of small rock and glass particles that are small and light enough to be carried thousands of miles away from the point of eruption. Prolonged exposure to ash poses a health risk to people with respiratory conditions, children, and the elderly often resulting in an increase in the number of patient visits to medical facilities and high demand for medication and other medical supplies. Ash build up on the rooftops of building can weaken structures and cause them to collapse, potentially causing injury or death to occupants or bystanders. Water quality, wastewater management, and other municipal water treatment and water supply infrastructure can be impacted or disrupted by ash fall. In addition to the risk to human health, ash can disrupt everyday activities; vehicle engines can become clogged with ash causing them to stall, power distribution systems can fail, communication systems may be disrupted due to the scattering or absorption of radio signals, and crop damage and effects on livestock can range from minimal to severe¹⁸. Additionally, ash fall can disrupt transportation systems through the closing of roadways and airports, potentially resulting in an economic loss and stranded citizens.

Developmental Trends

Despite a steady increase in population and fluctuating demand for development, the vulnerability of Benton County to volcanic activity has not changed. While difficult to prepare for the consequences of ash fall, mitigation strategies, such as keeping roadways clear for emergency crews and first responders, can help protect and save lives during a volcanic eruption.

Value of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles

within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



City of Kennewick Profile

The City of Kennewick covers 27.7 square miles of land and 1.5 square miles of water along the south bank of the Columbia River southeast of the confluence of the Yakima and Columbia Rivers. With an estimated 2018 population of 81,850, Kennewick is the 13th largest city in Washington and the largest of the three Tri-Cities. Since its incorporation in 1904 Kennewick has seen steady population growth (Table 27). The City was primarily an agricultural center until the 1940s, when it began to experience growth associated with the Hanford Site. Leading up to and following extensive layoffs at the Hanford Site in 2011, Kennewick has developed as a bedroom community and shopping destination for the region. Kennewick is governed by an elected City Council. Daily operations are directed by the City Manager.

Table 26) Historic Populations of Kennewick, WA.

Census	Population	% Change
1910	1219	
1920	1684	38%
1930	1519	-10%
1940	1918	26%
1950	10106	427%
1960	14244	41%
1970	15212	7%
1980	34397	126%
1990	42155	23%
2000	54693	30%
2010	73917	35%

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for Kennewick can be found in Appendix B.

Development Trends

As part of the Growth Management Act, the Washington State Office of Financial Management (OFM) has provided Benton County with a population estimate for a period ending in the year 2037. For planning purposes, the countywide population estimate was distributed on an existing percentage basis to the various cities and unincorporated areas within Benton County. Kennewick's official population forecast is a total of 112,044 in the incorporated area by the year 2037. Current 2018 population estimate within the incorporated area is 81,850.

Kennewick's Comprehensive Plan includes a land use inventory which summarizes developed and buildable lands within current City limits and the 20-year Urban Growth Area. It also provides an estimate of acres needed for development to accommodate the projected 2037 population. Overall, the Comprehensive Plan indicates that an additional 1,687 beyond the acres already included in the Kennewick UGA will be required to support the expected development.

The current Kennewick UGA is scattered along the eastern City limits with additional parcels south of State Highway 240 in the northern part of the City and between Interstate 82 and Clearwater Avenue in the southwest portion of the City (Benton County Comprehensive Plan). To accommodate the projected population, increase, Kennewick is analyzing the areas to the southwest and southeast of the City for potential inclusion in the 50-year UGA (Kennewick Comprehensive Plan). The area south of Interstate 82 has been specifically targeted for possible expansion.

Kennewick Hazard Annex

Flood Profile

The City of Kennewick does not have any differing levels of risk associated with this hazard than Benton County as a whole. However, Kennewick's exposure to flooding will be different than that of Benton County and the other jurisdictions within the county.

Local Event History

The City of Kennewick was inundated by the May 31, 1948 Columbia River flood and was likely impacted by other flooding events that caused damage to Benton County (Table 27). Since most of the historic flood events involved the Yakima River it is difficult to determine which events would have caused damage to Kennewick.

Table 27) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
17-Dec	53,800 at Prosser	18.5 est.		
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.
1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	
5-Jun-13	20900	13.1	5	

13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

Kennewick has flooding potential due to its proximity to the Columbia, Snake, and Yakima rivers. The threat of flooding has been greatly reduced by the construction of dams along these rivers but some potential still exists. Therefore, Kennewick has a **MODERATE** probability of flooding. Due to the centrally-located, highly-valuable resources in Kennewick, a flood event carries a **MODERATE** risk. The flash flooding potential of Zintel Canyon was reduced by the construction of the Zintel Dam and risk associated with levy failure was reduced with canal lining.

The Kennewick Flood Map (Figure 24) shows that all structures that are susceptible to flooding fall within flood zones A, AE, or AO (Table 28). This means there is a 1% chance, more for structures located in zone AO, that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage.

Table 28) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

AR Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99 Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.



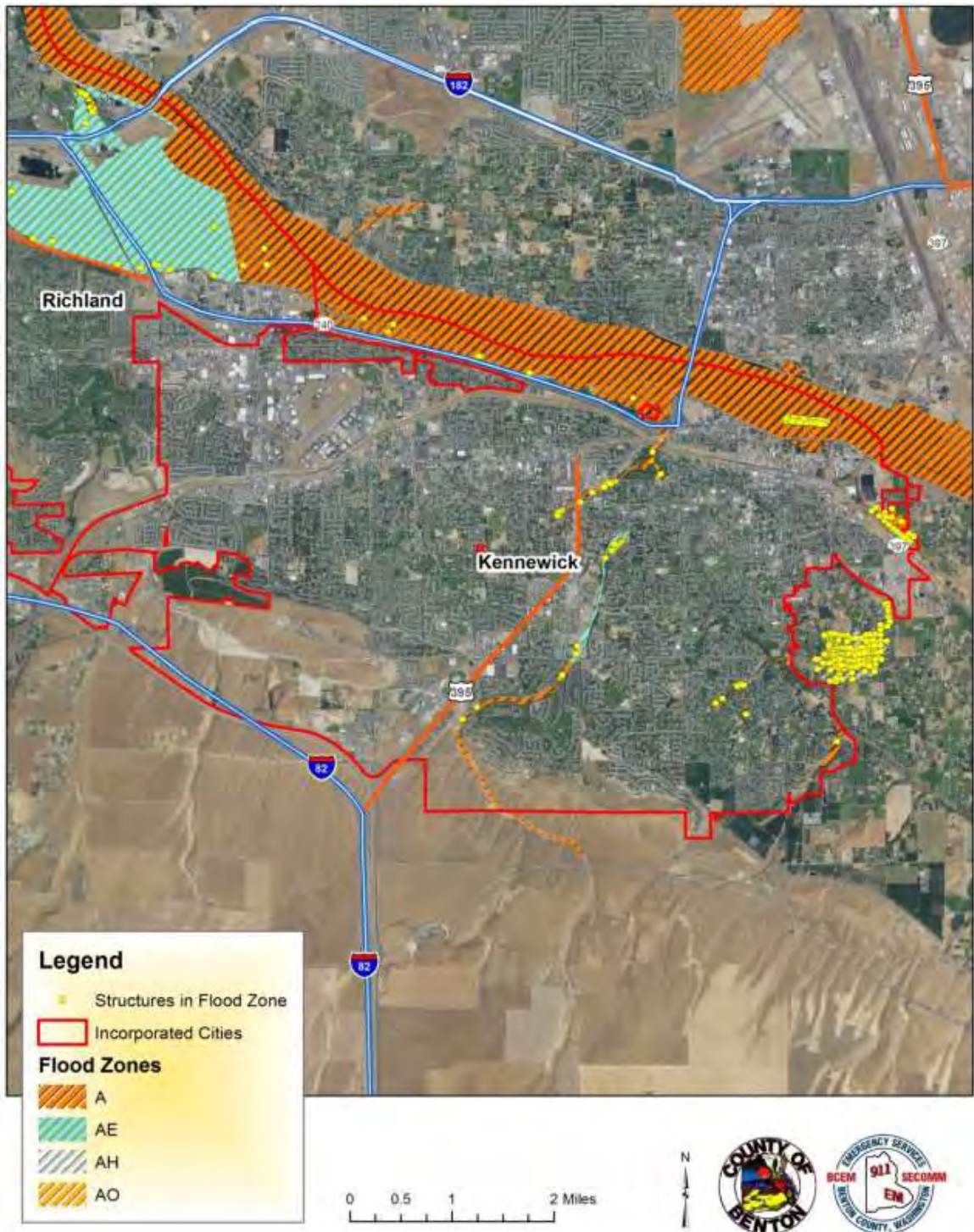


Figure 24) National Flood Insurance Program flood zone map for Kennewick, WA.

Structures in flood zone AO will likely be inundated with 1 to 3 feet of water during a flood event while it is unknown what depths to expect during a flood event for flood zone A as an analysis has been not been performed in those areas.

Impacts of Flooding

Potential impacts caused by flooding in Kennewick include increased landslide risk, damage to infrastructure or roads, and damage to personal property. Refer to *Benton County Annex* for additional information.

Development Trends

As both population and demand for development are projected to increase for the City of Kennewick, it should be expected that Kennewick, over time, will have more infrastructure at risk during a flood event. Land use planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

Value of Resources at Risk

In total, the City of Kennewick has 108 structures, six of which are government owned (Table 29), in areas that are designated flood zones that are currently appraised at just over \$501 million (Table 30). The majority of the structures, 93 of 108, are located in flood zone A (Table 28) which means there is a 26% chance that they will flood over the life of a 30 year mortgage. Looking at the flood map for Kennewick (Figure 24) damage from flooding would be a result of a Columbia River flood event.

Table 29) Total number and total value of appraised Government structures in designated flood zones in Kennewick, WA (includes only incorporated Government structures).

Flood Zones	Appraised Gov't Struct.	Value of Appraised Gov't Struct
A	6	\$ 64,781,660.00
Total	6	\$ 64,781,660.00

Table 30) Total number and total value of appraised structures in designated flood zones in Kennewick, WA (includes only incorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
A	93	\$ 500,155,770.00
AE	13	\$ 1,008,890.00
AO	2	\$ 278,290.00
Total	108	\$ 501,442,950.00

Drought Profile

The City of Kennewick does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Through the analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. Kennewick experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

Kennewick does not differ from the rest of Benton County regarding future drought probability. It is reasonable to anticipate drought in 20 to 30 out of the next 100 years, resulting in a **MODERATE** probability rating. Because the population relies heavily on agriculture, and support industries tied to agriculture, there is a **MODERATE** risk associated with drought.

Impacts of Drought

Under drought conditions in the City of Kennewick, the agriculture and water transportation industries would be most heavily impacted. Both of these industries depend on steady water flow in the Snake and Columbia rivers. Drought impacts to agriculture and transportation would potentially harm Kennewick's local economy.

Drought also increases the threat of wildfire ignition and spread by accelerating depletion of soil and vegetation moisture and by reducing water available for fire suppression. Dried fuels in and around Kennewick are at the highest risk of ignition in the late summer and early fall.

Development Trends

As both population and demand for development are expected to increase, the City of Kennewick should expect an increase in water usage as well. With increased pressure on water sources, Kennewick will become more sensitive to drought conditions and will likely have to implement water conservation practices earlier during a period of drought. New development may also be vulnerable to wildfire as a result of the increase in fire risk that is often associated with drought conditions.

Value of Resources at Risk

The agriculture industry represents the most at-risk values to the City of Kennewick in the case of a severe drought. Those values are discussed in detail in the Drought Profile within the *Benton County Annex*. The City of Kennewick would be especially affected by drought impacts to the agriculture industry because of the number of people relying on the local economy, directly or indirectly, for income.

Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

The City of Kennewick has not had any large-scale wildfire events in recent history, but Benton County has experienced numerous fires since 1981. ***Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.*** Although large historic fires have not directly impacted Kennewick, local fire personnel respond to numerous ignitions along the roadways, railways, and in undeveloped areas within and immediately surrounding the city annually.

Probability of Future Occurrence

There is a **HIGH** probability of fire ignitions in the city; however, these ignitions are unlikely to result in large areas burned due to the availability of rapid response. Property that suffers damage due to wildfire could potentially harm the local agriculture industry or support industries. There is, therefore, a **MODERATE** risk associated with wildfire in Kennewick.

Impacts of Wildfire Events

With a large population, and therefore a greater number of people living and working in the wildland-urban interface, Kennewick has greater impact potential in the case of a serious wildfire event. The impacts to the area that were discussed in the *Benton County Annex* are comparable to the potential impacts that a wildfire event would have on Kennewick.

Zintel Canyon, a natural area within the city limits of Kennewick, would likely impact surrounding neighborhoods in the event of a wildfire. Considering that it is a park with high levels of human activity and is characterized by a natural cover type, the wildfire risk at the park is higher than surrounding areas. A Zintel Canyon fire could threaten homes and property and possibly displace residents in impact-areas.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As both population and demand for development are projected to increase for the City of Kennewick, it should be expected that Kennewick, over time, will have more infrastructure at risk during a wildfire event. Land use planning, adherence to Firewise or other community wildfire standards in WUI areas, and fire-resistant construction should help reduce the amount of infrastructure at risk during a wildfire event.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

The values of at-risk resources in and around Kennewick are generally greater than the rest of the county. This is because of the greater number of structures and personal property, and because of the much larger population of Kennewick compared to the rest of the county. This means there are more people relying on the local economy, infrastructure, and other elements that could be distressed by a serious wildfire event.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.

Severe Weather Profile

The City of Kennewick does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Severe storms, especially severe wind storms, are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.
- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.

The most recent severe storm event was in February 2017. Heavy snow and rain caused flooding and eventually led to a FEMA Major Disaster Declaration.

Probability of Future Occurrence

Regionally, severe storms are expected to occur regularly resulting in a **HIGH** probability. Therefore, Kennewick can anticipate at least one severe storm each year and very likely multiple storms. Disaster events caused by severe storms are not expected to happen as regularly but predicting when and what events will occur is not possible. Severe storms pose a **MODERATE** risk to Kennewick.

Impacts of Severe Weather Events

As mentioned above, impacts from severe storms often manifest in the form of another hazard type, such as flooding, landslides, and lightning-caused wildfire. Windstorms can greatly affect Kennewick,

possibly impacting power sources or causing debris hazards. Unexpected or unusually heavy snowstorms can also have a major impact on Kennewick especially because of its large population. Stress on infrastructure or a major disruption of transportation caused by severe weather, could potentially create a disaster event that impacts human safety and commerce.

Development Trends

The population of Kennewick has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

The values of resources at risk in and near Kennewick can be significant. Kennewick is a major component of the Tri-Cities metropolitan area, the industrial, economic, and political hub of Benton County. Because of the confluence of the Columbia and Snake rivers near Kennewick, the prolific agriculture industry, and neighboring industries, Kennewick contains substantial infrastructure, personal property, municipal facilities, and industrial facilities.

It is difficult to estimate potential losses in Kennewick due to severe weather. Construction throughout the County has been implemented in the presence of high wind events, and with typical levels of snow accumulation in mind and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Earthquake Profile

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Because of the infrequency of such devastating events, there is a **MODERATE** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of Kennewick should such an earthquake occur.

Impacts of Earthquakes

An in-depth examination of the impacts that an earthquake event might have on the area can be found in the *Benton County Annex*. The impacts discussed are comparable to the potential overall impacts that could occur within the City of Kennewick.

Considering Kennewick’s proximity to the Columbia and Snake Rivers, Kennewick is at risk for flooding should an upstream dam fail as the result of an earthquake. Please refer to the *Benton County Annex* for more information about Columbia River dams and Dworshak Dam. The study by Sherrod et al (2016) supports that a fault (part of the Wallula fault zone) capable of producing earthquakes passes through the City of Kennewick, close to Trios Hospital and Southridge High School and is indicated by the upheaval that created the Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain “ridge”. A fault located directly under the City of Kennewick has the potential to cause significant damage to infrastructure and would place the general populous at risk.

Infrastructure that could be damaged by an earthquake with a local epicenter includes Zintel Dam. Depending on the extent of the damage, there could be an increase in the risk of flash flooding for communities down canyon from Zintel Dam until repairs are made. Also susceptible to earthquakes are large canal syphons that are approximately nine feet in diameter.

Development Trends

The population of Kennewick has increased over the previous decade and therefore demand for development has increased as well. With additional development and infrastructure, Kennewick will become more vulnerable to Earthquake hazards. However, land use planning, adherence to and development of building codes, seismically sound engineering, and community preparedness will help to minimize the impact of an earthquake on the City of Kennewick.

Value of Resources at Risk

According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$25 to 926 million in damages to Kennewick (Table 31). Of the 24,019 structures that were included in the different analyses, up to 1,970 structures were lost in the Rattlesnake Wallula Fault scenario totaling more than \$925 million in damages. Figure 25 shows the areas of Kennewick that are likely to experience the greatest losses in dollars.

Table 31) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for Kennewick, WA. Total number of structures and total value of structures used in the analyses are included below the table.

City of Kennewick Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$24,980,593	0.2%
M7.4 Rattlesnake Wallula Fault	\$925,490,068	8.2%
M7.1 Horse Heaven Hills Fault	\$482,755,433	4.3%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	3072	12.8%

Total number of structures identified in analyses:

24,019

Total value of all structures and structure content:

\$11,349,094,210

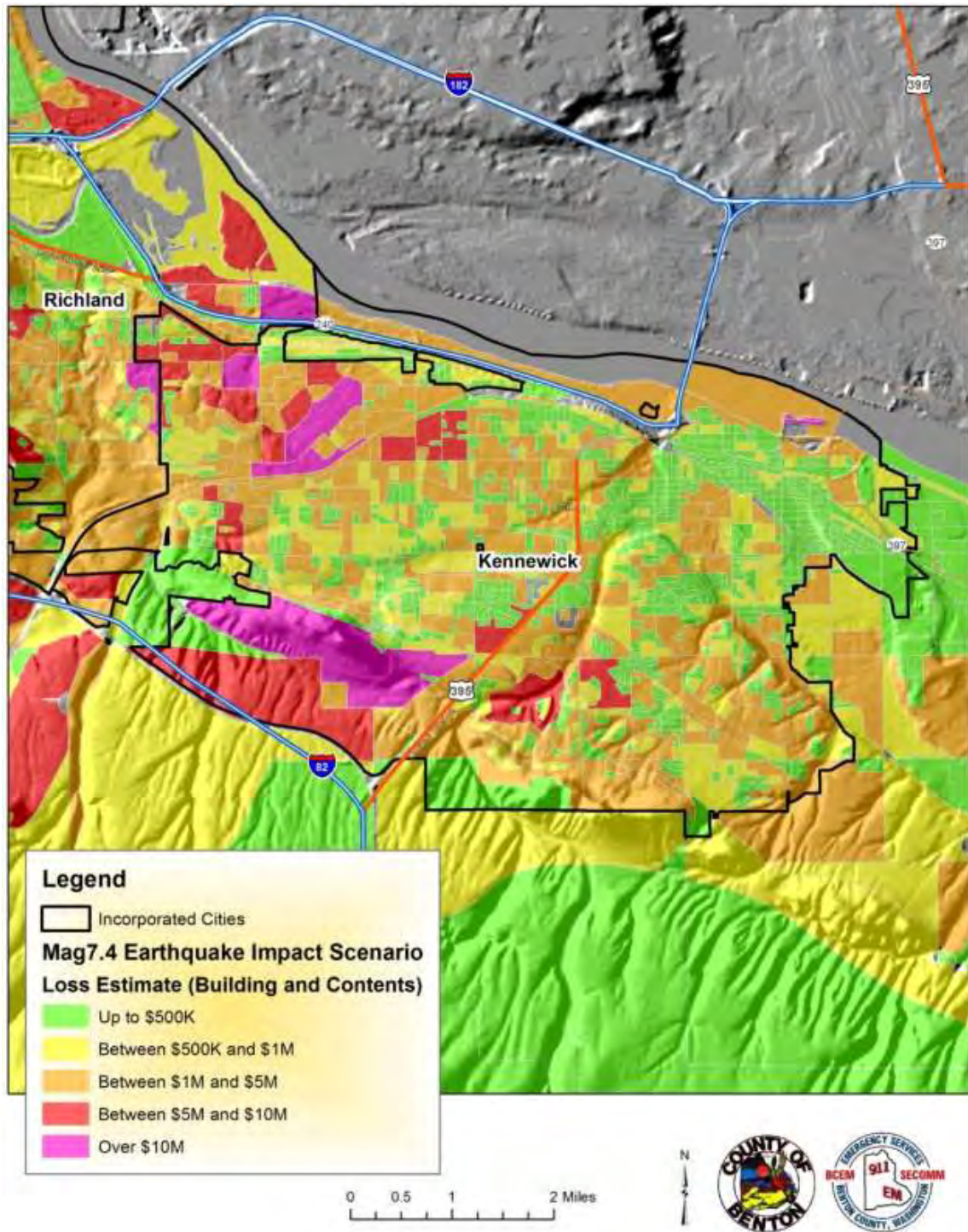


Figure 25) Mag 7.4 Earthquake impact scenario map for Kennewick, WA. The different colors represent potential financial losses (in dollars) for different parts of Kennewick.

Landslide Profile

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Most landslides in Benton County have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

Probability of Future Occurrence

Most of Kennewick is at **LOW** risk for a landslide. However, as a result of steeper terrain and erosive soils, the ridges on the SW side of Kennewick have the highest risk for a landslide or land movement event. Refer to Figure 26 which details critical landslide prone areas in and near Kennewick.

Impacts of Landslide Events

Potential impacts that the City of Kennewick would experience in the case of a landslide or land movement event are comparable to those highlighted in the *Benton County Annex*. The biggest concerns for Kennewick are threats to human safety, disruptions to the local economy and infrastructure, and damages to personal and municipal property. Specifically, the homes and other structures located on the north slopes of the ridges on the SW side of Kennewick are at a higher risk and may be damaged during a landslide or land movement event.

Development Trends

The population of Kennewick has increased over the previous decade and therefore much of the demand for development has increased. As a result, new homes are being constructed beyond the inner-city limits on the slopes of the ridges that are on the SW side of Kennewick. Interest in those new neighborhoods has increased the amount of development taking place on landslide or land-movement prone slopes.

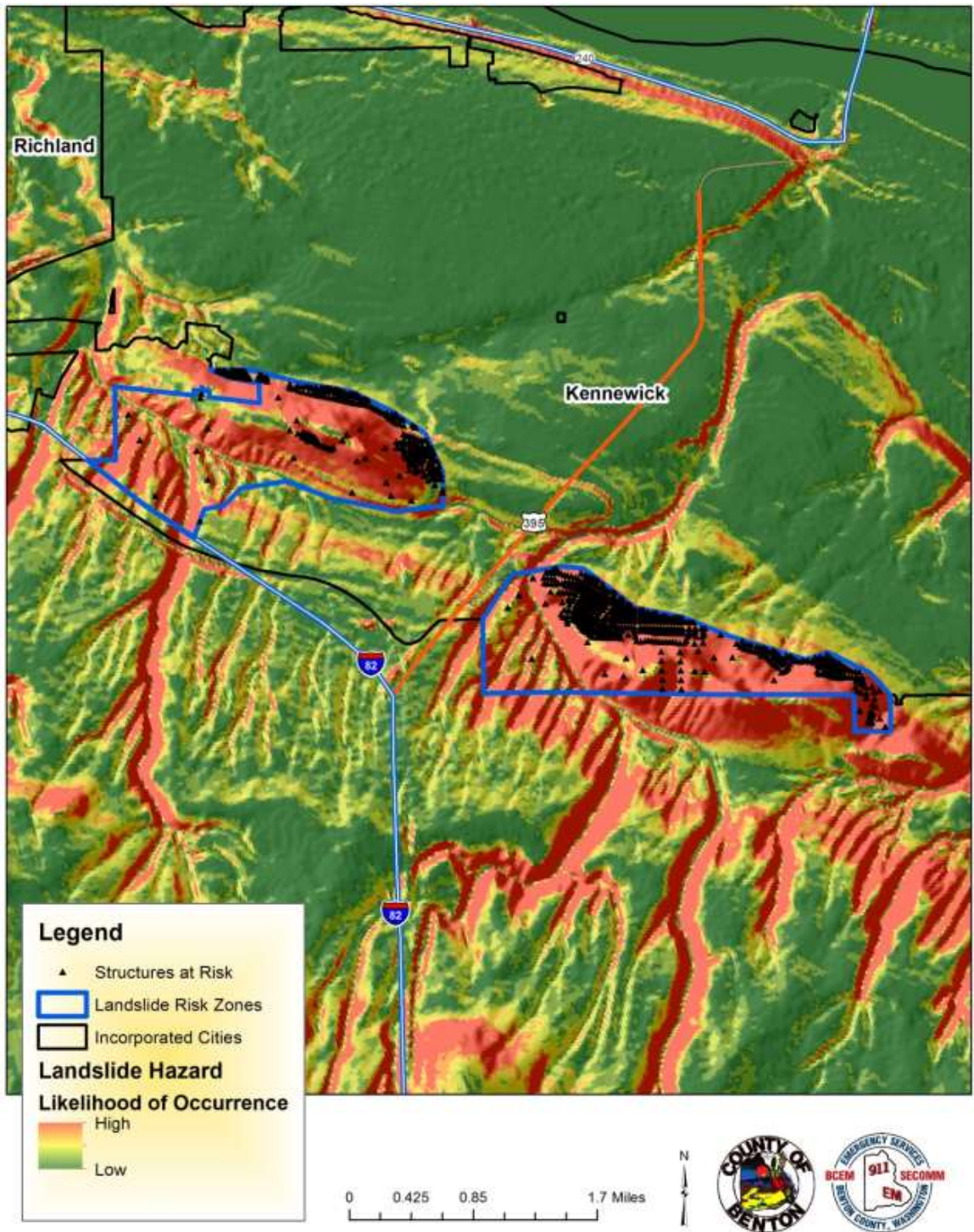


Figure 26) Structures at risk within landslide prone areas in Kennewick, WA.

Values of Resources at Risk

The values of resources at risk in and near Kennewick can be significant. Kennewick is a major component of the Tri-Cities metropolitan area, the industrial, economic, and political hub of Benton County. Because of the confluence of the Columbia and Snake rivers near Kennewick, the prolific agriculture industry, and neighboring industries, Kennewick contains substantial infrastructure, personal property, municipal facilities, and industrial facilities. In total, there are 847 structures in Kennewick that are in designated high-risk landslide zones (Table 32). The appraised value of these structures, 99% of which are residential and would be the neighborhoods on the SW side of Kennewick, is just over \$230 million.

Table 32) Number and value of appraised structures by type in designated high-risk landslide zones in Kennewick, WA.

Building Type	Number of Appraised Structures	Value of Appraised Structures
Agricultural	4	\$1,212,650.00
Commercial	6	\$839,970.00
Residential	837	\$229,289,300.00
Total	847	\$231,341,920.00

Volcano Profile

Kennewick does not differ from Benton County as a whole with regard to volcanic hazards.

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanos that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure, and the environment in Benton County would be serious though not necessarily catastrophic. Therefore, there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcano Events

Refer to the *Benton County Annex* for volcano event impacts that would be expected to affect all jurisdictions in a similar manner. A volcanic eruption would likely be preceded or accompanied by seismic activity. Considering the fault connectivity noted by Blakely et al (2011), Kennewick could potentially experience local seismic activity which could produce landslides, flooding, ground cracking, and soil liquefaction.

Development Trends

The population of Kennewick has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Values of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



City of Richland Profile

The City of Richland lies at the confluence of the Columbia and Yakima rivers, encompassing land on the west bank of the Columbia River, and north and south of the mouth of the Yakima River. Richland was established in 1892 as an agricultural community. In 1942, with the development of the Hanford Site, Richland was transformed from a small town of 247 residents to a federally owned town of 11,000 (Table 34). Self-rule was re-established in 1958. Richland's estimated 2018 population was 55,320 (April 1, 2018 OFM Estimate). Richland continues to be a center of production and research into nuclear energy and related technology. It has been the home of Pacific Northwest National Laboratory (PNNL) since 1965. One of the two Laser Interferometer Gravitational-Wave Observatory sites is located immediately north of Richland. The City covers approximately 35.72 square miles of land and 3.39 square miles of water. Richland is governed by an elected City Council. Daily operations are directed by the City Manager.

Table 33) Historic population of Richland, WA

Census	Population	% Change
1910	350	
1920	279	-20%
1930	208	-25%
1940	247	19%
1950	21809	8729%
1960	23548	8%
1970	26290	12%
1980	33578	28%
1990	32315	-4%
2000	38708	20%
2010	48058	24%

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for Richland can be found in Appendix B.

Development Trends

As part of the Growth Management Act, the Washington State Office of Financial Management (OFM) has provided Benton County with a population estimate for a period ending in the year 2040. For planning purposes, the countywide population estimate was distributed on an existing percentage basis to the various cities and unincorporated areas within Benton County. Richland's official population forecast is a total of 81,366 in the incorporated area by the year 2040. Current 2018 population estimate within the incorporated area is 55,320.

Richland's Comprehensive Plan includes an analysis of available land use and capacity. It also provides an estimate of acres needed for development to accommodate the projected 2040 population. Overall, the Comprehensive Plan indicates that the City has sufficient land within its current UGA to accommodate the land needs for the projected residential, commercial, and industrial growth.

The current Richland UGA is separated into five distinct areas with the majority of the UGA land base divided between the Badger Mountain South area and the Horn Rapids area. The Badger Mountain South area is a master-planned community of 1,480 acres located in the southwest side of the City. The area is intended to be developed with 5,000 homes, businesses, and other community activities. The Horn Rapids area is located on the north side of the City and constitutes two planning areas: a) the Horn

Rapids Industrial Park area, a triangular area bounded by Horn Rapids Road to the north and State Route 240 to the south; and b) the 1,641 acres Horn Rapids North Industrial Area, north of Horn Rapids Road. The 1,641-acre industrial area has recently been transferred from the US Department of Energy to the City of Richland and has been specifically set aside for industrial development.



Richland Hazard Annex

Flood Profile

The City of Richland does not have any differing levels of risk associated with this hazard than Benton County as a whole. However, Richland's exposure to flooding will be different than that of Benton County as well as other jurisdictions within the county.

Local Event History

The City of Richland was inundated by the May 31, 1948 Columbia River flood and was likely impacted by other flooding events that caused damage to Benton County (Table 34). As the Columbia River runs along the eastern edge of Richland and the Yakima River bisects the city, Richland would likely have been exposed to most historical flood events in Benton County; particularly flood events associated with the Yakima River.

Table 34) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
17-Dec	53,800 at Prosser	18.5 est.		
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.
1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	

5-Jun-13	20900	13.1	5	
13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

Richland has flooding potential due to its proximity to the Columbia and Yakima rivers. Flooding threat has been greatly reduced with the implementation of dams along these rivers but some potential still exists, particularly from the Yakima River. Because the Yakima River bisects the city, Richland has a **MODERATE** to **HIGH** probability of flooding as the Yakima River isn't as large as the Columbia River and does not have the same number of Dams or means of control in place. Due to the centrally-located, highly-valuable resources in Richland, a flood event carries a **MODERATE** risk.

The Richland Flood Map (Figure 27) shows that all structures that are susceptible to flooding fall within flood zones A and AE (Table 35). This means there is a 1% chance that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.

Impacts of Flood Events

Potential impacts caused by flooding in Richland include increased landslide risk, damage to infrastructure or roads, and damage to personal property. Residential areas along the Yakima River are likely to be affected the most by a flood event. Refer to *Benton County Annex* for additional information about the impacts of flood events.

Development Trends

As both population and demand for development are projected to increase for the City of Richland, it should be expected that Richland, over time, will have more infrastructure at risk during a flood event. Land use planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

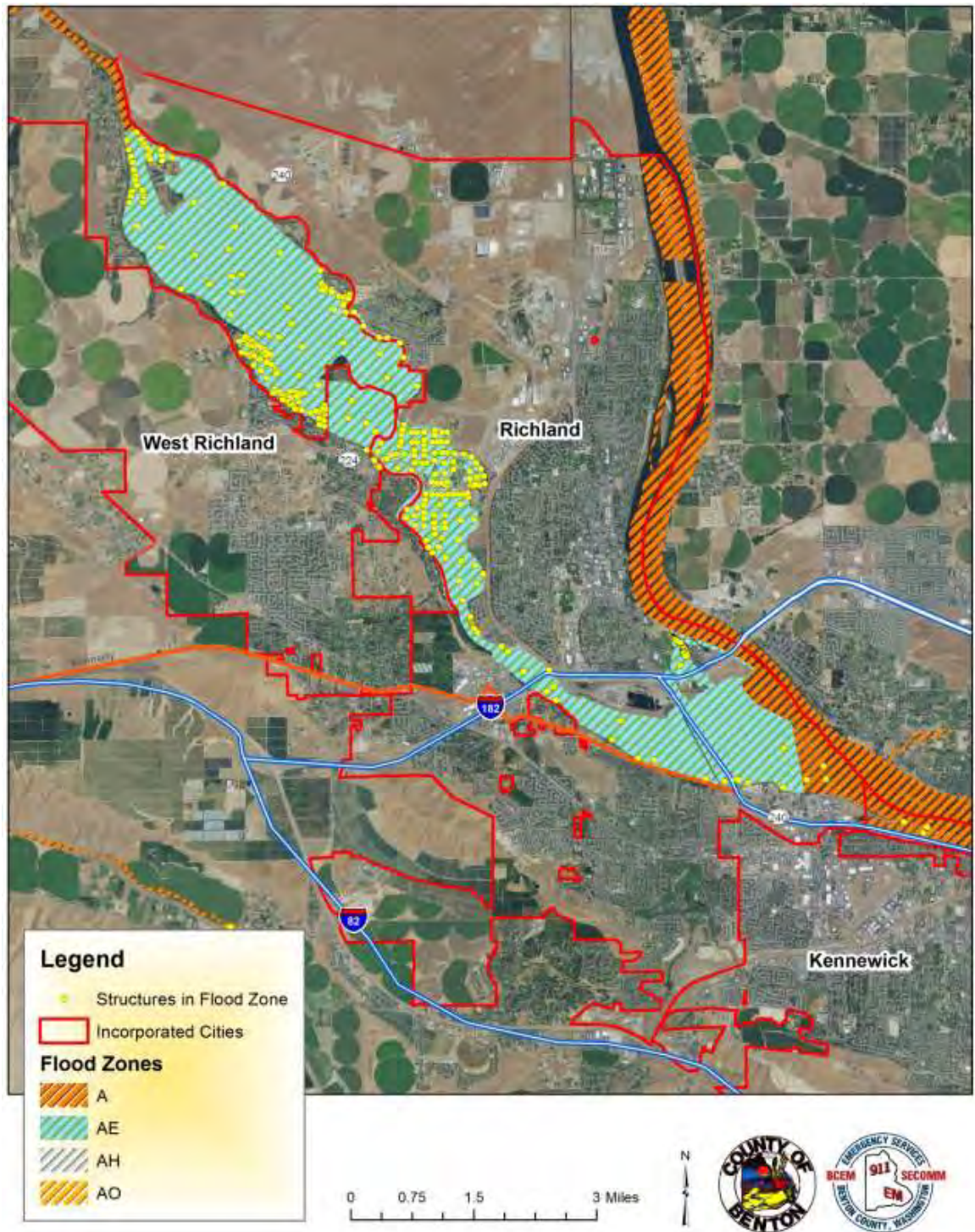


Figure 27) National Flood Insurance Program flood zone map for Richland, WA.

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Table 35) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

Value of Resources at Risk

Looking at the flood map for Richland (Figure 27) damage from flooding would be a result of a Columbia River and/or Yakima River flood event. In total the City of Richland has 200 structures, 28 of which are government owned (Table 36), in designated flood zones that are currently appraised at just over \$49 million (Table 37). The majority of the structures, 197 of 200 total structures, are located in flood zone AE (Table 35) which means there is a 26% chance that they will flood over the life of a 30-year mortgage.

Table 36) Total number and total value of appraised Government structures in designated flood zones in Richland, WA (includes only incorporated Government structures).

Flood Zone	Appraised Gov't Struct.	Value of Appraised Gov't Struct.
A	3	\$ 27,164,020.00
AE	25	\$ 22,232,270.00
Total	28	\$ 49,396,290.00

Table 37) Total number and total value of appraised structures in designated flood zones in Richland, WA (includes only incorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
A	3	\$ 27,164,020.00
AE	197	\$ 55,638,760.00
Total	200	\$ 82,802,780.00

Drought Profile

Local Event History

Through analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. Richland experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage from drought. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

Richland does not differ from the rest of Benton County regarding future drought probability. It is reasonable to anticipate drought in 20 to 30 out of the next 100 years, resulting in a **MODERATE** probability rating. Because the population relies heavily on agriculture, and support industries tied to agriculture, there is a **MODERATE** risk associated with drought.

Impacts of Drought Events

Under drought conditions in the City of Richland, the agriculture and water transportation industries would be most heavily impacted. Both of these industries depend on steady water flow in the Snake and Columbia rivers. Although agriculture and transportation are less important to the City of Richland relative to other jurisdictions within Benton County, drought impacts to these industries would still potentially harm Richland's local economy.

Drought also increases the threat of wildfire ignition and spread by accelerating depletion of soil and vegetation moisture and by reducing water available for fire suppression. The expanding WUI around

Richland would be at increased risk for severe wildfire under drought conditions during the late summer and early fall.

Development Trends

As both the population of Richland and demand for development are expected to increase, the City of Richland should expect an increase in water usage as well. With increased pressure on water sources, Richland will become more sensitive to drought conditions and will likely have to implement water conservation practices earlier during a period of drought. Increased fire risk associated with drought conditions may also make additional development vulnerable to wildfire.

Value of Resources at Risk

The agriculture industry represents the most at-risk values to the City of Richland in the case of a severe drought. Those values are discussed in detail in the Drought Profile within the *Benton County Annex*. The City of Richland would be especially affected by impacts to these values because of the number of people relying on the local economy, directly or indirectly, for their own income.

Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

The City of Richland has not had any large-scale wildfire events in recent history, but Benton County has experienced numerous fires since 1981. **Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.** Although large historic fires have not directly impacted Richland, local fire personnel respond to numerous ignitions along the roadways, railways, and in undeveloped areas within and immediately surrounding the city annually. In July of 2017, a fire occurred on Bateman Island, in Richland. Although the fire was only about 70 acres, it lasted for several days and closed the island for almost one year. The cost for the fire was approximately \$100,000.

Probability of Future Occurrence

There is a **HIGH** probability of fire ignitions in the city; however, these ignitions are unlikely to result in large areas burned due to the availability of rapid response. Property that suffers damage to due wildfire could potentially harm the local agriculture industry or support industries. There is, therefore, a **MODERATE** risk associated with wildfire in Richland.

Impacts of Wildfire

With a large population, and therefore a greater number of people living and working in the wildland-urban interface, Richland has greater impact potential in the case of a serious wildfire event. The impacts to the area that were discussed in the *Benton County Annex* are comparable to the potential impacts that a wildfire event would have on Richland.

The City of Richland has identified a number of natural/recreation areas that have a higher potential for ignition and are therefore have a greater wildfire risk. The Yakima Delta, Bateman Island (which is currently closed to the public as of May 2018), portions of Leslie Canyon, portions of WE Johnson Park, Country Ridge HOA canyon property, BLM land between Keene Rd. and Heritage Hills, and Badger Mountain. Richland fire personnel intend to conduct fuels projects in most of these areas.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As both population and demand for development are projected to increase for the City of Richland, it should be expected that Richland, over time, will have more infrastructure at risk during a wildfire event. Land use planning, adherence to Firewise or other community wildfire standards in WUI areas, and fire-resistant construction should help reduce the amount of infrastructure at risk during a wildfire event.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

The values of at-risk resources in and around Richland are generally greater than the rest of the county. This is because of the greater number of structures and personal property, and because of the much larger population of Richland compared to the rest of the county. This means there are more people relying on the local economy, infrastructure, and other elements that could be distressed by a serious wildfire event.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.

Severe Weather Profile

The City of Richland does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Severe storms, especially severe wind storms, are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.

- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.

The most recent severe storm event was in February 2017. Heavy snow and rain caused flooding and eventually led to a FEMA Major Disaster Declaration.

Probability of Future Occurrence

Regionally, severe storms are expected to occur regularly resulting in a **HIGH** probability. Therefore, Richland can anticipate at least one severe storm each year and very likely multiple storms. Disaster events caused by severe storms are not expected to happen as regularly but predicting when and what events will occur is not possible. Severe storms pose a **MODERATE** risk to Richland.

Impacts of Severe Weather Events

As mentioned above, impacts from severe storms often manifest in the form of another hazard type, such as flooding, landslides, and lightning-caused wildfire. Windstorms can greatly affect Richland, possibly impacting power sources or causing debris hazards. Unexpected or unusually heavy snowstorms can also have a major impact on Richland especially because of its large population. Stress on infrastructure or a major disruption of transportation caused by severe weather, could potentially create a disaster event that impacts human safety and commerce.

Development Trends

The population of Richland has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

The values of resources at risk in and near Richland can be significant. Richland is a major component of the Tri-Cities metropolitan area, the industrial, economic, and political hub of Benton County. Because of the confluence of the Columbia and Snake rivers near Richland, the prolific agriculture industry, and neighboring industries, Richland contains substantial infrastructure, personal property, municipal facilities, and industrial facilities.

It is difficult to estimate potential losses in Richland due to severe weather. Construction throughout the County has been implemented in the presence of high wind events, and with typical levels of snow accumulation in mind and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Earthquake Profile

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Because of the infrequency of such devastating events, there is a **MODERATE** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of Richland should such an earthquake occur.

Impacts of Earthquake Events

An in-depth examination of the impacts that an earthquake event might have on the area can be found in the *Benton County Annex*. The impacts discussed are comparable to the potential overall impacts that could occur within the City of Richland.

Considering Richland's proximity to the Columbia and Snake Rivers, Richland is at risk for flooding should an upstream dam fail as the result of an earthquake. Please refer to the *Benton County Annex* for more information about Columbia River dams and Dworshak Dam. The study by Sherrod et al (2016) supports that a fault (part of the Wallula fault zone) capable of producing earthquakes passes through the City of Kennewick, close to Trios Hospital and Southridge High School and is indicated by the upheaval that created the Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain "ridge". A fault passing directly under the neighboring City of Kennewick has the potential to cause significant damage to infrastructure and would place the general populous of Richland at risk.

Development Trends

The population of Richland has increased over the previous decade and therefore demand for development has increased as well. With additional development and infrastructure, Richland will become more vulnerable to Earthquake hazards. However, land use planning, adherence to and development of building codes, seismically sound engineering, and community preparedness will help to minimize the impact of an earthquake on the City of Richland.

Value of Resources at Risk

According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$50 to 743 million in damages to Richland (Table 38). Of the 19,479 structures that were included in the different analyses, up to 1,286 structures were lost in the Rattlesnake Wallula Fault scenario totaling more than \$742 million in damages. Figure 28 shows the areas of Richland that are likely to experience the greatest losses in dollars.

Table 38) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for Richland, WA. Total number of structures and total value of structures used in the analyses are included below the table.

City of Richland Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$50,293,151	0.4%
M7.4 Rattlesnake Wallula Fault	\$742,963,157	6.6%
M7.1 Horse Heaven Hills Fault	\$423,116,533	3.8%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	880	4.5%

Total number of structures identified in analyses: 19,479
 Total value of all structures and structure content: \$11,188,840,940



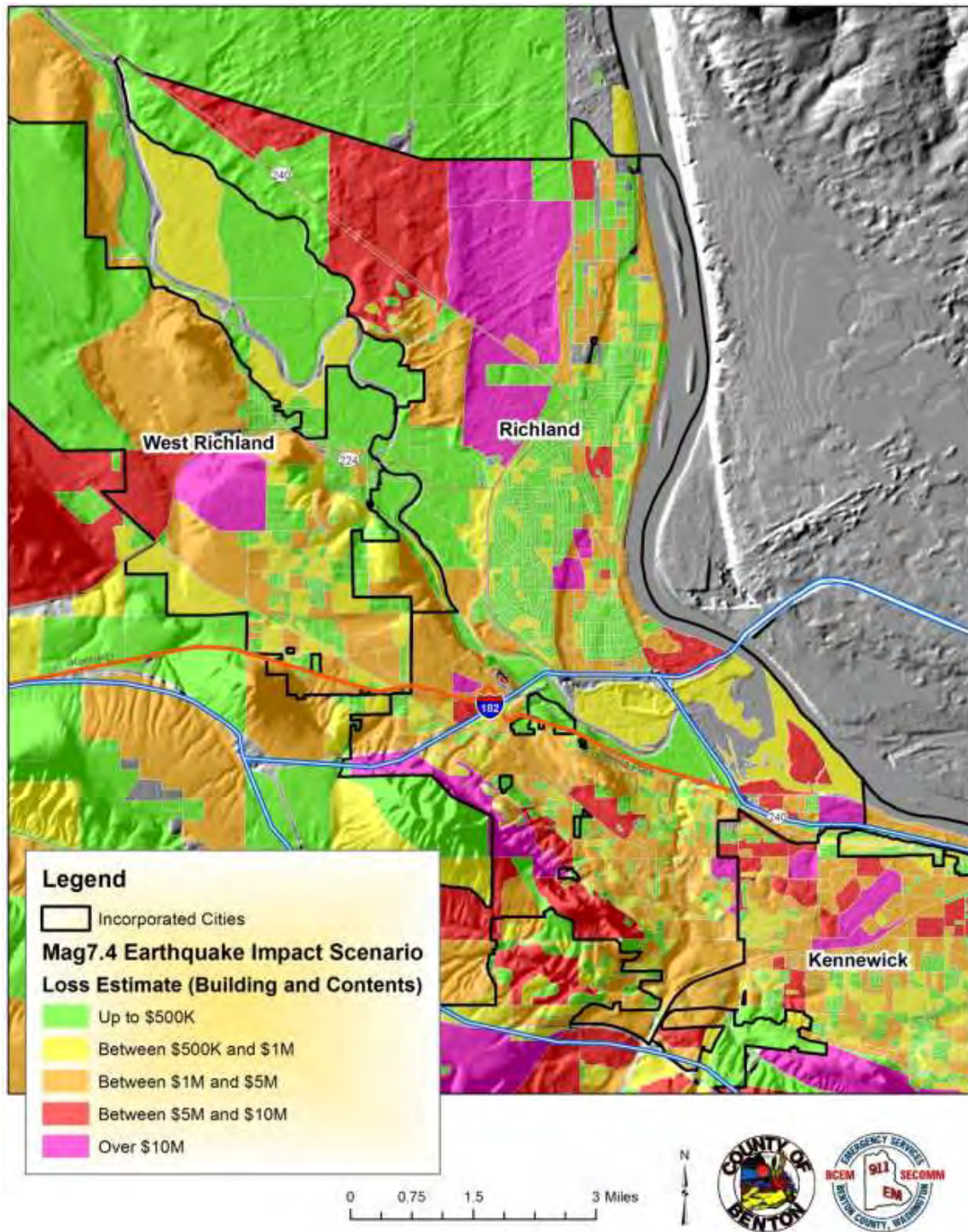


Figure 28) Mag 7.4 Earthquake impact scenario map for Richland, WA. The different colors represent potential financial losses (in dollars) for different parts of Richland.

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Landslide Profile

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Most landslides in Benton County have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

Probability of Future Occurrence

Most of Richland is at **LOW** risk for a landslide but there are areas that are considered to be high risk. As a result of steeper terrain and erosive soils, Badger Mountain and similar ridges are considered to be high risk for landslides or land movement.

Impacts of Landslide Events

Potential impacts that the City of Richland would experience in the case of a land movement event are comparable to those highlighted in the *Benton County Annex*. The biggest concerns for Richland are threats to human safety, disruptions to the local economy and infrastructure, and damages to personal and municipal property. Specifically, the homes and other structures located on the northeast slopes of the ridges in the Badger Mountain area are at a higher risk and may be damaged during a landslide or land movement event.

Development Trends

The population of Richland has increased over the previous decade and therefore much of the demand for development has increased. As a result, new homes are being constructed beyond the inner-city limits on slopes in the Badger Mountain area. Interest in those new neighborhoods has increased the amount of development taking place on landslide or land-movement prone slopes.



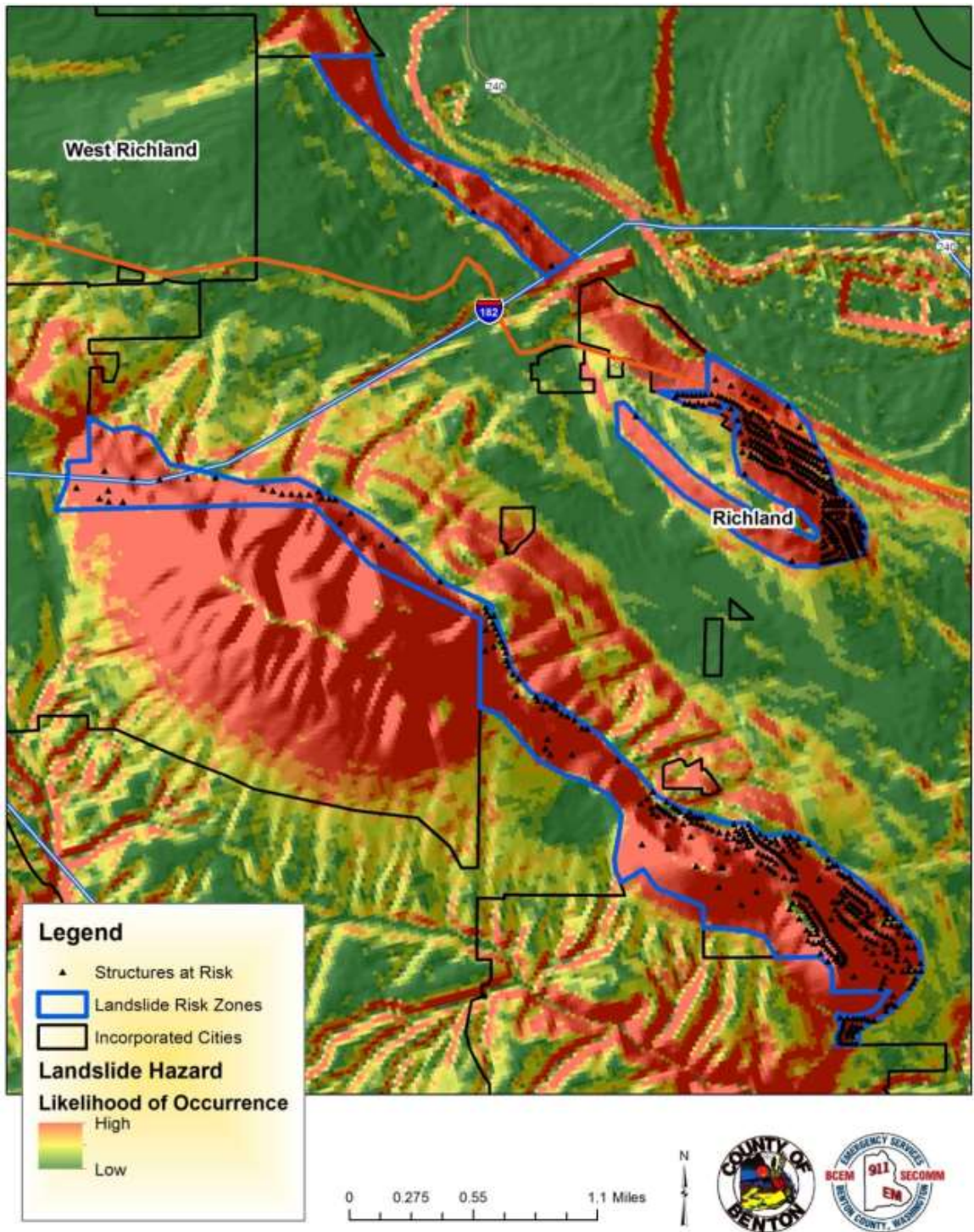


Figure 29) Structures at risk within landslide prone areas in Richland, WA.

Values of Resources at Risk

The values of resources at risk in and near Richland can be significant. Richland is a major component of the Tri-Cities metropolitan area, the industrial, economic, and political hub of Benton County. Because of the confluence of the Columbia and Snake rivers near Richland, the prolific agriculture industry, and neighboring industries, Richland contains substantial infrastructure, personal property, municipal facilities, and industrial facilities. In total, there are 610 structures in Richland that are in designated high-risk landslide zones (Table 39). The appraised value of these structures, 99% of which are residential, is just over \$195 million.

Table 39) Number and value of appraised structures by type in designated high-risk landslide zones in Richland, WA.

Building Type	Number of Appraised Structures	Value of Appraised Structures
Agricultural	2	\$894,970.00
Commercial	6	\$1,404,180.00
Residential	602	\$193,108,690.00
Total	610	\$195,407,840.00

Volcano Profile

Richland does not differ from Benton County as a whole with regard to volcanic hazards.

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanos that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure, and the environment in Benton County would be serious though not necessarily catastrophic. Therefore, there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcano Events

Refer to the *Benton County Annex* for volcano event impacts that would be expected to affect all jurisdictions in a similar manner. A volcanic eruption would likely be preceded or accompanied by

seismic activity. Considering the fault connectivity noted by Blakely et al (2011), Richland could potentially experience local seismic activity which could produce landslides, flooding, ground cracking, and soil liquefaction.

Development Trends

The population of Richland has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Values of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



City of Prosser Profile

The City of Prosser is located west of the Tri-Cities along Interstate 82 and covers approximately 4.49 square miles of land and 0.04 square miles of water. Prosser was first incorporated in 1899 and has served as the Benton County seat since the County's establishment in 1885. Prosser's estimated 2018 population was 6,125 (Table 41). The City is bisected by the Yakima River. Prosser serves as a local center supporting surrounding agricultural uses, including several area wineries, fruit orchards, pasture and dryland wheat fields. Within and adjacent to the City are several agricultural processing facilities and fertilizer plants. Prosser is governed by a Mayor and an elected City Council.

Table 40) Historic population of Prosser, WA

Census	Population	% Change
1900	229	
1910	1298	5%
1920	1697	31%
1930	1569	-8%
1940	1719	10%
1950	2636	53%
1960	2763	5%
1970	2954	7%
1980	3896	32%
1990	4476	15%
2000	4838	8%
2010	5714	18%

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for Prosser can be found in Appendix B.

Development Trends

As part of the Growth Management Act, the Washington State Office of Financial Management (OFM) has provided Benton County with a population estimate for a period ending in the year 2025. For planning purposes, the countywide population estimate was distributed on an existing percentage basis to the various cities and unincorporated areas within Benton County. Prosser's official GMA population forecast is a total of 6,735 in the incorporated area by the year 2025. Current 2018 population estimate within the incorporated area is 6,125.

Prosser's Comprehensive Plan includes an analysis of available land use and capacity. It also provides an estimate of acres needed for development to accommodate the projected 2025 population. Overall, the Comprehensive Plan indicates that the City has insufficient land within current City limits to accommodate the land needs for the projected residential, commercial, and industrial growth. However, ample area exists in the Prosser Urban Growth Area (UGA) to accommodate the forecasted growth.

The Prosser Comprehensive Plan provides the following description of the Prosser UGA:

Northern Boundary: The area's northernmost border starts east of the Hogue Cellars Winery, incorporating the area between the railroad line and the Yakima River, then running west along the southern shore of the Yakima River. Once the boundary hits I82, it crosses the highway and continues northwest along the highway to the city limits, following the city limits to the channel or centerline of section 36, thence north to O.I.E., following OIE to Johnson road; following Johnson road to the Western Boundary.

Eastern Boundary: On its eastern border, the study area follows the existing City boundaries except for the area between I-82 and the Yakima River. Here, the UGA is expanded, including some of the area between I-82 and SR 22.

Southern Boundary: The UGA's southern boundary is the same as for the existing City limit boundary-except for a line that is the northern boundary of parcel 107850000000000 (which would be the easterly extension of Park Street) that connects the southern city limits, thereby including an unincorporated area south of Highway SR221.

Western Boundary: The western boundary runs along Missimer Road south to Buena Vista. The boundary then goes east to Moore Road, then south on Moore Road to the Yakima River. South of the Yakima River, the western boundary runs along the river to Richards Road, and then south to the southern boundary.

The Prosser Comprehensive Plan also identifies two additional areas which are particularly suitable for urban development and should be considered for inclusion in the UGA if necessary. These areas are both adjacent to Interstate 82 near the eastern portion of the City of Prosser.



Prosser Hazard Annex

Flood Profile

The City of Prosser does not have any differing levels of risk associated with this hazard than Benton County as a whole. However, Prosser's exposure to flooding will be different than that of Benton County as well as other jurisdictions within Benton County.

Local Event History

The City of Prosser is located close to the western edge of Benton County and is bisected by the Yakima River. Because of its proximity to the Yakima River, it is likely that Prosser was affected by many of the same flood events that affected Benton County, but given that Prosser is situated further from the Columbia and Snake Rivers, it is unclear if there were any impacts from floods associated with these two rivers (Table 41). Runoff from the slopes to the south of Prosser has also caused issues related to flooding. Run off from heavy precipitation and snow melt is channeled by steep slopes into certain of Prosser on the south side of the Yakima River.

Table 41) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
17-Dec	53,800 at Prosser	18.5 est.		
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.

1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	
5-Jun-13	20900	13.1	5	
13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

Prosser has flooding potential due to its proximity to the Yakima River. Flood-potential has been greatly reduced with the construction of dams along major waterways but some potential still exists, particularly from the Yakima River. Because the Yakima River borders the city, Prosser has a **MODERATE to HIGH** probability of flooding as the Yakima River isn't as large as the Columbia River and does not have the same number of dams or means of control in place. Because of the values and services Prosser offers to surrounding communities, a flood event carries a **MODERATE** risk.

The Prosser Flood Map (Figure 30) shows that all structures that are susceptible to flooding fall within flood zones A and AE (Table 43). This means there is a 1% chance that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.

Impacts of Flood Events

Potential impacts caused by flooding in Prosser include increased landslide risk, damage to infrastructure or roads, and damage to personal property. Structures located adjacent to the Yakima River will likely be impacted the most. Refer to Benton County Annex for additional information.

Development Trends

As both population and demand for development are projected to increase for the City of Prosser, it should be expected that Prosser, over time, will have more infrastructure at risk during a flood event. Land use planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

Value of Resources at Risk

Looking at the flood map for Prosser (Figure 30) damage from flooding would be a result of a Yakima River flood event. In total the City of Prosser has 6 structures, none of which are government owned, in designated flood zones that are currently appraised at \$879,740.00 (Table 42). All structures are located in flood zone A (Table 43) which means there is a 26% chance that they will flood over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.



Figure 30) National Flood Insurance Program flood zone map for Prosser, WA.

Table 42) Total number and value of appraised structures in designated flood zones in Prosser, WA (includes only incorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
A	6	\$ 879,740.00
Total	6	\$ 879,740.00

Table 43) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

Drought Profile

Local Event History

Through analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. Prosser experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage from drought. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

Prosser does not differ from the rest of Benton County regarding future drought probability. It is reasonable to anticipate drought in 20 to 30 out of the next 100 years, resulting in a **MODERATE** probability rating. Because the population relies heavily on agriculture, and support industries tied to agriculture, there is a **MODERATE** risk associated with drought.

Impacts of Drought Events

Under drought conditions in the City of Prosser, the agriculture industry would be most heavily impacted. Irrigation supporting the agriculture industry depends on steady water flow in the Yakima, Columbia, and Snake Rivers. Drought impacts to agriculture would potentially harm Prosser's local economy.

Drought also increases the threat of wildfire ignition and spread by accelerating depletion of soil and vegetation moisture and by reducing water available for fire suppression. The expanding WUI around Prosser would be at increased risk for severe wildfire under drought conditions during the late summer and early fall. Additionally, the I-82/US 12 corridor has a history of and is at a higher risk of wildfire than surrounding areas. Drought would only increase the risk of wildfire on the steep slopes just south of Prosser.

Development Trends

As both population and demand for development are expected to increase, the City of Prosser should expect an increase in water usage making it more sensitive to drought conditions. Even though the increase in water usage in Prosser will be minimal due to its smaller size, it will likely have to implement water conservation practices earlier during a period of drought; particularly as larger neighboring communities place additional stress on water supplies. Increased wildfire risk associated with drought conditions will also make new development more vulnerable to wildfire, especially new housing on the slopes of the Horse Heaven Hills.

Value of Resources at Risk

The agriculture industry represents the most at-risk values to the City of Prosser in the case of a severe drought. Those values are discussed in detail in the Drought Profile within the Benton County Annex. The City of Prosser would be especially affected by impacts to these values because of the number of people relying on the local economy, directly or indirectly, for their own income.

Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

The City of Prosser has been directly impacted by several large-scale wildfires in the past, including the Ward Gap fire that occurred in 2016 and the Montecito fire that occurred in 2018. ***Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.*** Since 1980 the city has had wildfire within the southwest corner of the incorporated area on the north facing slopes of Horse Heaven Hills (see Figure 2, wildfire hazard profile). There have been other fires on the same slopes of the Horse Heaven Hills further east along the I-82/US 12 corridor.

Probability of Future Occurrence

There is a **HIGH** probability of fire ignitions in the city, particularly on the south side of highway 22 on the slopes of the Horse Heaven Hills. These ignitions are unlikely to result in large areas burned due to the availability of rapid response, but there is potential for fire to make a run upslope and into the dry agricultural areas of the Horse Heaven Hills. Property that suffers damage due to wildfire could potentially harm the local agriculture industry or support industries. There is, therefore, a **HIGH** risk associated with wildfire in Prosser.

Impacts of Wildfire

The Yakima River bisects the City of Prosser; the part of the city on the north side of the river is interfaced with agriculture while the portion on the south side of the river, particularly the fringe along highway 22, more closely resembles WUI conditions. As the slopes of the Horse Heaven Hills have burned in the past, another wildfire in that area could have significant impacts on homes and other structures along the highway 22 corridor. The overall impacts to the area that were discussed in the *Benton County Annex* are comparable to the potential impacts that a wildfire event would have on Prosser.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As both population and demand for development are projected to increase for the City of Prosser, it should be expected that Prosser, over time, will have more infrastructure at risk during a wildfire event. Land use planning, adherence to Firewise or other community wildfire standards in WUI areas, and fire-resistant construction should help reduce the amount of infrastructure at risk during a wildfire event.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

Because it is a smaller community, the values of at-risk resources in and around Prosser are not as high as some of the larger cities. In addition to being smaller in size, the incorporated area is concentrated and there are only a few small neighborhoods on the south end of town that “sprawl” out and resemble WUI conditions. Aside from the businesses located throughout the city, agriculture is an important part of Prosser’s economy. Prosser is also likely to be the home of a number of people that work in the tri-cities area.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.

Severe Weather Profile

The City of Prosser does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Severe storms, especially severe wind storms are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.
- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.

The most recent severe storm event was in February 2017. Heavy snow and rain caused flooding and eventually led to a FEMA Major Disaster Declaration.

Probability of Future Occurrence

Regionally, severe storms are expected to occur regularly resulting in a **HIGH** probability. Therefore, Prosser can anticipate at least one severe storm each year and very likely multiple storms. Disaster events caused by severe storms are not expected to happen as regularly but predicting when and what events will occur is not possible. Severe storms pose a **MODERATE** risk to Prosser.

Impacts of Severe Weather Events

As mentioned above, impacts from severe storms often manifest in the form of another hazard type, such as flooding, landslides, and lightning-caused wildfire. Windstorms can greatly affect Prosser, possibly impacting power sources or causing debris hazards. Unexpected or unusually heavy snowstorms can also have a major impact on Prosser if outside resources or emergency resources are needed. Residents that commute to the tri-cities area may also encounter problems going to and from their homes. Disruption to transportation could put lives at risk.

Development Trends

The population of Prosser has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

Because it is a smaller community, the values of at-risk resources in and around Prosser are not as high as some of the larger cities. Even though it is smaller, Prosser serves as a local center supporting surrounding agricultural uses, wineries, fruit orchards, pasture, and dryland wheat fields. A severe weather event in Prosser could have detrimental effects on crop yield and agricultural production.

It is difficult to estimate potential losses in Prosser due to severe weather. Construction throughout the County has been implemented in the presence of high wind events, and with typical levels of snow accumulation in mind and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Earthquake Profile

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Because of the infrequency of such devastating events, there is a **MODERATE** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of Prosser should such an earthquake occur.

Impacts of Earthquakes

An in-depth examination of the impacts that an earthquake event might have on the area can be found in the *Benton County Annex*. The impacts discussed are comparable to the potential impacts specific to the City of Prosser.

Considering Prosser's proximity to the Yakima River, there is a risk for flooding should an upstream dam fail as the result of an earthquake. Please refer to the *Benton County Annex* for more information about Columbia River dams and Dworshak Dam. The study by Sherrod et al (2016) supports that a fault (part of

the Wallula fault zone) capable of producing earthquakes passes through the City of Kennewick, close to Trios Hospital and Southridge High School and is indicated by the upheaval that created the Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain “ridge”. A fault located nearby to the northeast has the potential to cause significant damage to infrastructure and would place the general populous of Prosser.

Development Trends

The population of Prosser has increased over the previous decade and therefore much of the demand for development has increased. With additional development and infrastructure, Prosser will become more vulnerable to Earthquake hazards. However, the impacts of an earthquake should be minimized through land use planning and seismically-sound structural designs.



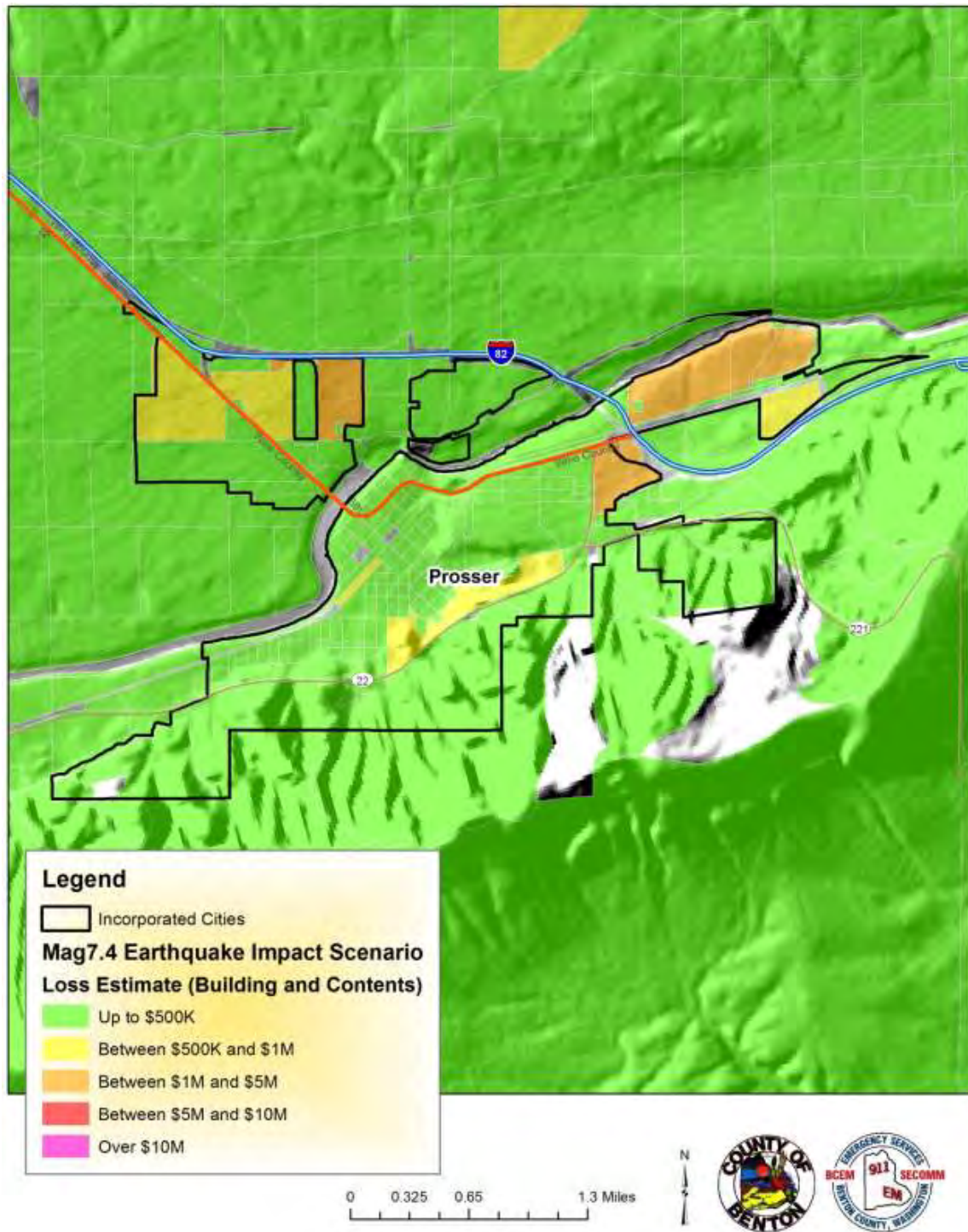


Figure 31) Mag 7.4 Earthquake impact scenario map for Prosser, WA. The different colors represent potential financial losses (in dollars) for different parts of Prosser.

2019 Revision

Value of Resources at Risk

According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$2.4 to 27 million in damages to the City of Prosser (Table 44). Of the 2,161 structures that were included in the different analyses, up to 61 structures were lost in the Horse Heaven Hills Fault scenario totaling more than \$26 million in damages. Figure 31 shows the areas of Prosser that are likely to experience the greatest losses in dollars.

Table 44) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for Prosser, WA. Total number of structures and total value of structures used in the analyses are included below the table.

City of Prosser Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$2,471,654	0.3%
M7.4 Rattlesnake Wallula Fault	\$25,288,039	2.6%
M7.1 Horse Heaven Hills Fault	\$26,742,393	2.8%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	3	0.1%

Total number of structures identified in analyses:

2,161

Total value of all structures and structure content:

\$963,913,630

Landslide Profile

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Most landslides in Benton County have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

Probability of Future Occurrence

The northern portions of Prosser are at **LOW** risk for a landslide. However, as a result of steeper terrain and erosive soils that are characteristic of the slopes of Horse heaven Hills, most of the southern edge of the city is at high risk. Refer to Figure 32 below, which shows critical and landslide prone areas in and near Prosser.

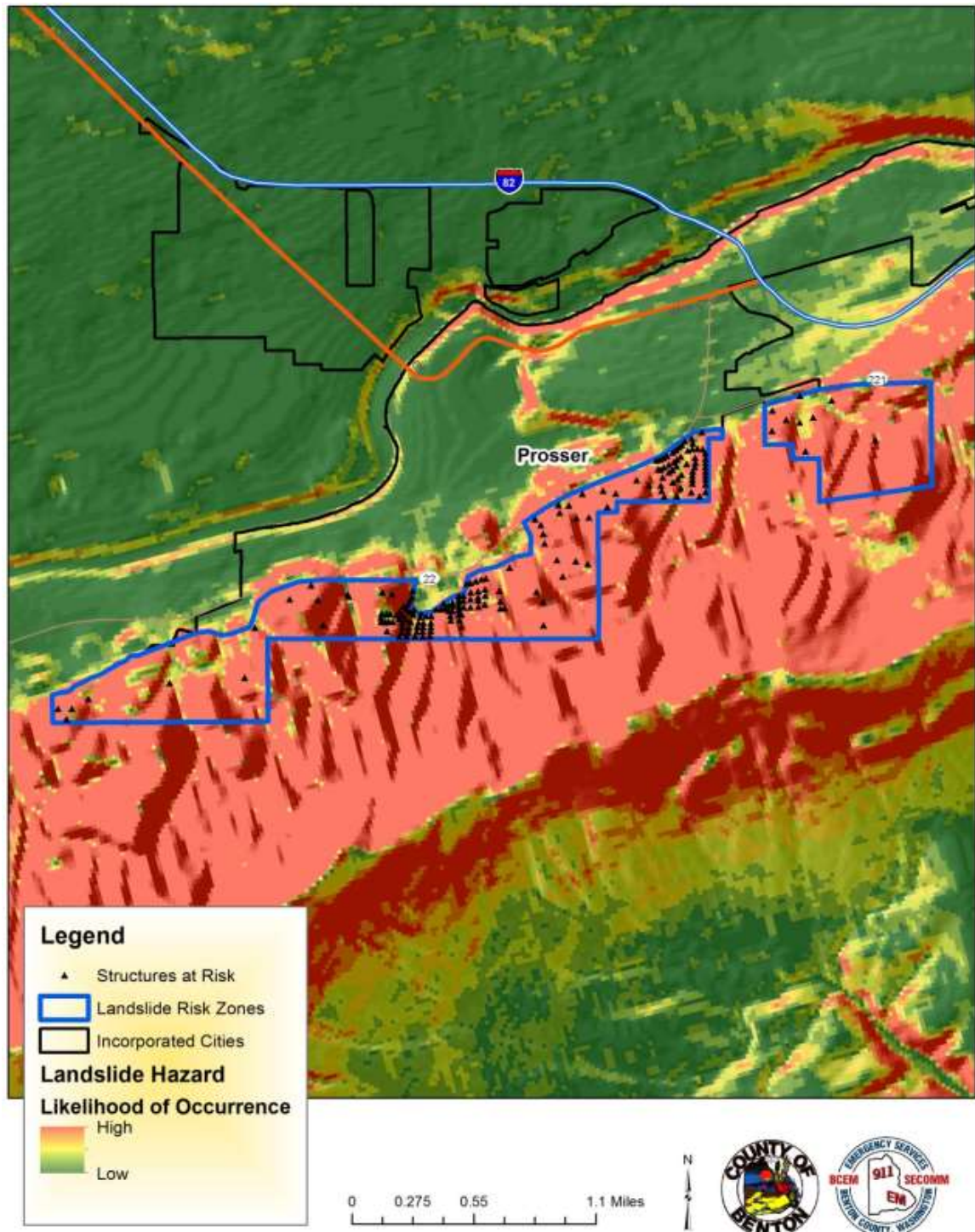


Figure 32) Structures at risk within landslide prone areas in Prosser, WA.

Impacts of Landslide Events

Potential impacts that the City of Prosser would experience in the case of a land movement event are comparable to those highlighted in the *Benton County Annex*. The biggest concerns for Prosser are threats to human safety, disruptions to the local economy and infrastructure, and damages to personal and municipal property. Since most of the structures that are located in high risk areas are residential, damage to homes would be the most likely impact of a landslide or land movement event in Prosser.

Development Trends

The population of Prosser has increased over the previous decade and therefore much of the demand for development has increased. As a result, new homes are being constructed on the south side of Prosser on the toe of the Horse Heaven Hills slopes which have been designated as high risk for landslides or land movement. Interest in those new neighborhoods has increased the amount of development taking place on landslide or land-movement prone slopes.

Values of Resources at Risk

In total, there are 190 structures in Prosser that are in designated high-risk landslide zones (Table 45). The appraised value of these structures, 96% of which are residential, is just under \$34 million.

Table 45) Number and value of appraised structures by type in designated high-risk landslide zones in Prosser, WA.

Building Type	Number of Appraised Structures	Value of Appraised Structures
Commercial	8	\$775,430.00
Residential	182	\$34,150,020.00
Total	190	\$34,925,450.00

Volcano Profile

Prosser does not differ from Benton County as a whole with regard to volcanic hazards.

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanos that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure,

and the environment in Benton County would be serious though not necessarily catastrophic. Therefore, there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcano Events

Refer to the *Benton County Annex* for volcano event impacts that would be expected to affect all jurisdictions in a similar manner. A volcanic eruption would likely be preceded or accompanied by seismic activity. Considering the fault connectivity noted by Blakely et al (2011), Prosser could potentially experience local seismic activity which could produce landslides, flooding, ground cracking, and soil liquefaction.

Development Trends

The population of Prosser has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Values of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



City of West Richland Profile

The City of West Richland is located west of Richland between Interstate 82 and State Highway 240. West Richland principally serves as a bedroom community for the Tri-Cities area. The area now considered West Richland was developed in the 1950s as residents moved across the Yakima River to avoid government restrictions on the community of Richland, which was federally owned between 1942 and 1958. The City's estimated 2018 population was 15,320. The City encompasses 21.92 square miles of land and 0.20 square miles of water. A single owner, the Lewis and Clark Ranch, holds almost 8,000 acres of the undeveloped land in West Richland. West Richland is governed by a Mayor and an elected City Council.

Table 46) Historic population of West Richland, WA

Census	Population	% Change
1960	1347	
1970	1107	-18%
1980	2938	165%
1990	4003	36%
2000	8315	108%
2010	11811	42%

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for West Richland can be found in Appendix B.

Development Trends

As part of the Growth Management Act, the Washington State Office of Financial Management (OFM) has provided Benton County with a population estimate for a period ending in the year 2037. For planning purposes, the countywide population estimate was distributed on an existing percentage basis to the various cities and unincorporated areas within Benton County. West Richland's official population forecast is a total of 22,409 in the incorporated area by the year 2037. Current 2018 population estimate within the incorporated area is 15,320.

West Richland's Comprehensive Plan includes an analysis of available land use and capacity. It also provides an estimate of acres needed for development to accommodate the projected 2037 population. Overall, the Comprehensive Plan indicates that the City has more than sufficient land within its current UGA to accommodate the land needs for the projected residential, commercial, and industrial growth.

The City of West Richland is unique in that the physical size of the city limits greatly exceeds that which is necessary to support the population as about half of the City, by size, is currently used for agricultural production and does not include urban services. As a result, West Richland's UGA is small, only encompassing 67 acres not already included within City limits. This UGA includes several small parcels located near the southern and southwestern City limits.

West Richland Hazard Annex

Flood Profile

The City of West Richland does not have any differing levels of risk associated with this hazard than Benton County as a whole. However, West Richland's exposure to flooding will be different than that of Benton County as well as other jurisdictions within Benton County.

Local Event History

West Richland is bordered by the Yakima River; almost half of the perimeter of the incorporated area follows the contour of the Yakima River. Because of its proximity to the Yakima River, it is likely that West Richland was affected by many of the same flood events that affected Benton County, but given that West Richland is situated further back from the Columbia and Snake Rivers, it is unclear if there were any impacts from floods associated with these two rivers (Table 47).

Table 47) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
17-Dec	53,800 at Prosser	18.5 est.		
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.
1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	

5-Jun-13	20900	13.1	5	
13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

West Richland has flooding potential due to its proximity to the Yakima and Columbia Rivers. Flooding threat has been greatly reduced with the implementation of dams along these rivers but some potential still exists, particularly from the Yakima River. Because the Yakima River borders the city, West Richland has a **MODERATE** to **HIGH** probability of flooding as the Yakima River isn't as large as the Columbia River and does not have the same number of Dams or means of control in place. Due to the centrally-located, highly-valuable resources in West Richland, a flood event carries a **MODERATE** risk.

The West Richland Flood Map (Figure 33) shows that all structures that are susceptible to flooding fall within flood zones A and AE (Table 48). This means there is a 1% chance that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.

Table 48) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26%

chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

AR Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.

A99 Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.



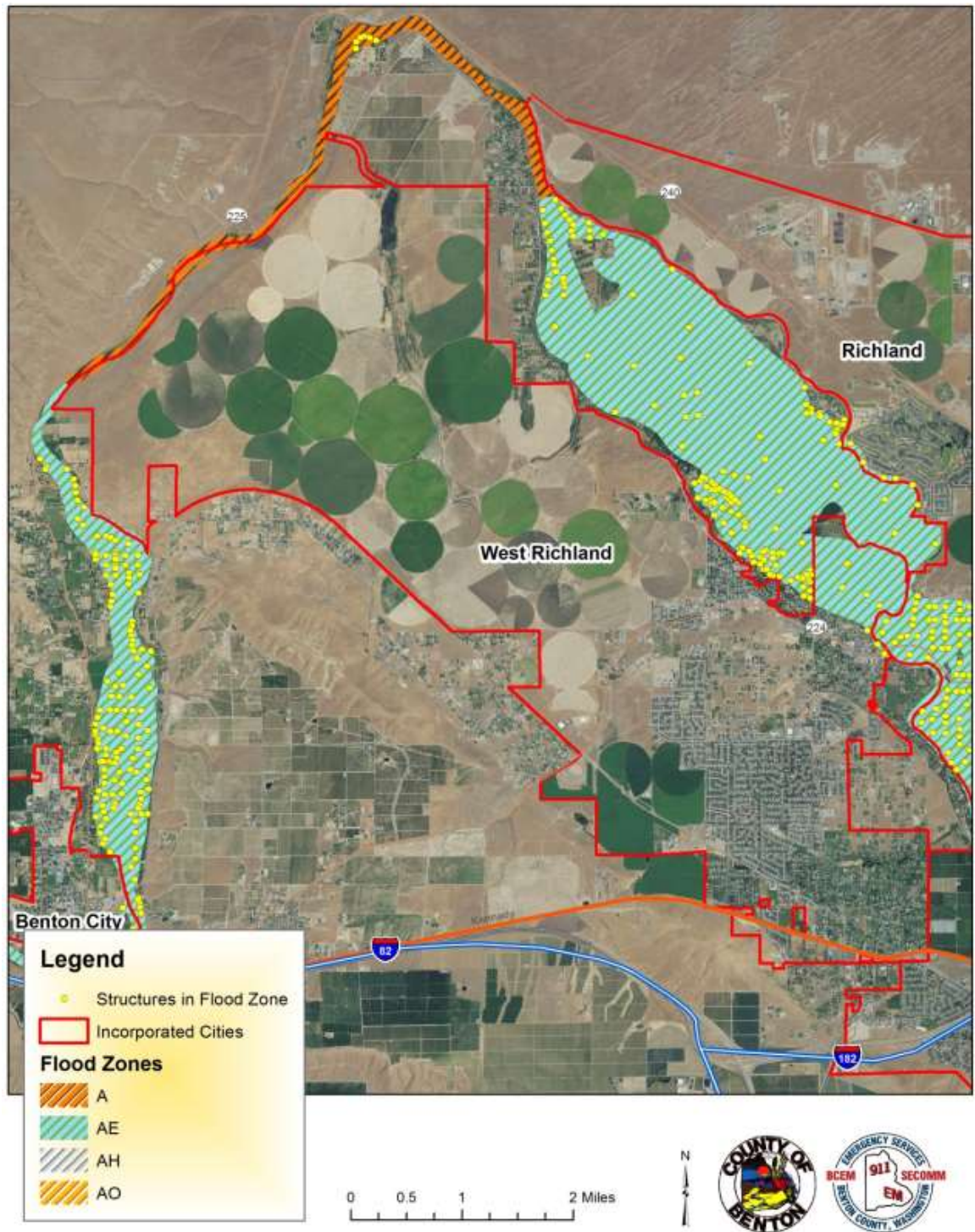


Figure 33) National Flood Insurance Program flood zone map for West Richland, WA.

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Impacts of Flood Events

Potential impacts caused by flooding in West Richland include increased landslide risk, damage to infrastructure or roads, and damage to personal property. Structures located adjacent to the Yakima River will likely be impacted the most. Refer to Benton County Annex for additional information.

Development Trends

As both population and demand for development are projected to steadily increase for the City of West Richland, it should be expected that West Richland, over time, will have more infrastructure at risk during a flood event. Land use planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

Value of Resources at Risk

Looking at the flood map for West Richland (Figure 33), damage from flooding would be a result of a Yakima River flood event. In total the City of West Richland has 8 structures, none of which are government owned, in designated flood zones that are currently appraised at more than \$2.2 million (Table 49). All structures that are susceptible to flooding fall within flood zones A and AE (Table 47). This means there is a 1% chance that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.

West Richland has flooding potential due to its proximity to the Yakima and Columbia Rivers. Flooding threat has been greatly reduced with the implementation of dams along these rivers but some potential still exists, particularly from the Yakima River. Because the Yakima River borders the city, West Richland has a **MODERATE** to **HIGH** probability of flooding as the Yakima River isn't as large as the Columbia River and does not have the same number of Dams or means of control in place. Due to the centrally-located, highly-valuable resources in West Richland, a flood event carries a **MODERATE** risk.

Table 49) Total number and total value of appraised structures in designated flood zones in West Richland, WA (only includes incorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
AE	8	\$ 2,232,280.00
Total	8	\$ 2,232,280.00

Drought Profile

Local Event History

Through analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. West Richland experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage from drought. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

West Richland does not differ from the rest of Benton County regarding future drought probability. It is reasonable to anticipate drought in 20 to 30 out of the next 100 years, resulting in a **MODERATE** probability rating. Because the population relies heavily on agriculture, and support industries tied to agriculture, there is a **MODERATE** risk associated with drought.

Impacts of Drought Events

Under drought conditions in the City of West Richland, the agriculture industry would be most heavily impacted. Irrigation supporting the agriculture industry depends on steady water flow in the Columbia and Snake Rivers. Drought impacts to agriculture would potentially harm West Richland's local economy.

Drought also increases the threat of wildfire ignition and spread by accelerating depletion of soil and vegetation moisture and by reducing water available for fire suppression. The expanding WUI around West Richland would be at increased risk for severe wildfire under drought conditions during the late summer and early fall.

Development Trends

As both the population of West Richland and demand for development are expected to increase, the City of West Richland should expect an increase in water usage as well. With increased pressure on water sources, West Richland will become more sensitive to drought conditions and will likely have to implement water conservation practices sooner during a period of drought. Increased fire risk associated with drought conditions may also make additional development vulnerable to wildfire; particularly on the west side of West Richland.

Value of Resources at Risk

The agriculture industry represents the most at-risk values to the City of West Richland in the case of a severe drought. Those values are discussed in detail in the Drought Profile within the *Benton County Annex*. The City of West Richland would be especially affected by impacts to these values because of the number of people relying on the local economy, directly or indirectly, for their own income.

Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

The City of West Richland has been directly impacted by several large-scale wildfires in the past, including the Rye Grass fire of 2016. **Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.** In addition to infrequent large fires, local fire personnel also respond to numerous ignitions along the roadways, railways, and in undeveloped areas within and immediately surrounding the city annually. Since 1981, there have been multiple wild fires on the north end of West Richland which were likely on the north side of the Yakima River and a few on the ridge southwest of West Richland (see Figure 2, wildfire hazard profile). Considering that the north end of West Richland is irrigated agriculture, these fires likely posed little threat to infrastructure in West Richland.

Probability of Future Occurrence

There is a **HIGH** probability of fire ignitions in the city; however, these ignitions are unlikely to result in large areas burned due to the availability of rapid response. Property that suffers damage to due wildfire could potentially harm the local agriculture industry, particularly the north end of West Richland, or support industries. There is, therefore, a **HIGH** risk associated with wildfire in Richland.

Impacts of Wildfire Events

With a moderate population, and therefore a significant number of people living and working in or near the wildland-urban interface, West Richland has greater impact potential in the case of a serious wildfire event. The impacts to the area that were discussed in the *Benton County Annex* are comparable to the potential impacts that a wildfire event would have on West Richland.

West Richland's exposure to wildfire may be less than that of neighboring cities as most of the incorporated area is bordered by the Yakima River and irrigated agriculture on the north end of the city could potentially serve as a buffer. However, undeveloped terrain on the south/southwest, in the event of a wildfire, could impact residential areas on that side of West Richland.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As both population and demand for development are projected to increase for the City of West Richland, it should be expected that West Richland, over time, will have more infrastructure at risk during a wildfire event. Land use planning, adherence to Firewise or other community wildfire standards in WUI areas, and fire-resistant construction should help reduce the amount of infrastructure at risk during a wildfire event.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

The values of at-risk resources in and around West Richland are moderate compared to the rest of the county. This is because of the greater number of structures, personal property, and moderate population in West Richland that are in proximity to larger populations and expansive infrastructure in neighboring cities. This means there are more people relying on the local economy, infrastructure, and other elements that could be distressed by a serious wildfire event.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.

Severe Weather Profile

The City of West Richland does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Severe storms, especially severe wind storms are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.
- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.

The most recent severe storm event was in February 2017. Heavy snow and rain caused flooding and eventually led to a FEMA Major Disaster Declaration.

Probability of Future Occurrence

Regionally, severe storms are expected to occur regularly resulting in a **HIGH** probability. Therefore, West Richland can anticipate at least one severe storm each year and very likely multiple storms. Disaster events caused by severe storms are not expected to happen as regularly but predicting when and what events will occur is not possible. Severe storms pose a **MODERATE** risk to West Richland.

Impacts of Severe Weather Events

As mentioned above, impacts from severe storms often manifest in the form of another hazard type, such as flooding, landslides, and lightning-caused wildfire. Windstorms can greatly affect West Richland, possibly impacting power sources or causing debris hazards. Unexpected or unusually heavy snowstorms can also have a major impact on West Richland especially because of its large population. Stress on infrastructure or a major disruption of transportation caused by severe weather, could potentially create a disaster event that impacts human safety and commerce.

Development Trends

The population of West Richland has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

The values of resources at risk in and near West Richland can be significant. West Richland is a significant component of the Tri-Cities metropolitan area, the industrial, economic, and political hub of Benton County. Characterized by a prolific agricultural industry and various other industrial facilities, West Richland contains substantial infrastructure, personal property, municipal facilities, and industrial facilities that could be at risk during a severe weather event.

It is difficult to estimate potential losses in West Richland due to severe weather. Construction throughout the county has been implemented in the presence of high wind events, and with typical levels of snow accumulation in mind and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Earthquake Profile

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Because of the infrequency of such devastating events, there is a **MODERATE** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of West Richland should such an earthquake occur.

Impacts of Earthquakes

An in-depth examination of the impacts that an earthquake event might have on the area can be found in the *Benton County Annex*. The impacts discussed are comparable to the potential impacts specific to the City of West Richland.

Considering West Richland’s proximity to the Yakima, Columbia, and Snake Rivers, West Richland is at risk for flooding should an upstream dam fail as the result of an earthquake. Please refer to the *Benton County Annex* for more information about Columbia River dams and Dworshak Dam. The study by Sherrod et al (2016) supports that a fault (part of the Wallula fault zone) capable of producing earthquakes passes through the City of Kennewick, close to Trios Hospital and Southridge High School and is indicated by the upheaval that created the Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain “ridge”. A fault running along the northwest edge of West Richland has the potential to cause significant damage to infrastructure and would place the general populous of West Richland at risk.

Development Trends

The population of West Richland has increased over the previous decade and therefore much of the demand for development has increased. With additional development and infrastructure, West Richland will become more vulnerable to Earthquake hazards. However, the impacts of an earthquake should be minimized through land use planning and earthquake-resistant structure designs.

Value of Resources at Risk

According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$7 to 127 million in damages to West Richland (Table 50). Of the 5,316 structures that were included in the different analyses, up to 388 structures were lost in the Rattlesnake Wallula Fault scenario totaling more than \$127 million in damages. Figure 34 shows the areas of West Richland that are likely to experience the greatest losses in dollars.

Table 50) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for West Richland, WA. Total number of structures and total value of structures used for the analyses are included below the table.

City of West Richland Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$6,946,223	0.4%
M7.4 Rattlesnake Wallula Fault	\$127,077,873	7.3%
M7.1 Horse Heaven Hills Fault	\$69,945,178	4.0%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	107	2.0%

Total number of structures identified in analyses: 5,316

Total value of all structures and structure content: \$1,748,640,995

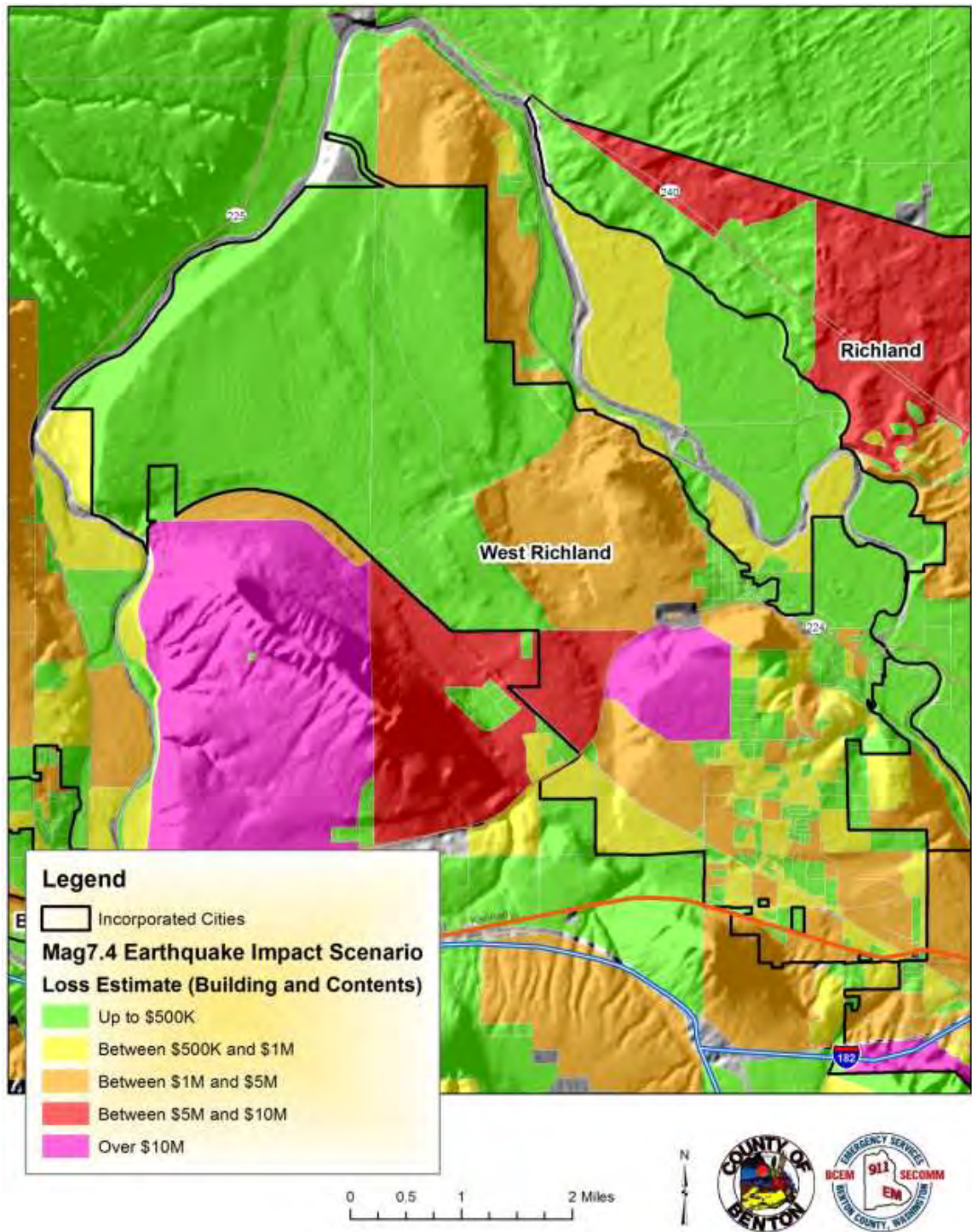


Figure 34) Mag 7.4 Earthquake impact scenario map for West Richland, WA. The different colors represent potential financial losses (in dollars) for different parts of West Richland.

2019 Revision

Landslide Profile

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Most landslides in Benton County have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

Probability of Future Occurrence

Most of West Richland is at **LOW** risk for a landslide. However, as a result of erosive soils and moderate slope, portions of two different new neighborhoods are at **HIGH** risk for landslides and land movement. Refer to Figure 35 below, which displays critical and landslide prone areas in and near West Richland.

Impacts of Landslide Events

Potential impacts that the City of West Richland would experience in the case of a land movement event are comparable to those highlighted in the *Benton County Annex*. The biggest concerns for West Richland are threats to human safety, disruptions to the local economy and infrastructure, and damages to personal and municipal property. Since most of the structures that are located in high risk areas are residential, damage to homes would be the most likely impact of a landslide or land movement event in Prosser.

Development Trends

The population of West Richland has increased over the previous decade and therefore much of the demand for development has increased. As a result, new homes are being constructed on the slopes in the central portion of West Richland. Interest in those new neighborhoods has increased the amount of development taking place on landslide or land-movement prone slopes.

Values of Resources at Risk

In total, there are 451 structures in West Richland that are in designated high-risk landslide zones (Table 51). The appraised value of these structures, 97% of which are residential, is just under \$89.5 million.



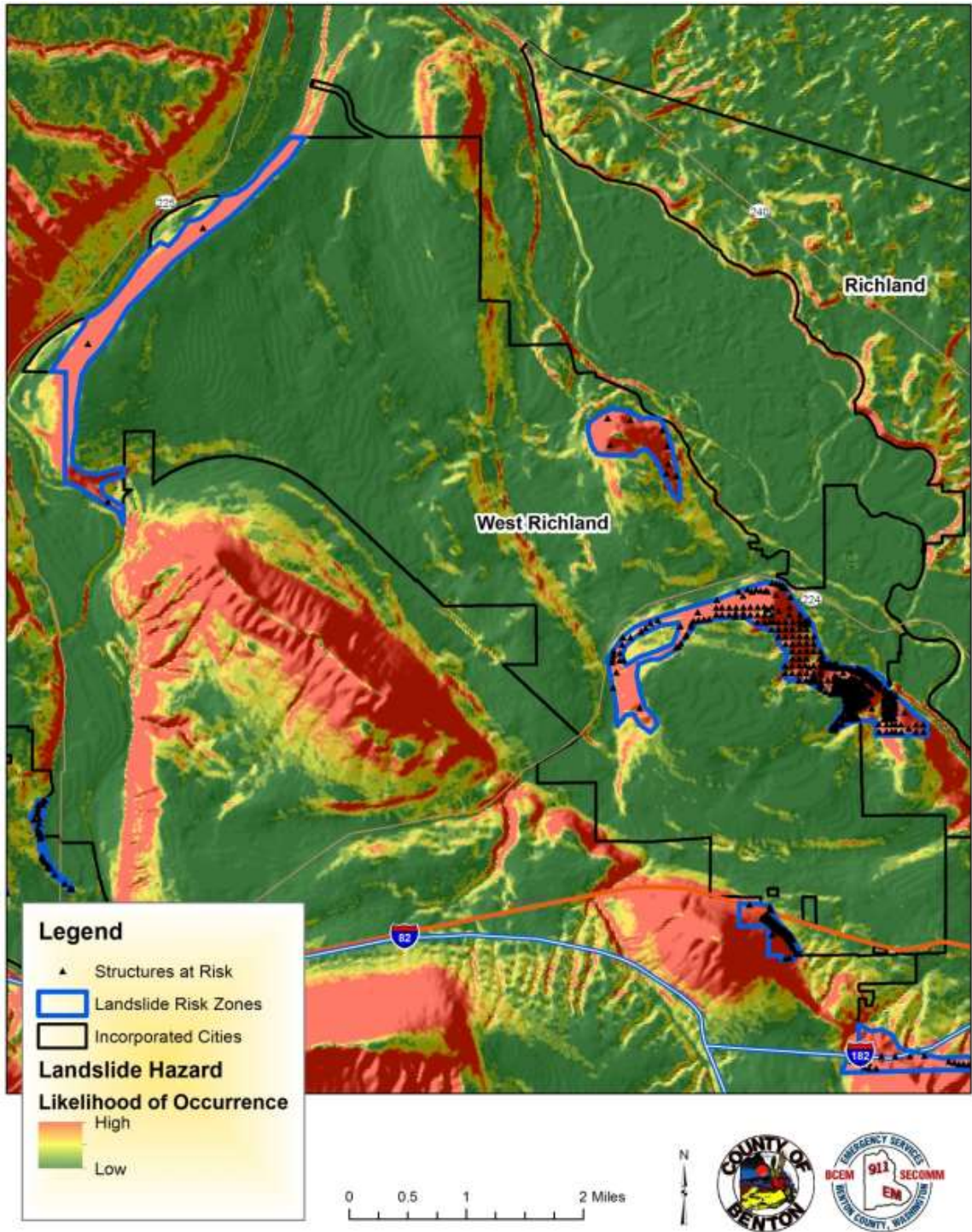


Figure 35) Structures at risk within landslide prone areas in West Richland, WA.

Table 51) Number and value of appraised structures by type in designated high-risk landslide zones in West Richland, WA.

Building Type	Number of Appraised Structures	Value of Appraised Structures
Commercial	14	\$1,552,040.00
Residential	437	\$87,854,570.00
Total	451	\$89,406,610.00

Volcano Profile

West Richland does not differ from Benton County as a whole with regard to volcanic hazards.

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanos that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure, and the environment in Benton County would be serious though not necessarily catastrophic. Therefore, there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcano Events

Refer to the *Benton County Annex* for volcano event impacts that would be expected to affect all jurisdictions in a similar manner. A volcanic eruption would likely be preceded or accompanied by seismic activity. Considering the fault connectivity noted by Blakely et al (2011), West Richland could potentially experience local seismic activity which could produce landslides, flooding, ground cracking, and soil liquefaction.

Development Trends

The population of West Richland has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Values of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



Benton City Profile

Benton City is located west of Richland along Interstate 82 and is bisected by the Yakima River. The City was founded in 1909, built around railroad freight and passenger depots established by the Oregon Washington Railroad and Navigation line. Although initially owned and controlled by rail and land companies, Benton City was publicly incorporated in 1945. Benton City's estimated 2018 population was 3,405. The City encompasses 2.46 square miles of land and 0.03 square miles of water. Despite the proximity of the Hanford Site, Benton City remained focused on agriculture and has become known for its viniculture and wineries. Benton City is governed by an elected mayor and city council.

Table 52) Historic population of West Benton City, WA

Census	Population	% Change
1950	863	
1960	1210	40%
1970	1070	-12%
1980	1980	85%
1990	1775	-10%
2000	2624	48%
2010	3038	16%

Capabilities Assessment

Mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Detailed Capabilities Assessments for Benton City can be found in Appendix B.

Development Trends

As part of the Growth Management Act, the Washington State Office of Financial Management (OFM) has provided Benton County with a population estimate for a period ending in the year 2037. For planning purposes, the countywide population estimate was distributed on an existing percentage basis to the various cities and unincorporated areas within Benton County. Benton City's official population forecast is a total of 5,812 in the incorporated area by the year 2040. Current 2018 population estimate within the incorporated area is 3,405.

Benton City's Comprehensive Plan includes an analysis of available land use and capacity. It also provides an estimate of acres needed for development to accommodate the projected 2040 population. Overall, the Comprehensive Plan indicates that the City has sufficient land within its current City limits and UGA to accommodate the land needs for the projected residential, commercial and industrial growth. However, there may be insufficient acres zoned for government use within either City limits or the UGA to accommodate the projected development.

Most of Benton City's UGA consists of area zoned for residential use on the northeast and northwest sides of the City. In addition, there is a parcel of the UGA located south of Interstate 82 and Kiona Road outside the southern City Limits and several smaller parcels located on either side of the Yakima River near the southern portion of Benton City.

Benton City Hazard Annex

Flood Profile

Benton City does not have any differing levels of risk associated with this hazard than Benton County as a whole. However, Benton City's exposure to flooding will be different than that of Benton County as well as other jurisdictions within Benton County.

Local Event History

Benton City is bordered by the Yakima River; almost half to two-thirds of the perimeter of the incorporated area follows the contour of the Yakima River. Because of its proximity to the Yakima River, Benton City has been affected by many of the same flood events that have affected Benton County. In 1996, access to a structure fire was impeded by flood waters in the area of 2nd and Abby. Parts of Benton City had also been evacuated. (Table 53).

Table 53) History of flood events that affected Benton County. Measurements were taken at Kiona.

Date	Flow (cfs)	Stage (ft)	Return Period (Yrs)	Comments
23-Dec-33	67000	21.57	167	Largest flood of record. Resulted in construction of extensive federal levee system in Yakima County.
17-Nov-06	66000	20.12	159	
17-Dec	53,800 at Prosser	18.5 est.		
11-Feb-96	49400	20.98	67	Benton County declared a federal disaster area (Note: crest may have reached up to 21.5 ft)
18-Jan-74	39700	18.56	36	Benton County declared a federal disaster area.
18-Nov-1896	38000	16.07	34	
30-May-48	37900	17.2	33	
13-Dec-21	35,800 at Parker			
17-Apr-04	32000	15.05	18	
26-Nov-09	30600	14.8	16	
23-Mar-10	29200	14.53	14	
6-Dec-75	28300	16.52	13	
28-Dec-80	27600	16.27	12	
4-Dec-77	27000	16.11	11	Benton County declared a federal disaster area.
3-Mar-01	26400	14	10	
14-Jun-03	26400	14	10	
2-Dec-95	26300	15.87	9	Benton County declared a federal disaster area.
10-Jan-09	25400	15.55		Benton County declared a federal disaster area.
16-Jun-16	24,800 at Parker			
17-Feb-1898	23100	13.27	7	
27-Nov-90	22600	14.36	7	Benton County declared a federal disaster area.
1-Feb-65	22400	13.76	6	
22-Feb-82	22200	14.42	6	

5-Jun-13	20900	13.1	5	
13-Feb-51	20900	12.99	5	
23-Jan-19	20,600 at Parker			
15-Mar-72	20200	13.57	5	
22-May-56	20100	12.73	5	
18-Feb-17	7340	7.85		Flooding was a result of snow melt. Benton County declared a federal disaster area.

Probability of Future Occurrence

Benton City has flooding potential due to its proximity to the Yakima River. Flood-potential has been greatly reduced with the construction of dams along major waterways but some potential still exists, particularly from the Yakima River. Because the Yakima River borders the city, Benton City has a **MODERATE** to **HIGH** probability of flooding as the Yakima River isn't as large as the Columbia River and does not have the same number of dams or means of control in place. Because of the values and services Benton City offers to surrounding communities, a flood event carries a **MODERATE** risk.

The Benton City Flood Map (Figure 36) shows that all structures that are susceptible to flooding fall within flood zones A and AE (Table 54). This means there is a 1% chance that structures will be subjected to flood conditions annually and a 26% chance that they will be subjected to flood conditions over the life of a 30-year mortgage. However, no analysis has been performed in areas designated as Flood Zone A, so depth of potential flooding is unknown.

Table 54) National Flood Insurance Program (NFIP) flood zone categories and descriptions.

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26%

chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

AR Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.

A99 Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.



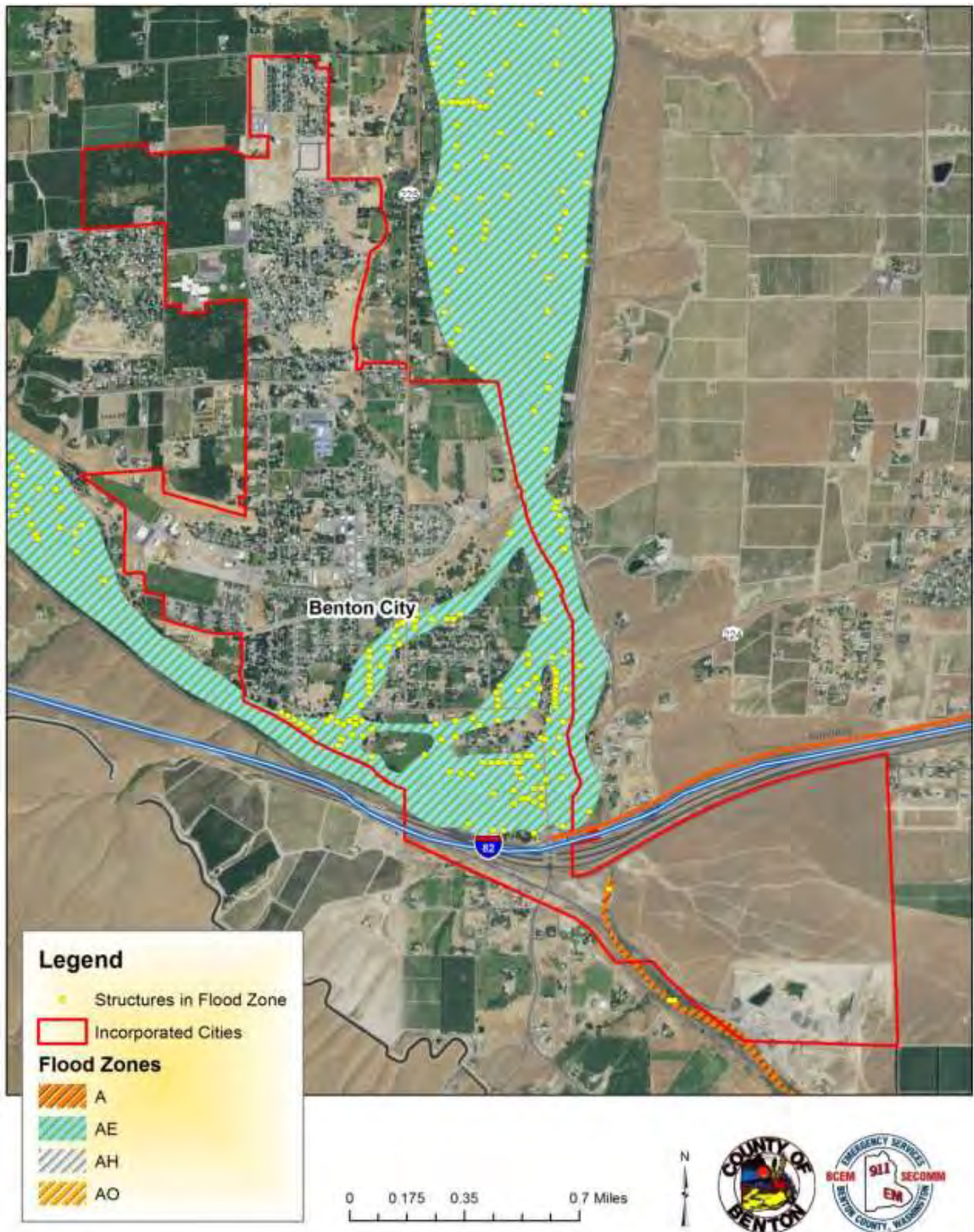


Figure 36) National Flood Insurance Program flood zone map for Benton City, WA

Impacts of Flood Events

Potential impacts caused by flooding in Benton City include increased landslide risk, damage to infrastructure or roads, and damage to personal property. Residential areas along the Yakima River are likely to be affected the most by a flood event. The impacts from the 1996 flood include the flooding of roads, disruption of emergency services (firefighters could not access a burning home), lift stations 4, 5, and 6 were inundated and had to be shut off, resulting in extensive efforts to repair lift station electrical systems, clean up and clear roadways, remove sand bags from around sewer drains and access points. Most residents living in the area south of the Kiona Canal were affected by the flooding.

Development Trends

As both population and demand for development are projected to steadily increase for Benton City, it should be expected that Benton City, over time, will have more infrastructure at risk during a flood event. Land use planning and adherence to building codes in flood sensitive areas should help reduce the amount of infrastructure at risk during a flood event.

Value of Resources at Risk

Looking at the flood map for Benton City (Figure 36), damage from flooding would be a result of a Yakima River flood event. In total the Benton City has 118 structures, none of which are government owned, in designated flood zones that are currently appraised at just over \$12.2 million (Table 55). All structures are located in Flood Zones A and AE which means there is a %1 chance that they will flood annually and a 26% chance that they will flood over the life of a 30-year mortgage.

Table 55) Total number and total value of appraised structures in designated flood zones in Benton City, WA (only includes incorporated structures).

Flood Zone	Appraised Structures	Value of Appraised Structures
A	1	\$ 38,850.00
AE	117	\$ 12,161,340.00
Total	118	\$ 12,200,190.00

Drought Profile

Local Event History

Through analysis of 100-year drought data (1895-1995), the EHMP reports that most of Washington State was in severe or extreme drought at least 5% of the time during that period. Benton City experienced severe or extreme drought 20-30% of the time during that 100 years. During the severe drought event that occurred in 2005, the Governor of Washington requested agricultural disaster designations from the U.S. Secretary of Agriculture because of significant crop damage from drought. Benton County was one of the 15 counties that were included in the disaster request.

Probability of Future Occurrence

Benton City does not differ from the rest of Benton County regarding future drought probability. It is reasonable to anticipate drought in 20 to 30 out of the next 100 years, resulting in a **MODERATE** probability rating. Because the population relies heavily on agriculture, and support industries tied to agriculture, there is a **MODERATE** risk associated with drought.

Impacts of Drought Events

Under drought conditions in Benton City, the agriculture would be most heavily impacted as it depends heavily on steady water flow in the Yakima River. Drought impacts to agriculture would potentially harm the city's local economy.

Drought also increases the threat of wildfire ignition and spread by accelerating depletion of soil and vegetation moisture and by reducing water available for fire suppression. The expanding WUI around Benton City would be at increased risk for severe wildfire under drought conditions during the late summer and early fall.

Development Trends

As both population and demand for development are expected to increase, Benton City should expect an increase in water usage making it more sensitive to drought conditions. Even though the increase in water usage in Benton City will be minimal due to its smaller size, it will likely have to implement water conservation practices earlier during a period of drought; particularly as larger neighboring communities place additional stress on water supplies. Increased wildfire risk associated with drought conditions will also make new development more vulnerable to wildfire, especially on the south side of I-82.

Value of Resources at Risk

The agriculture industry represents the most at-risk values to Benton City in the case of a severe drought. Those values are discussed in detail in the Drought Profile within the *Benton County Annex*. Benton City would be especially affected by impacts to these values because of the number of people relying on the local economy, directly or indirectly, for their own income.

Wildfire Profile

For a complete analysis of the wildfire hazard in Benton County, refer to the Wildfire Hazards section in Chapter 3. The information in that section is a complete excerpt of chapter 4 of the Benton County Community Wildfire Protection Plan which is why it is presented in the same section of this plan.

Local Event History

Benton City has been directly impacted by several large fires since 1990. **Table 3 in the wildfire section of chapter 3 shows wildland fires 300 acres in size or larger that occurred in Benton County since 1981.** Since 1980, Benton City has also had multiple fires in the southern portion of the incorporated area as well as numerous wildfires on the northeast facing slope of the Horse Heaven Hills (see Figure 2, wildfire hazard profile). There have been other fires on the same slopes of the Horse Heaven Hills further east and west along the I-82/US 12 corridor.

Probability of Future Occurrence

There is a **HIGH** probability of fire ignitions in the city, particularly on the south side of I-82 on the slopes of the Horse Heaven Hills. These ignitions are unlikely to result in large areas burned due to the availability of rapid response, but there is potential for fire to make a run upslope and into the dry agriculture areas of Horse Heaven Hills. Property that suffers damage due to wildfire could potentially harm the local agriculture industry or support industries. There is, therefore, a **HIGH** risk associated with wildfire in Benton City.

Impacts of Wildfire Events

The Yakima River borders most of Benton City; the part of the city on the north side of the river is interfaced with agriculture while the portion on the south side of the river is mostly undeveloped with minimal infrastructure that would be at risk during a wildfire. However, areas on the south side of I-82 have burned previously and could burn again which may impact residents, property, agriculture, and may even, under the required conditions, spread to the slopes of the Horse Heaven Hills. The overall impacts to the area that were discussed in the *Benton County Annex* are comparable to the potential impacts that a wildfire event would have on Benton City.

Refer to the wildfire section in chapter 3 for information about specific fire protection issues in Benton County.

Development Trends

As both population and demand for development are projected to increase for the Benton City, it should be expected that Benton City, over time, will have more infrastructure at risk during a wildfire event. Land use planning, adherence to Firewise or other community wildfire standards in WUI areas, and fire-resistant construction should help reduce the amount of infrastructure at risk during a wildfire event.

Refer to the wildfire section in chapter 3 for information about the wildland urban interface in Benton County and the specific risks associated with additional expansion.

Value of Resources at Risk

Because it is a smaller community, the values of at-risk resources in and around Benton City are not as high as some of the larger cities. In addition to being smaller in size, most infrastructure within the incorporated area is concentrated in the bend of the Yakima River (on the north side of the river) and there is only a gravel pit and very limited infrastructure in the undeveloped area on the south side of I-82. Aside from the businesses located throughout the city, agriculture is an important part of Benton City's economy. Benton City is also likely to be the home of a number of people that work in the tri-cities area.

Refer to the wildfire section in chapter 3 for relative threat level mapping information for Benton County and specifics about high-value resources at risk.

Severe Weather Profile

The Benton City does not have any differing levels of risk associated with this hazard than Benton County as a whole.

Local Event History

Severe storms, especially severe wind storms are common in Benton County during the spring and fall months and all areas of Benton County are vulnerable to the impacts of severe storms. Severe wind storms that occur in the Columbia River Basin routinely have wind speeds that can reach 60 mph but some storms, including winter storms, are capable of even greater wind speeds:

- During a five-day windstorm event in January 1972, wind speeds (gusts) up to 150 mph were recorded on Rattlesnake Mountain. In Toppenish (Yakima County), the windstorm leveled buildings, tore off roofs, and overturned trailers. It is estimated that the storm caused \$250,000 in damages (1972 dollars) in Benton County alone.
- In a January 1990 windstorm, wind gusts up to 81 mph were recorded causing an estimated \$3,000,000 in damages.
- In the winter of 1996-1997, Benton County experienced a massive storm that brought heavy snow accumulation, high winds and rain and led to a FEMA Disaster Declaration.
- Severe windstorms were also experienced in December 1995 and December 2001, causing damage to roofs, trees, and other property.
- In 2006 a windstorm affected all 39 counties in Washington, causing \$50 million in damage statewide.

The most recent severe storm event was in February 2017. Heavy snow and rain caused flooding and eventually led to a FEMA Major Disaster Declaration.

Probability of Future Occurrence

Regionally, severe storms are expected to occur regularly resulting in a **HIGH** probability. Therefore, Benton City can anticipate at least one severe storm each year and very likely multiple storms. Disaster events caused by severe storms are not expected to happen as regularly but predicting when and what events will occur is not possible. Severe storms pose a **MODERATE** risk to Benton City.

Impacts of Severe Weather Events

As mentioned above, impacts from severe storms often manifest in the form of another hazard type, such as flooding, landslides, and lightning-caused wildfire. Windstorms can greatly affect Benton City, possibly impacting power sources or causing debris hazards. Unexpected or unusually heavy snowstorms can also have a major impact on Benton City if outside resources or emergency resources are needed. Residents that commute to the tri-cities area may also encounter problems going to and from their homes. Disruption to transportation could put lives at risk.

Development Trends

The population of Benton City has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

Because it is a smaller community, the values of at-risk resources in and around Benton City are not as high as some of the larger cities. Even though it is smaller, Benton City serves as a local center supporting surrounding agricultural uses, wineries, fruit orchards, pasture, and dryland wheat fields. A severe weather event in Benton City could have detrimental effects on crop yield and agricultural production.

It is difficult to estimate potential losses in Benton City due to severe weather. Construction throughout the County has been implemented in the presence of high wind events, and with typical levels of snow accumulation in mind and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Earthquake Profile

Local Event History

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east.

The Washington coast and the greater Puget Sound Basin are most at risk although damaging earthquakes have occurred east of the Cascades. The Puget Sound basin had damaging earthquakes in 1909, 1939, 1946, 1949, 1965, and 2001. Eastern Washington had large earthquakes in 1872 near Lake Chelan and in 1936 near Walla Walla. The 1872 earthquake near Lake Chelan was the states most widely felt shallow earthquake. The magnitude for this event has been estimated at 7.4. The 1936 magnitude 6.1 earthquake near Walla Walla was also a shallow event. Because of their remote locations damage was light from these two quakes. Ground shaking from historic earthquakes in Washington and the western U.S. has been noted in Benton County, and has resulted in only minor damage in several events.

The EHMP examines two significant earthquake events near Benton County that have occurred since 1872:

Lake Chelan Earthquake– December 14, 1872

Likely originating northeast of Chelan, WA, the magnitude 6.8 (est.) Chelan Earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. At the time there were few man-made structures in the epicenter area near Lake Chelan so most of the regional impacts were ground affects. Observed after the earthquake were huge landslides, massive fissures in the ground, and a 27-foot high geyser. Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. In addition to the Columbia River shoreline, landslides also occurred throughout the Cascade Mountains.

As of 2014 geologists had begun the process of interpreting a large amount of evidence that they suspect will indicate the exact location of the epicenter of the 1872 earthquake. As of the update of this

plan, the study is still in progress, but some researchers believe the epicenter is located in Spencer Canyon, near Orondo, WA but this is yet to be confirmed. Determining the exact location of the epicenter is important as the fault is capable of producing another large earthquake in the future. Knowing where an earthquake may occur will help researchers predict the potential impacts it could have on nearby communities and help them prepare.

Milton-Freewater Earthquake – July 15, 1936

The earthquake, magnitude 6.1, occurred at 11:05 a.m. The epicenter was about 5 miles south-southeast of Walla Walla. It was widely felt through Oregon, Washington and northern Idaho, with the greatest shaking occurring in northeast Oregon. Property damage was estimated at \$100,000 (in 1936 dollars) in, what was at the time, a sparsely populated area.

In recent years, geologists have attempted to find the exact location of the epicenter of the Milton-Freewater earthquake. As of the update of this plan, geologists are attempting to determine exactly which fault was the source of the quake as it could either have occurred on the RAW or on the Hite fault. The location of the epicenter has implications for impacts of any future earthquakes occurring along the same fault and the way that communities prepare for such event. The results are expected to be available in the near future.

Probability of Future Occurrence

Because of the infrequency of such devastating events, there is a **MODERATE** probability for a potentially damaging earthquake to occur that would result in many people being injured or killed and damaging private property, government infrastructure and the local economy. However, there is a **HIGH** risk to the citizens, infrastructure, and economy of Benton City should such an earthquake occur.

Impacts of Earthquakes

An in-depth examination of the impacts that an earthquake event might have on the area can be found in the *Benton County Annex*. The impacts discussed are comparable to the potential overall impacts that could occur within Benton City.

Considering Benton City's proximity to the Yakima River, there is a risk for flooding should an upstream dam fail as the result of an earthquake. Please refer to the *Benton County Annex* for more information about Columbia River dams and Dworshak Dam. The study by Sherrod et al (2016) supports that a fault (part of the Wallula fault zone) capable of producing earthquakes passes through the City of Kennewick, close to Trios Hospital and Southridge High School and is indicated by the upheaval that created the Thompson Hill, Badger Mountain, Red Mountain, and Rattlesnake Mountain "ridge". A fault located nearby to the northeast has the potential to cause significant damage to infrastructure and would place the general populous of Benton City at risk.

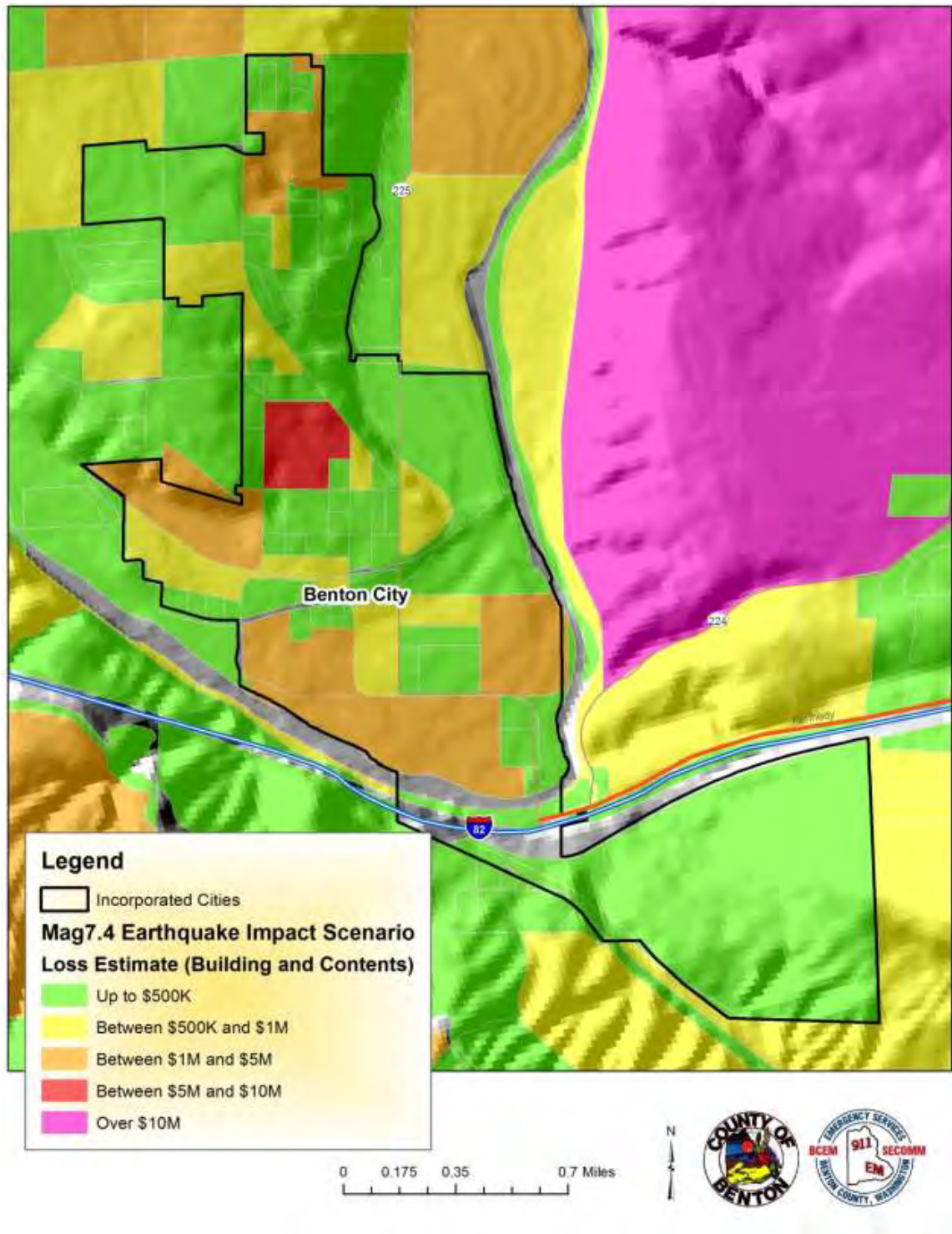


Figure 37) Mag 7.4 Earthquake impact scenario map for Benton City, WA. The different colors represent potential financial losses (in dollars) for different parts of Benton City.

2019 Revision

Development Trends

The population of Benton City has increased over the previous decade and therefore much of the demand for development has increased. With additional development and infrastructure, Benton City will become more vulnerable to Earthquake hazards. However, the impacts of an earthquake should be minimized through land use planning and earthquake-resistant structure designs.

Value of Resources at Risk

According to the Washington Earthquake Risk Assessment, earthquakes resulting from fault movement in or near Benton County could cause approximately \$1.2 to 32 million in damages to Benton City (Table 56). Of the 1,253 structures that were included in the different analyses, up to 151 structures were lost in the Rattlesnake Wallula Fault scenario totaling more than \$32 million in damages. Figure 37 shows the areas of Benton City that are likely to experience the greatest losses in dollars.

Table 56) Washington Earthquake Risk Assessment HAZUS Earthquake scenarios for Benton City, WA. Total number of structures and total value of structures included in the analyses are included below the table.

Benton City Earthquake Scenarios	Total Loss Value (Building and Contents)	Total Loss Ratio (Building and Contents)
M7.4 Saddle Mountain Fault	\$1,158,735	0.4%
M7.4 Rattlesnake Wallula Fault	\$32,152,011	12.0%
M7.1 Horse Heaven Hills Fault	\$22,120,715	8.3%
HAZUS Analysis (Earthquake Loss Ratio >= 10%)	Number of Structures	Percent of Total Structures
Hazus Earthquake Summary	450	35.9%

Total number of structures identified in analyses: 1,253

Total value of all structures and structure content: \$267,161,155

Landslide Profile

Local Event History

Washington has a long history of landslides. Widespread landslides have historically occurred during large storm events (1983, 1996, 1997, 2007, and 2009) and earthquakes (1949, 1965 and 2001). Landslides can also move without large events and without warning, such as the Aldercrest-Banyon landslide in Cowlitz County, the Carlyon Beach/Hunters Point landslide in Thurston County, and the Nile Landslide in Yakima County. Landslides can also be caused by volcanoes, such as the debris avalanche of the Mt. St. Helens eruption of 1980 and subsequent lahars (volcanic debris flows).

In 1982 in Benton County, the construction of Interstate-82 between Prosser and Benton City at mile marker 92 reactivated a historical landslide causing between \$10 and \$15 million in damages. Most landslides in Benton County have occurred along the steep slopes of Interstate 82 and along the Columbia River west of Paterson, WA.

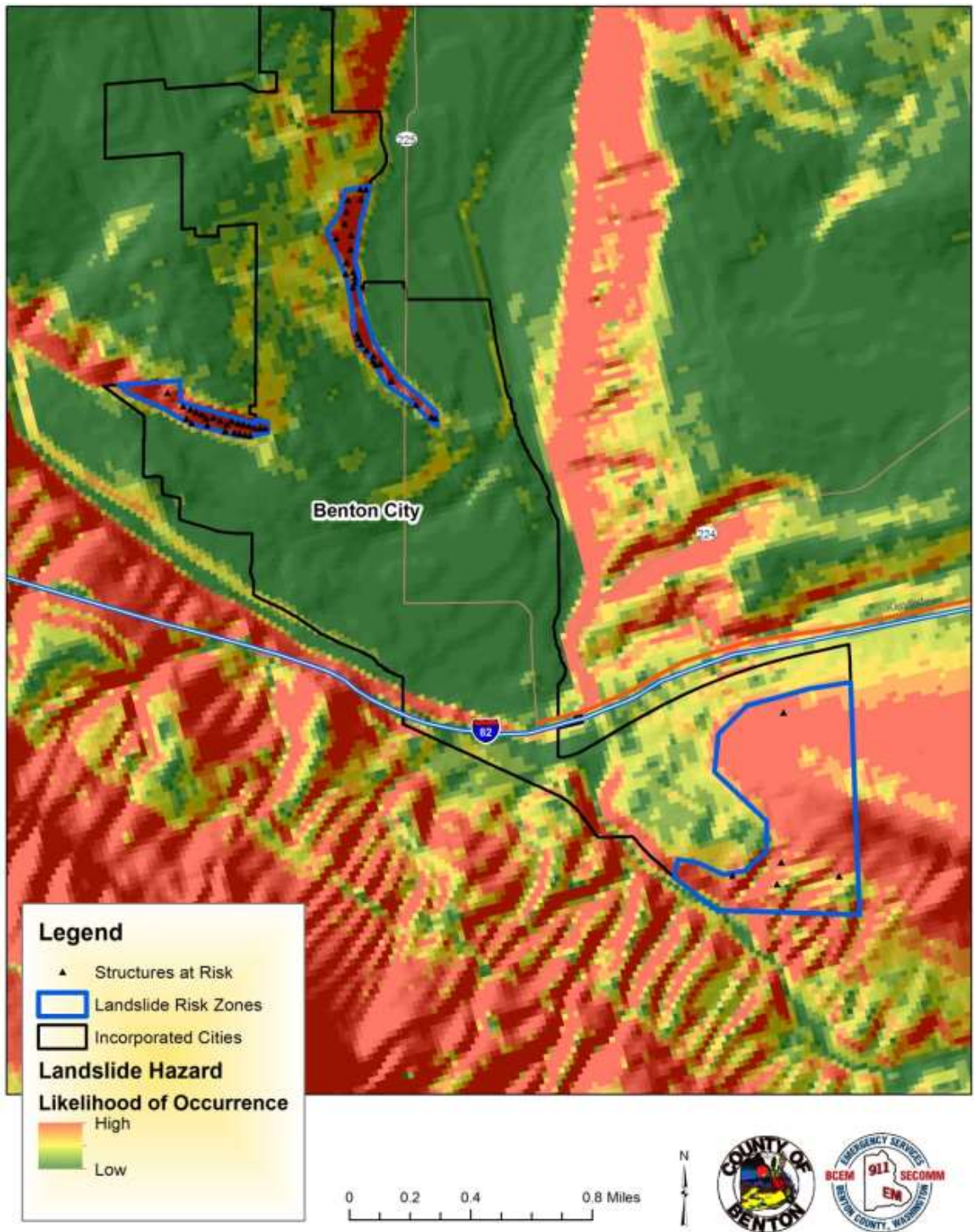


Figure 38) Structures at risk within landslide prone areas in Benton City, WA.

Probability of Future Occurrence

As a result of erosive soils and moderate slopes, there are small areas within Benton City that are at high risk for landslides or land movement. Refer to Figure 38 which displays critical and landslide prone areas in and near Benton City. The majority of Benton City is at **LOW** risk.

Impacts of Landslide Events

Potential impacts that Benton City would experience in the case of a land movement event are comparable to those highlighted in the *Benton County Annex*. The biggest concerns for Benton City are threats to human safety, disruptions to the local economy and infrastructure, and damages to personal and municipal property. Since most of the structures that are located in high risk areas are residential, damage to homes would be the most likely impact of a landslide or land movement event in Benton City.

Development Trends

The population of Benton City has increased over the previous decade and therefore much of the demand for development has increased. In response to previous demand for development, homes were constructed on or at the top of moderate slopes that have been designated as high risk for landslides or land movement. It appears that most of the land use in Benton City is for agriculture so it seems unlikely that a lot of new development would be located in the high-risk areas.

Values of Resources at Risk

In total, there are 56 structures in Benton City that are in designated high-risk landslide zones (Table 57). The appraised value of these structures, 98% of which are residential, is just under \$5 million.

Table 57) Number and value of appraised structures by type in designated high-risk landslide zones in Benton City, WA.

Building Type	Number of Appraised Structures	Value of Appraised Structures
Industrial	1	\$605,920.00
Residential	55	\$4,392,910.00
Total	56	\$4,998,830.00

Volcano Profile

Benton City does not differ from Benton County as a whole with regard to volcanic hazards.

Local Event History

Stretching from northern California into British Columbia, the Cascade Range of the Pacific Northwest has more than a dozen active volcanoes, most of which are capable of explosive eruptions. The volcanos that erupted most recently were Mount St. Helens (Washington, 1980–86 and 2004–8) and Lassen Peak (California, 1914–17). On May 18, 1980, after two months of earthquakes and minor eruptions, Mount St. Helens exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded \$1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption as public

officials had been alerted to the danger by the U.S. Geological Survey (USGS) and other scientists who were monitoring volcanic activity in the region.

Probability of Future Occurrence

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Benton County, the impacts of a major eruption from Mount Adams, Mount Hood or Mount Saint Helens to persons, property, infrastructure, and the environment in Benton County would be serious though not necessarily catastrophic. Therefore, there is a **LOW** probability of such an event occurring, but a **MODERATE** risk to persons, property, and the environment in Benton County should an eruption occur.

Impacts of Volcano Events

Refer to the *Benton County Annex* for volcano event impacts that would be expected to affect all jurisdictions in a similar manner. A volcanic eruption would likely be preceded or accompanied by seismic activity. Considering the fault connectivity noted by Blakely et al (2011), Benton City could potentially experience local seismic activity which could produce landslides, flooding, ground cracking, and soil liquefaction.

Development Trends

The population of Benton City has increased over the previous decade and therefore much of the demand for development has increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Values of Resources at Risk

It is difficult to estimate the value of resources at risk during a volcanic eruption. Costs associated with ash-related damage would likely depend on the duration of exposure and quantity of ash that settles within the municipality. Ash can collapse the roofs of buildings, impact water resources and infrastructure, clog vehicle engines, ground or damage airplanes, harm or kill livestock, crops, and other vegetation, and have adverse impacts on human and animal health. As indicated by the aftermath of the Mount St. Helens eruption in 1980, the damage caused by an eruption can total in the billions of dollars.

In addition to any kind of damage to infrastructure, there will be, depending on the volume of ash fall, high costs associated with clean-up efforts, the need for additional medical supplies, food and water, temporary shelter and transportation needs, and any other emergency supplies needed for both emergency responders and the general public.



Chapter 5: Mitigation Strategies

Mitigation Goals and Objectives

The goals and objectives, which guided the development of the plan, are intended to be implemented in the community by the year 2020. Each goal statement has objectives that provide a more specific framework for actions to be taken by the planning partners. They provide guidance for the development of the proposed mitigation action items in this section. Each mitigation action item is specifically designed to implement a corresponding goal and objective.

The following is a list of the goals and objectives for this hazard mitigation plan:

1. Encourage all sectors of the community to work together to create a disaster resistant community.
 - a) Encourage participation in the planning process among local governmental entities.
 - b) Encourage the promotion of hazard mitigation planning between local governmental entities, the business community, and volunteer organizations.
 - c) Update the hazard mitigation plan on a regular basis, and as needed after a disaster event.
 - d) Alert the community to the next update cycle of the hazard mitigation plan, and how they might become involved in that planning process.
2. Local governmental entities have the capabilities to develop, implement, and maintain effective hazard mitigation programs in Benton County.
 - a) Maintain existing data. Also gather new data and information needed to define hazards, risk areas, and vulnerabilities in Benton County.
 - b) Undertake an evaluation to determine the effectiveness of mitigation action items implemented in Benton County.
3. Collectively, the communities in Benton County have the capacity to initiate and sustain emergency operations during and after a disaster.
 - a) Ensure that local emergency services have the capability to detect emergency situations and promptly initiate emergency response operations.
 - b) Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities as needed.
 - c) Ensure that utility and communications systems that support emergency services operations can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
4. Local government operations are not significantly disrupted by disasters from natural hazards.
 - a) Protect important local government records from the impacts of disasters.
 - b) Retrofit or relocate buildings and facilities used for routine operations of government so they can withstand the impacts of disasters.
 - c) Have redundant equipment, facilities and supplies on hand to reestablish local government operations after a disaster.
 - d) Encourage the adoption of a plan and the identification of resources for how local government operations will be reestablished after a disaster.

5. Reduce the vulnerability to natural hazards to protect the health, safety and welfare of the community's residents and visitors.
 - a) Provide the highest degree of natural hazard protection at the lowest-possible cost by working with natural systems and prioritizing prevention.
 - b) Ensure there are adequate systems in place to provide emergency instructions during a disaster.
 - c) Rely upon a combination of state or federal grants and locally generated funds (for the required match) to implement most mitigation action items.
6. Local governments support hazard mitigation planning and support the implementation of the mitigation action items for their jurisdiction.
 - a) Support the integrations of mitigation action items from the hazard mitigation plan into local government comprehensive plans, development regulations, and Capitol Improvement Plans (CIPs).
 - b) Support the adoption of Critical Area Ordinance (CAO) regulations, which prohibit inappropriate land uses within areas of high risk; and require mitigation measures when structures or facilities are allowed in areas of less risk.
 - c) Adopt and enforce the most recent version of the International Building Code (IBC) along with its chapters as a way to address wind, fire, landslide and earthquake hazards.
 - d) Support the adoption of land use designations, comprehensive plan policies, and development regulations which minimize new development within high hazard areas.
 - e) Support the location of new facilities outside of areas vulnerable to the impacts of natural hazards.
 - f) Design facilities to withstand the impacts of a disaster when it is not feasible to relocate them.
 - g) Minimize the vulnerability of libraries, museums, and other institutions important to the daily lives of the community.
7. The local infrastructure of communities in Benton County is not significantly affected by a disaster from a natural hazard.
 - a) Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.
 - b) Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster.
 - c) Encourage private sector hazard mitigation planning for the design and retrofit of energy and telecommunications infrastructure to minimize the potential for disruption during a disaster.
 - d) Support key employers in the community to implement mitigation measures for their facilities and systems.
8. Residents understand the natural hazards of Benton County and are aware of ways to reduce their personal vulnerability to those hazards.
 - a) Encourage the development, implementation and maintenance of education programs which explain the vulnerabilities and risks of natural hazards in Benton County, and ways to reduce their personal vulnerability to those hazards.

Encourage the development and implementation of education programs which explain the mitigation action items to be undertaken by various communities in Benton County.

Sources of Funding

All of the action items listed in the following tables will require some kind of funding, whether it be the donation of a person's time or an expensive county improvement project. Different types of projects will apply for funding from a variety of sources that cater specifically to accomplishing the goals of the action item. For example, a culvert replacement on a county road may be eligible for funding from the Natural Resource Conservation Service and the Washington State Department of Ecology.

The following is list of potential funding sources for mitigation projects in Benton County; however, this is in no way an exhaustive list:

Federal Funding Sources:

- A. Hazard Mitigation Grants Program (FEMA)
- B. Flood Mitigation Assistance Program (FEMA)
- C. Pre-Disaster Mitigation Program (FEMA)
- D. Homeland Security Grant Program (FEMA)
- E. Federal Aviation Administration (U.S. Department of Transportation)
- F. Federal Highway Administration (U.S. Department of Transportation)
- G. Community Development Block Grant Program (U.S. Department of Housing and Urban Development)
- H. Natural Resource Conservation Service
- I. U. S. Forest Service

State Funding Sources:

- J. Flood Control Assistance Account Program (State of Washington Department of Ecology)
- K. Washington State Department of Transportation (various programs)
- L. Washington State Department of Natural Resources (DNR) Fire Prevention
- M. Aquatic Lands Enhancement Area Program (DNR)
- N. Washington State Department of Community, Trade and Economic Development's (DCTED) Grant
- O. Washington State Department of Community, Trade and Economic Development's (DCTED) Public Works Trust Fund
- P. Washington State Department of Community, Trade and Economic Development's (DCTED) Pre-Construction and Emergency Loans

Other Funding Sources:

- Q. Annual allocations of the Parks Capital Improvements Program (for acquisition of sites along the shoreline)
- R. Program for Growth Management Act compliance
- S. Community Economic Revitalization Board

- T. Insurance funds
- U. Local Jurisdiction

Mitigation Action Items (MAI)

Mitigation action items make up the central piece of the Benton County Hazard Mitigation Plan. It is through the implementation of these action items that the communities within Benton County will truly become disaster resistant. For the purposes of this document, mitigation action items are defined as activities designed to reduce or eliminate losses resulting from natural hazards. These are the action items that the participating jurisdictions and organizations would implement when resources become available to do so.

Preparation of Mitigation action items

The mitigation action items were prepared by the members of the Hazard Mitigation Planning Committee based on the natural hazards addressed in this plan: flood, drought, wildfire, severe weather, earthquake, landslide, and volcano. Each member of the committee represented their entity and was responsible for gathering and coordinating the information required for their jurisdictional action items. Committee members either had sufficient information to form an action item or coordinated with staff in their jurisdictions that were most familiar with the facility, system, or geographic area being addressed. For each action item, a local mitigation action item template was prepared.

In addition to the basic statement explaining the mitigation action item, the template required additional information regarding a description of the problem, timeline on which the item will be implemented, potential funding source(s), as well as prioritization relative to all the mitigation action items from that governmental entity. The template also identified who would implement the mitigation action item when resources become available to do so.

Selection and Prioritization of Action Items

As part of the preparation process, all initiatives were prioritized by staff within the developing entity based on internal plans and policies. The priority of an initiative was determined and agreed upon by the entity that developed it based on community goals, feasibility, cost, and overall impact on the community. The numerical labeling and ordering of the initiatives does not have any implications for priority.

Progress on Local Mitigation efforts

With each revision of the Benton County Hazard Mitigation Plan and effort will be made to clarify the progress that has or has not been made toward the identified mitigation efforts. Each Mitigation Action Item (MAI) is identified with a timeline projection in the table format. There are currently 55 MAI's identified, 2 of those MAI's are completed from the since the last plan update and 7 projects are on-going or done annually.

Mitigation Action Items: Benton County

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Flood

Benton County Flood MAI No. 1			
Mitigation Project Summary: Evaluate the development of a program (including obtaining a source of external funding) for acquisition of development rights within the Yakima River floodplain.			
Description of the Problem: Additional development can occur within the floodplain of the Yakima River, despite the potential for repetitive flood damage. An outright ban on development within the floodplain is not considered feasible.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Planning/Building Department	Contingent on Funding	B, J

Wildfire

Benton County Wildfire MAI No 1			
Mitigation Project Summary: Evaluate the development of a program of fire prevention inspections, particularly during those "red flag days" of high wildfire hazard. Target fire users and equipment operators.			
Description of the Problem: Many individuals are unaware of the potential wildland fire risk from "routine" actions.			
Priority	Lead Agency	Timeline	Funding Sources
High	Benton County Fire Marshal	2020	A, H, I

Benton County Wildfire MAI No 2			
Mitigation Project Summary: Evaluate the development of a program to control weeds and brush in interface areas. Where requirements for weed and brush control exist, expand enforcement as necessary to ensure the requirements are being met.			
Description of the Problem: A build-up of weeds and brush in interface areas contributes to the potential for wildfire.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Benton County Fire Marshal	2019 – On-going	L, A, C, H, I, U

Mitigation Action Items: Multi-Jurisdictional

The pages that follow document the specific hazard mitigation action items that each entity has elected to implement.

Multi-Hazard

Multi-Jurisdictional Multi-Hazard MAI No 1			
Mitigation Project Summary: Partner with other organizations (e.g. other federal, state, and local agencies, the Red Cross, other volunteer groups, etc.) to implement public education programs that focus on hazard mitigation. This project will help provide the following items: <ul style="list-style-type: none"> Reach out to public schools to provide information on emergency preparedness and mitigation activities. Provide mitigation workshops to community groups, emphasizing family preparations for disasters and hazards. 			
Description of the Problem: Established emergency response agencies in the County have very limited staff and cannot take advantage of all of the opportunities there are for decreasing the risk of damage from hazards.			
Priority	Lead Agency	Timeline	Funding Sources
High	BCEM	Annual – On-going	U, A, C

Multi-Jurisdictional Multi-Hazard MAI No 2			
Mitigation Project Summary: Implement CodeRED system that evaluates and streamlines the current process for giving out information to the public in a hazard event. Changes will be made as necessary to the process to ensure that correct and factual information reaches the public in a timely fashion. Consideration will be given to the differing information needs of the general public, media, businesses associated with tourism and travel, and other groups with special need or interests.			
Description of the Problem: Delays in providing information to the general public while obtaining official permission can make the information less useful than it might have been otherwise.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	BCEM	Implemented	D, U

Wildfire

Multi-Jurisdictional Wildfire MAI No. 1			
Mitigation Project Summary: Develop and implement a wildfire prevention education program. Educate the general public, especially targeting children, fire equipment users, builders and developers, and homeowners. Create a funded position to coordinate this program who focuses on public contact, both with individuals and groups.			
Description of the Problem: Property developers and owners in the interface are often not aware of the problems and risks they face. Many homeowners have done very little to manage or offset fire hazards on their property.			
Priority	Lead Agency	Timeline	Funding Sources
High	BCEM & combined Fire Districts/Departments	2020/ On-going	U, A, C

Multi-Jurisdictional Wildfire MAI No. 2			
Mitigation Project Summary: Work with WSU Extension, Master Gardner’s and other existing programs to offer Firewise Landscaping clinics to assist property owners in maintain fire-resistant defensible space around their property.			
Description of the Problem: Many homeowners have done very little to manage or offset fire hazards on their property.			
Priority	Lead Agency	Timeline	Funding Sources
Low	BCEM & combined Fire Districts/Departments	2020/ On-going	C, H, I, U

Windstorm

Multi-Jurisdictional Windstorm MAI No. 1			
Mitigation Project Summary: Evaluate the development and implementation of a public education program (in coordination with the Benton Clean Air Agency) to educate the community (in particular those typically involved in ground clearing, e.g. builders, developers, and farmers) on the need to maintain groundcover and not leave soil exposed to wind.			
Description of the Problem: Bare soil is eroded by the wind and contributes to blowing dust. The blowing dust exacerbates the impacts of windstorms.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Benton County Planning/Building Department and Benton County Clear Air Agency	2019/On-Going	U

Mitigation Action Items: Benton City

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Multi-Hazard

Benton City Multi Hazard MAI No. 1			
Mitigation Project Summary: Develop evacuation plans for all-natural hazard scenarios.			
Description of the Problem: As a part of a continued effort to prepare the residents of Benton City for natural hazard scenarios, evacuation plans need to be developed for the various natural hazards that are addressed below.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2 years	U
Goals Addressed: 3			

Benton City Multi-Hazard MAI No. 2			
Mitigation Project Summary: Determine a means of supplying backup power to well number 5 and sewer lift stations during the event of a power-outage. See <i>Benton City Sewer Drainage Basin Map</i> at the end of this section for more information.			
Description of the Problem:			
<p>Water: The city currently does not have any backup power for any of the wells. If the city was to lose power for more than 24 hours, it would impact our ability to service water. We currently have 4 operating wells. Considering how the system is currently set up we would only need a generator at well #5. This would allow the upper reservoir to furnish water to the whole town.</p> <p>Sewer: Our sewer lift stations have no back-up power. The city currently has 7 operating lift stations around town. In the case of a power outage lift station #1 is at WWTP with backup power already, #2 would last about 4hrs, # 3 about 8hours, #4 about 30 minutes, #5 about 2 hours, #6 about 5 hours, #7 about 4 hours currently. These numbers are based on peak flow times. We need some sort of backup power for the lift stations as the water will last 24 hours and the lift stations will not.</p> <p>Water and sewer go hand in hand. If we can supply water but cannot supply power to take care of the sewer then the system is not meeting the needs of the community.</p>			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2-5 years	A, U, C
Goals Addressed: 3			

Earthquake

Benton City Earthquake MAI No. 1			
Mitigation Action Summary: Assess structural integrity of major structures in Benton City as they relate to earthquake hazards and make any structural improvements necessary.			
Problem Description: Schools, fire stations, the post office, and city hall are larger buildings that should be assessed along with the bridge that spans the Yakima River.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2023	U, A, C, D
Goals Addressed: 1, 3, 4, 5			

Flood

Benton City Flood MAI No. 1			
Mitigation Project Summary: Perform GIS mapping/modeling of Benton city to show flooding at different flood stages as part of a public education and awareness effort.			
Description of the Problem: Yakima River flooding continues to be a public safety concern that can only be addressed through outreach and education.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2020	U, J
Goals Addressed: 3			

Benton City Flood MAI No. 2			
Mitigation Project Summary: Draft an action plan that outlines city responsibilities and involvement during a flood event.			
Description of the Problem: City preparedness for flood events is an on-going process that requires planning and organizational diligence.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2020	U
Goals Addressed: 3			

Benton City Flood MAI No. 3			
Mitigation Project Summary: Determine a way to close off sewer main lines to prevent river water from entering the city sewer system in the event of a flood. See <i>Benton City Sewer Drainage Basin Map</i> at the end of this section for more information.			
Description of the Problem: Should flood waters rise high enough, river water will enter the city sewer system and be pumped by the lift stations. Lift stations #5 should have two additional shut-off valves and lift station #6 should have three additional shut-off valves.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2021	U, J, A
Goals Addressed: 3			

Benton City Flood MAI No. 4			
Mitigation Project Summary: Increase the capacity of the storm water drain system and/or construct storm water retention ponds in problematic areas.			
Description of the Problem: Severe weather events pose a flash flood risk as the storm water drain system can become inundated during heavy rainfall. Portions of the system have become overloaded on several occasions due to heavy storms.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2021	H, M, B
Goals Addressed: 3			

Landslide

Benton City Landslide MAI No. 1			
Mitigation Action Summary: Assess slope stability of McBee grade along the slopes of the Horse Heaven Hills.			
Problem Description: Situated at the toe slope of the Horse Heaven Hills, Benton City could be affected by a landslide event; particularly structures along the southernmost edge of Benton City and those near McBee Grade.			
Priority	Lead Agency	Timeline	Funding Sources
Low	Public Works	2021-2024	H, L
Goals Addressed: 1, 3, 4, 5			

Wildfire

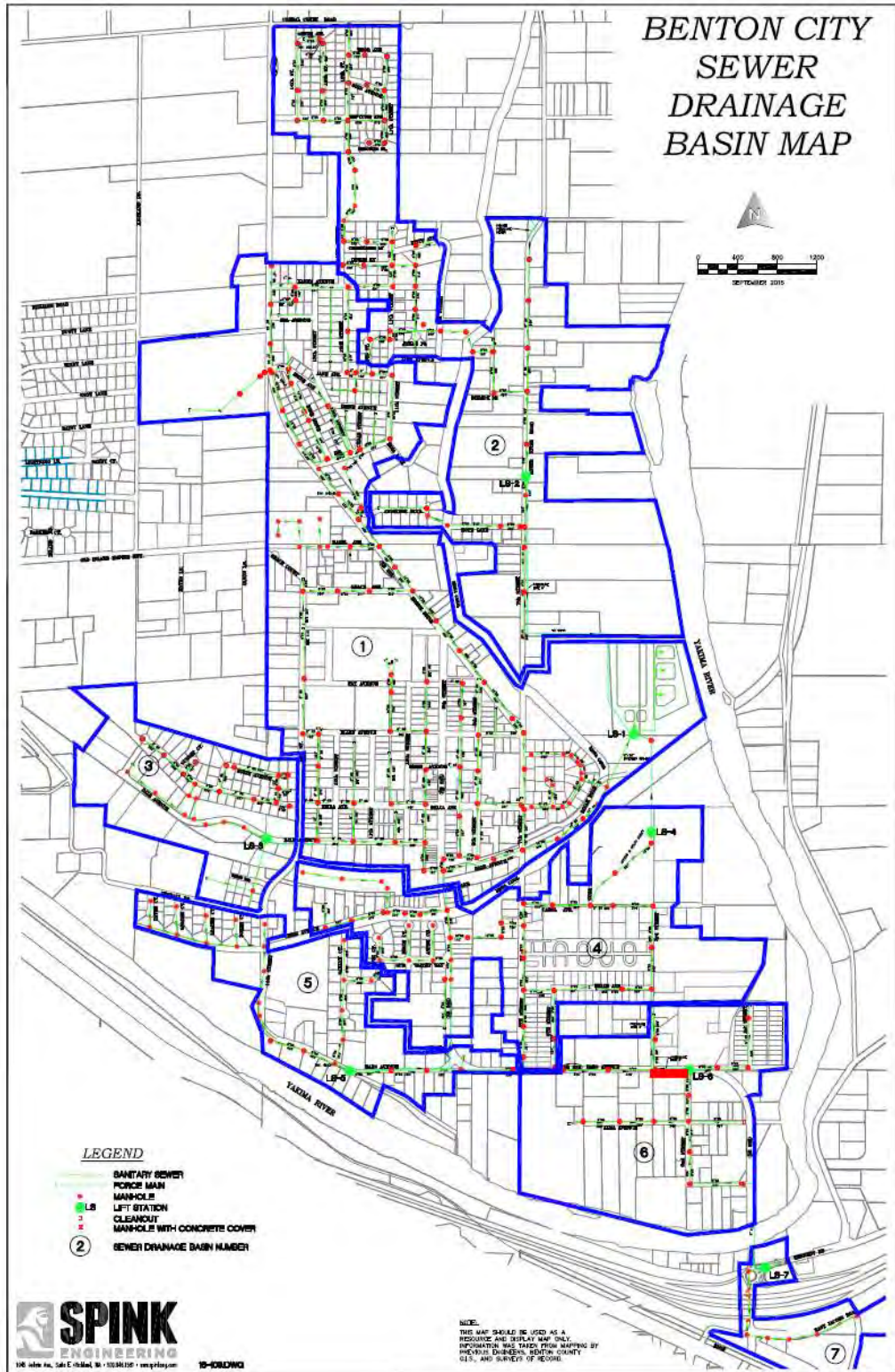
Benton City Wildfire MAI No. 1			
Mitigation Action Summary: Continue to promote wildfire awareness in the community through public education and outreach efforts.			
Problem Description: City preparedness for wildfire events is an on-going process that requires planning and organizational diligence.			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire District #2	Annually	U, L
Goals Addressed: 1, 2, 3, 4			

Benton City Wildfire MAI No. 2			
Mitigation Action Summary: Work with Benton County to control weeds, brush, and debris and develop firebreaks within the county, particularly in areas bordering on higher density land uses and/or municipal boundaries.			
Problem Description: Accumulation of weeds, brush, and debris pose a wildfire hazard.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	City Administrator	Annually	U, L
Goals Addressed: 1, 2, 3, 4			

Windstorm

Benton City Windstorm MAI No. 1			
Mitigation Action Summary: Work with Benton PUD and Benton REA to replace aboveground power lines with underground power lines.			
Problem Description: Severe windstorms can directly and indirectly damage aboveground power lines, causing power outages and disruption of services and businesses.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2021-2025	K, O, C, A
Goals Addressed: 1, 3, 4, 5			





2019 Revision

Mitigation Action Items: City of Kennewick

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Flood

Kennewick Flood MAI No. 1			
Mitigation Summary: Work with the U.S. Army Corps of Engineers, Walla Walla District, to provide erosion protection to the riverbank along the Columbia Park Trailway.			
Problem Description: The riverbank and Columbia Park Trail are subject to erosion and undermining during flood flows. The Walla Walla District maintains authority over the riverbank. Any project involving placement of riprap or other material along the riverbank will require USACE approval and permitting.			
Priority	Lead Agency	Timeline	Funding Sources
High	Kennewick Parks and Recreation	2021	H, B, A, C
Goals Addressed: 1, 4, 5			

Wildfire

Kennewick Wildfire MAI No. 1			
Mitigation Action Summary: Develop wildfire mitigation actions for the urban interface in concert with Benton County rural fire districts. Actions may include: public education in the most vulnerable areas, review and updating of codes and ordinances, fuel mitigation (e.g. thinning especially in the canyons), and evaluation of using physical barriers (similar to snow fences) to prevent tumbleweeds from accumulating along urban interface residential fences. The following items are in Chapter 6 of the Benton County CWPP (see Appendix E for more information)			
<ul style="list-style-type: none"> • Distribute Firewise-type educational brochures with occupancy permit (CWPP MAI 6.1a). • Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific “Response Plans” to include participation by all affected jurisdictions and landowners (CWPP MAI 6.2c). • Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified (CWPP MAI 6.2i, Benton Conservation District). • Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space (CWPP MAI 6.2j). • Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible (CWPP MAI 6.4b) 			
Problem Description: Wildfires burning northward toward Kennewick from the Horse Heaven Hills are difficult to access due to the steep terrain. Access is typically available to individual houses, but not into the hills and canyons around the houses. Weed and brush control on undeveloped lands outside the City’s boundaries is lacking.			
Priority	Lead Agency	Timeline	Funding Sources
High	Kennewick Fire Department	2019-2020	U, L,
Goals Addressed: 1, 2, 3			

Windstorm

City of Kennewick Windstorm MAI No. 1			
Mitigation Action Summary: Develop a public education, recovery, and debris management approach for dealing with windstorm impacts on a City-wide basis. Provide residents with information on tree management to help preserve and maintain their trees in a way that reduces the potential for windstorm damage.			
Problem Description: Severe windstorms can directly damage trees on both public and private property, and create secondary effects such as loss of power, damage to property, blocked roadways, etc.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Kennewick Municipal Services	2020	H, I, A, U
Goals Addressed: 2, 6			

Mitigation Action Items: City of Prosser

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Multi-Hazard

Prosser Multi-Hazard MAI No. 1			
Mitigation Action Summary: Develop an Emergency Operations Plan for the City of Prosser. In addition to the basic hazard and emergency response items to be addressed, the plan should address mitigation, preparation, and response activities for the following community concerns:			
<ul style="list-style-type: none"> • A large-scale ammonia release. • Railroad accident involving hazardous materials. • Hazardous materials incident (at plant or during transport by truck). • Event at the East Prosser Industrial Park. • Chlorine gas incident at WWTP. • Urban fire in downtown Prosser. 			
Description of Problem: Prosser lacks a city-specific emergency operations plan.			
Priority	Lead Agency	Timeline	Funding Sources
High	City Administrator	COMPLETED	

Prosser Multi-Hazard MAI No. 2			
Mitigation Action Summary: Develop alternate sources of power for the City to include (a) ensuring that all critical facilities have sufficient emergency power generators to maintain operations during the emergency; and (b) identify an alternate source of primary power transmission to shorten the recovery period.			
Problem Description: The City is served by a single main power transmission line. Failure of the line would cut off power to the City for however long it took to repair the line. Emergency generators are available for the City's critical facilities with the exception of the Housel Middle School (the emergency shelter and incident command post). Also, there is insufficient emergency power capability to fully maintain water supply and treatment, including waste treatment.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2022	A, C, D,

Prosser Multi-Hazard MAI No. 3			
Mitigation Action Summary: Procure traffic directional signage and barricades sufficient to direct traffic into Housel Middle School when shelter is required, and to direct Prosser residents out of town if evacuation is required.			
Problem Description: Although the city has designated Housel Middle School as an emergency shelter, they lack portable traffic signs and barricades to direct traffic during an evacuation scenario.			
Priority	Lead Agency	Timeline	Funding Sources
High	Police Department	2021	K, U, D, C

Prosser Multi-Hazard MAI No. 4			
Mitigation Action Summary: Acquire portable radios so that in the event of an emergency multiple departments can communicate with Public Works crews.			
Problem Description: Currently the Prosser Public Works Department has no radio system. In the event of an emergency communication is dependent on cellular service. A portable to portable system is less likely to be impacted by an emergency such as a power outage or other event.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Police Department	Short term	U, D, A, C

Flood

Prosser Flood MAI No. 1			
Mitigation Project Summary: Address high vulnerability of wastewater lines to flooding by (1) re-directing wastewater flow from the City north of the river directly to the WWTP, eliminating the need for the flow crossing the river twice; and (2) re-engineer the lines connecting the south side of the City with the plant to provide adequate flood protection, perhaps by raising them above the river (using nearby road bridges).			
Description of the Problem: Wastewater is collected from the City north of the Yakima River, pumped across the river to the south side of the City, and then sent back across the river in two buried lines to the City's treatment plant. All wastewater entering the plant does so through these two lines crossing the bottom of the Yakima River. The wastewater lines crossing the river are highly vulnerable to flood damage. The wastewater treatment plant is a critical facility for the City.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2024	H, B, M, O, A, C
Goals Addressed: 5			

Prosser Flood MAI No. 2			
Mitigation Project Summary: Provide structural flood mitigation/protection measures to the wastewater treatment plant pump house and drying beds.			
Description of the Problem: At the wastewater treatment plant, the area around the drying beds, including the pump house at the plant, is subject to flooding during the 100-year flood event. The pump house and the drying beds are considered moderately vulnerable to flood damage.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2024	C, A, B, U
Goals Addressed: 5			

Prosser Flood MAI No. 3			
Mitigation Project Summary: Redevelop downtown storm drains to accommodate current levels of storm water run-off and redesign drains to prevent debris blockage.			
Description of the Problem: Currently the Downtown floods due to a combination of poorly designs drains and undersized drain capacity. As Prosser has grown, and impervious surfaces increased, the amount of water carried to the downtown during nearly every significant storm has resulted in flooding of businesses in the Downtown.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2023	H, A, C, B
Goals Addressed: 5			

Windstorm

Prosser Windstorm MAI No. 1			
Mitigation Action Summary: Fully develop the Tree Management Program to allow for continual maintenance of the city-owned trees, including evaluation of potential hazards and immediate response to identified hazards.			
Problem Description: The City owns approximately 961 large old trees within parks, rights-of-way, etc. Periodic grants from the state have allowed development of a Tree Management Program to inventory trees and identify immediate hazards. However, funding has not been sufficient for the City to adequately maintain the tree hazard elimination aspects of the program. Severe windstorms can directly damage trees, and create secondary effects such as loss of power, damage to property, blocked roadways, etc.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2020	H, L, U, C

Prosser Windstorm MAI No. 2			
Mitigation Action Summary: Expand the Tree Management Program to include a public education and/or assistance component, providing residents with information on tree management, and possibly some form of assistance to preserve and maintain their trees in a way that mitigates against hazard damage.			
Problem Description: The current Tree Management Program does not provide for public education for addressing tree issues on private property. Severe windstorms can directly damage trees, and create secondary effects such as loss of power, damage to property, blocked roadways, etc.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2019-2021	U, H, L, U, C

Other Hazards

Prosser Other Hazard MAI No. 4			
Mitigation Action Summary: Identify and evaluate mitigation measures for urban fire hazards in Prosser, including public communication and education efforts.			
Problem Description: Urban fire is a serious concern for downtown Prosser. The older sections of downtown are turn-of-the-century unsupported brick buildings, lacking firewalls and sprinklers, and often with open or connected basements. A fire in the downtown area would be difficult to stop until it burned the entire connected block.			
Priority	Lead Agency	Timeline	Funding Sources
High	WBFR	2021	U, other Fire Prevention Grants



Mitigation Action Items: City of Richland

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Multi-Hazard

Richland Multi-Hazard MAI No. 1			
Mitigation Action Summary: Develop partnerships to deliver public education and training for hazard mitigation.			
Proposed Solution: This is consistent with the department's objective for the prevention of fire, injury, accident, and illness.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Fire	2019	U

Richland Multi-Hazard MAI No. 2			
Mitigation Action Summary: Streamline the process for providing information to the public pre, during, and post incident.			
Proposed Solution: The Department's Public Information Officer is already active with other high-profile organizations that closely interact with prevention programs. He is also experienced with multi-agency response and unified command through participation with Interagency Incident Management Teams on incidents.			
Priority	Lead Agency	Timeline	Funding Sources
High	COR Fire, Police and Marketing and BCEM	On-going	U

Richland Multi-Hazard MAI No. 3			
Mitigation Action Summary: Evaluate the equipment that will be required by emergency response personnel to ensure that personnel are self-contained			
Problem Description: The Fire Department will have to further refine plans to ensure self-sufficiency for at least a 72-hour period of active duty. A second concern is to ensure that firefighter's families are prepared so that firefighters can leave them and respond to the emergency.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Fire	2019	U

Richland Multi-Hazard MAI No. 4			
Mitigation Action Summary: Continue to evaluate data and conduct studies to provide for more in-depth and accurate evaluation of potential disaster impacts.			
Problem Description: While the emergency response components are generally well developed and exercised through preparation for technological disasters in the area, other elements such as education, enforcement, economic incentives, and engineering for specific natural threats require more thorough evaluation.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Fire, BCEM	2020	U

Richland Multi-Hazard MAI No. 5			
Mitigation Action Summary: Evaluate evacuation routes through and from the City.			
Problem Description: Topographical restrictions produce significant bottlenecks on the main arterial roads between south and central Richland. The Fire Department will have to develop a comprehensive route plan to address this issue.			
Priority	Lead Agency	Timeline	Funding Sources
Low	Fire, Public works	2023	U, K

Richland Multi-Hazard MAI No. 6			
Mitigation Action Summary: A system wide evaluation of the water system to identify specific issues that could occur during a hazard event.			
Problem Description: The department is totally reliant on the reticulated water supply for fire operations. Mutual aid tenders and static supply alternatives will be identified in the event of a water system failure.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Fire, Public Works	2023	U, A, C, O

Richland Multi-Hazard MAI No. 7			
Mitigation Action Summary: Evaluate critical infrastructure for self-sustainability in the event of catastrophe.			
Problem Description: Water, sewer, electricity, health care, and emergency facilities must be evaluated to confirm that they are capable of withstanding a 7.0 or greater earthquake with redundancies which will provide for self-sustainability over a period of at least 72 hours.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Public Works	2022	U, A, C

Richland Multi-Hazard MAI No. 8			
Mitigation Action Summary: Wide spread information delivery capabilities are important to ensuring calm and effective delivery of services during an emergency.			
Problem Description: City of Richland must have a system in place which will allow dissemination of information throughout the city regardless of damage to traditional communication channels.			
Priority	Lead Agency	Timeline	Funding Sources
Low	Communications and Marketing	2024	U, A, C

Richland Multi-Hazard MAI No. 9			
Mitigation Action Summary: City of Richland must have a complete critical infrastructure and key resources (CIKR) inventory with the ability to provide community triage both city wide and in zones depending on the size, type, and severity of an incident.			
Proposed Solution: The CIKR must integrate with mobile data terminals and dispatching centers to allow rapid and calculated initiation of triage for CIKR in the city. All CIKR stakeholders within the city must be aware of the triage system and reasons for triaging prior to an incident.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Community Development, Fire, BCES, Public Works	2023	U, A, C,

Earthquake

Richland Earthquake MAI No. 1			
Mitigation Action Summary: Develop more stringent seismic rating system for buildings and other major structures.			
Problem Description: New development and developmental-expansion onto steeper, less stable terrain has increased Richland's vulnerability to earthquake events.			
Priority	Lead Agency	Timeline	Funding Sources
Low	Community Development	2025	U, N, A, C

Flood

Richland Flood MAI No. 1			
Mitigation Action Summary: Develop a flood mitigation plan that focuses on, but is not limited to, prevention projects such as an assessment of the dyke system, identification of at-risk structures, and assessment of wastewater transportation and treatment capabilities.			
Problem Description: With the Columbia and Yakima Rivers converging in side city limits, the potential for a flood event is high. A flood could inundate structures in flood zones and overwhelm infrastructure such as wastewater transportation and treatment facilities.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	Community Development, BCEM, public works,	2024	U, C, B, A

Wildfire

Richland Wildfire MAI No. 1			
<p>Mitigation Action Summary: Develop a program to foster communication and coordination of wildfire prevention measures between wildland/urban interface property owners, developers, and city agencies. The following items are in Chapter 6 of the Benton County CWPP (see appendix E for more information):</p> <ul style="list-style-type: none"> • Implementation of youth and adult wildfire educational programs (CWPP MAI 6.2a). • Distribute educational information regarding construction in high risk wildfire areas (CWPP MAI 6.2b). • Work with area homeowner’s associations to foster cooperative approach to fire protection and awareness and identify mitigation needs (CWPP MAI 6.2d). • Work with WSU Extension, Master Gardeners, and other existing programs to offer firewise landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures (CWPP MAI 6.2e) • Develop a range of public education programs to encourage healthy management of natural resources on private property (CWPP MAI 6.2f). • Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space (CWPP MAI 6.2j). • Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible (CWPP MAI 6.4b). 			
<p>Proposed Solutions:</p> <ul style="list-style-type: none"> • Encourage single-family residences to have fire plans and practice evacuation routes. • Encourage fire inspections in residential homes by fire departments to increase awareness among homeowners and potential fire responders. • Encourage a standard for the State Fire Marshall to evaluate fire plans and emergency plans. • Encourage landowners and/or developers who choose to build in the wildland/urban interface to identify and mitigate conditions that aggravate wildland/urban interface wildfire hazards. • Encourage property owners to retrofit existing structures to remove/replace shake roofs. 			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire	2020	U, L, A, C,

Richland Wildfire MAI No. 2			
<p>Mitigation Action Summary: Develop a detailed WUI and Wildfire Hazard Assessment for the City of Richland. The following items are in Chapter 6 of the Benton County CWPP (see appendix E for more information):</p> <ul style="list-style-type: none"> • Review State Building Codes and recommend revisions to meet Firewise standards as needed (CWPP MAI 6.2g). • Enhance radio availability in each district, link to existing dispatch, improve range within the region, and convert to a consistent standard of radio types (CWPP MAI 6.4a). 			
<p>Proposed Solution:</p> <ul style="list-style-type: none"> • Identify areas where existing vegetation creates a wildfire hazard. • Identify locations with limited access for emergency equipment due to width and grade of road. • Identify location with inadequate water supplies. 			

<ul style="list-style-type: none"> • Evaluate areas with inadequate fuel breaks, or lack of defensible space. • Evaluate the use of highly flammable construction materials. • Identify building lots and subdivisions that are not in compliance with state and local land use and fire protection regulations. 			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire	2021	U, M

Richland Wildfire MAI No. 3			
<p>Mitigation Action Summary: Develop and implement a plan to reduce wildfire potential in the Yakima River delta and Amon Creek drainage. The following item is in Chapter 6 of the Benton County CWPP (see appendix E for more information):</p> <ul style="list-style-type: none"> • Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified (CWPP MAI 6.2i, Richland). 			
<p>Proposed Solution:</p> <ul style="list-style-type: none"> • Employ mechanical thinning to abate the risk of catastrophic fire and restore the more natural regime of higher frequency, low-intensity burns. Mechanical thinning can provide benefits to ecosystems by thinning hazardous vegetation and restoring ecological diversity to areas homogenized by invasive plants. • Clear trimmings, trees, brush, and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk. 			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire	2021	U, H, L, M,

Richland Wildfire MAI No. 4			
<p>Mitigation Action Summary: Conduct fuels mitigation projects and implement community fire protection standards.</p>			
<p>Proposed Solution:</p> <ul style="list-style-type: none"> • Enter into contracts with US Army Corps of Engineers, BLM, and DNR, which provide for fuel mitigation in critical locations within the City of Richland. Critical locations include Yakima River delta, Amon Creek Drainage, Bateman Island, Columbia Point, and federally controlled lands located in south Richland. Contracts must identify and provide for pre-incident fuel mitigation cost allocations. Financial responsibilities must also be identified for combat and rehabilitation of these wildlands in the event of a catastrophic event. • Identify and employ hazard mitigation programs within the above-mentioned critical locations. Hazard mitigation will include mechanical thinning, creation of firebreaks, and improvement/annual maintenance of access and egress points in the identified areas to ensure access for responders as well as safe egress for users in the event of fire. • Develop and implement a program using existing Fire-Wise criteria and materials to ensure that current residents as well as developers in urban interface zones have the knowledge and tools needed to reduce the potential for loss of life and property in the event of wildfire. Current hazard zones are identified in the City of Richland Community Wildfire Protection Plan. 			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire	2021	U, M C

Richland Wildfire MAI No. 5			
Mitigation Action Summary: Develop and implement a plan to reduce wildfire potential in the wild land-urban interface.			
<ul style="list-style-type: none"> • Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific “Response Plans” to include participation by all affected jurisdictions and landowners (CWPP MAI 6.2c). 			
Proposed Solution:			
<ul style="list-style-type: none"> • Badger Mountain is characterized by light fuels with very little potential for effective fuel mitigation. This area is a hazard due to its recreational attraction and will require awareness education for visitors to improve fire safety. • BLM owns a large piece of contiguous property inside the City of Richland, between Keene Rd. and Heritage Hills, which is comprised primarily of grasses and sagebrush. This area is being quickly surrounded by housing developments. As a result, the area is seeing increased human activity and further potential for problems. Ongoing education of homeowners in the area will reduce property losses in the event of a fire in this area. 			
Priority	Lead Agency	Timeline	Funding Sources
High	Fire	2020	L, U, C A

Windstorm

Richland Windstorm MAI No. 1			
Mitigation Action Summary: Pruning and removal of hazard trees will reduce the potential for injury to people and damage to property during a windstorm event.			
Problem Description: Hazard trees are not only capable of interrupting critical infrastructure through power line disruption but are a hazard to homes and lives during a significant wind event. With increasing budgetary constraints, funding for hazard abatement personnel and equipment needs to be a high priority. A fully funded dual-role hazard abatement team with equipment would be capable of performing hazard mitigation prior to wind events as well as fuel mitigation projects identified above in the Wildfire section.			
Priority	Lead Agency	Timeline	Funding Sources
High	Public Works	2020	U, H,

Mitigation Action Items: City of West Richland

The pages that follow document the specific hazard mitigation action items that this entity has elected to implement.

Multi-Hazard

West Richland Multi-Hazard MAI No. 1			
Mitigation Action Summary: Develop alternate routes of access into and out of the City, including constructing a new bridge over the Yakima River connecting the City to SR 240, completing the Keene Road extension and other projects as detailed in the City's Six-Year Transportation Improvement Program. In addition, the City will work with State and Federal highway agencies to develop a new access to I-82 west of Candy Mountain.			
Problem Description: The City's access routes are insufficient in the event of large-scale evacuation (whether into or out of the City). Some suggested transportation projects, such as a new connection to I-82, require action by State and Federal agencies.			
Priority	Lead Agency	Timeline	Funding Sources
High	West Richland Public Works	Long (> 5 yrs)	K, N, O

West Richland Multi-Hazard MAI No. 2			
Mitigation Action Summary: Develop an Emergency Operations Plan for the City of West Richland. In addition to the basic hazard and emergency response items to be addressed, the plan should address various evacuation scenarios.			
Description of Problem; West Richland does not have a city-specific emergency operations plan. The City relies on the general Benton County Comprehensive Emergency Management Plan developed by BCEM. The general County Plan, however, lacks community-specific detail on various potential hazards and situations of concern to the City and local residents.			
Priority	Lead Agency	Timeline	Funding Sources
High	West Richland Public Works	Short (0 - 2 yrs)	U

West Richland Multi-Hazard MAI No. 3			
Mitigation Action Summary: Develop alternate sources of power for the City to ensure that all critical facilities have sufficient emergency power generators to maintain operations during the emergency.			
Problem Description: The City has insufficient emergency power capability to fully maintain water supply and treatment, including waste treatment services in the event of a sustained power outage.			
Priority	Lead Agency	Timeline	Funding Sources
High	West Richland Public Works	Short (0 - 2 yrs)	A, D, C, U

Flood Hazard

West Richland Flood MAI No. 1			
Mitigation Project Summary: Redesign and engineer the WWTP to ensure protection against future flooding, including: placing the influent line underground; installing a pumped outflow to the river with a backflow prevention device; and acquiring backup generators for the entire system (including sewer lift stations). The City anticipates building a new expansion plant of similar capacity adjacent to the existing facility in five years to accommodate increasing growth. Ideally, protection of the existing WWTP should occur prior to or in sync with the new construction.			
Description of the Problem: The wastewater treatment plant has experienced flood damage during significant flood events. During the flood of February 1996, floodwaters damaged the aboveground influent pipe to the plant, and damaged the power supply. The gravity flow effluent system failed, and effluent backed up within the berm around the plant.			
Priority	Lead Agency	Timeline	Funding Sources
High	West Richland Public Works	Long	U, A, J, C

Wildfire

West Richland Wildfire MAI No. 1			
Mitigation Action Summary: Develop a detailed Wildland Urban Interface and Wildfire Hazard Assessment through a cooperative agreement between the City and Benton County Fire Protection District No. 4.			
Problem Description: As new homes are built on the edge of the open area surrounding the City, there is an increasing amount of potential for property damage.			
Priority	Lead Agency	Timeline	Funding Sources
Medium	West Richland Code Enforcement/Benton County Fire District No. 4	Short (< 5 yrs)	U,L

Windstorm

West Richland Windstorm MAI No.1			
Mitigation Action Summary: Develop and implement programs to keep trees from threatening lives, property and public infrastructure during windstorm events.			
Problem Description: A number of power lines are surrounded by trees throughout the City. Damage to any of these trees could mean the loss of a power line causing an outage in a significant portion of the City.			
Priority	Lead Agency	Timeline	Funding Sources
High	West Richland Public Works	Short (< 1-2 yrs)	U, H, L, C, A

Appendix A: Forms

The various forms in Appendix A are designed to assist the planning committee in maintaining the Hazard Mitigation Plan. These forms can be used to document mitigation projects as they are completed and assist in annual plan updates.

Mitigation Action Implementation Worksheet

Complete a mitigation action implementation worksheet for each identified mitigation action.

Jurisdiction:	
Mitigation Action/Project Title:	
Background/Issue:	
Ideas for Integration:	
Responsible Agency:	
Partners:	
Potential Funding:	
Cost Estimate:	
Benefits: (Losses Avoided)	
Timeline:	
Priority:	
Worksheet Completed by:	(Name/Department)



Mitigation Action Progress Report Form

Progress Report Period	From date:	To date:
Action/Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	<input type="checkbox"/> Project completed <input type="checkbox"/> Project canceled <input type="checkbox"/> Project on schedule Anticipated completion date: _____ <input type="checkbox"/> Project delayed Explain _____	

Summary of Project Progress for this Report Period

1. What was accomplished for this project during this reporting period?

2. What obstacles, problems, or delays did the project encounter?

3. If uncompleted, is the project still relevant? Should the project be changed or revised?

4. Other comments



Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision-maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	



Plan Section	Considerations	Explanation
	Are there repetitive losses and/or severe repetitive losses to document?	
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	



Appendix B: Capabilities Assessment

Hazard mitigation capabilities include existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

Benton County Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes, 2018	The current Benton County Comprehensive Plan has a chapter dedicated to natural resources which covers flood hazards and geologic hazards as mandated by State law. While the plan does not specifically outline mitigation strategies, it does reference development regulations. Benton County recently completed updating its Comprehensive Plan which has goals and policies related to wildland fire hazards.
Capital Improvements Plan	Yes, 2018	The Capital Improvement plan does not specifically address hazard mitigation. However, projects that might address hazard mitigation would be added to the CIP in order to be funded.
Economic Development Plan	Yes, 2014	No. The Economic Development Plan is a high-level strategic document that deals with broad economic development goals and objectives, lists possible large-scale projects, and identifies possible strategic partnerships.
Local Emergency Operations Plan	Unknown	Refer to Benton County Emergency Services
Continuity of Operations Plan	Unknown	Refer to Benton County Emergency Services
Transportation Plan	Yes, 2018	The transportation plan does not address natural hazards but does include projects that are intended to improve roadway safety. The transportation plan would not be an appropriate place to implement mitigation actions.
Stormwater Management Plan	No	
Community Wildfire Protection Plan	Yes 2019	Refer to Benton County CWPP – revised 2019
Other special plans (i.e., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	BCC 3.04; revised 3/2016. Building codes are enforced by either the building inspectors (3 FT inspectors) or with the assistance of the Code Enforcement Officer
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	Score:
Fire department ISO rating	No	Rating:
Site plan review requirements	Yes	All site plans are reviewed by the building and planning departments for compliance with both departments codes, including compliance with any critical area (flood/geologic hazard) requirements.
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	The zoning ordinance is effective to the degree that it discourages development or redevelopment within natural hazard areas by requiring compliance with its regulations. Yes, this ordinance is adequately administered and enforced by the Planning Department and additionally enforced by the Code Enforcement Officer.
Subdivision ordinance	Yes	Yes, the ordinance is effective, please see some of the following requirements: All subdivision applications undergo a critical area review and must have adequate means of ingress and egress. Applications are forwarded on to the following agencies for their review and requirements; Fire Marshal and Fire Districts; at which time they can address proposed access issues if necessary. All subdivisions must meet applicable emergency vehicle standards. Lot sizes in excess of the minimum standards may be required if hazards are present. A subdivision may be recommended for disapproval if flood conditions occur on the subject parcel. The ordinance is well enforced as no subdivision development can occur without meeting all the regulations set forth in the subdivision ordinance.
Floodplain ordinance	Yes	The Flood Damage Prevention ordinance regulates develop within FEMA flood zones and floodways. This ordinance reduces flood hazard impacts by ensuring all FEMA regulations are met, such as elevating structures 1 foot above the base flood elevation that fall within a 100 yr flood zone. Yes, this ordinance is adequately enforced, as no building permit is issued until it's requirements are met.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Title 15 of the Benton County Code covers Critical Areas and Resources. Pertaining to hazard mitigation, it includes rivers and creeks, frequently flooded areas, and geologically hazardous areas. The ordinance is effective at reducing geologic and flood hazards. The 2018 update to this CAO is complete and will be more effective at reducing hazard impacts.
Flood insurance rate maps	Yes	The use of the FEMA FIRM maps does reduce hazard impacts by ensuring all development within flood zones and floodways are regulated. These maps are used during critical area reviews, administered and enforced.
Acquisition of land for open space and public recreation uses	Yes	The County has had multiple opportunities to acquire property for parks, recreation, and conservation purposes. While this has not been specifically for hazard mitigation, the ordinance would facilitate that.
Other		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	The Planning Commission serves as an advisory board on matters related to physical development of land in the unincorporated area. They often defer to the expertise of Planning Staff on issues such as flood and geologic hazards as well as outside technical expertise if necessary.
Mitigation Planning Committee	No	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	The Public Works Department regularly performs tree trimming along roadways, cleaning of roadside ditches, cleaning of culverts and cleaning of storm drainage facilities. The focus of this effort is roadway operations and safety.
Mutual aid agreements	Yes	Benton County has mutual aid agreements with surrounding jurisdictions for provision of equipment, labor and materials. Coordination is effective.
Staff	Yes/No FT/PT ⁴²	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes, FT	Building staff is adequate to enforce building code regulations with assistance from the Code Enforcement Officer. Staff is not generally trained on hazards and mitigation, however Building staff rely on Planning Department for some hazard regulations.
Floodplain Administrator	Yes, FT	The Benton County Planning Department acts as the local floodplain administrator in coordination with the Building Department.
Emergency Manager	No	Benton County defers all services under this role to Benton County Emergency Services.
Community Planner	Yes, FT	Yes, staff is adequate to enforce regulations with the assistance of the Code Enforcement Officer. All four FT Planners are trained on identifying critical area hazards and implementing the appropriate regulations to help mitigate potential affects. Coordination between agencies and staff is very effective.
Civil Engineer	Yes, FT	Staffing is adequate to enforce regulations which are limited for this position. Staff is trained on hazards and mitigation and can coordinate well with other agencies.
GIS Coordinator	Yes, FT	This position does not enforce regulations. This position creates the data layers for Benton County's GIS maps (including critical areas) and does not do any work on mitigation.
Other	Yes, FT	FT Code Enforcement Officer enforces many of the County's regulations.

⁴² Full-time (FT) or part-time (PT) position

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	No	Responsibility of Benton County Emergency Services.
Hazard data and information	No	
Grant writing	Yes	Grant writing capabilities are on a case-by-case basis, mostly dependent on the rigor and workload needed to complete the task. If a project is important but is beyond the capabilities of staff, professional services are contracted.
Hazard analysis	Yes	Planning Department does a critical area (geologic and flood hazard) review for parcels during the development permit process.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Authority to levy taxes for specific purposes	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Storm water utility fee	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Incur debt through general obligation bonds and/or special tax bonds	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Incur debt through private activities	No	
Community Development Block Grant	Yes	Yes, the County has access to this type of project funding, however historically it has not been used on hazard mitigation.
Other federal funding programs	Yes	Yes, the County has access to this type of project funding, however the sources and types of funding that has been historically utilized is unknown.
State funding programs	Yes	Yes, the County has access to this type of project funding, however the sources and types of funding that has been historically utilized is unknown.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Lower Columbia Basin Audubon, works to conserve and restore ecosystem in the area; Benton Conservation District, works on environmental conservation; Tapteal Greenway is a local environmental group, there is an annual NW Preparedness Expo in Prosser; American Red Cross. Most of the groups listed above may not have the capacity to do mitigation work.
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Benton Conservation District addresses water conservation; Local fire districts address fire safety.
Natural disaster or safety related school programs	No	Not sure, recommend asking the school district superintendents for more information.
StormReady certification	No	Unknown.
Firewise Communities certification	No	Not within our purview, ask Fire Districts?
Public-private partnership initiatives addressing disaster-related issues	No	Not sure.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Kennewick Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes 2017	The Comprehensive Plan sets policies regarding hazards. No. No, but policies can be used to develop code requirements that will implement mitigation actions.
Capital Improvements Plan	Yes 2016	No No The plan is used to identify funding that can be used to implement mitigation actions
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Yes; No; No
Continuity of Operations Plan	Yes 2015/2017	Yes; No; No
Transportation Plan	Yes, 2008	Yes; Yes; Yes
Stormwater Management Plan	Yes, 2007	Yes; Yes; Yes
Community Wildfire Protection Plan	Yes	Yes; Yes; Yes
Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	YES	Version/Year: 2015 INTERNATIONAL BUILDING CODE
Fire department ISO rating	YES	Rating:3 WASHINGTON STATE USES <u>WSRB</u> RATINGS
Site plan review requirements	YES	YES
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	YES	YES – FLOODING; YES
Subdivision ordinance	YES	YES
Floodplain ordinance	YES	YES
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	NO	
Flood insurance rate maps	YES	YES
Acquisition of land for open space and public recreation uses	YES	YES
How can these capabilities be expanded and improved to reduce risk?		



Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	YES	The Planning Commission holds public hearings and provides recommendations to the City Council on rezones, comprehensive plan amendments and changes to development regulations contained in the municipal code. Coordination with the commission has generally been positive and beneficial.
Mitigation Planning Committee	NO	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	YES	Tree trimming on public property as well as maintaining all facets of the City's stormwater system Yes
Mutual aid agreements	YES	Both Fire and Police have entered into mutual aid agreements with their respective counterparts in the region. Yes
Staff	Yes/No (Full/Part Time)	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes FT	Yes; No; Yes
Floodplain Administrator (Planning Dept handles flood permits)	Not certified.	Yes; Somewhat; Yes
Emergency Manager	Yes	Depends on event. For natural disasters the Fire Dept typically takes lead and coordinates public works, police and other necessary agencies. If a large event, a regional team is assembled at the EOC.
Community Planner	Yes (FT)	Yes; Somewhat; Yes
Civil Engineer	Yes (FT)	Yes; Somewhat; Yes
GIS Coordinator	Yes	No; No; Yes
Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services	No	
Hazard data and information	Yes	The city has GIS layers for steep slopes and flood hazard areas
Grant writing	Yes	Public Works have been the main grant writers and recipients of grant funding. Yes, Clearwater Ave. safety assessment and implementation of mitigation measures.
Hazus analysis	No	
How can these capabilities be expanded and improved to reduce risk?		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Yes, Hildebrand Rd/Bob Olson Parkway has been constructed providing emergency vehicle access to the urban interface area in Southridge
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	No Maybe, depending on the project
Impact fees for new development	Yes	The City currently has traffic impact fees and park impact fees. Traffic impact fees have been used for improvements linked to Hildebrand Rd/Bob Olson Parkway that has provided emergency vehicle access to the urban interface. Yes, if traffic related or if there was a parks improvement that would double as hazard mitigation
Storm water utility fee	Yes	These funds have been used for education and pretreatment activities. Yes
Incur debt through general obligation bonds and/or special tax bonds	Yes	Not that I am aware of
Incur debt through private activities	No	CDBG funds have been used in the past for road reconstruction. In those instances, the streets are brought up to current stormwater standards. Yes
Community Development Block Grant	Yes	These are mainly used for road construction or water/sewer projects Yes
Other federal funding programs	Yes	These are mainly used for road construction or water/sewer projects Yes
State funding programs	Yes	This resource could be used in the future to fund mitigation actions as funds become available.
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	There are community groups and churches that promote emergency preparedness and environmental protection, but not sure if they are equipped to implement mitigation measures. Unfortunately, I don't know the names of the organizations, but have heard that they are out there.
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Fire safety education programs are available from the City as well as alarm battery replacement for the elderly and disabled. Water conservation education done in cooperation with neighboring jurisdictions.
Natural disaster or safety related school programs	?	I suspect that the schools still have fire drills other drills and that staff receives training on what to do during a disaster.
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
How can these capabilities be expanded and improved to reduce risk?		



Richland Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	YES	YES
Capital Improvements Plan	YES 2018	NO NO The CIP is used for identifying and prioritizing projects for budget consideration that can be used for mitigation actions.
Economic Development Plan	YES	Addressed in comprehensive plan; mitigation strategies and actions not yet included.
Local Emergency Operations Plan	YES	Coordinated with Benton County through the Benton County Comprehensive Emergency Management Plan.
Continuity of Operations Plan		
Transportation Plan	YES 2005	YES YES YES
Stormwater Management Plan	YES 2016	YES YES YES
Community Wildfire Protection Plan	YES	Coordinated through the Benton County Wildfire Protection Plan.
Other special plans (i.e., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	NO	

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	YES	Version/Year: 2015
Building Code Effectiveness Grading Schedule (BCEGS) Score	YES	Score: 3
Fire department ISO rating	YES	Rating: 3
Site plan review requirements	YES	YES
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	YES	YES YES
Subdivision ordinance	YES	YES YES
Floodplain ordinance	YES	YES YES
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	YES	YES YES
Flood insurance rate maps	YES	YES YES
Acquisition of land for open space and public recreation uses	YES	YES YES
Other		
How can these capabilities be expanded and improved to reduce risk?		



Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	YES	The Planning Commission serves as an advisor to the City Council to promote the physical development of the City, with the purpose of, among other things, secure safety from fire, preservation of clean air, water, and natural qualities of the environment, analyze and flood protection. YES.
Mitigation Planning Committee	NO	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	YES	Public Works, Energy Services and Park & Public Facility implement maintenance programs for their respective utilities/facilities. YES.
Mutual aid agreements	YES	The City of Richland has mutual aid agreements with Kennewick, Pasco, West Richland and Benton County for both fire and police services.
Staff	Yes/No FT/PT ⁴³	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	YES FT	YES NO YES
Floodplain Administrator	YES. Program managed by Planning Dept.	YES NO YES
Emergency Manager	YES	Coordinated through City Fire Department, Police Department and Benton County Emergency Services.
Community Planner	YES FT	YES. NO. TES.
Civil Engineer	YES FT	YES To Some Extent. YES
GIS Coordinator	YES FT	YES To Some Extent YES
Other		

⁴³ Full-time (FT) or part-time (PT) position

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	NO	
Hazard data and information	YES	Floodplain, Steep Slopes and Sensitive Lands are mapped throughout the City.
Grant writing	YES	Public Works is the primary recipient of grant funding to address the needs that may arise from the Transportation Plan. Grant funds to construct the Duportail Bridge will benefit the City and surrounding communities include improved traffic safety, improved emergency response, and improved water supply security.
Hazus analysis	NO	
Other		
How can these capabilities be expanded and improved to reduce risk?		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	YES	YES Construction of Duportail Bridge.
Authority to levy taxes for specific purposes	NO	
Fees for water, sewer, gas, or electric services	YES	Fees for each utility are collected to support the financial obligations of each utility, respectively. POSSIBLY.
Impact fees for new development	YES	The City currently implements a South Richland Traffic Impact Fee to finance transportation improvements in south Richland, and a Park Mitigation Fee for the acquisition or development of open space.
Storm water utility fee	YES	Funds are to be used for system operation/maintenance, regulatory compliance, planning/design/improvements.
Incur debt through general obligation bonds and/or special tax bonds	YES	Unknown.
Incur debt through private activities	NO	
Community Development Block Grant	YES	CDBG funds have been used for infrastructure improvements.
Other federal funding programs	YES	Federal funds have been used for street and utility improvements. YES.
State funding programs	YES	Federal funds have been used for street and utility improvements. YES.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	?	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	YES	Fire, Police, Public Works, Energy Services all implement conservation and safety awareness programs.
Natural disaster or safety related school programs	?	
StormReady certification	?	
Firewise Communities certification	?	
Public-private partnership initiatives addressing disaster-related issues	NO	
Other		
How can these capabilities be expanded and improved to reduce risk?		



Prosser Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes/2018	Complete Review was completed in 2018
Capital Improvements Plan	Yes/2018	CFP was updated spring of 2018
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	Yes	
Stormwater Management Plan	NA	
Community Wildfire Protection Plan	NA	
Other special plans (i.e., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Yes	Housing Incentive Program to include low income density bonuses

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating	NA	Rating: WBRFA is a separate fire authority. Prosser lies within its district boundary
Site plan review requirements	Yes	Chapter 18 and 19 of the Prosser Municipal Code
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Floodplain ordinance	Yes	Shoreline plan
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Several ordinances to include Steep Slope Residential Zoning address
Flood insurance rate maps	Yes	FIRM 530012 0005 C October 31, 1981
Acquisition of land for open space and public recreation uses	Yes	Comprehensive Plan as Subdivision regulations
Other		
How can these capabilities be expanded and improved to reduce risk?		



Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	Coordination is limited to staff and citizens
Mitigation Planning Committee	No	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	Some tree and maintenance programs are enacted through the budget
Mutual aid agreements	Yes	Prosser Police Department
Staff	Yes/No FT/PT⁴⁴	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	Yes 1 FTE	
Civil Engineer	Yes/ Contracted Service with HLA	
GIS Coordinator	Yes	
Other		

⁴⁴ Full-time (FT) or part-time (PT) position



Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	Yes	Contracted service with Sue Jetter Consulting
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		



Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Program is two part- Physical display of water conservation tips at City Hall and reminders sent in water bills.
Natural disaster or safety related school programs	No	
StormReady certification	NA	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		



West Richland Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes / 2017	No " " " "
Capital Improvements Plan	Yes / 2017	No " " " "
Economic Development Plan	Yes / 2017	No " " " "
Local Emergency Operations Plan	N/A to the City.	Yes. Interlocal Agreement for Benton County Emergency Services – Contract number: 145-11
Continuity of Operations Plan	N/A to the City.	Yes. Same as above
Transportation Plan	Yes / Annual update	No " " " "
Stormwater Management Plan	Yes / Annual update	No " " " "
Community Wildfire Protection Plan	N/A to the City.	
Other special plans (i.e., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	



Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	2015 IBC
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	Score:
Fire department ISO rating	Yes	Rating: 5 per WSRB
Site plan review requirements	Yes	A detailed review is performed for every permit.
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	Document is current.
Subdivision ordinance	Yes	Yes, so far as the entire municipal code is applied but not with respect to wildfire. Yes
Floodplain ordinance	Yes	Yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Yes to stormwater & slopes. The city does not regulates for wildfire management.
Flood insurance rate maps	Yes	Yes " "
Acquisition of land for open space and public recreation uses	Yes	The park plan identifies areas of focus for local and regional parks and trails. Hazard impacts are managed via the SMP, Critical Areas Ordinances and other development regulations.
Other	N/A	
How can these capabilities be expanded and improved to reduce risk?		
<p>Wildfire management would be the area I can think of with respect to fire breaks and weed & vegetation management. The Fire District BCFD#4 would be able to address this.</p>		



Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	The 7 member commission effectively applies the municipal code.
Mitigation Planning Committee	No	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	No	
Mutual aid agreements	Yes.	The West Richland P.D. and BCFD#4 have these agreements and coordination is effective.
Staff	Yes/No FT/PT ⁴⁵	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes / FT	Yes Unsure Yes
Floodplain Administrator	Yes / FT as the Director	Yes No Yes
Emergency Manager	Yes, PT Mayor and FT Police Chief	Yes Yes Yes
Community Planner	Yes / FT	Yes " " " "
Civil Engineer	Yes / FT	Yes " " " "
GIS Coordinator	No	
Other		

⁴⁵ Full-time (FT) or part-time (PT) position

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Unsure	WRPD and/or BCFD#4 would know.
Hazard data and information	Unsure	WRPD and/or BCFD#4 would know.
Grant writing	No	
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
This would be best answered after a discussion with WRPD and BCFD#4		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Yes. For infrastructure improvements. None applied for/utlized to my knowledge.
Authority to levy taxes for specific purposes	Yes	Unsure.
Fees for water, sewer, gas, or electric services	Yes	Yes. Accounts for impact to infrastructure systems. No to my knowledge.
Impact fees for new development	Yes	Transportation impact and parks mitigation. No per Washington State law.
Storm water utility fee	Yes	Yes. Outfall elimination projects. Unsure but would assume so.
Incur debt through general obligation bonds and/or special tax bonds	Unsure	
Incur debt through private activities	?	Is this related to impact fees or development agreements?
Community Development Block Grant	No	
Other federal funding programs	See comment to the right column.	The Federal funding the city receives has been applicable to infrastructure projects, not land use development.
State funding programs	See comment to the right column.	The State funding the city receives has been applicable to infrastructure projects, not land use development.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Participation staffing a booth that discusses stormwater and the NPDES requirements at the annual Benton County Fair & Rodeo.
Natural disaster or safety related school programs	No	
StormReady certification	Not to my knowledge.	Inquire with BCFD#4.
Firewise Communities certification	Not to my knowledge.	Inquire with BCFD#4.
Public-private partnership initiatives addressing disaster-related issues	Not to my knowledge.	Inquire with BCFD#4.
Other		
How can these capabilities be expanded and improved to reduce risk?		



Benton City Capabilities Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	YES 2017	NO
Capital Improvements Plan	YES (?)	NO; YES; NO
Economic Development Plan	NO	
Local Emergency Operations Plan	NO	
Continuity of Operations Plan	NO	
Transportation Plan	YES	6 YEAR STREET PLAN
Stormwater Management Plan	NO	
Community Wildfire Protection Plan	NO	BCFPD #2
Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	YES	Version/Year: 2015 INTERNATIONAL BUILDING CODE
Fire department ISO rating	YES	Rating:3 WASHINGTON STATE USES <u>WSRB</u> RATINGS
Site plan review requirements	YES	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	YES	YES – FLOODING; YES
Subdivision ordinance	YES	YES
Floodplain ordinance	YES	YES
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	NO	
Flood insurance rate maps	YES	
Acquisition of land for open space and public recreation uses	YES	
How can these capabilities be expanded and improved to reduce risk?		



Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	YES	YES
Mitigation Planning Committee	NO	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	YES	YES
Mutual aid agreements	YES	YES
Staff	Yes/No (Full/Part Time)	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	CONTRACTED	
Floodplain Administrator	YES, PT	AT THIS TIME. MORE TRAINING WOULD BE HELPFUL.
Emergency Manager	NO	
Community Planner	NO	
Civil Engineer	CONTRACTED	
GIS Coordinator		
Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services	NO	
Hazard data and information	NO	
Grant writing	NO	
Hazus analysis	NO	
How can these capabilities be expanded and improved to reduce risk?		



Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	YES	HISTORY (?): YES
Authority to levy taxes for specific purposes	YES	HISTORY (?): YES
Fees for water, sewer, gas, or electric services	YES WATER SEWER	HISTORY (?): YES
Impact fees for new development	NO	
Storm water utility fee	NO	
Incur debt through general obligation bonds and/or special tax bonds	YES	HISTORY (?): YES
Incur debt through private activities	NO	
Community Development Block Grant	YES	HISTORY (?): YES
Other federal funding programs	YES	HISTORY (?): YES
State funding programs	YES	HISTORY (?): YES
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	NO	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	YES	WATER BILL INSERTS INFO ON WEBSITE YES
Natural disaster or safety related school programs	NO	
Storm Ready certification	NO	
Firewise Communities certification	YES	BCFPD#2
Public-private partnership initiatives addressing disaster-related issues	NO	
How can these capabilities be expanded and improved to reduce risk?		



Appendix C: Documentation of Participation

Documentation of Committee Participation

October 26, 2017 – Committee Meeting Agenda

A G E N D A	Hazard Mitigation Plan & Community Wildfire Protection Plan Meeting Thursday, October 26th, 2017 1:30 p.m. – 3:30 p.m. Location: Benton County Emergency Management 651 Truman Avenue, Richland WA	
1:30 pm	OPEN – Introductions	Benton Count EM
1:45 pm	GROUP MEETING I. Northwest Management Presentation ✓ Planning Process Powerpoint Presentation ✓ Preparing a HMP/CWPP ✓ Question & Answer – Committee Expectations II. Discuss Mission, Vision, and Goals Statement ✓ Present and Review statements III. Resources and Capabilities ✓ Handout form ✓ Equipment List? ✓ Logos IV. Risk Assessments ✓ Assessment Format ✓ Specific Areas of Concern V. Map Products ✓ Review Examples ✓ Data Availability? ✓ Begin Identifying Projects VI. Meeting Schedule ✓ Timeline ✓ Monthly Meeting Dates ✓ Public Meeting Dates	Northwest Management, Inc.
3:20 pm	OPEN DISCUSSION	Group

Contact List:

HPM/CWPP Steering Committee Lead: Benton County Emergency Management

Matthew Blackmarr

509-572-8066

m.blackmarr@bccs.wa.gov

Deanna Davis

509-628-8092

d.davis@bccs.wa.gov

NMI Project Managers: 208-883-4488

Mark Corrao (ext. 129)

meorrao@nmi2.com


Bill Mathews (ext. 128)

mathews@nmi2.com

Tera King (ext. 133)

king@nmi2.com

October 26, 2017 - Committee Meeting Sign-In Sheet



**Benton County Hazard Mitigation Plan
Planning Committee Meeting
10/26/17**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
Patricia Purcell	WVEMD	ppurcell@co.walla-walla.wa.gov
Liz Jesse	WVEMD	ljesse@co.walla-walla.wa.gov
Edward Dunbar	BEPD 4	edunbar@bcpd4.org
Kyle Kurth	Benton City	KKurth@CityofBenton-city.gov
Bill Mathews	Northwest Management	mathews@nm12.com
Scott Clemenson	Richland Fire	sclemenson@ci.richland.wa.gov
Pete Rogalitsky	Richland Public Works	progalitsky@ci.richland.wa.gov
Cary Roe	City of Kennewick	caroe@ci.kennewick.wa.gov
Anthony Mucci	City of Kennewick	anthony.mucci@ci.kennewick.wa.gov
Karen Howard	Port of Benton	khoward@portofbenton.com
Jerrad MacPherson	Benton County	jerrad.macpherson@co.benton.wa.gov
Matt Beckman	BCEM	m.beckman@bcems.wa.gov



**Hazard Mitigation Plan Meeting with
WA-EMD
10/26/17**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
Matt Beckman	BCEM	m.beckman@bcems.wa.gov
Derrick Liebert	WA EMD	derrick.liebert@wa.gov
Bill Mathews	North West Management	mathews@nm12.com
Patricia Purcell	WVEMD	ppurcell@co.walla-walla.wa.gov
Liz Jesse	WVEMD	ljesse@co.walla-walla.wa.gov
Sean Davis	FEEM	sdavis@co.franklin.wa.us
Deanna Davis	BCEM	ddavis@bcems.wa.gov
Ron Dincer	BEPD 2/RFD	

December 12, 2017 –Committee Meeting Agenda

A G E N D A	Hazard Mitigation & Community Wildfire Protection Plan Meeting Tuesday, December 12th, 2017 11:00 p.m. – 1:00 p.m.	
	Location: Benton County Emergency Management 651 Truman Ave, Richland WA	
11:00 am	OPEN – Introductions	Deanna Davis, Matthew <u>Blackmarr</u>
11:15 am	GROUP MEETING <ol style="list-style-type: none"> I. Discuss Agenda, and Non-meeting hours <ul style="list-style-type: none"> ✓ Additional Stakeholders or Committee Members II. Document <ul style="list-style-type: none"> ✓ Proposed Outline ✓ Capabilities Assessments ✓ Review Hazard Profiles (Previous Plan & State) ✓ Status report III. Press Release IV. Risk Assessments <ul style="list-style-type: none"> ✓ Review Countywide Wildfire Risk Assessment ✓ Data Needs ✓ HAZUS Data for Flood Analysis V. Public Meetings <ul style="list-style-type: none"> ✓ Potential Outreach Methods ✓ Dates and Venues ✓ Press Release 	Northwest Management, Inc.
12:30 pm	OPEN DISCUSSION	Group

December 12, 2017 - Committee Meeting Sign-In Sheet



**Benton County Hazard Mitigation Plan
Planning Committee Meeting**

December 12, 2017

Name (Please print)	Company/Agency	E-Mail
Matthew Blackman	BCEM	m.blackman@bces.wa.gov
Deanna Davis	BCEM	ddavis@bces.wa.gov
Bill Mathews	Northwest Management	mathews@nmi2.com
Mark Lorraco	Northwest Management	mlovraco@nmi2.com
Chuck Freeman	Kennecook 2nd Dist	c.freeman@kid.org
Charlie Crank	BLM	cpcrank@blm.gov
Kyle Kurth	Benton City	kkurth@ci.benton-wa.us
Scott Clemenson	Richland Fire	sclemenson@ci.richland.wa.us
Aaron Lambert	City of West Richland	alambert@westrichland.org
SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US
Jerrold MacPherson	Benton County	jerrod.macpherson@colbenton.org
Michelle Cooke	Benton County	Michelle.cooke@colbenton.org



**Benton County Hazard Mitigation Plan
Planning Committee Meeting**

December 12, 2017

Name (Please print)	Company/Agency	E-Mail
Lorrie Chiz	BCFD #1	lorrie@bentacbc.org
Anthony Mearns	CVK	anthony.mearns@ci.kennecook.wa.us
Neil Hines	Kenn Fire Dept.	neil.hines@ci.kennecook.wa.us

December 12, 2017 –Committee Meeting Notes

- 1) Prefer the document organized by jurisdiction.
- 2) Capabilities assessment to follow: how each jurisdiction can respond to hazards, what plans are available, and their resources.
- 3) NMI will only focus on the natural hazards and the County will add in their manmade hazards of interest following the document completion to not infringe on FEMA's direction.
- 4) Is there a way to add flash flooding from localized storms? (also debris that enter irrigation canals and cause overtopping and damage)
- 5) When the wind exceeds 20mph the irrigation district deploys vegetation clearing crews to canals.
- 6) Ice storms and freezing rains impacting powerlines and grid supply throughout the region.
- 7) KID (Kennewick Irrigation Dist.) levy failure and canal lining to mitigate flood hazards for communities and residents. Also, semantics for inclusion of flooding that may occur from dam failure.
- 8) FEMA is completing the HAZUS runs for earthquake hazards for Benton County.
- 9) There are some 9-foot in diameter syphons for Kennewick that would be susceptible to earthquakes and should be included in the FEMA HAZUS modeling.
- 10) LiDAR flood estimation mapping for Benton at 25, 100 and 500-year event elevation levels for county risk discussions only.
- 11) California Ground squirrel or gophers are natural hazards that impact the irrigation canal infrastructure and have led to damage of private property and safety concerns in the past.
- 12) Drought challenges impact the irrigation district curtailment because people begin to use potable water for irrigation when they start getting reduced and then the officers need to be dispatched to uphold the ordinance. If the ordinance is upheld during a drought there is a risk of increased wildfire.
- 13) Need to add some project language for a FIREWISE program funding as they currently do not have an official program and work on an as-available business.
- 14) Fire map has a lot of green area and most of the county that doesn't get irrigation will indeed burn. Comment: the old plan suggested longer fire return intervals because they assumed sagebrush ecosystems....now much of the county area is cheat grass so the return interval is more like 3-5 years.
- 15) Condense the fire section to something simple that says "there is grass there and the wind blows a lot...so when we have a wet spring there is a greater fire danger because the fuels grow, when there is a drought there is often a less critical fire risk because the grass grows less." More of a narrative that supports the graphics that show grass and wind are the main drivers in their risk areas. Have the narrative align with the need for fuel reduction needs and infrastructure, human safety concerns. There are really only localized pockets of sage brush and then Russian Olive along water ways, everything else is grass.
- 16) Identify some "high priority" fuel breaks (roads, tilling, retardant etc.) as these may have a greater value and better importance to the County than just the vegetation condition. There are some areas of the County that need fuel reduction practices as well as identifying the fuel

break locations. The “Rattlesnake area” is not a place they are able to treat and currently in the fire modeling we have completed it is skewing the whole heat map. We asked for a general identification of area where risk is the greatest in their experience and for them to make a “fat crayon” map.

- 17) Local TV network to advertise the plan public outreach meeting dates, times and locations. Kelly Mackhart is the contact. Meeting in Prosser, Richland, and Kennewick for the public meeting locations. Use the Utility bill flyers for helping to notice people.

Matt will setup an email, Facebook announcement, and link to the document on the EM webpage. NMI will develop a flyer in .PDF form to post along with the draft document for the public to view in case folks don’t want to read the document and would rather just read an overview and see the times, dates and locations of the three public meeting locations.

March 8, 2018 - Committee Meeting Agenda

A G E N D A	<p>Hazard Mitigation & Community Wildfire Protection Plan Meeting Thursday, March 8th, 2018 11:00 p.m. – 1:00 p.m.</p> <p>Location: Benton County Emergency Management 651 Truman Ave, Richland WA</p>	
11:00 am	OPEN – Introductions	Deanna Davis,
11:15 am	<p>GROUP MEETING</p> <ul style="list-style-type: none"> I. Risk Assessment Workshop <ul style="list-style-type: none"> ✓ Review prior plans Mitigation Action Items ✓ Work through risk assessment maps to determine new Mitigation Action Items II. Public Meetings <ul style="list-style-type: none"> ✓ Solidify Outreach Methods ✓ Dates and Venues 	Northwest Management, Inc.
12:30 pm	OPEN DISCUSSION	Group

District Summaries received: BCFD #2 and West Benton Fire Rescue

March 8, 2018 – Committee Sign-In Sheet



**Benton County Hazard Mitigation Plan Meeting
March 8, 2018**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
Ken Buechler	RFD	
Bill Matthews	Northwest Management	matthews@nwmi2.com
Adam Herenbruck	Northwest Management	herenbruck@nwmi2.com
Deanna Davis	RCEM	d.davis@bcps.wa.gov
Edward Dunbar	BCFD 4	edunbar@hcd4.org
Neil Hines	KFD	neil.hines@ci.keenewick.wa.gov
Louise Clark	SCFD #1	Louise@ci.Bainbridge.org
Michelle Cooke	Benton County	michelle.cooke@co.benton.wa.us
Al Lawson	WAO NR	al.a.lawson@clwa.gov
Kevin Howard	Port of Benton	kevinh@portofbenton.com
Charles Freeman	KID	cfreeman@kid.org



**Benton County Hazard Mitigation Plan Meeting
March 8, 2018**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
Tia Burbach		
Kyle Kurth	City of Benton City	kkurth@ci.benton-city.wa.us
Jerrad MacPherson	Benton County	jerrad.macpherson@co.benton.wa.us
Anthony Muni	City of Kennewick	anthony.muni@ci.keenewick.wa.us
Scott Clemenson	Richland Fire + Emergency Services	sclemenson@ci.richland.wa.us
William Wheaton	BCFD 4	wheaton@hcd4.org
SETH JOHNSON	WBRP	sjohnson@weatherforbenton.com

March 8, 2018 - Committee Meeting Minutes
Agenda Item #1 - Introductions

2019 Revision

Deanna Davis opened the meeting by introducing Bill Mathews and Adam Herrenbruck, both with NMI. Bill briefly discussed where the plan stands in the update process. He plans to start sending out portions of the plan out, 1-2 chapters at a time, for the committee to review and give feedback.

Another topic Bill brought up was the location of the flood map data. So far NMI has seen the earthquake data sent by the state but has not seen the new flood hazard data. Some members of the committee noted that the data needed might be found at the Army Corps of Engineers or the irrigation district.

Agenda Item #2 – Risk Assessment Workshop

Bill led a review of the mitigation action items that were expressed in previous plans. Using a handout that summarized previous mitigation projects, the committee discussed: 1) are the action items still current (have they been completed or are they still necessary); 2) is there a more specific timeframe for implementation of each action item; and 3) are the details regarding each action item still applicable or specific enough.

Many changes were made to the past action items due to vague language, completed initiatives, or shifts in objectives. The changes recommended by the committee were recorded so they could be incorporated into the updated Hazard Mitigation Plan. Details of some action items were unknown by those present at the meeting. These action items will need to be discussed by the appropriate parties and then the feedback will be sent to Deanna Davis and NMI.

Bill asked the committee members present to consider any new action items they might want to incorporate into the Hazard Mitigation Plan update. The committee discussed adding some initiatives, particularly ones that address landslide and earthquake mitigation. No specific action items were raised by the committee, but some suggestions might be raised over the next few weeks.

Agenda Item #3 – Plan for moving forward (public meetings)

Bill asked the committee how they would like to proceed with the Hazard Mitigation Plan update process, specifically regarding the public meeting portion. It was suggested and agreed upon to hold the public meetings in three different locations throughout the county, on two different days. The locations chosen were Kennewick, Richland and Prosser, but specific venues have not yet been determined. Tentative dates for these meetings are April 25, at 4:00 in Richland and 6:00 in Kennewick and April 26 in Prosser. The exact times and dates will be finalized when venue availability is determined by Deanna. There will also be a planning committee meeting prior to the first meeting on April 25, at Benton County Emergency Management.

Agenda Item #4 – CWPP Discussion



Bill led the area fire chiefs in a review of the fire hazard risk map, seeking their feedback and corrections. Many recommendations were made and noted and will be incorporated into an updated hazard risk map and hazard vulnerability assessments.

Bill asked if water sources were necessary for inclusion in the hazard risk map. It was determined that the sources should be included in case the information is needed for any future funding.

The next CWPP meeting was scheduled for Wednesday, April 18 from 9:00 a.m. to 11:00 a.m. at Benton County Emergency Management.

July 19th, 2018 –Committee Meeting Agenda

A G E N D A	Hazard Mitigation & Community Wildfire Protection Plan Meeting Thursday, July 19, 2018 11:30 p.m. – 1:30 p.m. Location: Benton County Emergency Management 651 Truman Ave, Richland WA	
11:30 am	OPEN – Introductions	Deanna Davis,
11:40 am	GROUP MEETING I. Quick Status Update II. Hazard Mitigation Plan ✓ Review draft ✓ Discuss missing pieces and committee comments III. Community Wildfire Protection Plan ✓ Review committee draft ✓ Discuss missing components ✓ Threat Level Mapping ✓ Project map review IV. Next Steps ✓ Public comment periods ✓ Review process for state and federal review ✓ Timelines for completion	Northwest Management, Inc.
1:30 pm	OPEN DISCUSSION	Group

July 19th, 2018 –Committee Meeting Sign-In Sheet



**Benton County Hazard Mitigation Plan Meeting
July 19th 2018**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
* Deanna Davis	BCEM	d.davis@bces.wa.gov
Kyle Kurth	Benton City	KKurth@Ci.Benton-City.WA
* Scott Clemenson	RF+ES	sclemenson@ci.richland.wa.
Aaron Lambert	City of W Richland	alambert@westrichland.org
SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US
* Lori Ferris	BCEM	l.ferris@bces.wa.gov
Anthony Mui	Kemewick	anthony.mui@ci.kemewick.wa.
Michelle Cooke	Benton Co.	Michelle.cooke@co.benton.wa.us
Tina R. Kenny	NMI	tkenny@nmi2.com
* William Wheelan	BCFD	wwheelan@bcfd.org
* Neil Hines	KIFD	neil.hines@ci.kemewick.wa.us

* stayed for cwpp specific planning mtg.

January 30, 2019 -Committee Meeting Sign-In Sheet



**Benton County Hazard Mitigation Plan Meeting
January 30, 2019**

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail
Scott Clemenson	Richland Fire + Emergency Serv	sclemenson@ci.richland.wa
Michelle Cooke	Benton County	michelle.cooke@co.benton
Jerrad MacPherson	Benton County	jerrad.macpherson@co.ben
Kyle Kurth	Benton City	kkurth@ci.Benton-city.wa.us
Brian Calvert	BCEM	bcalvert@bcem.wa.gov
SHANE O'NEILL	RICHLAND PLUMB	SONEILL@CI.RICHLAND.WA.US
SETH JOHNSON	WBFR	sjohns@westlandfire.com
Lori Ferris	BCEM	lferris@bcem.wa.gov
Neil Hines	KFD	neil.hines@ci.kennecott.wa
Deanna Davis	BCEM	d.davis@bcem.wa.gov
ERIC NELSON	NMI	nelson@nmi2.com
Lonnie Click	BCFD #1	

Documentation of Public Involvement

November 15th, 2017 -Press Release to Public

Benton County

Media Release

From: Deanna Davis, Emergency Manager

Date: November 15, 2017

RE: Benton County Natural Hazard Mitigation Plan & Community Wildfire Protection Plan Update

Benton County Set to Update Hazard Risk Plans

Richland, WA. Benton County has launched a project to update the Benton County Natural Hazard Mitigation Plan. This update will include an update of the Benton County Community Wildfire Protection Plan as well. Local agencies and organizations in Benton County have created a committee to complete the required 5-year updates of these documents as part of the FEMA Pre-Disaster Mitigation program and National Fire Plan and Healthy Forests Restoration Act. The project is being funded through a grant from FEMA.

The planning update will include risk analyses, vulnerability assessments, and mitigation recommendations for the hazards of flood, landslide, earthquake, severe weather, wildland fire, and others.

Northwest Management, Inc. has been retained by Benton County to provide risk assessments, hazard mapping, field inspections, interviews, and to collaborate with the planning committee to update the Plans. The committee includes representatives from local communities, rural and wildland fire districts, Washington DNR, Bureau of Land Management, highway districts, area businesses, various Benton County and City departments, and others.

One of the goals of the planning process will be to increase the participating jurisdictions' eligibility for additional grants that will help minimize the risk and potential impact of disaster events. The planning team will be conducting public meetings to discuss preliminary findings and to seek public input on the Plans' recommendations. A notice of the dates and locations of these meetings will be posted in local newspapers. Once completed, the updated draft Plans will also be available for public review and comment.

The first meeting was held on October 26th, located at the Benton County Emergency Management Office at 651 Truman Ave, Richland, Wa 99352. For more information on the Benton County Natural Hazard Mitigation Plan update contact Deanna Davis, Emergency Manager at (509)628-8092, email d.davis@bces.wa.gov

April 18th, 2018 – Press Release: Schedule of Public Meetings



Public meeting comments on Benton County Hazard Mitigation plan:

Wednesday April 25th 4:00 P.M.

Richland Public Library Conference Rm A&B
955 Northgate, Richland WA 99352

Wednesday April 25th 5:00 P.M.

West Benton Fire & Rescue
1200 Grant, Prosser WA 99350

Wednesday April 25th 6:00 P.M.

Benton PUD Auditorium
2721 W. 10th Kennewick WA 99336

For more information call 509-628-8092

ADD TO BEGIN ON APRIL 18TH AND END ON APRIL 26TH – ADD CAN RUN IN THE MISC ANNOUCMENTS SECTION.

Contact: Deanna Davis, EM Manager
Benton County Emergency Services
509-628-8092 or cell: 509-380-4522
d.davis@bces.wa.gov

April 18th, 2018 – Newspaper Advertisement for Public Meetings



April 25th and 26th, 2018 - Public Meeting Presentation

*Benton County, Washington
Multi-Hazard Mitigation Plan Update and
Community Wildfire Protection Plan*




Northwest Management, Inc.
Tera King, B.S. and MBA
233 East Palouse River Drive
Moscow, Idaho 83643
208-683-4488 Telephone

1

Northwest Management, Inc.

- Serving the Western U.S. since 1984
- Main Office in Moscow, Idaho
 - Deer Park and Colville, Washington
 - Helena, Montana
- Natural Resource Consultants



NORTHWEST MANAGEMENT, INC. *Providing a balanced approach to natural resource management*

2

Purpose of the Plans

- Recognize and Identify Risk Factors
- Reduce the Risk of Loss for Life, Property, Infrastructure, Natural Resources, and Economy
- Map and Prioritize Mitigation Projects
- Provide for Public Awareness

Improve County's Eligibility for Funding Assistance



3

FEMA Multi-Hazard Mitigation Plan

- Flooding
- Landslides
- Wildland Fire
- Severe Weather
- Earthquake
- Volcano




MHMPs are required for all counties.
As of November 1, 2004 by FEMA

4

FEMA Requirements  **FEMA**

- Adoption by Local Government Body
- Multi-Jurisdictional Planning
- Identification of Hazards & Risk Assessment
 - Profiling Hazard Events
 - Mapping Juxtaposition of Hazards, Structures, Infrastructure
 - Potential Dollar Losses to Vulnerable Structures (B/C Analysis)
- Documented Planning Process
- Assessing Vulnerability
- Mitigation Goals
- Analysis of Mitigation Measures
- Monitoring, Evaluating & Updating the Plan (5 year cycles)
- Implementation Through Existing Programs
- Public Involvement

5

Who is on the committee?

<p>Adopting Jurisdictions:</p> <ul style="list-style-type: none"> • Benton County • Incorporated Cities <ul style="list-style-type: none"> • Benton City • Richland • Kennewick • West Richland • Puyallup 	<p>Other Committee Members:</p> <ul style="list-style-type: none"> • Members of the public and local business operators • Fire Districts • Washington DNR • Port of Benton • US Fish and Wildlife Service • BLM • Irrigation Districts
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6



7



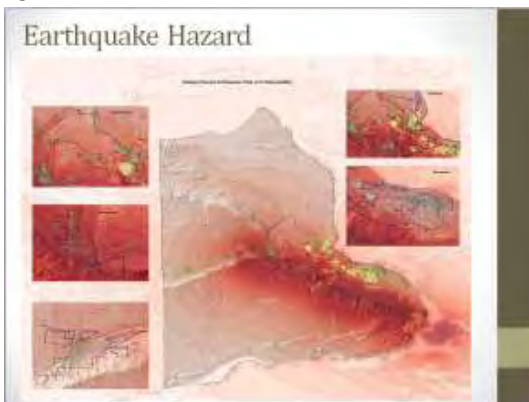
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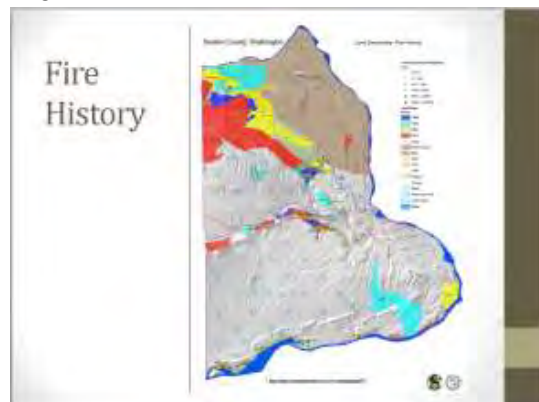
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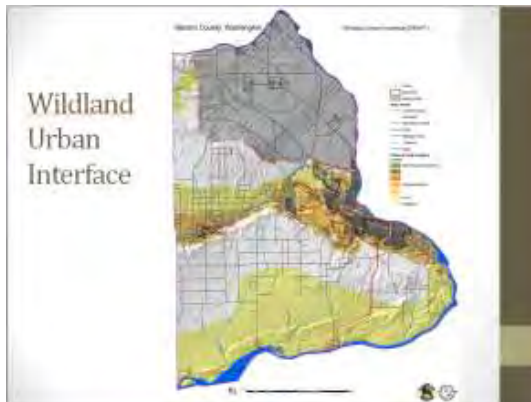
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13

Preparedness

- Emergency Services
- Fire Protection
- Weather Impacts
- Flood Protection/Programs
- Earthquake, Landslide, & Storm Readiness
- Hospital Protection
- Public Works/Highway District Readiness
- Communications



14

Types of Projects

- Defensible Space and Fuels Treatments
- Floodplain Management and Infrastructure Upgrades
- Slope Stabilization
- Studies (e.g. watershed) and Evaluations (e.g. culvert capacity)
- Access Improvements
- Emergency Response Needs
- Policy Issues
- Infrastructure Hardening and Communication Upgrades
- Public Education

15

Public Involvement

- Press Releases and Social Media
- Public Meetings x3
- Public Review of the DRAFT Plan
- Open public adoption hearings



16

Your Input

- Maps on the walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!

Thank you for attending and participating!
Please visit with us.

17



**Benton County, Washington
Multi-Hazard Mitigation Plan Update and
Community Wildfire Protection Plan**

18

Appendix D: NFIP Status Letter for Benton County



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1250 West Alder Street • Union Gap, Washington 98903-0009 • (509) 575-2490

June 11, 2019

Deanna Davis
Benton County Emergency Manager
651 Truman Avenue
Richland, WA 99352

Dear Deanna Davis:

You indicated that Benton County, Washington, is working towards the completion of its Hazard Mitigation Plan and information is needed regarding the standing of the County in the National Flood Insurance Program (NFIP).

This is to certify that Benton County (Community Identification Number 530237) participates in the NFIP and is a member in good standing in that program. Benton County established eligibility in the Regular Phase of the NFIP on July 19, 1982. A Community Assistance Visit (CAV) was conducted by Ecology on April 15, 2009 and was closed on December 6, 2010.

This is to certify that the City of Benton City (Community Identification Number 530010) participates in the NFIP and is a member in good standing in that program. Benton City established eligibility in the Regular Phase of the NFIP on July 16, 1979. A Community Assistance Visit (CAV) was conducted by Ecology on October 4, 2013 and was closed on October 8, 2013.

This is to certify that the City of Kennewick (Community Identification Number 530011) participates in the NFIP and is a member in good standing in that program. Kennewick established eligibility in the Regular Phase of the NFIP on August 15, 1979. A Community Assistance Visit (CAV) was conducted by Ecology on September 29, 2010 and was closed on September 21, 2011.

This is to certify that the City of Prosser (Community Identification Number 530012) participates in the NFIP and is a member in good standing in that program. Prosser established eligibility in the Regular Phase of the NFIP on June 30, 1976. A Community Assistance Visit (CAV) was conducted by Ecology on July 1, 1987 and was closed on July 1, 1988.

This is to certify that the City of Richland (Community Identification Number 535533) participates in the NFIP and is a member in good standing in that program. Richland established eligibility in the Regular Phase of the NFIP on March 31, 1970. A Community Assistance Visit (CAV) was conducted by Ecology on August 20, 2010 and was closed on August 25, 2010.

This is to certify that the City of West Richland (Community Identification Number 530014) participates in the NFIP and is a member in good standing in that program. West Richland established eligibility in the Regular Phase of the NFIP on September 30, 1981. A Community Assistance Visit (CAV) was conducted by Ecology on July 29, 2008 and was closed on August 4, 2008.

If you have any questions, please feel free to contact me at (509) 457-7139 or matt.gerlach@ecy.wa.gov.

Sincerely,



Matt Gerlach
Central Washington NFIP Coordinator

cc: Suzanne Sarpong, FEMA
Dave Radabaugh, Ecology

Appendix E: 2018 Benton County CWPP MAI’s

The following tables contain the mitigation action items (MAI’s) from the 2018 Benton County Community Wildfire Protection Plan (CWPP) update. This appendix serves to cross reference the wildfire MAI’s found in chapter 5 of this plan with those found in the CWPP.

Policy and Planning Efforts

Wildfire mitigation efforts should be supported by a set of policies and regulations that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

Table 58) Action Items in Safety and Policy.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.1.a: Distribute Firewise-type educational brochures with occupancy permit.	CWPP Goal #1, 2, 4, 6, 7, & 9	Lead: KFD Prevention Division Support: Kennewick Suppression Crews	

Fire Prevention and Education Projects






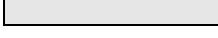
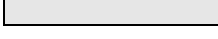


The protection of people and structures will be tied together closely because the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire or to a firefighter combating that fire. Many of the recommendations in this section involve education and increasing wildfire awareness among Benton County residents.






Residents and policy makers of Benton County should recognize certain factors that exist today, the absence of which would lead to increased risk of wildland fires in Benton County. The items listed below should be acknowledged and recognized for their contributions to the reduction of wildland fire risks:

Shrub-steppe Management has a significant impact on the fuel composition and structure in Benton County. The shrub-steppe management programs of the Bureau of Land Management, Bureau of Reclamation, and numerous private landowners in the region have led to a reduction of wildland fuels. Furthermore, shrub-steppe systems are dynamic and will never be completely free from risk. Treated areas will need repeated treatments to reduce the risk to acceptable levels in the long term. Recommended treatments include mechanical thinning of shrubs and/or light prescribed burning to reduce fuel loads. Monitoring invasive species in these areas will also be required.

Table 59) Action Items for Fire Prevention, Education, and Mitigation.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
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Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.a: Implementation of youth and adult wildfire educational programs.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.b: Distribute educational information regarding construction in high risk wildfire areas.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.c (Kennewick): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: KFD Prevention Division Support: Kennewick suppression crews	
6.2.c (Richland): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.d: Work with area homeowner's associations to foster cooperative approach to fire protection and awareness and identify mitigation needs.	CWPP Goal #1, 2, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.e: Work with WSU Extension, Master Gardeners, and other existing programs to offer firewise landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.f: Develop a range of public education programs to encourage healthy management of natural resources on private property.	CWPP Goal #1, 4, 6, & 9 	Lead: Richland Fire and Emergency Services	
6.2.g: Review State Building Codes and recommend revisions to meet Firewise standards as needed.	CWPP Goal #1, 3, 5, 6, 8, & 9 	Lead: Richland Fire and Emergency Services	
6.2.h (BCFD #1): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	CWPP Goal #1, 6, & 7 	Lead: BCFD #1 Support: Benton County Fire Districts	

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.h (Richland): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	CWPP Goal #1, 6, & 7 	Lead: Richland Fire and Emergency Services	
6.2 i (Benton Conservation District): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Benton Conservation District Support: Kennewick Fire Department	
6.2 i (Richland): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Richland Fire and Emergency Services	
6.2.j (Kennewick): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: KFD Prevention Division Support: Kennewick Fire Department	
6.2.j (Richland): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	CWPP Goal #1, 2, 4, 6, 7, & 9 	Lead: Richland Fire and Emergency Services	

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Benton County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies and are fully supported by the CWPP steering committee.

The implementation of each action item will rely on either the isolated efforts of the rural fire districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve countywide equity.

Table 60) Action Items for Resource and Capability Enhancements.

Action Item	Goals Addressed (see page 4)	Responsible Organization	Timeline
-------------	---------------------------------	--------------------------	----------

Action Item	Goals Addressed (see page 4)	Responsible Organization	Timeline
<p>6.4.a: Enhance radio availability in each district, link to existing dispatch, improve range within the region, and convert to a consistent standard of radio types.</p>	<p>CWPP Goal #1, 6, 8, & 9</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<p>Lead: Richland Fire and Emergency Services</p>	
<p>6.4.b (Kennewick): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.</p>	<p>CWPP Goal #1, 2, 4, 6, 7, & 9</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<p>Lead: KFD Training Division Support: Kennewick Fire Department</p>	
<p>6.4.b (Richland): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.</p>	<p>CWPP Goal #1, 2, 4, 6, 7, & 9</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<p>Lead: Richland Fire and Emergency Services</p>	



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Appendix O

Comment Response Matrix

Benton County Comprehensive Plan Update Comment/Response Summary

Planning Commission Comments Received September 12, 2017 to November 21, 2017

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
1	Population	Bilskis	Page 48, Section 3.7 – update text Population growth in Benton County from 2011 to 2016 grew at a rate reflective of the slow growth in the nation’s economy, the improved national economy of 2017 has provided a rebound in growth reminiscent of the growth in 2009.	Revise as noted
2	Guiding Principles	Bilskis	Page 61, Section 4.5.4.1 - update text 7. Develop county regulations and policies in full consultation with local governments that support federal and state regulations where they meet the needs of the local population and municipalities.	Revise as noted
3	Public Lands	JM	Page 43 Section 3.3.4 Public Land Designation The Public Lands (PR) – PR should be “PL” or just “P”	Revise as noted
4	Transportation	Debi Freudenthal (WSDOT)	We would like more information about the proposed comp. plan updates, specifically the traffic impact analysis supporting the EIS Addendum that details potential transportation impacts to SR 240 by the potential increased density (and how that relates to the mitigation measures, table Pg 19). How does this relate to existing facilities, currently proposed improvements by WSDOT, and LOS? Can we get additional information about where /how much increased density would occur, including traffic peak hour numbers? Let me know if I should contact someone in Public Works for this info instead.	The statements in the EIS addendum were general and qualitative based on Planning staff’s current experience with these areas, and without detailed supporting traffic analysis. As densities continue to increase in urban areas and as capacities remain unchanged on the high use routes identified, then peak hour issues will continue to be a problem until addressed. Traffic analysis information available from the Benton-Franklin Council of Governments and WSDOT, along with supporting analyses from city comprehensive plans will be reviewed and incorporated into findings for the final comprehensive plan and appendices.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
4	Continued: Transportation	Debi Freudenthal (WSDOT)		Applicable mitigation measures will also be identified, including measures the County could take, noting the County often has limited opportunity to mitigate effects, and the mitigation measures that the County would expect others to be responsible for.
5	Best available science	Yakama Nation Department of Natural Resources	Draft Plan fails to use, consider, and appropriately incorporate best available science and information (a) regarding the identification and protection of critical areas (b) regarding the identification and protection of cultural resources, (c) to ensure that adequate water supplies are legally and physically available for development, and (d) to acknowledgement and planning for climate change. Further, YN DNR is concerned that the probable environmental impacts of the Draft Plan cannot be adequately assessed as required under the State Environmental Policy Act ("SEPA") in the absence of such information.	<p>The Comprehensive Plan is designed to set goals, policies, and actions for addressing the four areas identified. The level of detail noted for two areas will be developed as part of plan implementation: a) The critical areas information noted as missing is information that is developed through the County's critical areas code update currently underway, and b) the water supply information – this is currently determined at time of application, and this process will be further supported by the actions proposed in the plan to verify and mitigate for potential water resource impacts.</p> <p>For identification and protection of cultural resources, additional goals, policies, and actions are being added to the plan to further strengthen the County's efforts to identify and protect cultural and historic resources (see Comment #7 below).</p> <p>The EIS review is completed at a programmatic level, with more detailed environmental review occurring at the time of application or through subsequent environmental review that will tier off the comprehensive plan environmental review.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
6	Critical Areas	Yakama Nation Department of Natural Resources	YN DNR recommends a more robust set of Comprehensive Plan goals and policies to designate and protect critical areas. YN DNR submitted a separate letter addressing the concerns specific to Benton County's Draft Critical Areas Ordinance on October 16, 2017.	<p>The County is proposing to designate shrub-steppe habitat as an area of local importance in the draft Critical Areas Ordinance in response to the Yakama Nation's comment letter dated 10/16/17.</p> <p>Also add suggested new Policy under CA Goal 3 (Ch. 2.5):</p> <ul style="list-style-type: none"> Identify and designate habitats of local importance to protect locally important habitats and species under the County Critical Areas Ordinance.
7	Cultural Resources	Yakama Nation Department of Natural Resources	YN DNR recommends a more robust set of Comprehensive Plan goals and policies and other regulations to identify and protect cultural resources. [Potential risk factors to consider include amount of proposed ground disturbance, the development site's risk rating and others.]	<p>Add new suggested language:</p> <ul style="list-style-type: none"> PR Goal 5: Identify, preserve, and protect historic, cultural, and archaeological resources found to be significant by recognized local, state, tribal or federal processes. <p>Policies</p> <ul style="list-style-type: none"> Identify known, recorded archaeological, cultural, and historic resources. Update and refine the local process for evaluating the significance of historic, cultural, and archaeological resources. Preserve areas that contain valuable historical or archaeological sites of federal, state, tribal, or local significance including those maintained in the DAHP database, areas known only to tribes and areas of higher risk potential. Maintain and enforce development code provisions that require conditioning of project approval on findings made by a professional archaeologist for development activities on sites of known cultural, historical, or archaeological significance.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
7	Continued: Cultural Resources	Yakama Nation Department of Natural Resources		<ul style="list-style-type: none"> Prior to demolition, moving, or alteration to any designated historic, cultural, and archaeological landmark, ensure that due consideration is given to its preservation or, at a minimum, documentation of its historic, cultural, or archaeological value.
8	Cultural Resources	Yakama Nation Department of Natural Resources	In order to protect cultural resources, Benton County should enter into a data-sharing agreement with DAHP so they will know where cultural resources are located or likely to be located.	The County will take steps to follow up with DAHP on this suggestion.
9	Cultural Resources	Yakama Nation Department of Natural Resources	YN DNR recommends that the draft comp plan be revised to better protect cultural resources. including those which are known to Tribes but not identified on the DAHP database, and undiscovered cultural resources in areas that have been identified as ' high risk' or 'very high risk' by the DAHP predictive model.	See response to Comments #7 and #8.
10	Cultural Resources	Yakama Nation Department of Natural Resources	For high-risk projects, professional cultural resources investigations or surveys may be warranted. Cultural resource surveys are specifically requested by the Yakama Nation for projects proposed within ¼ mile of a known site. Notification and the opportunity to comment on all professional cultural resource surveys completed should also be provided to both the Yakama Nation and DAHP to ensure professional survey and reporting guidelines are followed. YN DNR encourages Benton County to work with the Yakama Nation's cultural resources staff to develop specific revised language to the Comprehensive Plan, and associated regulations.	These suggestions will be considered as part of implementation of the goals and policies update as outlined in response to Comment #7. The County will follow up with the YN cultural resources staff for implementation input, as suggested. Additionally, the County's recently approved updated Shoreline Master Program goals, policies and regulations also provide additional protections for cultural resources in higher risk areas along the Columbia and Yakima rivers in the County.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
11	Water availability	Yakama Nation Department of Natural Resources	<p>The Draft Plan fails to adequately address the County's obligations under the Growth Management Act and associated state law to ensure adequate water supplies are legally and physically available before approving new development.</p> <p>If implementing regulations are not yet developed, then interim regulations must be included in the County code to require that all new land use and development applications be required to show that water is both legally and physically available prior to any license approval.</p>	<p>The county follows current procedures established in state law and County code to verify water supply is legally and physically available for new development proposals. The County follows a procedure in accordance with RCW 58.17.110 and other applicable state laws and regulations, to ensure that appropriate provisions have been made for potable water supplies prior to the approval of any applicable development proposal that will rely on groundwater. The County reviews well logs and supplemental written record materials, verifying that potable water supplies are both legally and physically/factually available for the proposed development.</p> <p>Goals, policies, and actions in the draft Comprehensive plan have been updated to further emphasize steps the County will be taking to strengthen the process and technical foundation for verifying water availability. Implementation of the groundwater actions for addressing rural exempt water supply availability and mitigation plans for the Yakima basin portion of the County will begin in December 2017, even prior to the Comprehensive Plan adoption. The County has secured a consultant and will be establishing a coordination group with invitations extended to the Yakama Nation, Washington State Department of Ecology, the US Bureau of Reclamation, irrigation districts and others to participate on the group and provide technical input on the information the county will use to refine its rural exempt well water supply program. The first phase of this work is expected to be completed in 2018, and the County will also include in this phase an evaluation of an interim regulation that could be put in place for ongoing rural development that require exempt wells, while the longer-term program is being developed.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
11	Continued: Water availability	Yakama Nation Department of Natural Resources		Once the science information is developed and a strategy formulated for addressing mitigation of groundwater withdrawals on the Yakima River in Benton County, then the County expects to also update development regulations consistent with the rural water supply strategy. This update is expected to occur in 2019 or 2020, as part of implementing the strategy.
12	Climate Change	Yakama Nation Department of Natural Resources	The Draft Plan fails to address climate change and its potential to contribute to or exacerbate the environmental impacts of proposed development. YN DNR suggests that Benton County review and incorporate within the Draft Plan either text from or a reference to the Yakama Nation's Climate Adaptation Plan. (Attached).	<p>Add this sentence in Section 4.5.2.1, after list of bullets near end of section: "Pressures on salmon and other aquatic species may be further exacerbated as increased variation in both ocean and freshwater hydrologic conditions occurs from changes in climactic conditions."</p> <p>Add these sentences to the end of the first paragraph in section 4.5.3.1: "Efforts continue both for the Columbia and Yakima River basins to address water management to meet in and out of stream needs, and manage hydropower and other river operations. The Columbia River Treaty renegotiations may further modify operations on the Columbia and this could impact river uses and how flow is managed for fisheries and out of stream water uses. Additionally, climatic variation could affect the levels of snowpack in the upper Columbia and in particular in the lower elevation mountains of the Yakima River, and the associated timing of runoff, further potentially impacting the amount of water available for fish, farms and cities in the spring and summer months, and existing and future drought resiliency,"</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
13	Water Rights	Mark Nielson (FCD)	<p>Page 61, Section 4.5.5.1 - update text</p> <p>In September 2011, the U. S. Geological Survey released the final report of a 12-year, multi-million-dollar study confirming that <u>some</u> groundwater and surface water are directly connected, which means <u>some</u> groundwater withdrawals <u>have the potential to can</u> impair senior surface water rights.</p> <p>Ecology, in cooperation with the U.S. Bureau of Reclamation and the Yakama Nation, has determined that groundwater management <u>in some areas may will</u> need to occur in order to protect senior water rights, flows for fish, and economic development.</p>	Revise as noted
14	Water Rights	Mark Nielson (FCD)	<p>Page 62, Section 4.5.5.3 - update text</p> <p>It is understood that Yakima River Basin <u>some</u> surface and ground water <u>in the Yakima Basin</u> are hydrologically connected.</p>	Revise as noted
15	Water Rights	Mark Nielson (FCD)	<p>Page 63, Section 4.5.5.3.1 - update text</p> <p>...use. <u>The permit well exemption also allows pumping of 5,000 gallons per day for industrial use, 5,000 gallons per day for irrigation up to ½ acre, and an unlimited amount for stock water purposes.</u> Permit...</p>	Revise as noted
16	Critical Aquifer Recharge Areas	Mark Nielson (FCD)	<p>Page 66, Section 4.6.2.2 - update text</p> <p>Nitrate contaminations occur principally in upper aquifer wells drilled in the lower lying areas of the County. The spatial correlation between elevated concentrations of nitrates in groundwater and irrigated lands <u>croplands</u> indicates that the major source of contamination is applied fertilizers for on irrigated <u>lands including crops, lawns, golf courses, parks, etc.</u> croplands.</p>	Revise as noted

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
17	Positive Feedback	William Simpson (Department of Commerce)	<p>We especially liked the following aspects of Benton County's Comprehensive Plan:</p> <ul style="list-style-type: none"> • User friendly design • Supporting technical documentation • Strong polices regarding <ul style="list-style-type: none"> ○ Economic development and recognition of the importance of the agricultural economy ○ Encouraging the assessment of suitability for future development and the underlying capability of the land ○ Future demand for alternative energy vehicles and specific policies in support of anticipated changes in the transportation sector ○ Principles designed to make wise use of water resources • Recognition of the importance of land use compatibility with military training routes and installations • Future considerations in the Land Use Element • Detailed assessment of agricultural resource lands of long-term commercial significance 	Comment noted
18	City of Prosser UGA	William Simpson (Department of Commerce)	<p>We would like to express support for the City of Prosser's request to amend their urban growth boundary, which is discussed in the Land Use Element. The City's underlying analysis and decision to retract portions of the urban growth area is based on revised growth figures and a careful consideration of the cost of providing urban services. The City provided an analysis and request that is in the overall public interest of the community, and reflects the goals and recommendations of the GMA.</p>	Comment noted

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
19	Housing	William Simpson (Department of Commerce)	Suggestion for strengthening the plan: The County should consider expanding the allowances for accessory dwelling units (ADUs) to provide additional options for affordable housing, and to expand the types of housing available in Benton County. The current allowances appear to be limited to attached ADUs for individuals with a disability or infirmity. ADUs can serve an important role in ensuring a variety of housing options at different price points, in addition to providing opportunities for residents to age in place.	Under HE Goal 1, add policy 7 to read: <ul style="list-style-type: none"> Consider accessory dwelling units as an affordable housing option and look for flexible and innovative ways of integrating ADU's into single family residential zones. Under Housing Element, subsection 6.4.2 Housing Types, Accessory Dwelling Units, add language as follows: <ul style="list-style-type: none"> The County plans to review its zoning code for provisions to allow accessory dwelling units in its single family residential zones in addition to its current code provision of allowing accessory dwelling units for disabled, infirm, or elderly residents.
20	Physical Activity	William Simpson (Department of Commerce)	Suggestion for strengthening the plan: The County's Land Use Element should include more specific language regarding planning approaches that increase physical activity consistent with RCW 36.70A.070(1). The County might consider making specific references to how multimodal options in the Transportation and Parks and Recreation Element encourage physical activity, and how that relates to the Land Use Element.	Active lifestyle is addressed in: <ul style="list-style-type: none"> TE Goal 2, which states: Provide an integrated network of trails and paths for non-motorized circulation throughout rural areas connecting to urban trails and paths to promote active lifestyles. PR Goal 1, Policy 2, which states: Encourage the development of a system of bicycling, hiking, recreational, and equestrian trails. Under LU Goal 1, add new policy 5 to read: <ul style="list-style-type: none"> Encourage multi-modal connectivity between land uses that enhances community access, and promotes healthier and more active lifestyle for residents.
21	Population	William Simpson (Department of Commerce)	Suggestion for strengthening the plan: Benton County adopted the high Office of Financial Management (OFM) population projection. We encourage close monitoring of growth trends considering the medium series is OFM's most likely projection.	Add suggested language in Section 3.7: Population Projections for Benton County, end of the second paragraph to read: <ul style="list-style-type: none"> County will review the future growth trends and adjust population projections if necessary.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
22	LAMIRDs	William Simpson (Department of Commerce)	<p>Concern that should be addressed: The County should review the original designation of limited areas of more intensive rural development (LAMIRD) in the previous comprehensive plan and maintain the designation of Type I, Type II, or Type III LAMIRDs as originally established. The description of areas as "equivalent" to LAMIRDs in the Land Use Element (Section 3.3.2.2) does not appear to meet the requirements in WAC 365-196-425. We recommend that you amend the section to clarify that rural community centers are LAMIRDs and that RL-1 lands are not, but may develop at an intensity similar to a LAMIRD based on historical development patterns and plats approved prior to the GMA.</p>	Revise as suggested
23	Fully Contained Communities	William Simpson (Department of Commerce)	<p>Concern that should be addressed: The Land Use Element contains a new goal and underlying policies to allow fully contained communities in agricultural or industrial areas. We recommend removing LU Goal 5, the underlying policies, and any amendments to the development regulations that allow fully contained communities in agricultural or industrial areas. The requirements for fully contained communities are expressed in RCW 36.70A.350, and include features such as new infrastructure, impact fees, transit-oriented site planning, affordable housing, and provisions to mitigate impacts to designated resource lands.</p> <p>A fully contained community requires a significant investment in new infrastructure and other services. Allowing fully contained communities in industrial or agricultural zones would likely undermine County goals for economic development, and result in compatibility issues with adjacent industrial or agricultural operations.</p>	Update per comment

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
24	Population	William Simpson (Department of Commerce)	Concern that should be addressed: Section 6.3 in the Housing Element states that the "high" series estimates indicate that Benton County can expect a population increase of 91,519 by the year 2037. The figure 91,519 is inconsistent with the projection identified in the Land Use Element, which is 86,609. You should review and correct these figures prior to final adoption and make any necessary adjustments to the calculations in the Housing Element.	Update to 6.3 Current Trends: <ul style="list-style-type: none"> Benton County can expect a population increase of 91,519 <u>86,609</u> by the year 2037. The unincorporated County's 19 percent allocation of the countywide 2037 Population projection is estimated to be 19,090 <u>18,135</u> additional people. At an estimated unincorporated ratio of 2.7 residents per household, this increase in population would require up to 7,070 <u>6,716</u> new homes in the next 20 years
25	Maps	Martin J. Sheeran (Benton County Planning Commission Chairman)	It would be very useful to have major roads, streams, and the Yakima river on the map to help get a better feel of where the land classifications are located in relation to traffic and sensitive wetlands.	Maps will be updated to reflect this suggested change.
26	Rural Lands	Martin J. Sheeran (Benton County Planning Commission Chairman)	I like the rural transition designations and would like to see Benton County employ more if possible along the Dallas Road, Badger Canyon, and 1-84 corridors as these seem to be a great potential for Benton County to capitalize on future growth. I believe there are lots of people who are tired of living in fish aquariums and want a little space and one acre lots are perfect. See if you can get it up to 2%. You probably have a better feel of where the hot beds are for development in and around the County.	County has identified areas that meet criteria based on current conditions. Future designation updates will be considered based on future conditions.
27	Rural Lands	Martin J. Sheeran (Benton County Planning Commission Chairman)	The Rural Resource lands are a great opportunity to put lands that are generally too steep for agriculture into a class that allows individuals who are determined to be able to have an opportunity at private small farms. I would like to see if this could be more inclusive to match topo maps to include lands that are 10% grade or more into these areas, realizing that places like Badger Mountain, and tops of others may be best served in reserves.	Rural resource lands were reviewed subsequent to comment, and areas around Finley were reevaluated. Additional areas near Finley were added while others were removed to better meet criteria. Rural resource lands are designed to protect steeper slopes and ridgetop areas among others.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
28	Agricultural Lands	Martin J. Sheeran (Benton County Planning Commission Chairman)	GMA Ag Lands that are small parcels less than or equal to 50 acres should probably be in a different land use class. Either Rural Resource or Rural Remote and let the topos dictate which would be the best designation. This is where roads and access are important. If adjacent to a County road, I would opt for Rural Remote designation particularly if there is higher use in the immediate areas.	Some parcels equal to or less than 50 acres with agricultural activity are included in Rural Resource or Rural remote. However, parcels larger than 10 acres with agricultural activities that are of long-term commercial significance have been designated as GMA Agriculture consistent with the RCW and WAC requirements.
29	Subdivision	Martin J. Sheeran (Benton County Planning Commission Chairman)	Other comments which are not Comprehensive Plan Update, but I would like to address are: I would like to see a renewal option for expired or expiring plats and subdivisions in the County. (I know the State hates this.) There would be a fee for this option and could be a source of income to the County.	Comment noted – further discussion on this topic can be scheduled with the Planning Commission.
30	Transportation	Martin J. Sheeran (Benton County Planning Commission Chairman)	Other comments which are not Comprehensive Plan Update, but I would like to address are: Private road traffic ratings. I would like to see a revisit of this and look at having a road distinction of paved verses County minimum standards traffic ratings, so that if a developer or individual wishes to pave than there is a benefit to their cost ratio. In 2011 the private roads in the County changed from no limit to a limit of 12 residences. I supported this decision at the time, but also said during the meeting that I thought if the roads were paved that I would not have a problem with it increased to 50 residences. At the time, Mike Shuttleworth was referring to a private road in Prosser that was gravel which had almost 100 residences on it and it was a source of great contention for the County Roads Department. It is my opinion that in trying to correct this problem that the County's Road Policy pendulum has swung too far the other way and now is greatly and adversely affecting future land developments in the County on paved private roads.	Comment noted – further discussion on this topic can be scheduled with the Planning Commission and in coordination with the County Roads Department. Comment will be shared with County Roads Department and the Planning Department will continue to work with them to evaluate private roads.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
31	Water Rights	Martin J. Sheeran (Benton County Planning Commission Chairman)	<p>Other comments which are not Comprehensive Plan Update, but I would like to address are:</p> <p>The Thurston County decision commonly referred to as the Hirst Decision is a judicial decision that will have great problematic ramifications for Benton County and the other Counties in the State. I believe this decision was a judicial shot at the heart of the Eastside Counties that the State intends to control our growth whether we agree or not. The fact that most municipalities are flush with water rights and the State views the municipalities in a different light than County government is obvious. My recommendation would be to talk with the DOE Yakima Office and see if the County can get additional water rights. Also, perhaps talk with Rick Simon (Richland) and see if the City is willing to turn loose of some of their hundreds of thousands of gallons of water rights for the County. I can talk with you further on how I know this is so.</p>	<p>Additional goals, policies, and actions have been included in the plan addressing water rights and rural exempt wells to support future development in the unincorporated area of the County. The County expects to begin implementing actions as soon as the comprehensive plan is approved.</p>
32	Critical Areas (wetlands)	Seth Defoe (Kennewick Irrigation District)	<p>Page 65, Section 4.6.1 Wetlands:</p> <p>This section refers to the July 2010 "Focus on Irrigation-Irrigation Influenced Wetlands" sheet issued by Ecology and largely repeats statements directly from that sheet. This Ecology publication does not constitute best-available science and should not be referenced as authoritative regulatory guidance in the Comprehensive Plan.</p> <p><i>This comment provides additional detail on why the above sheet is not an applicable reference.</i></p>	<p>The County has found this to be a helpful resource document in providing regulatory guidance for conditioning development activity. For irrigation water that results in the creation of riparian habitat and wetlands, the County protects the associated riparian habitat and wetlands from adjacent development, regardless of whether the source is from an irrigation district or individual water user.</p> <p>See also response to Comment #34.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
33	Critical Areas (streams)	Seth Defoe (Kennewick Irrigation District)	<p>Page 70, Section 4.6.5, Fish and Wildlife Conservation Areas: This section acknowledges that many "streams" in Benton County are dry washes that do not contain aquatic species habitat since natural flows only occur during large runoff events. This section also brings up the argument developed during the Voluntary Stewardship Program (VSP) process that 3rd order streams in irrigated areas are likely to carry ephemeral flows. A number of dry washes in Benton County are used as irrigation drains by irrigation districts such as KID (see Appendix A: Map Folio, Figure 13 - Fish and Wildlife Habitat Conservation Areas), and only contain seasonal or even perennial water due to their status as an important component of the irrigation conveyance system. Regardless of stream order or flows found in dry washes and swales, RCW 36.70A.030(5) excludes certain irrigation features from designation as fish and wildlife habitat conservation areas, and this section of the draft comprehensive plan could be worded better to acknowledge this statutory exemption.</p>	Clarifications will be made to the text. See also response to Comment #34.
34	Critical Areas (streams)	Seth Defoe (Kennewick Irrigation District)	<p>Appendix A, Map Folio; Figure 9, Wetlands, Rivers, and Streams, and Figure 13, Fish and Wildlife Habitat Conservation Areas: These maps depict KID irrigation drains as streams, including Zintel Canyon Drain in Kennewick, the AP Lateral Drain, and portions of the Amon Wasteway. As mentioned above, RCW 36.70A.030(5) excludes "artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company" from designation as fish and wildlife habitat conservation areas. These features, including KID irrigation drains, should be removed from the maps.</p>	<p>For irrigation drains that follow natural topographic lows and result in the creation of riparian habitat and wetlands, or other irrigation water management that results in the creation of riparian habitat and wetlands, the County protects the associated riparian habitat and wetlands from adjacent development. The County's Voluntary Stewardship Program, once approved (in 2018) is expected to protect these areas from agricultural activities.</p> <p>The County does not regulate irrigation district construction or operational activities associated with drains, wasteways, canals or other water</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
34	Continued: Critical Areas (streams)	Seth Defoe (Kennewick Irrigation District)		<p>management facilities, although the County does encourage irrigation districts to avoid impacts to wetlands and riparian areas when possible. The County acknowledges that when these facilities are lined or piped and associated hydrology changes occur that reduce riparian or wetland habitat then the critical area functions also change, typically through reduced or in some cases eliminated function.</p> <p>The County has added the following note to the critical area maps per KID's comments:</p> <ul style="list-style-type: none"> • R.C.W. 36.70A.030 (5) states that Fish and Wildlife Habitat Conservation Areas do not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company. Any mapped streams or habitat areas associated irrigation systems consistent with this provision are not considered designated Fish and Wildlife Habitat Conservation Areas.
35	Reservoirs	Seth Defoe (Kennewick Irrigation District)	<p>Page 58, Section 4.5.2.1.2, Yakima River:</p> <p>While the Yakima Project does technically have six reservoirs, really only five of them are major. Clear Creek Reservoir is quite small (5,300 acre-feet) and is used primarily for recreation. During the 2015 drought, Clear Creek Reservoir was not drawn down as a source of irrigation water, even though supplies for pro-ratable irrigators were curtailed to 47 percent.</p> <p>In addition, as noted, the reservoirs can also contribute to higher summer flows in the Yakima River compared to historical conditions, especially in the upper river below the reservoirs. However, the opposite may be true in some reaches below diversions, such as the reach between Prosser Dam and Chandler Power and Pumping Plant.</p>	Clarifications will be made to update this discussion.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
36	Water Temperature	Seth Defoe (Kennewick Irrigation District)	<p>Page 59, Section 4.5.2.1.2, Yakima River:</p> <p>Higher temperatures in the lower Yakima River may not be caused by lower flows, as the water is already warm by the time it enters Benton County. Studies have shown that adding flow to the lower river does not significantly lower the temperature of the water, which is correlated instead to ambient air temperatures.</p>	<p>Revise the discussion in this section to read:</p> <p>The current condition of the Yakima River, especially in its lower reaches in Benton County, is degraded and poor due to high ambient air temperatures, lower summer flows, non-point source pollution, and areas of high water temperatures, all of which are functionally related.</p>
37	Water Rights	Set Defoe (Kennewick Irrigation District)	<p>Page 61, Section 4.5.5, Focus on the Yakima River Basin:</p> <p>The first paragraph mentions that Kennewick and Roza irrigation districts get large portions of their water under a 1905 Yakima River water right. To expand on this, Roza gets 100% and KID gets 84% of their respective water supplies from a Yakima River water right with a priority date of May 10, 1905. This water right is "pro-ratable," which means that in years of drought these supplies are curtailed to an amount that is based upon total water supply available. In 2015, Roza received only 47% of their water supply; KID received more overall due to the ability to take all waters above the flow target at Prosser Dam, but still experienced substantial shortages during the hot summer months due to significant swings in river levels. KID is currently working with the Bureau of Reclamation and other stakeholders to electrify the hydraulic pumps at Chandler that supply most of the KID. This project will eliminate significant shortages for KID water users, and will also provide some water security for other pro-ratable water users by eliminating the need for KID to call upon storage water in the future. Electrification of the pumps will also provide an opportunity to provide more instream flow in the Yakima River between Prosser Dam and Chandler.</p>	<p>Revise paragraph 4.5.5.1 to read:</p> <p>A large portion of the Benton County irrigated agriculture within the Yakima River Basin, including both the Kennewick (KID) and Roza (Roza) irrigation districts, receives irrigation surface water through the U.S. Bureau of Reclamation's Yakima Project. Roza and KID have 1905 water rights that are junior and subject to pro-rationing in droughts and other low water years. In years of drought these supplies are curtailed to an amount that is based upon total water supply available. Roza only received 47 percent of its supply in the 2015 drought, and KID also had a reduced supply. These reduced supplies can have significant impacts on crops and the regional economy.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
38	Water Rights	Seth Defoe (Kennewick Irrigation District)	<p>Pages 63 & 64, Section 4.5.5.4, Developing a Yakima River Basin Rural Water Supply Program:</p> <p>KID appreciates the County's recognition of groundwater development issues in the Yakima basin, and the potential impacts of groundwater withdrawals on instream flows and on other more senior water users. As you are aware, KID claims ownership of the artificially stored groundwater found in Badger Coulee and other areas within the district where it can be shown that seepage from KID canals and return flows from applied KID irrigation have contributed water that is stored in the shallow aquifers. KID requests that the County work in coordination with KID and other stakeholders on developing the program to address rural water supplies.</p>	The County acknowledges KID's ownership assertion for stored groundwater in Badger Coulee and other areas, and considers this assertion in the evaluation of development proposals when determining if water is physically and/or legally available.
39	Development	Ron C. Cowin (Sunnyside Valley Irrigation District)	<p>Buildings, permanent structures, trees, etc. will not be allowed within SVID easement or right of-way.</p> <p>Non-permanent improvements such as fences, pipelines, landscaping, etc. will not be allowed within SVID easement or right-of-way unless prior approval is obtained through the permitting process.</p> <p>Runoff and/or crossings into or across any SVID facility will not be allowed unless prior approval is obtained through the permitting process.</p>	Comment noted
40	Critical Areas (streams)	Lori Brady (Sunnyside Valley Irrigation District)	<p>Appendix A, Map Folio, Figure 9 it appears SVID's Joint Drain Facilities have been designated as wetlands, rivers, and streams. In addition, on Figure 13 they have been identified as fish and wildlife habitat conservation areas. Under the current Critical Area Ordinance all irrigation district distribution facilities, waterways and drains are exempt from the definition of a wetlands because they are non-natural water courses. It is also stated in the current Critical Area Ordinance that Fish and wildlife conservation areas do not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company. It should be clear that those non-natural water courses are categorically exempt and should be removed from both maps.</p>	See response to Comment #34.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
41	Transportation	Paul Gonseth (WSDOT)	The Draft Comprehensive plan states that peak hour congestion occurs in the urban areas, including SR 240. However, no additional information, data or modeling is provided about state transportation facilities in the draft plan or appendices.	See response to Comment #4. Updated projections for LOS for County roads were provided as part of this update.
42	Transportation	Paul Gonseth (WSDOT)	<p>The EIS Addendum, Transportation/Circulation element identifies some potential impacts of the Proposed Action in Appendix B. However, there are no specifics. What are the transportation demand management approaches to address the congestion? Where and on how much will SR 240 be affected? Where are the areas of increased density and how much of an increase is estimated?</p> <p>Specific comments on the EIS Addendum, Table Page 19 are as follows:</p> <ol style="list-style-type: none"> 1. 1st bullet - clarify what is intended in this mitigation measure. Is it impact fees? 2. 2nd/ 4th bullets - Clarify if active transportation projects become funding priorities over other projects. 3. 3rd bullet - Clarify how cooperating on levels of service will mitigate impacts. <ol style="list-style-type: none"> a. What is the resulting Level of Service on state facilities by the proposed land use changes? b. How is the minimum level of service of D for urban areas and C for rural areas maintained by the changed land use designations? 	<p>See response to Comments #4 and #41.</p> <p>Additionally, the following responses are provided to the specific comments:</p> <ol style="list-style-type: none"> 1. The County does not plan to implement impact fees at this time. Mitigation measures will reference proposed county improvements, as applicable, and other improvements referenced in WSDOT, BFCG, and city plans. 2. Transportation projects are typically funded by County sources that do not compete with other capital projects funding in the County. Active projects are typically given higher priority. 3. Cooperating on levels of service - <ol style="list-style-type: none"> a. State facilities LOS will be evaluated based on expected changes from the County's plan. LOS and associated evaluation results will be included in Appendix H-2. b. LOS is maintained through the excess capacity that exists on these county roads. Overall densities are not substantially changing, except in a few localized areas, and these are areas where it has been determined by County staff that excess capacity also exists.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
42	Continued: Transportation	Paul Gonseth (WSDOT)	<p>c. How are improvements that are needed to maintain LOS to be financed?</p> <p>d. How are improvements identified in regional plans having a beneficial impact?</p> <p>We request that the effects of the proposed Comprehensive Plan update on state facilities are evaluated and included in the draft Plan update and EIS Addendum.</p>	<p>c. County road funding and other transportation improvements help to maintain LOS.</p> <p>d. The improvements identified in regional plans have a beneficial impact by providing an integrated transportation network that the County will continue to support.</p> <p>The County does not plan to conduct additional traffic analysis at this time but will qualitatively describe potential effects on state facilities from the comprehensive plan.</p> <p>Additionally, BFCG concurrency/consistency review will be sought as part of completing the final plan, and this review will also be coordinated with WSDOT.</p>
43	Transportation	Paul Gonseth (WSDOT)	Finally, we support the endorsement and promotion of multi-modal and active transportation policies and actions for bicycle and pedestrian facilities that are included in the proposal.	Comment noted
44	Compact Development	Futurewise (page 4 of 11/20/17 letter)	<p>Add a policy encouraging compact development in urban growth areas under LU Goal 1. Compact development conserves water, reduces costs for taxpayers and ratepayers, and is more affordable because the land per housing unit is less. So, we recommend that a policy encouraging well designed, compact development in urban areas be included under LU Goal 3. We recommend adoption of the following new policy:</p> <p>Policy 2: Encourage well-designed, compact development in urban growth areas to save taxpayers and ratepayers money, conserve water, reduce water pollution, and support transit use.</p>	<p><u>Revise as noted.</u></p> <p>2.2 Land Use – LU Goal 1 – add a new Policy 6: Encourage compact development within urban growth areas.</p> <p>2.2.1 Urban Growth – LU Goal 3 – add a new Policy 2: Encourage well-designed, compact development in urban growth areas to save taxpayers and ratepayers money, conserve water, reduce water pollution, and support transit use.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
45	Population Projection	Futurewise (page 4-5 of 11/20/17 letter)	Benton County has chosen a 20-year population projection at the high end of the State of Washington Office of Financial Management (OFM) population projection range to size its urban growth areas (UGAs). ¹¹ But Benton County is growing slightly under the OFM Medium Projection. ¹² So, Benton County will not need new communities outside the existing UGAs to accommodate its growth over the next 20-years. ... the demand for water is forecast to exceed the supply in two of the three basins in Benton County by 2035, which is within the 20-year horizon of this comprehensive plan update. Establishing new communities outside UGAs will likely require the diversion of water from agriculture to those new communities, harming the county economy. ¹³ So we recommend that LU Goal 5 and Policies 1 and 2 be deleted.	<p><u>Revise as noted.</u> Consistent with Dept. of Commerce Comment #23, remove LU Goal 5 and Policies 1 and 2 on page 14.</p> <p>The County will review the future growth trends and adjust population projections if necessary.</p> <p>New communities outside the UGA are not expected.</p> <p>Also, the State referenced water demand forecast does not include Groundwater - "Groundwater supplies were not modeled or quantified in the 2016 forecast." The County expects that the combination of surface and groundwater supplies will be adequate to meet growth needs through 2038, and beyond, but the County is also committed to developing technical studies that verify and confirm this understanding or indicate otherwise and then will develop and implement strategies that consider interim measures, mitigation, and other measures to address study findings. These additional water management strategies will be pursued during plan implementation with the aim of improving water supply reliability for existing and future demands.</p> <p>Further, the County will be addressing specifically rural exempt water supply through the water management program outlined in Section 4.5 of the Comprehensive Plan.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
45	Continued: Population Projection	Futurewise (page 4-5 of 11/20/17 letter)		Additionally, Benton County supports access and use of the water reservation out of the McNary and John Day pools for future agricultural and municipal water needs (WAC 173-531A-040 and 050), and the County will work with the State to access this reservation of water to support growth along with other water supply strategies that are being or will be pursued as described in Section 4.5.
46	Rural Lands	Futurewise (pages 6-8 of 11/20/17 letter)	We are concerned that the goal and policies in 2.2.3 Rural Lands do not protect rural character. Water resources for new uses is very limited to non-existent in Benton County and new water uses typically require mitigation. The WRIA 37 forecast shows that by 2035, demand will exceed supply during parts of high, middle, and low flow years. ¹⁸ The forecasts show that the frequency of pro rating water, reducing water available to junior water rights holders, will increase. ¹⁹ In WRIA 40, demand will exceed supply in low water years as occurs now. One challenge Benton County faces regarding the wildfire hazard is from the increasing number of houses being built on the urban/rural fringe compared to 20 years ago. Wildfires are a frequent occurrence in Benton County.	2.2.3 Rural Lands – Land Use Goal 7 <u>Revise as noted.</u> LU Goal 7: Preserve rural lifestyles outside UGAs and incorporated areas while accommodating new population growth <u>consistent with the protection of rural character.</u> <u>Revise as noted.</u> LU Goal 7, Policy 1: Maintain overall residential densities within rural residential areas that reflect rural character as defined by the GMA and are low enough to perpetuate rural lifestyles, which are typically characterized locally by a predominantly open landscape inhabited by households engaged in diverse and recreational land use activities related to livestock and crop production; <u>protect surface and ground water; and that can be supported by available public services</u>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
46	Continued: Rural Lands	Futurewise (pages 6-8 of 11/20/17 letter)	<p>Benton County Wildfire Protection Plan Steering Group concluded that the population and housing growth anticipated in rural Benton County "will certainly stretch the current firefighting resources of each fire district in the county. Firefighting infrastructure will have to also expand."</p> <p>We recommend that LU Goal 7 & and Policy 1 be modified to better protect rural character including water availability. We also recommend adoption a of new policy to protect people and property from wildfires and other natural hazards. Our additions are underlined and our deletions are struck through.</p> <p>LU Goal 7: Preserve rural lifestyles outside UGAs and incorporated areas while accommodating new population growth <u>consistent with the protection of rural character.</u></p> <p><u>Policy 1:</u> Maintain overall residential densities within rural residential areas that reflect rural character as defined by the GMA and are low enough to perpetuate rural lifestyles, which are typically characterized locally by a predominantly open landscape inhabited by households engaged in diverse and recreational land use activities related to livestock and crop production; <u>protect surface and ground water; and that can be supported by available public services.</u></p> <p><u>Policy 4: Direct rural development away from urban/wildland interface, areas without adequate emergency services, and other areas subject to natural hazards.</u></p>	<p><u>Add new policy.</u> LU Goal 7, Policy 4: Encourage the reduction of fire risk and urban/wildland interface through fire-wise principles, prevention measures, and other programs.</p> <p>Also, as noted in response to Comment #45, the County has water supplies and strategies identified to support the projected growth.</p>
47	Water Resources	Futurewise (page 8 of 11/20/17 letter)	<p>Modify Policy 2, on page 18 under "2.4.3 Rural Domestic Water Policies" to reflect that all ground water pumping affects instream flows and to protect industries that rely on water supplies and senior water right holders.</p>	<p>We believe our findings our consistent with the existing science, and that this science indicates that all groundwater pumping does NOT affect instream flows.</p> <p>The USGS model for the Yakima River does document that groundwater pumping affects flows, and that some affect occurs from basalt pumping but only a small percentage of basalt pumping affects flows, a 1% change at Richland or a 19% mean annual pumpage amount, suggesting much of the basalt pumping has no effect on the Yakima River flows.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
47	Continued: Water Resources	Futurewise (page 8 of 11/20/17 letter)	The ground water model developed by the U.S. Geological Survey documents that ground water pumping in the Yakima basin affects stream and river flows, including ground water pumping from basalt hydrogeologic units. ²⁵ Permit-exempt wells alone affected instream flows. ²⁶ We recommend that Policy 2 on page 18 under "2.4.3 Rural Domestic Water Policies" be modified to reflect these scientific findings.	<p>The report states that "basalt pumpage was not as important... to simulated effects on surface water resources." It only accounted for about 16 to 17 percent of the effect on flows, even though significant basalt aquifers pumpage occurs.</p> <p>Additionally, the cumulative effect from rural exempt wells on surface water was minimal, even when considering the entire basin. It was noted that during model calibration the effects from exempt well pumping combined with septic system returns were so small that calibration with variations in flows made it difficult at times to even see an effect. Benton County represents only a small portion of the basin and likely even a smaller portion of rural exempt well pumping, and with many rural exempt wells completed in the basalt aquifers. The water management planning, studies and strategies outlined in Section 4.5 are designed to address effect on instream flows from rural exempt well usage as applicable.</p> <p>See response to Comment #48 for edits to the referenced Policy 2.</p>
48	Water Resources	Futurewise (page 8 of 11/20/17 letter)	<p>...we also recommend that the policy be modified reflect the high priority of maintaining water for agriculture, other industries, and municipal water right holders. Our recommended additions are underlined and our recommended deletions are struck through.</p> <p>Policy 2: Recognize that new rural water right permit exempt wells in the unconfined aquifer adjacent to the Yakima River basin are junior to senior surface water rights <u>including instream flows, and may have the potential to impair these water rights for impairment. Support implementing/Implement</u> mitigation strategies to offset impacts from exempt wells that allow for continued growth and development <u>if sufficient water supplies will be available for the agricultural industry, other industries, and municipal water rights holders.</u></p>	<p>See response to Comment #47. Additionally, instream flows are not established on the Yakima River but do exist on the Columbia River as measured at McNary and John Day dams (WAC 173-563)</p> <p>Policy 2 will be revised to read: Recognize that new rural water right permit exempt wells are junior to senior surface and ground water rights, and may have the potential to impair these water rights. Support the implementation of water management and mitigation strategies to avoid or offset impacts from exempt wells, as applicable, that allow for continued growth and development consistent with the land use plan.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
49	Water Resources	Futurewise (page 9 of 11/20/17 letter)	<p>... water resources are limited in Benton County and the demand for water is forecast to exceed the supply in two of three Benton County basins by 2035.²⁹ Water conservation and focusing growth into existing cities and towns can stretch water supplies and accommodate growth and it is important to reserve water for agriculture and value-added agricultural processing and manufacturing to maintain and enhance the county economy. So, we recommend that a policy be added to 2.4.5 Agriculture Policies to reserve sufficient water for agriculture and its related industries. We recommend a new policy like the following:</p> <p>Policy 5: Reserve sufficient water to maintain the agricultural industry and agricultural processing and value-added manufacturing.</p>	See response to Comment #45.
50	Transportation	Futurewise (page 10 of 11/20/17 letter)	While the comprehensive plan includes many good transportation policies, we recommend that a complete streets policy be included too.	Add a new complete streets policy to 2.8 Transportation Element – TE Goal 1 – Policy 12: Support the development of a complete streets policy that would make accommodations for pedestrian, bicycle, and transit users on appropriate roadways.
51	Low Impact Development	Futurewise (page 10 of 11/20/17 letter)	<p>Low impact development (LID) requirements can reduce the adverse storm water impacts of new development and redevelopment. The benefits of LID include reduced flooding, improved water quality, and increased ground water recharge replenishing drinking and irrigation water supplies.³¹ Low impact techniques can reduce costs for developers by reducing storm water facilities sizes and the land needed for those facilities.³² We recommend that the comprehensive plan include policy requiring new development to comply with the with low- impact development (LID) requirements from the <i>Eastern Washington Low Impact Development Guidance Manual</i>.³³</p>	Add a new low impact development policy to 2.5 Critical Areas – CA Goal 1 – Policy 2: Encourage new development and redevelopment in urban growth areas and large developments outside of urban growth areas to comply with low impact development standards as applicable.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
52	Agricultural Lands	Futurewise (page 11 of 11/20/17 letter)	We recommend that the <i>Benton County Comprehensive Plan</i> explicitly set out the County's criteria for agricultural lands of long-term significance. Section 3.32.5 would be a good location for the criteria, but they could be elsewhere. Section 4.3.1, Agricultural Soils, on page 54 includes some criteria, but as will be documented below seems to indicate that agricultural lands designations are done on a case-by-case basis, which is not the case. ³⁴	Criteria used for conducting the comprehensive, county-wide update of designated agricultural lands of long-term commercial significance will be included in Section 4.3.1. The language describing this analysis was conducted on a case by case basis will be struck from the plan, as this description is inaccurate.
53	Water Quality	Futurewise (page 11 of 11/20/17 letter)	While Chapter 4 does review some flooding issues, the land use element does not. Both chapters lack adequate policies or other measures to protect water quality. We recommend the following improvements: Include a policy or other provision requiring "green infrastructure" in new developments and redevelopments to address flooding and storm water runoff. ³⁶ Green infrastructure refers to using storm water infiltration, retaining native vegetation, and similar measures to manage storm water.	Add a new "green infrastructure" policy to 2.2 Land Use – LU Goal 1 – Policy 7: Encourage "green infrastructure" in new developments and redevelopments to address flooding and storm water runoff.
54	Low Impact Development	Futurewise (page 12 of 11/20/17 letter)	Low impact development should be required for new development and redevelopment in urban growth areas and encouraged for large developments outside urban growth areas. ³⁷ Low impact development retains native vegetation, reduces impervious surfaces, and uses infiltration and transpiration to manage storm water.	See response to Comment #51 above - Add a new low impact development policy to 2.5 Critical Areas – CA Goal 1 – Policy 2: Encourage new development and redevelopment in urban growth areas and large developments outside of urban growth areas to comply with low impact development standards as applicable.
55	Water Quality	Futurewise (page 12 of 11/20/17 letter)	Incorporate the other applicable water quality management recommendations from <i>Land Use Planning for Salmon, Steelhead and Trout</i> . ³⁸	The County's Critical Areas Ordinance update, along with the recently approved and updated Shoreline Master Program, which is incorporated into this Comprehensive Plan update by reference, includes goals and policies applicable to water quality management standards for salmonids. Add a new water quality policy to 2.4 Water Resources – WR Goal 4 – Policy 4: Protect and enhance water quality to improve habitat conditions for salmonids.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
56	Rural Element Densities	Futurewise (page 12 of 11/20/17 letter)	<p>We were unable to identify measures in either Chapters 3 or 4 that meet these [RCW 36.70A.070(5)(c)] requirements with exception of the 150-foot-wide setback adjunct to agricultural lands, which we strongly support. We recommend including the following measures in the Chapter 3's rural element:</p> <p>Rural comprehensive plan designations with 40- and 80-acre minimum lot sizes and allowed densities. These densities will help better match rural growth with available water supplies, protect water quality and quantity, and better protect fish and wildlife habitats.</p>	<p><u>Rural Element:</u> Benton County's GMA Agricultural District incorporates a 20-acre minimum lot size. Rural land lot sizes range in size up to 20 acres. This plan proposes moving 7,130 acres from Rural Remote, a 5 acre density designation to Rural Resource, a 20 acre density designation. Additionally, the plan proposes a net increase of 1,400 acres moving from rural land designations to GMA Agriculture. These changes assist the county with densities that better protect agriculture, hillsides, landslide/steep slope areas, water supplies and fish and wildlife habitats/corridors.</p>
57	Rural Element Impervious Surfaces	Futurewise (page 12 of 11/20/17 letter)	<p>Limit impervious surfaces and retain native vegetation and native soils.³⁹ These measures will protect water quality and quantity, and better protect fish and wildlife habitats, and help assuring visual compatibility of rural development.</p>	<p><u>Rural Element:</u> Add a new impervious surface policy to 2.2 Land Use – LU Goal 7 – Policy 4: Limit impervious surface in rural lands by implementing maximum lot coverage in the development regulations.</p>
58	Rural Element Floodplain	Futurewise (page 13 of 11/20/17 letter)	<p>Direct new development away from the 100-year floodplain.⁴⁰ This will protect fish and wildlife habitat and people and property.</p>	<p><u>Rural Element:</u> Add a new floodplain policy to 2.2 Land Use – LU Goal 7 – Policy 5: Encourage new rural development away from the 100-year floodplain, and as guided in the County's Flood Damage Prevention Ordinance, Critical Area Ordinance, and Shoreline Master Program.</p>
59	Rural Element CMZ's	Futurewise (page 13 of 11/20/17 letter)	<p>"Discourage new dwelling units or expansion of existing structures within the [channel migration zone] CMZ."⁴¹ "Allow no development in CMZ plus 50 feet."⁴² Exceptions must be mitigated and not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonids. Like directing development away from floodplains, this measure will protect fish and wildlife habitat and people and property.</p>	<p><u>Rural Element:</u> Add a new CMZ policy to 2.5 Critical Areas – CA Goal 3 – Policy 6: Any developments, uses, and/or activities in the CMZ should be consistent with the standards in the Shoreline Master Program.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
60	Landslide Hazard Areas Streams/Rivers	Futurewise (page 13 of 11/20/17 letter)	"Give special protection to landslide hazard areas that can damage rivers and streams during mass wasting events." ⁴³ This measure will protect fish and wildlife habitat and people and property.	<u>Rural Element:</u> Add a new landslide areas policy to 2.5 Critical Areas – CA Goal 3 – Policy 7: Protections associated with landslide areas should be maintained according to the standards in the County Critical Area Ordinance and Shoreline Master Program.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
61	Rural Areas	Futurewise (page 15 of 11/20/17 letter)	<p>... the <i>Benton County Comprehensive Plan Update</i> plans for 1,142 people in the Rural Transition comprehensive plan designation and 5,652 people in the Rural Remote designation over the next 20 years.⁵⁷ This level of growth in the rural areas is unsustainable. We recommend lower densities and higher minimum lots sizes in the rural areas and directing more growth into existing cities and towns. This is necessary to save taxpayers money, protect people and property, and reserve water resources for uses that bring a greater economic payoff to Benton County and its residents and businesses.</p>	<p>Our evaluation of the projected growth is that existing water supplies and planned water management strategies, roads and other infrastructure and standards are in place to sustainably accommodate this and additional growth that would occur beyond the next 20 years. Additionally, technical studies are planned in 2018 to further evaluate and refine this understanding, and develop a long-term program for accommodating projected growth, including interim measures, mitigation and other strategies as described further in response to Comments #11, #45, #47, #48 and others.</p> <p>The Rural Element of the comprehensive plan, provides for those rural areas not designated urban, agricultural, or mineral resource, and maintains the variety of densities that are consistent with the county's rural character. While accommodating the County's rural population growth rate, the county is continuing to protect its agricultural lands, mineral resources, rural character and encouraging growth in areas and ways that protects the County's water supplies, hillsides and fish and wildlife areas. See response to Comment #62 for information regarding the County's plan to move approximately 7,130 acres from a rural remote designation with a 5 AC/DU classification, to a rural resource designation of 20 AC/DU. Additionally, the plan proposes a net increase of 1,400 acres moving from rural land designations to GMA Agriculture. This will assist in preserving lands for rangeland, agricultural uses, protecting hillsides, protecting property from landslides/steep slope areas, water supplies and fish and wildlife habitats/corridors.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
62	Wildland/Urban Interface	Futurewise (page 15 of 11/20/17 letter)	<p>Increased residential development in the urban/rural fringe has “produced a significant increase in threats to life and property from wildfires.”⁵⁸ To reduce future fire hazards and development that is beyond the capability of the fire protection systems, we recommend that the following provisions be added the comprehensive plan.</p> <p>First, the areas identified as being within the wildland-urban interface should be designated and zoned for rural densities of one dwelling unit per 20, 40, or 80 acres or as GMA Agriculture.</p> <p>Second, new developments should meet Firewise Communities Program standards or the equivalent.</p> <p>Third, the Firewise Principles recommend “‘two ways out’ of the neighborhood for safe evacuation during a wildfire emergency.”⁶² So does the U.S. Fire Administration.⁶³ Two ways out is important to protect the safety of property owners, residents, and firefighters. All new subdivisions and other significantly sized developments should have two ways out.</p>	<p>The comprehensive plan proposes adding 7,130 acres of land, previously designated Rural Remote (5 AC/DU), to the Rural Resource designation (20 AC/DU). Additionally, the plan proposes a net increase of 1,400 acres moving from rural land designations to GMA Agriculture. This change provides the county with larger lot sizes to assist in preserving lands for rangeland, agricultural uses, protecting hillsides, protecting property from landslides/steep slope areas, water supplies and fish and wildlife habitats/corridors.</p> <p>Add a new transportation policy to 2.8 Transportation Element – TE Goal 1 – Policy 12: Maintain location and alignment of all proposed streets within a subdivision compatible with existing and planned streets, topographical conditions, public convenience and safety, and the proposed uses of the land to be served by such streets. Limit dead-end street to 600 feet in maximum length as a means of protection to property owners, residents, and emergency personnel.</p> <p>Will review and address access requirements with the Fire Marshal as it relates to new development and access standards.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
63	Water Resources	Futurewise (page 16 of 11/20/17 letter)	<p>The second sentence in Guiding Principle 3 is not accurate. As we have documented previously, water is limited in all of the county's geographical areas, not some. We do however agree, that if managed well, including focusing growth in areas where water use is reduced such as existing cities and towns, that water resources do exist to meet current and future needs, although perhaps not in low water years as was also documented above. So, we recommend that the second sentence in Guiding Principle 3 be modified to read as follows with our deletion struck through and our addition underlined.</p> <p>3. Focus on improving water resource management at all jurisdictional levels by supporting the efforts of municipal and special purpose governments within Benton County and a legislative agenda at the federal and state level. Though limited in some geographical areas, water resources physically exist within Benton County to meet current and future needs <u>if used wisely</u> and innovative strategies are required to allow beneficial use of these water resources.</p>	<p>Our understanding is that physical limitations exist in some areas of the County, but many areas have plentiful water supplies. Studies, strategies, and actions identified in Section 4.5 will help to verify and update the technical understanding of water availability in the County, as applicable, starting first with the Yakima basin portion of the County as discussed in several other responses to comments.</p> <p>Revise Guiding Principle 3 to read:</p> <p>3. Focus on improving water resource management at all jurisdictional levels by supporting the efforts of municipal and special purpose governments within Benton County and a legislative agenda at the federal and state level. Though limited in some geographical areas, water resources physically exist within most areas in Benton County to meet current and future needs. Effective water management and innovative strategies are required to allow beneficial use of these water resources.</p>
64	Water Resources	Futurewise (pages 16-17 of 11/20/17 letter)	<p>Guiding Principle 8 could be read as being inconsistent with RCW 36.70A.070 because it does not recognize that the plan must be consistent with available water resources. We recommend that Guiding Principle 8 be modified to read as follows with our additions underlined.</p> <p>8. <u>The land uses and intensities provided for in the comprehensive plan shall be consistent with available long-term water supplies and the protection of the quality and quantity of groundwater used for public water supplies.</u> Support securing long-term, sustainable water supplies sufficient to realize the build out of the land uses designated in the Comprehensive Plan <u>that are consistent with this principle</u> as well as the Hanford Comprehensive Land Use Plan.</p>	<p>See response to Comments #45, #47, #48, #61, and #63.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
65	Agricultural Lands	Futurewise (page 17 of 11/20/17 letter)	<p>... under the discussion of agricultural soils, the <i>Comprehensive Plan Update</i> appears to indicate that agricultural resource land of long-term commercial significance "are determined on a case-by-case basis by assessing a variety of factors including, but not limited to, classification of prime and unique farmland soils, proximity to urban areas, proximity to markets, and other factors."⁷⁰ We recommend that this language be deleted. Agricultural lands of long-term commercial significance must be designated and dedesignated through a comprehensive review, not a case-by-case review. We also recommend that the comprehensive plan clearly spell out the criteria for designating agricultural lands of long-term commercial significance and mineral resource lands of long-term commercial significance.</p>	<p>Revise as noted. See also response to Comment #52.</p>
66	Agricultural Lands	Futurewise (page 18 of 11/20/17 letter)	<p>The County's 20-acre minimum lot size GMA Agriculture (GMA AG) designation is not sufficient to conserve agricultural lands of long-term commercial significance. "Lot sizing for agriculture at up to 40 acre densities merely causes rural sprawl."⁷³ So we recommend that the minimum lot size and density for the GMA Agriculture designation be changed to one dwelling unit per 40 acres to conserve agricultural land. As required by the Washington State Supreme Court's <i>Soccer Fields</i>,⁷⁴ <i>Lewis County</i>,⁷⁵ and <i>Kittitas County</i>⁷⁶ decisions, nonagricultural uses should not be allowed in the GMA Agriculture zone. Value added agricultural uses should be allowed.</p>	<p>A 20 acre density in the GMA Agriculture designation has historically been and continues to be an appropriate minimum lot size density to conserve and protect agricultural lands of long term commercial significance in Benton County.</p> <p>Since the County's first GMA compliant Comprehensive Plan was adopted nearly 20 years ago (1998), there have been less than 3 short plats per year (approx. 2.6), of an agricultural nature and complying with the required agricultural density, within the GMA Agriculture designation in all of Benton County.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
67	Capital Facilities Element	Futurewise (page 18 of 11/20/17 letter)	RCW 36.70A.070(3)(e) provides in relevant part that the capital facilities element shall include "a requirement to reassess the land use element if probable funding falls short of meeting existing needs" We were unable to find where this requirement is addressed in the capital facilities element. Proposed 9.3.2 discusses what will happen if local funding referendums are not held or not successful, but reassessing the land use element is not one of the options. ⁷⁷ We recommend that proposed 9.3.2 be deleted and the requirement to reassess the land use element if probable funding falls short of meeting existing needs be substituted.	<p>Revise 9.3.2 to read:</p> <p>When funding is unavailable to meet existing needs and support plan implementation or as County priorities evolve, the CFP will be revised at the next annual amendment in one or more of the following ways, as applicable:</p> <ul style="list-style-type: none"> • Reduce the LOS for one or more public facilities • Increase the use of other sources of revenue • Decrease the cost, and therefore the quality of some types of public facilities while retaining the quantity of the facilities that is inherent in the standard for LOS • Decrease the demand for and subsequent use of public facilities • Reassess the land use element
68	Capital Facility Plan	Futurewise (page 19 of 11/20/17 letter)	We recommend that the project "Adair Road from the end of County Road to Christensen (1.1 Miles)" be deleted from the Capital Facility Plan. ⁷⁸ This project is justified based on the industrial development of the area, but the area is currently designated GMA Agriculture and is proposed to be designated as Rural Remote. So, industrial development of this area is, at least, premature. RCW 36.70A.120 provides that "[e]ach county and city that is required or chooses to plan under RCW 36.70A.040 shall perform its activities and make capital budget decisions in conformity with its comprehensive plan." Building an industrial road in an agricultural or rural area is not consistent with the County Comprehensive Plan.	The County's Capital Facilities Plan will be revised at the next annual amendment to more accurately reflect the Adair Road project being built as a rural roadway.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
69	Agricultural Long-Term Economic Significance Criteria	Futurewise (page 19 of 11/20/17 letter)	<p>In Benton County, the application of certain pesticides is restricted countywide including the aerial application of certain herbicides.⁷⁹ The term pesticides includes herbicides and insecticides.⁸⁰ In North Horse Heaven Hills the aerial application of certain pesticides is prohibited, certain formations are prohibited during certain times of the year, and the application of certain herbicides is limited to certain hours.⁸¹ Similar restrictions apply to two other areas.⁸² These limitations apply to very large areas.⁸³ Other counties also have restrictions and some restrictions apply to all of eastern Washington.⁸⁴</p> <p>... we do not believe that pesticides or herbicide restrictions affect long-term economic significance. So, this criterion should be dropped.</p>	<p>These criteria, while perhaps less important than some of the other considerations in the comprehensive review and update of the agricultural lands designations for the County, are still applicable in certain conditions and areas in the County. It is one additional factor that can contribute to whether lands meet the definition of agricultural lands of long-term commercial significance. For example, marginal dryland ground with low precipitation, required higher inputs (with associated increased production costs) and with aerial chemical application restrictions can result in a cumulative effect that can make ground uneconomical to farm.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
70	Agricultural Lands	Futurewise (page 20 of 11/20/17 letter)	<p>We do not support the removal the current GMA Agriculture lands southwest of Kennewick and west of Richland. These areas are separated from the urban growth areas and cities by I-84, a divided four lane interstate highway.⁸⁸ So they are not proximate to cities or urban growth areas. These areas have high quality Non-Irrigated Land Capability Class soils and, in large part, receive more than six inches of rain a year.⁸⁹ Only 2.3 inches of available water is needed before wheat development begins.⁹⁰ Dryland wheat is grown in areas with six or more inches of average annual precipitation.⁹¹ Grazing, which requires less water, is also an agricultural use under the GMA.⁹² So these areas have water suitable for agriculture. They are not needed for other uses and if reclassified as rural will increase the fire danger and contribute to increased water demands in two overallocated basins.⁹³ We recommend they retain their GMA Agriculture designation.</p>	<p>Comments are noted.</p> <p>The County engaged in a county-wide, comprehensive assessment of all potential agricultural lands using relevant criteria in the WAC and relevant case law. Based on our analysis and application of these criteria we have concluded that the referenced lands are proximate to cities and UGAs and no longer meet the definition of agricultural lands of long-term commercial significance.</p> <p>Dryland agriculture even with higher quality soils when located in lower rainfall areas will produce less yield. The ideal time to plant dryland wheat in Benton County is late August through September, and in the areas with higher precipitation there is typically sufficient moisture stored deeper in the soil to support germination and plant growth prior to winter. For lower precipitation areas, planting is often delayed into October or even early November based upon precipitation events that occur in the fall, and the lack of stored moisture in the soil column. This delayed planting and reduced growing time typically results in reduced yields as plants are not able to mature prior to winter, and are more prone to winter kill.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
70	Continued: Agricultural Lands	Futurewise (page 20 of 11/20/17 letter)		<p>These conditions and the associated reduced yields on lands with lower precipitation affect the long term commercial significance of these lands, was one of the finds along with other findings consistent with our criteria that led to the de-designation of the referenced areas.</p> <p>Regarding grazing, grazing on land with lower precipitation typically produces less forage density. Grazing in Benton County primarily occurs on irrigated ground (pasture) or irrigated ground after row crop production (e.g., corn) is complete, or on larger tracts of dryland ground (typically thousands of acres) with higher elevation and higher precipitation dryland areas in the County (that produces adequate forage). Even with these conditions the dryland can only sustain grazing for a few weeks before the forage is consumed. The short periods of time that this ground can be grazed in a year makes it commercially less viable for long term use of the land for agricultural grazing. Accordingly, this limited grazing potential was not considered as a valid criterion for determining long-term commercial significance of dryland agriculture.</p>

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
71	Positive Feedback	Futurewise (page 20 of 11/20/17 letter)	<p>While we cannot list all of the well done goals, polices, and provisions, we do want to identify the following provisions as particularly well done:</p> <ul style="list-style-type: none"> • The water resources policies in Section 2.4 of Chapter 2. • The critical areas policies in Section 2.5 of Chapter 2. • PR Goal 2 of Chapter 2 which calls for working with cities and agencies to protect greenways and open spaces along the riverine corridor of the lower Yakima River. The Yakima River Greenway is an important Benton County asset. • Proposed PR Goal 5 and the associated historic, cultural, and archaeological resources policies from page 2 of the <i>Benton County Comprehensive Plan Update Comment/Response Summary Washington State Department of Commerce and SEPA Comment Period Sept. 12, 2017 to Nov. 13, 2017</i>. We also recommend that the policies call for the identification and protection of areas likely to contain cultural, and archaeological resources. The Washington State Department of Archaeology and Historic Preservation has developed an archaeological predictive model that can predict where archaeological resources are likely to be located and where the department recommends archaeological surveys should be completed before earth disturbing activities and other uses and activities that can damage archaeological sites are undertaken. <p>1 Significant areas in Benton County are rated "survey recommended moderate risk," "survey highly advised high risk," and "survey highly advised very high risk."</p>	

71	Continued: Positive Feedback	Futurewise (page 20 of 11/20/17 letter)	<p>2 Addressing archaeological resources upfront before projects begin can save money. For example, the Jefferson County Public Utility District's (PUD) contractor building a community septic system at Becket Point in Jefferson County encountered human bones and Native American artifacts.</p> <p>3 The contractor had to stop construction. An archaeologist was called in and conducted an investigation that allowed the project to be redesigned and to be completed. However, PUD staff "estimated the delays and additional engineering incurred because of the artifacts added about \$90,000 to the project's cost."</p> <p>4 That money could have been saved by an upfront archeological investigation.</p> <ul style="list-style-type: none"> • Futurewise supports the proposed Yakima River Basin Rural Water Supply Program and a similar program for the Columbia River basin. Requiring new subdivisions and new building permits to have physically and legally available water is just basic consumer protection. Without physically and legally available water lot and home buyers are at risk of not being able to use their water sources during times of high water demand. Requiring new subdivisions and new building permits to have physically and legally available water also protects senior water rights holders. Throughout Washington State, overdevelopment has caused wells used by farmers and homeowners to have lower yields or run dry. These proposed programs will protect current water rights holders, lot buyers, and home buyers. See <i>Benton County Comprehensive Plan Update</i> page 18, Requiring 2.4.3 Rural Domestic Water Policies, and pages 62 through 64, 4.5.5.3 Addressing Exempt Wells to Meet Long-term Growth Needs and 4.5.6 Columbia River. • PR Goal 3 of Chapter 2 calling for the conservation of visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods and the associated policies. These areas are important visual assets for the community and attract visitors to the community, contributing to the economy. 	Comments noted
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No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
			<ul style="list-style-type: none"> • The Rural Resource comprehensive plan designation which will better protect rural character, the county's very limited water resources, and adjacent natural resource lands. • Chapter 4's recognition that the Voluntary Stewardship Program, along with other management measures, can help to prevent further degradation of ground water quality and potentially improve conditions. • Including Chapter 5, the Economics Element, in the comprehensive plan. • Including Chapter 8, the Parks and Recreation Element, in the comprehensive plan. 	
72	Private Road Standards	Wayne Schmelzer 198811 E. 73 rd Kennewick	During his testimony at 11/21/17 PC meeting, he stated that he was just here to ask for an increase on the private road ingress-egress that is limited to twelve right now. He would like to see an increase in the amount of lots allowed on a graveled private road and also on a paved private road to possibly 24 or 50.	Private road standards may be addressed during implementation- specifically during the review and adoption of the subdivision code standards.
73	Summarized Comments	Alison Cable, Futurewise	During her testimony at 11/21/17 PC meeting, she summarized their comments for the record (Exhibit PCH 1.3).	See Futurewise comments in this Matrix.
74	Prosser UGAB	Kay Simon, 835 Main Street Prosser	During her testimony at 11/21/17 PC meeting, she stated that she owned property with a winery in the area proposed for expansion of the Prosser UGA. She stated that she had attended a Prosser Planning Commission meeting and that the City of Prosser has noted discrepancies within their Industrial designation which is what they wanting to designate this area. Within the Industrial designations the City has several different zoning options which are called Agri-Tourism and Agri-business. These options have discrepancies between them and the Industrial designation and what they permit within these sub designations. The City needs to come up with a way to address these discrepancies before the UGA is defined.	This Urban Growth Area Boundary request was heard by the Planning Commission in the Spring of 2017 and the Planning Commission forwarded a positive recommendation to the Board of County Commissioners and is included by reference as part of this Comprehensive Plan periodic update.

No.	Comment Topic	Commenter	Comment	Local Government Response and Rationale
75	Prosser UGAB	Jason Gilbert, 2521 Sales Yard Road, Prosser	During his testimony at 11/21/17 PC mtg, he stated that he was speaking on behalf of Bill Thompson, a land owner within the proposed UGA area for Prosser. This is about the annexed area outside of Prosser. Three out of four owners, eighty percent of the land do not want to be included in the UGA. When the City ran water and sewer services outside of their city limits they created an area of urban sprawl or leapfrog effect. This is clearly one of the reasons why the GMA was adopted. The land owners have been caught between two city lines for 30+ years. This is the second attempt to put this area within the UGA. This issue needs to be viewed more closely, we are asking the County for their help and would like a heads up on where they stand on this issue. The UGA boundary at face seems harmless until you take into account that it opens the door for potential annexation along with a sleuth of other land use issues. Coupled with the fact that the City has a total disregard for the potential impact and personal lives of the people in this area gives even more reason for the County to look into this issue and its proposed UGA.	See response to Comment #74 above.
76	Agricultural Lands	John Christensen, 3802 W. 43 rd Avenue, Kennewick	During his testimony at 11/21/17 PC meeting he stated that he wished to confirm the approval of the update. He noted that the area that he owned and had historically farmed was no longer being farmed. He stated that most of it was in CRP and a large portion of the CRP area has expired and cannot go back into the CRP program. He would like to see the land go from GMA Ag into a Rural Lands designation.	Comments noted
77	Commercial Development Standards	Jesse Greenough, 4209 S. Cascade St., Kennewick	During his testimony at 11/21/17 PC meeting, he stated that he owned property in Plymouth along Hwy 14 and Plymouth Road and that it was zoned Interstate Commercial and that he would like to see the availability of having living units above the commercial units within that zoning designation.	Currently, the County Zoning Ordinance, specifically Interstate Commercial Zoning District BCC 11.27, does allow outright a dwelling unit within the 2 nd level of a structure that is also used for commercial purposes.