Chapter 2 Proposed Action and Alternatives

2.1 Introduction

Wallula Generation, LLC (the applicant) proposes to construct a natural gas-fired combustion gas turbine facility in Walla Walla County, Washington. Figure 2-1 presents the project site location. The facility, referred to as the Wallula Power Project, would be a nominal 1,300-megawatt (MW), combined-cycle gas turbine facility. The project would consist of

- two independent 650 MW power generation blocks, each consisting of two combustion gas turbine-generators, two heat recovery steam generators (HRSGs) each with steel exhaust stacks that are 175 feet high and 20 feet in diameter, and one single reheat condensing steam turbine-generator;
- two wet mechanical-draft cooling towers;
- two circulating water supply systems including condensers;
- one emergency diesel generator, diesel-fired fire pump, and aboveground 5,600-gallon diesel fuel tank;
- two aboveground 500-gallon fuel tanks (for diesel oil and gasoline);
- a new 1,200 gallon per minute (gpm) capacity deep groundwater supply well, well connections, and water storage tanks;
- one 5.14-million-gallon raw water tank;
- one 1.173-million-gallon raw water tank;
- two 15,000-gallon aboveground ammonia storage tanks;
- two 225,000-gallon demineralized water storage tanks;
- one 372,300-gallon service water storage tank;
- one brine concentrator;
- two 11-acre lined evaporation ponds;
- two stormwater detention ponds (2.2 acres);
- six step-up and auxiliary transformers;
- one 45,000 pound per hour auxiliary boiler and building; and
- a turbine building, water treating building, warehouse, gas metering building, and administrative building.

Project ancillary facilities would include

- a temporary construction access road intersecting U.S. Highway 12;

- a permanent county access road linking the project site to Dodd Road;
- a 4.6-mile makeup water supply pipeline to interconnect the proposed project with the existing 10 Boise Cascade Corporation fiber farm water wells;
- an approximate 33.1-mile, 500-kilovolt (kV) electrical transmission line and switchyard interconnection; and
- a 5.9-mile natural gas pipeline interconnection.

The Port of Walla Walla currently owns the project site, which is zoned for heavy industrial use. The site is within the heavy industrial zone of the Attalia Industrial Urban Growth Area as specified in the Walla Walla County Comprehensive Plan. The applicant has a real estate option on the property and will exercise that option contingent upon financing and obtaining the Site Certification Agreement and other approvals.

The Bonneville Power Administration (Bonneville) has determined that reliable distribution of electricity generated by the Wallula Power Project would require construction of a new 500 kV transmission line, construction of a new switchyard, and upgrades to the existing McNary Substation. The new line would comprise an initial segment (Wallula-Smiths Harbor segment) that would be approximately 5.1 miles long and would interconnect with a new switchyard (Smiths Harbor Switchyard). A second approximately 28-mile segment (Smiths Harbor-McNary segment) would extend to the McNary Substation. The proposed transmission route and switchyard are shown on Figure 2-2.

In addition, the project would need a supply of natural gas. If the project were approved, a 5.9-mile pipeline interconnection would be engineered, constructed, owned, and operated by PG&E Gas Transmission-Northwest (GTN) to provide firm delivery of up to 175,000 dectherms per day (Dth/day) of natural gas from Alberta, Canada to the project site.

2.1.1 The Applicant and Bonneville Power Administration

The applicant for the Site Certification Agreement is Wallula Generation, LLC, formerly named Newport Northwest, LLC. The applicant applied for and received approval for the name change from the Office of the Secretary of State for the State of Delaware on June 28, 2001. Newport Northwest, LLC was initially formed on June 26, 2001 pursuant to the Delaware Limited Liability Company Act.

Wallula Generation, LLC was created as a Delaware limited liability company for the sole purpose of developing, permitting, financing, constructing, owning, and operating the Wallula Power Project. Wallula Generation, LLC is majority owned in equal shares by Newport Wallula, Inc. and by Wallula Power, Inc. Wallula Land Company, LLC holds a minority interest in Wallula Generation, LLC. Newport Wallula, Inc. and Wallula Power, Inc. are both Delaware corporations formed on June 26, 2000 and owned 100% by Newport Generation Ventures, LLC.

Bonneville is an agency of the U.S. Department of Energy. It sells electric power produced at 31 federal projects, one nuclear power plant, and other nonfederal sources in the Pacific Northwest. Bonneville, founded in 1937, is one of five federal power-marketing agencies. It was established under the Bonneville Project Act as an interim agency to market the power produced by Bonneville Dam.

Bonneville sells about 46% of the electric power consumed in the northwestern United States. To deliver that power, Bonneville owns and operates one of the largest high-voltage transmission systems in the world. Bonneville's service territory includes the states of Oregon, Washington, Idaho, and the portion of Montana west of the Continental Divide. Bonneville also directly serves small portions of California, Nevada, Utah, and Wyoming. In addition, it sells surplus power to California and the southwestern United States.

Bonneville established a transmission business line that moves power sold by Bonneville and others throughout the Northwest and, through alternating current and direct current interties with California, across the western United States. The transmission business line maintains over 300 substations and switchyards and nearly 15,000 miles of transmission lines across the Pacific Northwest. The 33-mile electrical transmission line associated with the Wallula Power Project is proposed by and would be built and operated by Bonneville.

2.1.2 Purpose and Need

The applicant and Bonneville have separate needs that they are proposing to meet with the proposed power plant and transmission line, respectively.

2.1.2.1 Power Plant Purpose and Need

Prior to the wholesale restructuring of the power industry, public authorities needed to undertake detailed energy planning to ensure the availability of adequate power supply, and to avoid construction of unnecessary energy facilities. However, in recent years industry restructuring has resulted in the development of a market-based wholesale power market in the western United States and Canada. This market is expected to encourage the development of efficient power facilities to satisfy increasing power demands and to discourage the development of inefficient and unnecessary facilities. In this market, project developers are expected to move forward with construction of projects only when convinced demand exists for the power the facilities would produce. Project financing, likewise, depends on a demonstration of demand and economic benefit.

Recent national and regional forecasts project increasing consumption of electrical energy to continue into the foreseeable future, requiring development of new generation resources to satisfy the increasing demand.

The Western Systems Coordinating Council (WSCC) forecasts a 2.1% per year increase in peak power demand between 1999 and 2009 for the Northwest Power Pool (the states of Washington, Oregon, Idaho, and Utah; the Canadian provinces of British Columbia and Alberta; and portions of Montana, Wyoming, Nevada, and California) (WSCC 2000). The Northwest Power Planning Council predicts a 24% probability of one or more "generation insufficiency events" in the Northwest by 2003. This suggests a probability of service interruption approximately five times the currently accepted standard, and it suggests a shortfall in projected energy supply versus demand in the Northwest of between 3,000 and 6,000 MW. The Northwest Power Planning Council also concluded that some part of the needed new resources would be supplied by new generation developed in response to market forces.

In early 2001, the governor of the State of Washington issued an emergency proclamation stating that the threat to statewide energy supply could jeopardize the public health, safety, and general welfare. The governor issued an energy supply alert that directed state and local governmental agencies to minimize the injurious economic, social, and environmental consequences of the energy supply crisis. Finally, the reliance of the Northwest region on hydroelectric power generation makes it vulnerable to variations in generation capacity due to weather.

The purpose of Wallula Generation's project is to construct and operate a new generation resource that will meet a portion of existing and future energy loads in the Pacific Northwest.

2.1.2.2 Transmission Line Purpose and Need

Generation resources typically require interconnection with a high-voltage electrical transmission system for delivery to purchasing retail utilities. Bonneville owns and operates the Federal Columbia River Transmission System (FCRTS), comprising more than three-fourths of the high-voltage (greater than 230 kV) transmission grid in the Pacific Northwest. Bonneville operates the FCRTS, in part, to integrate and transmit "electric power from existing or additional Federal or non-Federal generating units."[1] Interconnection with the FCRTS is essential to deliver power from many generation facilities to loads both within and outside the Pacific Northwest.

The FCRTS, as a whole, is nearing the limit of how much electricity it can carry. The system has experienced a rapid increase in use with an annual load growth rate of 4.7 % over the past five years. At the same time, there has been very little investment in expansion of the transmission line system. Many transmission paths require significant reinforcement or additional capacity through the construction of new transmission lines to accommodate new power generation.

[1] 16 U.S.C. 838b.

2.1.3 Decisions to be Made

This document is a joint SEPA/NEPA DEIS that will meet the needs of both the Energy Facility Site Evaluation Council (EFSEC) for the State of Washington and Bonneville Power Administration (Bonneville).

EFSEC has jurisdiction over all of the evaluation and licensing steps for siting major energy facilities in the State of Washington. Once approved by the Governor of the state of Washington, EFSEC's Site Certification Agreement acts as an "umbrella" authorization that incorporates the requirements of all State laws and regulations.. Through it's review, EFSEC coordinates the comments and interests of State agencies that participate in the EFSEC review process. EFSEC will jointly issue the Final Environmental Impact Statement (FEIS) with Bonneville and make a recommendation to the governor to approve or deny the Wallula Power Project.

Bonneville will utilize the FEIS to meet National Environmental Policy Act requirements, and will prepare a Record of Decision. If the Governor of Washington approves the Wallula Power Project for construction, then Bonneville needs to decide whether and how to provide transmission service for the power project because Wallula LLC has requested (i) to integrate power from its proposed Wallula Power Project into the FCRTS at a point on the lower Monumental to McNary transmission line in T7NR32E and (ii) firm point-to-point transmission service from the Wallula Power Project to the John Day and Big Eddy substations[2].

Bonneville intends to base its comparison of alternatives and final decision on the following objectives or purposes:

- Provide an adequate, economical, efficient, and reliable transmission system for the Pacific Northwest;
- Follow Bonneville's Open Access Transmission Tariff;
- Comply with Federal environmental and energy laws and policies;
- Achieve cost and administrative efficiency;
- Minimize impacts to the natural and human environment through site selection and transmission line design.

[2] Bonneville has adopted the Federal Energy Regulatory Commission's (FERC) *pro forma* open access tariff as incorporated into Bonneville's Open Access Transmission Tariff. Bonneville offers transmission services, including interconnection of generation projects, in accordance with this tariff to all eligible customers on a first-come, first-served basis. Although Bonneville is not subject to FERC's jurisdiction, Bonneville follows its tariff as a matter of national policy. This course of action demonstrates Bonneville's commitment to non-discriminatory access to its transmission system and ensures that Bonneville will receive non-discriminatory access to the transmission systems of public utilities, which are subject to FERC's jurisdiction. Although Bonneville's interconnection of a generator is subject to NEPA review, Bonneville otherwise will not deny interconnection to any eligible customer that complies with Bonneville's financial and technical requirements.

FERC needs to decide whether GTN would construct and connect a new 5.9-mile pipeline lateral to an existing gas pipeline located southeast of the project site.

A list of permits and requirements for the project is included in Chapter 2, Table 2-4.

2.2 Description of the Proposed Action

The applicant proposes to construct a nominal 1,300 MW combined-cycle combustion gas turbine electrical generation facility and associated components located near Wallula, in Walla Walla County, Washington (Figure 2-1). The completed generation plant and all associated facilities would occupy approximately 97 acres of a 175.48-acre industrially zoned site. The Wallula Power Project would be designed to provide low cost electric energy to meet the growing needs of the Northwest and other interconnected electric transmission areas. This section describes the proposed action. The No Action Alternative and other alternatives to the proposal and alternative components are discussed later in this chapter.

Wallula Generation, LLC would construct and operate the generation plant and associated facilities, including the makeup water supply line. Bonneville would design, construct, and operate the two 500 kV transmission line segments and switching yard. In addition, a natural gas interconnection would be designed, constructed, owned, and operated by GTN to supply natural gas to the power plant.

2.2.1 Project Location

The proposed Wallula Power Project would be located in the northwestern portion of Walla Walla County, Washington, approximately 8 miles south of the City of Pasco, 2 miles north of the unincorporated community of Wallula, and 7 miles southeast of the unincorporated community of Burbank. The project site is within the southern half of Section 34, Township 8 North, Range 31 East and is bordered on the west by U.S. Highway 12 with the Union Pacific Railroad bordering the project site to the east. Lake Wallula (the McNary Pool reach of the Columbia River) is located approximately 800 feet to the west.

The project site is part of an area zoned for heavy industrial development in the existing land use plan for western Walla Walla County. The project site is currently developed for irrigated agriculture and has most recently been used for production of alfalfa hay. Existing industrial land use in the project site vicinity includes the Iowa Beef Processors, Inc. slaughterhouse; J.R. Simplot Company feedlot; Ponderosa Fibers of Washington deinking plant; and Boise Cascade Corporation Wallula Mill. Agricultural fields, forestry/plantation lands, vacant shrub-steppe, and rangeland are primary land uses in the county and in the general project area. Parks, managed wildlife areas, rural residential communities (including Burbank and Wallula), commercial uses along U.S. Highway 12, industrial operations, utility corridors, and transportation facilities also occur in the general project area. The nearest residential property is located approximately 4,000 feet north of the closest cooling tower for the proposed plant.

The project site is located near the east bank of the Columbia River, approximately 7 miles downstream of the confluence of the Columbia and Snake Rivers and 4.5 miles upstream of the confluence of the Columbia and Walla Walla Rivers. The area immediately east of the project site is characterized by rolling uplands. Prominent physical features in the project vicinity include the Columbia and Snake Rivers, the Wallula Gap, and the Horse Heaven Hills.

The site generally slopes westward toward the Columbia River. It is separated from the river floodplain by a moderately sloping bluff. The topography of the project site is gently rolling land sloping downward from northeast to southwest with total topographic relief of approximately 40 feet, from approximately 360 to 400 feet above mean sea level (MSL). It lies above the mapped 100- and 500-year Columbia River flood elevations. Five ponds associated with irrigation systems are located on the project site. There are no other prominent geographic features on the project site. There are no unique or unusual topographic features on or close to the project site.

The transmission line associated with the Wallula Power Project would run generally parallel to an existing 500 kV line. It would originate at the generation plant and terminate at the existing McNary Substation in the southeast corner of Section 9, Township 5 North, Range 28 East. The terminus is approximately 1 mile east-northeast of the town of Umatilla, Oregon. The initial transmission line segment (Wallula-Smiths Harbor segment) would run approximately 5.1 miles to the proposed Smiths Harbor Switchyard. The proposed switchyard would be located in the northwest corner of the northeast corner of Section 13, Township 7 North, Range 31 East. From the Smiths Harbor Switchyard, the new line would parallel the existing Lower Monumental–McNary 500 kV line, except in the area where the existing 230 kV PacifiCorp transmission line is to the north of the Lower Monumental–McNary line. In this area, the new transmission line alignment would be north of the existing PacifiCorp transmission line. This transmission line segment (Smiths Harbor-McNary segment) would traverse about 28 miles south from Walla Walla County, Washington into Umatilla County, Oregon and west to the McNary Substation. The route into the McNary Substation would follow the corridor currently occupied by the existing Lower Monumental–McNary transmission line. The Lower Monumental–McNary transmission line would be relocated 125 feet east of the double-circuit towers that carry the Calpine-McNary and McNary Loop lines to the Lower Monumental–John Day transmission line.

The new transmission line would traverse approximately 33.1 miles of land used for industrial development, agricultural croplands, and undeveloped grass and shrub-steppe habitat, as well as the Walla Walla River. In addition, the transmission line would cross federally managed lands and wildlife areas, including the Wallula Habitat Management Area owned by the U.S. Army Corps of Engineers (Corps) and managed by the U.S. Fish and Wildlife Service (USFWS), the Bureau of Land Management (BLM) Baker Resource Management Area, and the Juniper Canyon Wildlife Management Unit (owned and managed by the Corps).

2.2.2 Project Facilities

The proposed power project includes a generation plant and related facilities situated on a 175.48-acre site. Related facilities include a 4.6-mile makeup water supply pipeline to the farthest well at the Boise Cascade Fiber Farm. Approximately 33 miles of new transmission line with an intermediate switching yard is proposed by Bonneville. In addition to the proposed action, a 5.9-mile natural gas pipeline would be designed, constructed, owned, and operated by GTN to supply natural gas to the proposed generation plant. Additional details about the proposed facility are discussed below.

2.2.2.1 Generation Plant

The power plant would occupy approximately 97 acres within the 175.48-acre site. The plant comprises a 1,300 MW natural gas-fired combined-cycle combustion gas turbine system consisting of two independent 650 MW power "blocks" with backup systems to maintain overall plant reliability and availability. Each power block consists of two combustion gas turbine-generators, two heat recovery steam generators (HRSGs), and one single reheat, condensing steam turbine-generator. Each power block has a wet mechanical-draft cooling tower system. Figure 2-3 presents the power plant layout.

Power Plant Process

In each power block, air would flow through an inlet air filter, evaporative coolers, and associated air ductwork. The air would be compressed and mixed with natural gas at a regulated pressure and injected and ignited at various locations in the combustor chamber. The hot combustion gases expand through the turbine sections of the combustion gas turbine-generators and drive the electric generators and combustion gas turbine-generator compressors.

The hot combustion gases exit the combustion gas turbine and enter the HRSGs. Feedwater entering the HRSG would be converted to superheated steam using the heat from the hot gases and additional heat as needed from gas-fired "duct" burners. The steam is delivered to the steam turbine to drive additional electrical generation. Each HRSG would be provided with a 175-foot-tall steel exhaust stack, 20 feet in diameter. The stacks would include continuous emissions monitoring systems and sampling ports, exterior ladders and platforms, lighting, and grounding systems.

Cooling System

Steam leaving the steam turbine enters the condenser. The water-cooled condenser uses circulating water to condense the exhaust steam to "condensate" (water). Condensate would be pumped from the condenser by the condensate pumps back to the HRSG feedwater system. The water from the circulating water-cooling system would be pumped to the wet mechanical-draft cooling tower, where the heat would be emitted to the atmosphere. The wet mechanical-draft cooling tower produces cool water in the closed loop circulating water system by spraying hot circulating water over a large surface, or “fill,” and using a fan to pull air through the fill and falling water. As part of this cooling process, a portion of the circulating water is evaporated and must be replaced. This evaporation is the source of about 80% of the heat transfer from the circulating water. The other 20% of the heat is transferred by convection of the hot water passing through the lower temperature air. The water evaporated in this process comprises nearly all of the water consumed by the project.

Heat transfer through water evaporation occurs at lower temperatures than heat transfer through dry cooling. This temperature difference leads to much more efficient heat rejection from the cooling water, thus minimizing capital and operating costs, and maximizing system efficiency.

Approximately 168,000 gpm of circulating water would be required to pass through the tube side of each condenser to condense the exhaust steam at maximum plant load. An additional closed loop cooling system would use 4,000 gpm of the circulating water to remove heat that would be produced by the closed cooling water system for each unit.

Power Block Wastewater Discharge

The primary wastewater stream would be cooling water system blowdown. Blowdown is the term used for water that has been recirculated through a cooling system a sufficient number of times that it must be discharged. The blowdown water would consist of raw water that has been recycled through the cooling towers. It would contain concentrated salts and residues of chemicals added to the circulating water to control scaling and fouling by biological contaminants.

No plant wastewater would be discharged to the surface or groundwater. Blowdown water would be drawn from the cooling water stream at a rate between 160 gpm and 280 gpm. This water would then be sent to the wastewater storage tank, which would be oversized so that it can store wastewater during periods of wastewater system maintenance or shutdowns. Under normal operating conditions, the wastewater is cycled directly from the tank to a brine concentrator. The wastewater is heated, water vapor forms, and a clean water distillate is drawn off for future use.

The clean distilled water would be sent to the inlet of the power plant mobile polishing units or to the service water tank for reuse in the power plant water systems. A concentrated brine fluid is also produced in the process. The brine is sent to one of two 100% capacity decant basins to settle out a majority of solids before overflowing to one of two lined evaporation ponds that cover a 22-acre area. Evaporation to the atmosphere removes the remaining liquid. The decant basin solids would be removed periodically to either an off-site licensed disposal site or to the on-site evaporation ponds.

The two 11-acre evaporation ponds would provide evaporation of all of the brine produced by the brine concentrator at the average expected evaporation rate at the project site. They would be located west of the paved portion of the project site and each would include two clay liners with a high-density polyethylene (HDPE) liner in between. A leakage detection system, consisting of a network of collection pipes and sumps, would lie under the evaporation ponds to detect and collect any leakage that might occur through the evaporation pond liners. This evaporation system would be used because liquid solids produced by the brine concentrators tend to settle quickly and, if pumped through a long section of pipe, might cause maintenance problems.

The evaporation ponds could accommodate 30 years of solid brine accumulation and still provide sufficient volume to evaporate plant wastewater discharge. However, during this 30-year period, solids accumulation in the evaporation pond would be regularly shipped to a licensed landfill unless someone were able to use them for some future beneficial use.

Stormwater Collection, Treatment, and Discharge

Stormwater would be collected in stormwater detention ponds, which would be sized to contain the 100-year rainfall event of 1.8 inches in a 24-hour period. Collected stormwater from the power plant proper areas would be pumped through oil/water separators to a lined stormwater retention pond, and reused in the power plant circulating water system if a water right could be obtained. Alternatively, it would be discharged to an unlined stormwater detention pond.

All on-site stormwater collected in areas outside the power plant would be directed to a second unlined stormwater detention pond without processing the water through oil/water separators. All stormwater collected in the second stormwater detention pond would either be evaporated or would percolate into the ground. No stormwater would be released off-site except through evaporation or ground percolation.

Sanitary Waste Stream (Sewage)

All sanitary wastes would be collected and directed to an on-site sanitary waste system. Treated liquid effluent from the system would flow to a leaching field. Collected solids in the holding tank would be periodically removed by a sanitary waste hauler and disposed of at a local wastewater treatment facility or publicly owned treatment works that is licensed to handle these sanitary wastes. No power plant drains would be connected to the sanitary waste system, eliminating the potential for contamination of the leaching field.

Power Plant Electrical Supply

During normal power plant operation, auxiliary alternating current (AC) power systems would be supplied from the low side of each auxiliary transformer for service to each power block via two 18 kV to 4.16 kV oil-filled station service transformers. Each station service transformer would supply power to two separate 4.16 kV bus systems. The 4.16 kV supply system would provide power to equipment such as the large motors, with the load center transformers rated at 4.16 kV to 480-volt distribution. If located indoors, the load center transformers would be dry transformers. If located outdoors, the transformers would be oil-filled.

The power plant would be designed with six generator step-up power transformers to increase the power plant voltage from 18 kV to the transmission system voltage of 500 kV. Four of the transformers would be sized to support the combustion gas turbine-generators; the other two would be sized to support the steam turbine-generators.

The power plant would be supplied with a direct current (DC) battery backup power system for use under abnormal or emergency conditions or when the AC power supply system was unavailable. An emergency diesel oil-fired generator would be supplied to provide power to key lighting loads, AC lube oil systems, and AC turbine gear systems for large shaft equipment in case of a complete plant electrical failure (blackout). No full power plant "black start" (startup with no external power available) capacity would be supplied. The emergency diesel generator would be located in the auxiliary boiler building.

Diesel and Gasoline Fuel Storage

A diesel fuel oil system would be located on-site for supplying diesel oil to the emergency diesel generator and the diesel fire protection pump. The diesel system fuel would be supplied from a 5,600-gallon aboveground diesel fuel tank located adjacent to the auxiliary boiler building. In addition, the facility would have a single 500-gallon aboveground diesel fuel tank and a single 500-gallon aboveground gasoline tank to service facility vehicles.

Project Site Access

The applicant has met with state and county transportation officials to discuss project site ingress and egress and roadway modifications and additions. The Washington State Department of Transportation (WSDOT) is engaged in the early design stages of the proposed widening and realignment of U.S. Highway 12 to four lanes from south of the Snake River Bridge to Depot (Attalia) Road, and eventually to Wallula Junction. The applicant would continue to work closely with Walla Walla County, the Port of Walla Walla, and WSDOT staff to determine the best alternatives to meet current and future state and county access road needs.

The applicant has proposed the building of a temporary at-grade construction access road with an intersection at U.S. Highway 12 just south of the project site. WSDOT is opposed to this alternative and has suggested the continued use of Dodd Road as the primary access route as an alternative to this plan (see Section 2.4, Alternatives Considered but Rejected). Although rejected by the applicant in the Draft EIS, agencies will consider both alternatives and show the preferred alternative in the Final EIS.

The applicant is also planning a new road extension between the project site and Dodd Road and through the project site, designed to county collector or arterial standards (Figure 2-3). This road would be the primary project site access for operation, as well as a northern link in a future county collector roadway. The road would provide the first link in a network of off-highway roads to provide access to other properties in the area as well as for the power plant.

Upon completion of project construction, the access point with U.S. Highway 12 would be gated to provide access only during emergencies, when a second access would be required to the power plant. When the WSDOT interchange projects commence, this temporary access would be terminated. The applicant has also requested installation of traffic signals at the Dodd Road/U.S. Highway 12 intersection and a temporary signal at the intersection of the proposed project access road and Dodd Road. The traffic signals would slow traffic in the vicinity of the project site and allow turning movements in and out of the project site.

2.2.2.2 Water Supply and Facilities

It is estimated that the maximum project water usage would be 4,087 gpm, with water usage averaging 3,171 gpm over a 1-year period. Water supply for the plant would be acquired from various sources in the area. First, the applicant has entered into a purchase option agreement with Boise Cascade Corporation under which it would purchase a portion of a hybrid cottonwood fiber farm and its associated shallow groundwater rights. This groundwater is produced from 10 existing shallow wells with completion depths ranging from 100 to 150 feet below the surface with the water in continuity with the Columbia River. A water supply pipeline would be constructed from these wells to the Wallula Power Project. The distance from the Wallula Power Project to the most remote fiber farm well would be approximately 4.6 miles (Figure 2-4). Pursuant to the associated water rights certificates and water rights requirements of the Washington Department of Ecology (Ecology), the existing Boise Cascade Corporation fiber farm wells will deliver to the Wallula Power Project a total allowable instantaneous pumping rate of 9,485 gpm up to an anticipated volume limited to 5,024 acre-feet per year.

Second, the applicant has entered into a purchase option and lease option agreement with the J.R. Simplot Company that would allow the purchase of conservation easements and associated water rights, and, if needed, the lease of additional agricultural lands and associated water rights. J.R. Simplot Company owns farmlands used to produce feed for the 40,000 head of cattle located at the feedlot adjacent to the proposed power plant. These water right purchase options are expected to be for an instantaneous pumping rate of 3,285 gpm up to a maximum of 1,425 acre-feet per year after Ecology transfer requirements are satisfied. The point of withdrawal for these water rights would shift from the current Legrow Irrigation District McNary Pool surface withdrawals, to the Boise Cascade Corporation shallow groundwater well withdrawals.

Third, additional water supply would also be provided by on-site deep groundwater wells. The applicant would purchase the on-site well groundwater rights from the Port of Walla Walla. One deep well currently exists at the project site and a second deep well would be installed to provide a backup system. The existing well provides an instantaneous pumping rate of 1,200 gpm and would be limited to 1,800 acre-feet per year.

Various water tanks would be built for the project. In addition to the main supplies described above, a raw water tank would be located on-site to store 5.14 million gallons of water to provide 20-hour emergency backup water supply. No pretreatment would be required from the wells to the raw water storage tank. A service water storage tank with a capacity of 372,300 gallons would be used to store makeup water for the demineralized water treatment system, the plant potable water supply, and the plant service water system. In addition, water stored in the service water storage tank would be used for fire suppression. Two on-site 225,000-gallon tanks would store treated water from the demineralization system and would supply water for boiler water makeup, the closed cooling water system makeup, and the other demineralized water use systems.

2.2.2.3 Transmission Line and Associated Facilities

In response to a request from the applicant for interconnection and firm transmission, Bonneville proposes to design, construct, own, and operate a 500 kV transmission system from the proposed 1,300 MW Wallula Power Project in Walla Walla County, Washington to Bonneville's existing McNary Substation in Umatilla County, Oregon. The system would consist of an approximately 5.1-mile-long transmission line from the proposed generation plant to a new switchyard near Smiths Harbor (Wallula-Smiths Harbor segment) and a new approximately 28-mile-long transmission line from the Smiths Harbor Switchyard to the McNary Substation (Smiths Harbor-McNary segment).

The facilities, equipment, and features to be constructed in the transmission line project include

- steel lattice transmission tower structures, averaging 145 feet high (1,150-foot span), to support conductors, insulators, fiber optic cable, and ground wire;
- counterpoise for lightning protection (buried around the tower structure);
- right-of-way purchases for transmission line corridor segments and access roads;
- 70 to 80 new spur roads, each approximately 250 feet long;
- 11 miles of new access roads;
- 5 culverts;
- 28 new gates;
- installation at the McNary Substation (and at the Wallula Substation by the applicant) of equipment including a power circuit breaker, a disconnect switch, bus tubing and pedestals, and a substation "dead end structure;"
- a transmission "dead end structure" at both substations; and
- a switchyard at the Smiths Harbor site, including all equipment listed above, plus a switchyard fence and rock surfacing.

Two basic types of 500 kV steel lattice structures would be used: tangent or light-angle structures, and dead end structures. Tangent structures are used to elevate wires a safe distance above the ground on relatively straight stretches of a line without sharp angles. The predominant tangent structure proposed for use on this line is known as the "delta" design. A specialized tangent structure called a "flat configuration" would be used at the Walla Walla River crossing. Dead end structures elevate the conductors above the ground and equalize tension of the conductors between two segments of transmission line when the line makes a turn. Dead end structures are much stronger and heavier than tangent structures and cost more. A typical tangent structure would cost about $75,000; a dead end structure could cost upward of $300,000 or more depending on tower height. Because of the high cost, engineers try to avoid sharp turns and angles when designing 500 kV transmission lines.

Wallula-Smiths Harbor Segment

The Wallula-Smiths Harbor segment is needed to connect the Wallula Power Project to the existing Federal Columbia River Transmission System Grid. There are no existing high voltage transmission lines owned or operated by Bonneville or other utilities along this route. Much of this segment would be on land with rights either owned or optioned by Wallula Generation, LLC.

Approximately 25 structures would be erected on the Wallula-Smiths Harbor segment. Most of these structures would be the delta design averaging 145 feet in height. The standard span distance between structures would be approximately 1,150 feet. Approximately four dead end structures would be needed for connecting to the substation and switching yard and at locations where the transmission line turns at sharp angles.

Smiths Harbor-McNary Segment

The Smiths Harbor-McNary segment would be constructed to the west and north of an existing 500 kV Bonneville transmission line. It is estimated that approximately 140 structures are needed for the Smiths Harbor-McNary segment. Approximately 136 of these would be delta design tangent and light-angle structures, as well as several flat configuration structures, and four would be heavy dead end structures. The standard span distance between structures would be approximately 1,150 feet. The standard structure height would be approximately 145 feet.

The WSCC system reliability requirements led system planners to suggest a transmission line location at least 1,200 feet from the existing Lower Monumental–McNary 500 kV transmission line to protect against simultaneous dual outages of both 500 kV transmission lines. System planners subsequently determined that a 1,200-foot separation would not be necessary because the consequence to overall transmission system reliability resulting from the loss of both transmission lines along this route would not be significantly worse than loss of a single transmission line. As a result, it is now proposed to locate the new transmission line about 200 feet from the existing Lower Monumental–McNary 500 kV line except in the area where the existing 230 kV PacifiCorp transmission line is to the north of the Lower Monumental–McNary transmission line. In this area, the new transmission line would be 125 feet north of the PacifiCorp transmission line. This would lead to an overall separation between the Lower Monumental–McNary transmission line and the proposed new transmission line greater than 200 feet. Configurations for the proposed new line in relationship to existing lines are illustrated in Figure 2-5.

In areas where there are long spans between structures, such as across Juniper Canyon, specific structure siting may also lead to transmission line separations greater than 200 feet. A 200-foot line separation is also proposed for the Walla Walla River crossing, with flat configuration structures used to support the conductors. In any case, the new transmission line would be designed such that a structural failure on either existing transmission line would not lead to a fallen structure damaging the new transmission line causing a dual simultaneous outage.

Terminating a transmission line at a substation or switchyard requires special types of equipment. Required new equipment for the termination of the new transmission line at the McNary Substation would be constructed by Bonneville on its property. The Wallula Substation would be constructed as part of the proposed project by Wallula Generation, LLC. At the Wallula Substation, all of the equipment would be installed, owned, operated, and maintained by Wallula Generation, LLC on property it owns. The transmission dead end structures would be installed, owned, and operated by Bonneville on property within its right-of-way to be either acquired for the project or on land owned by Wallula Generation, LLC.

Substations contain electrical equipment that enables Bonneville (and the applicant at the Wallula Substation) to interconnect several different transmission lines, disconnect transmission lines for maintenance or outage conditions, and regulate voltage fluctuations. The following equipment associated with transmission line termination would be installed in either or both the Wallula and McNary Substations at each end of the proposed project:

- a power circuit breaker;
- substation dead end structures;
- transmission dead end structures;
- a disconnect switch; and
- bus tubing and bus pedestals.

Smiths Harbor Switchyard

The Smiths Harbor Switchyard would be a new facility in the transmission system (see Figure 2-2 for switchyard location and Figure 2-6 for switchyard site plan). A switchyard serves the same functions as a substation except that it does not regulate voltage fluctuations. In addition to the equipment listed for the substation, a chain-link fence with barbed wire on top provides security and safety, and a 3-inch layer of rock selected for its insulating properties is placed on the ground within the switchyard to protect operation and maintenance personnel from electrical danger during switchyard electrical failures.

Transmission Line Components

Conductors are the wires that carry electrical current in a transmission line. Bonneville's proposed line has three sets (called phases) of conductors arranged in a triangular design on the transmission line structures. Each of the three phases consists of three subconductors held in a triangular arrangement (18 to 20 inches apart) by spacer brackets. Subconductors are not covered with insulating material, but use the air for insulation instead. Each subconductor is 1.3 inches in diameter. Arranging electrical conductors this way reduces magnetic field strength and noise and also decreases the amount of right-of-way needed.

Conductors are suspended from towers with **insulators**. Insulators are made of nonconductive materials (porcelain or fiberglass) that prevent electric current from passing through the structures to the ground. Porcelain insulator strings for Bonneville's line would be 6 inches in diameter, 15 feet long, and nonreflective to reduce their visibility.

Transmission structures elevate conductors to provide safety within the right-of-way for people and buildings. The National Electrical Safety Code establishes minimum conductor heights. Minimum conductor-to-ground clearance for a 500 kV line is about 35 feet depending on the type of land use under the line. Greater clearance would be provided over highway, railroad, and river crossings and some agricultural areas.

Lines are generally strung above that height to allow for future sag. As power lines (conductors) carry increasing amounts of power, electrical resistance causes the conductors to get warmer, expand, increase in length, and hang lower to the ground.

A **fiber optic cable** may be attached to provide a communication link. The 0.5-inch-diameter fiber optic cable would be hung below the conductors.

Overhead ground wires, two smaller wires attached to and strung between the tops of the structures, protect the transmission line against lightning damage. The width of each wire is typically 0.5 inch. Marker devices known as "bird diverters" would be installed on the ground wires at the Walla Walla River crossing to lower the risk of bird strikes. Marker balls also would be used at the Walla Walla River crossing and in other areas where there could be low flying aircraft or the structure is greater than 200 feet tall.

Counterpoise, a set of wires buried in the ground surrounding each structure, provides lightning protection by providing a low resistance path to the earth.

Steel lattice tower structures would be used to support the single circuit 500 kV conductors. The height of each structure may vary depending on location and surrounding landforms. Structures would average 145 feet high in the proposed action. The average span between the structures would be 1,150 feet.

Right-of-Way

Bonneville would acquire any additional easements for right-of-way needed for the transmission lines or access roads from the landowners. The easements would give Bonneville the rights to construct, operate, and maintain the line and access roads in perpetuity. A right-of-way of at least 150 feet would be purchased for the 5.1-mile Wallula-Smiths Harbor segment. Additional right-of-way for the Smiths Harbor-McNary segment would range from 140 feet to 200 feet in width. Approximately 19 miles of this segment would parallel the existing Bonneville 500 kV transmission line, requiring the acquisition of additional right-of-way 200 feet in width. Nine miles of this segment would parallel an existing PacifiCorp 230 kV transmission line, which would require the acquisition of 140 feet of additional right-of-way.

The rights-of-way, usually easements, for 14 new access roads would need to be acquired from property owners. Fifty feet of right-of-way would be acquired for new road access and 20 feet of additional right-of-way would be acquired for existing access roads.

Access Roads

The project would use about 60% of the existing Bonneville Lower Monumental–Wallula transmission line road access system with minimal improvements. Approximately 16 miles of these roads would require reconditioning, minor rocking, and widening. Major reconstruction and rocking of one road, approximately 2 miles long, would be needed for access to the new Smiths Harbor Switchyard site.

Construction of 70 to 80 spur roads (less than 250 feet long) on existing right-of-way would be needed for access to new structure sites. Construction of about 11 miles of new roads within the right-of-way would be needed to support construction of the new structures.

Approximately 28 new gates would need to be installed. Most of these new gates would replace existing barbed wire gates.

Culverts

Overall, placement of about five culverts would be required. Four culverts are for seasonal runoff control and the fifth culvert would replace an existing culvert that crosses an irrigation ditch. One of the four culverts for seasonal runoff control is a 60-inch-diameter culvert that would be placed in a small stream just east of Highway 207. This culvert placement would require approximately 50 tons of fill material to allow placement of the roadbed across the stream. Drain dips and water bars would not be required except in a few instances in areas that may carry seasonal runoff.

Staging Areas

It is unknown at this time where the staging areas for materials and equipment would be located. The construction contractor determines the staging area locations. Construction contractors would not be selected until a record of decision (ROD) is issued.

2.2.2.4 Natural Gas Pipeline

The project would need a supply of natural gas. An estimated 5.9-mile interconnecting pipeline would be engineered, constructed, owned, and operated by GTN, the owner/operator of existing natural gas transmission pipelines located to the southeast of the proposed generation plant (Figure 2-4). Interconnection is to provide firm delivery of up to 175,000 Dth/day of natural gas from Alberta, Canada to the project site.

The Federal Energy Regulatory Commission (FERC) would be responsible for siting of the 5.9-mile natural gas pipeline. Environmental impacts associated with the proposed natural gas pipeline would be assessed under a separate NEPA document.

2.2.3 Construction Activities

The construction of the Wallula Power Project would involve

- the power plant and associated equipment and structures;
- water supply and discharge facilities;
- two 500 kV transmission line segments and an intervening switchyard; and
- a natural gas pipeline interconnection and gas metering building.

Construction of these elements is described below.

2.2.3.1 Generation Plant

The existing project site topography for the power plant is reasonably flat. A final project site grade of approximately 2% would be achieved for the power plant proper area. The amount of material cut would be almost equal to the fill required. Earth suitable for backfill would be stored in stockpiles at designated locations using proper erosion protection methods. Backfilling would be done in layers of uniform material of specified thickness. Soil in each layer would be moistened to facilitate compaction and to achieve the required density. Excess fill would be spread on the project site. Materials not suitable for use as backfill would be removed from the project site and disposed of at an acceptable location.

Power plant process components would be shipped to and assembled at the project site. Construction would be performed according to approved construction plans, specifications, and permit conditions. Temporary construction facilities would be established, including fencing to secure project site access, construction offices, fabrication sheds, and storage areas.

Approximately 3 acres would be used for construction equipment parking, maintenance activities, and construction trailers and offices. Construction equipment and material laydown areas would also be at various locations on the site: inside the temporary fenced area and to the east of the power plant; inside the temporary fenced area and to the south of the switchyard; and inside the temporary fenced area and to the west and north of the proposed warehouse and maintenance building. As necessary, silt fences and hay bales would be erected around the construction and major maintenance areas to control surface runoff.

Approximately 22 acres of wastewater evaporating ponds would be constructed, as well as two 100% capacity decant basins and a brine concentrator. The two 11-acre evaporation ponds would be constructed west of the paved portion of the project site. Each would include a clay liner, approximately 2 feet thick, on top of which would be an HDPE liner. There would also be a clay liner on top of the HDPE to protect the HDPE liner. A leakage detection system, consisting of a network of collection pipes and sumps, would be installed under the evaporation ponds to detect and collect any leakage that might occur through the evaporation pond liners. This leakage detection system would be monitored to ensure the integrity of the evaporation pond liners. Tanks and pumps associated with the brine concentrator would be installed inside a containment area sized to contain 110% of the tank volume in order to contain any leaks or spills.

Two stormwater detention ponds covering approximately 2.2 acres would also be constructed. The stormwater collection system would consist of contoured grading and ditches, collection troughs, and diversion ditches that would lead all stormwater that falls on the project site to the stormwater detention ponds. This system is described in more detail in Section 2.2.2.1.

Installation of underground utilities, the cooling tower basins, and all major equipment foundations would follow project site preparation. Major equipment and systems include the combustion gas turbine-generators; HRSGs, including stacks; steam turbine-generators; wet mechanical-draft cooling towers; condensers; water treatment facilities; transformers; electrical switchyard; a gas metering building; and water storage tanks. The construction of turbine, administration, water treating, auxiliary boiler, and warehouse buildings would follow the major foundation work. Piping, electrical, and instrumentation installation would follow mechanical completion by area.

Final construction activities would include final grading, paving of plant and access roads, removal of construction debris, cleanout of the stormwater detention ponds, touch-up painting, and hydroseeding of unimproved areas.

2.2.3.2 Water Supply

The makeup water supply pipeline route would be surveyed and staked. The makeup water supply pipeline would be approximately 4.6 miles long to the farthest well. It would be buried approximately 5 feet deep to protect it from accidental rupture by tilling activities. Normal agricultural activities can occur over the pipeline corridor after construction.

2.2.3.3 Transmission Line and Associated Facilities

The transmission line would be constructed over terrain that is for the most part arid and rocky, alternating between tilled agricultural fields and shrub-steppe. Side slopes of 5% or less are common along the alignment. Approximately 45% of the proposed transmission line corridor is tillable and currently worked as either farmland or ranchland. Approximately 10% of the proposed corridor traverses lands managed for wildlife. Approximately 40% traverses relatively flat shrub-steppe terrain. Another 5% traverses a suburban environment as the transmission line goes through Power City on the last leg into the McNary Switchyard.

The approximately 5.1-mile Wallula-Smiths Harbor segment would be constructed along a new right-of-way that does not parallel any existing Bonneville transmission lines. Construction of this transmission line would take advantage, to the maximum extent practicable, of existing county and other public roads for access, as well as private agricultural access roads (with landowner input).

The approximately 28-mile Smiths Harbor-McNary segment would be constructed along a new right-of-way with a centerline that is generally 200 feet to the west and/or north of the centerline of the existing Lower Monumental–McNary transmission line, except where the existing PacifiCorp 230 kV transmission line lies to the north of this existing Bonneville transmission line. Where the new transmission line would parallel the existing PacifiCorp 230 kV wood pole transmission line, the centerline would be 125 feet to the north of the centerline of the PacifiCorp transmission line. Construction of this transmission line would take advantage, to the maximum extent practicable, of existing access roads for the Lower Monumental–McNary transmission line.

Transmission Tower Structures

Transmission structures would normally be assembled in sections at a structure site and lifted into place by a large crane (30 to 100 ton capacity). Occasionally transmission structures would be assembled at a remote staging area, then lifted, transported, and placed on foundation footings at the structure site by large sky-crane helicopters. Using helicopters enables structures to be constructed more quickly and reduces ground disturbance. Helicopter construction could be more costly than conventional crane construction, but time saved by faster structure assembly sometimes reduces the cost differential. Bonneville's selected construction contractor would decide when helicopter-assisted assembly is appropriate. The construction contractor would not be selected until completion of the ROD for the proposed project.

Site Preparation and Clearing

Clearing around the structures and switchyards would include removal of all brush and debris and possibly grading to level the working area. On average, an area of approximately 0.25 acre would be disturbed for each of the 163 structures required to support the transmission lines. Therefore, approximately 40 acres would be cleared or disturbed for structure placement. The Smiths Harbor Switchyard would require clearing of an area approximately 372 feet by 758 feet, or about 7 acres.

The cleared or disturbed areas that are not directly covered by transmission structures, facilities, or accessories would be reseeded with naturally occurring shrubs and grasses at the end of the construction period. Vegetation within the transmission line right-of-way would be kept low growing to allow safe and uninterrupted operation of the transmission line. The vegetation along the proposed transmission line predominantly consists of either low-growing shrub-steppe or agricultural crops. For this reason, little trimming or clearing would be required along the right-of-way during the construction phase.

Structure Footings

Transmission structures are attached to the ground by burying a metal footing assembly at each of four structure corners. Three types of footings are commonly used: plate, grillage, and rock anchors. Plate footings are 4-foot by 4-foot steel plates buried 10 to 12 feet deep. Grillage footings are 12.5-foot by 12.5-foot assemblies of steel I-beams that have been welded together and buried 14 to 16 feet deep. Grillage footings are used to support heavier structures, such as dead end structures. Rock anchor footings are used when a structure is built on bedrock. Holes are drilled into the bedrock, steel anchor rods are secured within the holes with concrete, and the structure footings are then attached to these rods.

A track hoe is used to excavate the soil to allow footing placement. The excavation is usually 1 to 2 feet larger than the footing to be installed. Additional footing excavation could be required in certain soil types. The soil and rock materials removed are later used to backfill the excavation once the footings are installed. Excess material would be stockpiled and spread along the right-of-way.

Conductors, Overhead Ground Wire, Fiber Optic Cable, and Insulators

Conductors and insulators would be installed after transmission structure construction. Workers would first attach a small steel cable called the “sock line” to the structures. The other end of the sock line would be attached to the conductor. As the sock line is pulled through pulleys on the structures, it would pull the conductor from large reels mounted on trucks equipped with a brake system. This allows the conductor to be unwound and pulled through the structures under tension, usually by a helicopter.

The conductors would be attached to the structure using glass, porcelain, or fiberglass insulators. Insulators prevent the electricity in the conductors from moving to other conductors, the structure, or the ground. The conductor would be pulled through pulleys or "travelers" that are attached to the bottom of these insulators on each structure. The locations where the trucks with conductor reels support the conductor installation process are called conductor-tensioning sites. These sites would likely be located every 2 to 3 miles along the transmission line corridor. A conductor-tensioning site typically disturbs an area of about 1 acre. For the 33.1 miles of transmission line proposed, this would lead to between 11 and 17 acres of construction ground disturbance.

Two smaller wires, called overhead ground wires, would be attached to the top of the transmission structures. Overhead ground wires protect the transmission line against lightning damage. The diameter of each wire is typically 0.5 inch. Bonneville could also attach a 0.5-inch-diameter fiber optic cable to the transmission structures to provide a communication link. If attached, it would be hung below the conductors. A series of wires called "counterpoise" would be buried in the ground at each structure. These wires would establish a low resistance path to the earth for lightning protection.

Transmission Line Access Road Construction and Improvement

General Construction Practices

To the extent practicable, existing public and private roads would be used for access during the construction effort. It is anticipated that the county roads would be of sufficient quality to allow equipment and personnel movement to the construction site without significant road improvement. Any damage to county roads due to equipment movement or operation would be repaired to county standards prior to equipment demobilization.

Some improvement to agricultural roads would be required. Improvements to existing roads would generally be limited to a zone 20 feet wide (for a 16-foot roadbed and adjacent ditches). No permanent access road construction would be allowed in cultivated or fallow fields. Any roads in cropland would be removed and the ground may be restored to its original contour when the transmission line is completed depending on the landowner's needs.

Dips and culverts would be installed within the access roadbeds to provide drainage. If the road were temporary, any disturbed ground would be repaired and reseeded with grass or other seed mixtures as appropriate. At the conclusion of construction, access roads would likely be used for transmission line maintenance. If the ground were disturbed by maintenance activities, the roadbed would be repaired and reseeded if necessary. Fences, gates, cattle guards, and additional rock would be added to these roads when necessary to maintain access.

Due to a general lack of brush and trees along the proposed right-of-way, site disturbance for new construction would generally be limited to widths of 25 feet (for a 16-foot roadbed and adjacent ditches and turning curves). Total acreage of ground disturbed during construction of new access roads and spur roads would be approximately 42 acres.

Proposed access roads along each of the various stretches of the transmission line are presented in Table 2-1.

Staging, Assembly, and Refueling Areas

Construction contractors usually establish staging areas near the transmission line to stockpile materials for structures, spools of conductor, and other construction materials until the material is needed. Steel for structures would be delivered in pieces and would need to be assembled on-site. If the terrain is too steep at the actual structure site, general assembly yards would be used to erect the structure in pieces after which they would be transported to the structure site by truck or helicopter. Because trucks and helicopters need to refuel often, these areas would also likely be used for refueling.

Table 2-1. Proposed Access Roads along the New Transmission Line

Transmission Line Segment	Proposed Access Roads
Wallula-Smiths Harbor	
	Preliminary analysis suggests that the section line road south of Wallula (along the boundary of Sections 13 and 24, T7N, R31E) would be improved to a 24-foot-wide two-lane road with a gravel top course for access to the switchyard. The zone of disturbance for road construction would be approximately 30 feet wide.
	A new road would be constructed from near the northeast corner of Section 23, T7N, R31E to the northeast corner of Section 2, T7N, R31E (approximately 3 miles).
	A new 16-foot-wide access road would be built from the northeast corner of Section 2, T7N, R31E to a point midway into Section 3, T7N, R31E within the right-of-way and 25 feet from the right-of-way centerline (approximately 1.5 miles).
Smiths Harbor-McNary	
New Switchyard to Burlington Northern Railroad Crossing	In this 1-mile-long section, access from U.S. Highway 12 to the right-of-way is along an existing 2-mile-long road. This 20-foot-wide native soil road would need to be graveled in order to accommodate construction traffic for the transmission line and new switchyard. Once within the right-of-way, existing roads would be used for construction access.
Burlington Northern Railroad Crossing to U.S. Highway 12 Crossing	This section includes the Madame Dorian Park, the Walla Walla River crossing (and associated wildlife management unit), and the land up to U.S. Highway 12. Existing roads in the area would be used with no need for road improvements. It is estimated that about 300 feet of tractor work would be needed to access the three new structure sites in this area.
U.S. Highway 12 Crossing to Washington/Oregon Border	This section is approximately 4 miles long and climbs over 600 feet in elevation within 0.75 mile of the U.S. Highway 12 crossing. Construction access would be available through an existing jeep road that extends uphill along the right-of-way. The jeep road would be reshaped and widened. Approximately 2,500 feet of tractor work would be needed to access new structure sites along the right-of-way. Road building would be on rocky, sloping terrain covered in sagebrush. The right-of-way along the transmission line travels through gently rolling terrain that is being used for dryland wheat farming. Existing county and farm roads would be used to access the transmission line. Road building between structures would be through farmland. At the completion of structure construction, these roads would be obliterated over the next few farming cycles. No new road building would occur in Spring Gulch.
Washington/Oregon Border to Juniper Canyon	This approximately 4-mile section traverses dryland wheat farming terrain. The transmission line would cross gently rolling terrain up to Juniper Canyon. Existing farm roads would be used to access the right-of-way. These roads are under permit as existing Bonneville access roads and would require minor improvements including new gates, widening, blading, and shaping. Approximately 1.5 miles of new road system would be required along the edges of existing fields to support construction and future maintenance activities. Road building between most of the structures would be within existing farmland. After structure construction, these roads would be obliterated over the next few farming cycles. No road building would occur in Juniper Canyon.
Juniper Canyon to State Highway 37 Crossing	This approximately 7-mile section is very arid, sandy, flat, and covered with sagebrush. Land use activities appear to be limited to seasonal cattle grazing. Construction access for this 7-mile stretch originates from State Highway 37. The existing Lower Monumental─McNary right-of-way roads would be used for only about 20% of the section as a result of the position of the existing 230 kV PacifiCorp wood pole transmission line on the north side of the existing Bonneville transmission line. This necessitates the construction of approximately 5.5 miles of new right-of-way road approximately 125 feet to the north of the PacifiCorp transmission line, and two crossings of the PacifiCorp transmission line by the new Bonneville transmission line. The wood pole line also creates the need for a new access road to the east of the second crossing of the PacifiCorp transmission line. These two roads would generally traverse flat, sandy sagebrush terrain. Due to a paucity of brush, only minor clearing activities would be needed. Road construction in this section would likely require filter fabric installation and crushed rock top course in areas where the underlying sand is too thick to accommodate construction vehicles.

Transmission Line Segment	Proposed Access Roads
State Highway 37 Crossing to State Highway 207 Crossing	This section traverses sand and sagebrush terrain, as well as a U.S. Bureau of Reclamation irrigation water conveyance canal and the Union Pacific Railroad track and grade. Access to the right-of-way would be accomplished by using State Highway 37, State Highway 207 and an existing 0.8-mile road not currently owned by Bonneville. Road quality is generally fair to good. Existing Bonneville right-of-way roads would provide access for about 35% of this section. Due to the position of the PacifiCorp wood pole transmission line to the north of the existing Bonneville transmission line, approximately 2 miles of new right-of-way roads would be needed along the new transmission line. Most of the road building would be through rocky sagebrush terrain with grades up to 10%. The last 0.5 mile would traverse pasture and crop land.
State Highway 207 Crossing to Craig Road (County Road 1259) Crossing	This section is approximately 2 miles long and traverses flat farmland. The proposed transmission line right-of-way would be approximately 600 feet south of State Highway 14 in this section as the new line approaches the City of Umatilla. In this section, the new right-of-way would cross an existing Umatilla Electric Cooperative (UEC) 7.2 kV transmission line and a UEC 12.5 kV underground electric power cable. Roads accessing the right-of-way in this section are in good repair. The new transmission line right-of-way would for the most part be just off the edge of cultivated farmland. In one location it would cross about 2,000 feet of active crop fields. Approximately 1.5 miles of new right-of-way road would be needed in this section. Most of the road building would avoid the farmland and is through flat sagebrush ground with some wet uneven areas. Road grades would not exceed 5%.
Craig Road to Irrigation Canal (Wanaket Wildlife Area)	This 3-mile section traverses the Wanaket Wildlife Area, a wildlife unit managed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The land is flat with interspersed small round pothole lakes within and adjacent to the proposed transmission line right-of-way. The ground is stable and somewhat rocky. Four-wheel drive tracks along the existing Lower Monumental–McNary transmission line right-of-way would be used for construction access for the new transmission line for about 80% of the length of this section. About 0.5 mile of new right-of-way road and twelve 300-foot spur roads would be required within this section. When construction is complete, roads not needed for maintenance access would be closed and the native vegetation would be reestablished in all disturbed areas.
Irrigation Canal to McNary Substation	Most of this section is in existing pastureland or flat grass fields with easy access to the proposed right-of-way. Temporary right-of-way roads would need to be built through the pastures. An estimated 11 permanent gates would be needed at fence lines.

Substation Additions and Switching Station

New transmission line termination equipment would be installed at McNary Substation. The location for the new Smiths Harbor Switchyard would need to be cleared and graded. The disturbed area at Smiths Harbor Switchyard would be about 758 feet by 372 feet (approximately 7 acres).

2.2.3.4 Natural Gas Pipeline

Although there is currently no applicant, permit, or permit submittal for the line, a natural gas line would be built by GTN if the project is approved. Construction of the natural gas pipeline would commence with the survey and staking of the natural gas pipeline route. Following the survey, work crews would begin excavation of the natural gas pipeline route at several points. The natural gas pipeline would be hot-tapped to the existing GTN gas transmission line located approximately 5.9 miles from the project site after the natural gas pipeline had been constructed and pressure tested. The termination of the natural gas pipeline at the project site would be at the gas metering building. The natural gas pipeline would be buried approximately 5 feet deep to protect it from accidental rupture by tilling activities.

Normal gas pipeline construction includes the following steps:

- clearing and grubbing;
- topsoil movement/stockpiling;
- trenching;
- lining the trench with a gravel bed, and a water barrier on steep hills;
- pipe assembly and welding;
- X-ray of welds;
- hydrostatic testing;
- installing pipe in the trench;
- repeat testing (optional);
- backfilling;
- replacing topsoil; and
- seeding and restoring the site (or resuming farm practices).

Hydrostatic test water used to test for leaks before burying the pipe must be acquired from an approved source and tested before discharge into an approved location.

2.2.4 Operation and Maintenance

2.2.4.1 Generation Plant

Activities associated with normal plant operations would include running and monitoring the electrical generation units and providing project site security. These are discussed below.

Routine Operation and Maintenance

The power plant would be expected to operate as a base plant combined-cycle operation with natural gas firing in the combustion gas turbines, and intermittent natural gas-fired duct burning assistance. The most economical operation would be the base plant operation. Gas-fired duct burning assistance could produce additional power but at a lower efficiency. The exact mode of operation would be dependent on the types of sales and contracts the applicant executes with other parties.

The power plant would be expected to be on a 6-year schedule for major maintenance inspections, with the power plant scheduled to be out of service at least 4 weeks. In addition, there would be an inspection outage every 3 years where the power plant would be scheduled to be out of service from 3 to 4 weeks.

Weekly deliveries would be needed to support ongoing operations. Routine deliveries would include reagent for emission control systems, chemicals, lubricating oils, fuels, and spare parts. Solid waste would be regularly removed from the plant.

The applicant would operate and maintain the cooling system wastewater decant and evaporation ponds. The solids collected in the decant basins would be removed periodically and trucked either to a licensed off-site disposal area or to the evaporation ponds. The solid material remaining in the evaporation ponds would be removed as necessary. The evaporation ponds would be designed to hold 30 years of power plant solid wastes from the evaporation process.

The sanitary septic system at the project site would have solids removed periodically and disposed of by a licensed contractor in accordance with local requirements.

Site Security

The project site area would be enclosed with a permanent chain-link fence both east and west of the county line access road. Each fenced area would have two ingress and egress gates. The 8-foot fenced area around the power plant proper located to the east of the county access road would have one ingress and egress gate for normal power plant operations and one for major power plant maintenance activities. The fenced area to the west of the county access road would have two ingress and egress gates for normal maintenance activities. Project site security would include electronic surveillance at the access gates with closed circuit television and voice intercom.

2.2.4.2 Pipelines

The applicant would operate and maintain the makeup water supply wells and the makeup water supply pipeline. The applicant would perform regular surveillance of the makeup water supply pipeline to identify and repair dune shift erosion and accretion, should it occur to an extent that would cause water or wind erosion. On-site natural gas pipelines would be inspected and maintained in accordance with the facility operation and maintenance plan.

2.2.4.3 Transmission Line and Associated Facilities

Bonneville would provide for the operation and maintenance of all transmission facilities starting from the high side of the disconnect switch located at the applicant's substation at the power plant, in compliance with applicable federal regulations and permit conditions.

Bonneville would perform routine and periodic maintenance and emergency repairs on structures, switchyards, conductors, and other equipment. These activities could include replacing insulators or repairing damaged conductors and other ancillary equipment. Within switchyards, Bonneville may need to replace equipment periodically. Bonneville would use the access and spur roads described in the previous sections to perform repairs and routine maintenance.

Bonneville would also maintain the access roads and the right-of-way. Maintenance activities on roads would include road grading, clearing of vegetation, and repairing ditches and culverts. Very little clearing of vegetation is anticipated for maintenance of the right-of-way. However, any vegetation would be trimmed if necessary to maintain appropriate height restrictions near the transmission lines.

Maintenance crews would be responsible for controlling noxious weeds within the right-of-way. Methods used would be compatible with practices identified in the Transmission System Vegetation Management ROD (July 2000) (DOE/EIS-0285).

2.2.4.4 Natural Gas Pipeline

Operation, inspections, and maintenance of the natural gas supply line would be the responsibility of GTN in compliance with federal regulations (49 CFR and 40 CFR 192) administered by the U.S. Department of Transportation and state safety regulations administered by the Utilities and Transportation Commission.

2.2.5 Schedule and Workforce

2.2.5.1 Construction

Generation Plant

Construction activities are expected to last approximately 24 months and would employ up to a peak of 520 workers in a monthly period. The construction schedule would be based on the date EFSEC approves the Application for Site Certification. Table 2-2 presents the estimated total workforce required by quarter for the power plant construction period.

Table 2-2. Average Construction Workforce (3-Month Periods)

Quarter	Workers	
	Average	Min-Max
1	95	21-201
2	337	312-339
3	272	253-299
4	342	326-347
5	365	347-369
6	489	435-513
7	334	216-458
8	119	76-164
9	16	0-25

Water Supply Pipeline

Construction of the makeup water supply pipeline would require a workforce of approximately 28 workers over a period of 2 months at the end of the first year of plant construction.

Transmission Line and Associated Facilities

It is expected that construction of 33.1 miles of transmission line, switchyard, and upgrades to the McNary Substation would need to occur in a compressed time frame to accommodate the anticipated startup of the Wallula Power Project in the fall of 2004. The expected time to begin transmission system construction is October 2003. The transmission line would need to be completed and tested by summer of 2004. This compressed time frame would require either a larger crew working on the transmission line or two separate crews working on different segments of the transmission line simultaneously.

Two crews working simultaneously could complete two separate 15- to 20-mile segments in approximately 6 months. Assuming that two crews would simultaneously be used during the construction period, the following number of personnel and vehicles would be used to construct the new transmission line:

- 100 to 120 construction workers;

- 40 vehicles (pickups, vans);
- 6 Manitex bucket trucks;
- 2 conductor reel machines;
- 6 large excavators;
- 2 line tensioners; and
- 2 helicopters.

Construction of the switchyard and upgrades to the McNary Substation would take approximately 18 months and require 25 to 30 workers.

Natural Gas Pipeline

Construction of the natural gas pipeline would take approximately 4 months and would be expected to add an average of 37 additional workers per month above those projected for construction of the plant facilities. Construction of the natural gas pipeline could occur at any time during the 2-year construction window projected for the generation plant.

2.2.5.2 Operation and Maintenance

Generation Plant

When operational, the Wallula Power Project would be estimated to employ 32 personnel. The facility would be staffed 24 hours per day, 7 days per week, with 8-, 10-, or 12-hour shifts. Each shift would include one lead operating technician and three operating technicians. All other personnel would be on a daytime shift except where maintenance activities require either additional hours or extra maintenance work on other than the daytime shift. Listed below are the number of personnel and associated positions that would be required for normal power plant operations:

- 1 plant/site manager;
- 1 operations manager;
- 5 lead operating technicians;
- 15 operating technicians;
- 1 maintenance manager;
- 4 maintenance technicians;
- 2 electrical instrument technicians;
- 1 compliance engineer;
- 1 administrative manager; and
- 1 administrative assistant.

In addition to the regular workforce, a temporary workforce with appropriate skills would be used during major maintenance or other nonroutine operational work (see Section 2.2.4, Operation and Maintenance, for a description of the maintenance schedule).

Water Supply Pipeline

The applicant would conduct operation and maintenance of makeup water supply wells and the makeup water supply pipeline.

Transmission Line and Associated Facilities

No new workers would be needed to operate and maintain this addition to the Bonneville transmission system. Bonneville would use its inspection and maintenance staff to check towers, switchyard, and activities in the right-of-way.

Natural Gas Pipeline

GTN, as the owner and operator of the natural gas pipeline, would provide regular surveillance and maintenance of the natural gas supply line in compliance with applicable U.S. Department of Transportation and Washington Utilities and Transportation Commission regulations and permit conditions.

2.2.6 Costs

2.2.6.1 Construction

Generation Plant and Associated Facilities

The total estimated project costs of the proposed Wallula Power Project are estimated to be $731.9 million, as presented in Table 2-3.

Transmission Line and Associated Facilities

The total estimated engineering, design, construction, and startup cost for the transmission line project is $56 million. This includes $21 million for the Wallula-Smiths Harbor segment including the new Smiths Harbor Switchyard and $35 million for the Smiths Harbor-McNary segment.

Table 2-3. Estimated Project Costs

Component	Cost ($)
Land	2,700,000
Mechanical Equipment	298,700,000
Civil and Structural Equipment/Material	10,700,000
Electrical and Control Equipment/Material	27,900,000
Chemical and Water Equipment/Material	6,600,000
Field Construction and Construction Indirect Costs	87,200,000
Engineering, Construction Management, Contingency, and Fee	68,900,000
Transmission Line to 500 kV Bonneville Line and Breaker Substation	12,100,000
Gas Pipeline	7,700,000
Spare Parts	9,000,000
State and Local Taxes (Sales and Property)	46,300,000
Permitting, Project Management, and Other Owner Costs	6,500,000
Environmental Mitigation, PM10 Emission Reduction Credits, and Water Rights	9,800,000
Development Costs	15,000,000
Interest During Construction	72,800,000
Other Financing Costs	17,500,000
Working Capital Costs	4,600,000
Contingency	27,900,000
Total Project Costs	731,900,000

2.2.6.2 Operation and Maintenance

Generation Plant

Typical items that would contribute to variable operating costs for the Wallula Power Project include

- fuel;
- catalyst replacement;
- raw water;
- water treatment chemicals;
- other consumables;
- liquid waste disposal;
- solid waste disposal; and
- aqueous ammonia.

Typical items that would contribute to fixed operating costs for the Wallula Power Project include

- electrical energy purchases;
- electrical demand charges;
- incremental plant startup costs;
- direct labor;

- labor benefits;
- contractor fees;
- home office fees;
- plant operation and maintenance contractor services and materials;
- insurance;
- property taxes;
- federal, state, and local taxes;
- spare parts;
- capital improvements;
- miscellaneous costs;
- legal fees;
- auditor fees;
- financial fees;
- owner's engineer costs;
- consultant costs; and
- financial repayments.

Transmission Line and Associated Facilities

The estimated annual operations and maintenance costs are $13,300 per year for the Wallula-Smiths Harbor segment and $42,390 per year for the Smiths Harbor-McNary segment, totaling $55,690 per year for the transmission line project. The estimated annual cost for maintenance of the Smiths Harbor Switchyard would be $95,310, and maintenance of additional equipment at McNary Substation would cost $31,770. Total annual maintenance cost for the transmission line and substation facilities is $182,770.

2.2.7 Mitigation Measures Inherent in the Project Design

In addition to complying with applicable codes and standards, best management practices (BMPs) and a number of mitigation measures have been incorporated into the design, construction, operation, and maintenance of the Wallula Power Project and Bonneville's transmission line and switchyard project to eliminate or minimize potential adverse impacts on the physical or human environment. These measures are presented in Appendix A.

2.3 Alternatives

2.3.1 Other Alternatives

In the mid-1990's, Bonneville prepared a number of NEPA documents that analyzed the environmental effects of various alternative policies and business strategies. In particular, the "Resource Program Final Environmental Impact Statement: (DOE/EIS-0162) and the "Business Plan Final Environmental Impact Statement" (DOE/EIS-0183) included detailed analyses of the environmental consequences of alternative strategies for managing demand and increasing the supply of electrical energy in the Pacific Northwest. Alternatives analyzed included various combinations of conservation, development of renewable resources (including hydropower, geothermal, wind, and solar energy), efficiency improvements, cogeneration, combustion turbines, nuclear power, and coal.

The Business Plan EIS included a description of how it would be used in the decision making process. It stated:

> "This BPA EIS is a programmatic EIS: that is, it addresses 'umbrella' policies and concepts. Approaches, strategies and general agency direction – not site-specific actions – are recommended here. As the Administrator implements his broader policies and business strategies, other more specific business decisions such as the development of individual energy generation resources and transmission facilities will have their own environmental review and decision processes. These additional environmental reviews will look at site-specific actions, using the information and decision in this EIS as a base to understand how they fit into more global policies and business strategies. This process is called 'tiering', where more specific additional information on potential environmental consequences adds to the understanding for subsequent decisions."

Consistent with this approach, this EIS for Wallula Power Project confines itself to analysis of the site-specific environmental impacts of the proposed action. The analyses of larger policy and strategy alternatives are contained in the programmatic Business Plan EIS and Resource Program EIS and are included here by reference.

In the Business Plan Record of Decision, Bonneville's Administrator selected the Market-Driven alternative. The Market-Driven alternative strikes a balance between marketing and environmental concerns, including those for transmission related actions. It also helps Bonneville to ensure the financial strength necessary to maintain a high level of support for public service benefits such as energy conservation and fish and wildlife mitigation and recovery activities. The Business Plan EIS was intended to support a number of decisions, including contract terms Bonneville would offer for transmission services.

2.3.2 No Action Alternative

Under the No Action Alternative the proposed Wallula Power Project and all associated features including the makeup water supply pipeline, the transmission lines and switchyard, the access roads and road improvements, and the natural gas pipeline would not be constructed.

Under the No Action Alternative there would be no environmental impacts from the generation plant. However, because the site is already zoned industrial, future industrial development could occur at the site. The No Action Alternative would eliminate the local economic benefits to Walla Walla County and nearby communities in the form of tax revenues and opportunities for employment resulting from this proposal.

The No Action Alternative does not remove the need for power production; it potentially transfers the impacts to another site and potentially another technology. There would be no contribution to new electrical generation required to meet increasing power demands in the Pacific Northwest and adjoining regions.

2.3.3 Alternative Tower Height and Longer Span Design

As an alternative to the standard transmission tower structure height of 145 feet and average span distance of 1,150 feet, Bonneville is considering the possibility of building structures that would be approximately 165 feet high with associated average span distances of approximately 1,500 feet for a portion of the transmission line. The proposed segment having longer span distances is shown in Figure 2-2. This alternative design segment would potentially run from just south of Wallula Junction to about a point parallel to milepost 195 on U.S. Highway 730, denoted as Visual Assessment Area 3 in Section 3.11, Visual Resources/Light and Glare. The area considered for this alternative is less visually sensitive and has less potential for bird strikes because it is farther away from the Columbia River.

Potential advantages of this alternative include a reduction in

- the number of structure locations requiring surface disturbance;
- the overall quantity of steel used in project construction; and
- the overall cost of construction.

Potential disadvantages of this alternative include

- a change in the visual perspective along the existing transmission line corridors due to the difference in height of key structural elements in the new system; and
- a greater distance between the ground and the conductors leading to potential additional disruption of avian flight corridors and potential increase in avian strikes.

- Bonneville considers the potential advantages of the alternative structure heights and span distances to be significant enough to carry this alternative forward in the environmental evaluation.

2.3.4 Alternative Alignment near McNary Substation

Because of extensive development in the approach to the McNary Substation, a slightly different alignment is being considered to reduce potential route congestion issues.

In 2001, a new 500 kV terminal was being installed at McNary Substation for the transmission line from Hermiston Power's Calpine Project. The Calpine line will be connected at the substation where the Lower Monumental–McNary has been connected. The Lower Monumental–McNary connection is being moved to the east where it will angle into the southeast corner of the substation. Construction was to be completed in 2001.

Figure 2-7, the proposed action, would involve relocating the Lower Monumental–McNary line from its newly relocated position to a corridor 125 feet east of the double circuit towers that carry Calpine–McNary and McNary Loop to Lower Monumental–John Day. The new Smiths Harbor–McNary line from the Wallula Power Project would then connect to McNary Substation in the corridor previously occupied by Lower Monumental–McNary.

Figure 2-8 displays an alternative for termination of the new Smiths Harbor-McNary transmission line at McNary Substation. This option turns north before reaching the new location of the Lower Monumental–McNary line and then continues north before reaching an angle point northeast of the angle point where Lower Monumental–McNary turns into the substation. This option requires the fewest changes to the existing configuration coming into McNary Substation. The new line parallels the location of the Lower Monumental–McNary line at a distance of 125 feet from center line to center line.

2.4 Alternatives Considered but Rejected

This section summarizes the process and decisions made by the applicant to accept or reject alternatives for purposes of this Draft EIS. Agency acceptance or denial of the proposed alternatives is part of the permit/review process.

2.4.1 Alternative Generation Plant Locations

Southeastern Washington provides three optimal conditions that contribute significantly to the development of generating plant facilities in the area, and specifically a gas-fired generation plant. These include (1) the availability of a natural gas supply to support power plant operations, (2) the close proximity of existing or proposed electrical transmission lines to transfer electrical power produced, and (3) the availability of land priced lower than land in western Washington.

Although two other sites in the general area were considered, the selected project site is the only location identified in the southeastern portion of Washington that met all six screening criteria considered appropriate by the applicant for the Wallula Power Project:

- heavy industrial zoning;
- located within 10 miles of the GTN natural gas pipeline;
- located within 10 miles of a 500 kV electrical transmission line;
- access to an industrial water supply;
- access to supplemental water rights and delivery system; and
- located a suitable distance away from any concentration of sensitive receptors.

2.4.2 Alternative Generation Plant Designs

A larger power plant of either 1,950 MW or 2,600 MW was considered and rejected for the following reasons.

- The project would be located in one of the few heavy-industrial-zoned areas in Walla Walla County. This area is located in the middle of a moderate nonattainment area for PM10 emissions governed by amendments to the Clean Air Act, which require new projects to offset the PM10 emissions generated by a new facility. The only significant activities located in the area from which PM10 emission offsets can be procured or developed are the Boise Cascade Corporation Wallula Mill, the J.R. Simplot Company feedlot, the Ponderosa Fibers of Washington deinking plant, the Iowa Beef Processors slaughterhouse, and cultivated farmland. The only practical method to provide PM10 emission offsets is to retire actively cultivated farmland to reduce windblown agricultural dust. As the project size increases, the quantity of retired farmland required to offset the emissions increases as does the associated expense.
- Water availability in the area is restricted to existing water rights. The project would acquire and place in trust sufficient existing water rights to accommodate the 1,300 MW power plant. A larger project would have to obtain additional existing water rights or rely, in part, upon a dry cooling system, which would materially increase the capital and operating costs of the project.
- The present Bonneville transmission system has limited capacity for firm transmission rights. The proposed 1,300 MW Wallula Power Project requires the construction of a new 500 kV line from the power plant to the McNary Substation. The addition of both the 1,200 MW Starbuck Project and the 1,300 MW Wallula Power Project requires the addition of a 70-mile 500 kV transmission line from the McNary Substation to the John Day Substation as well as other selected line upgrades. Integrating a larger project size into the Bonneville transmission grid would likely require additional upgrades/circuit additions that would add to the overall cost of the project.

A smaller plant of either 650 MW or 975 MW was considered and rejected as less economical based on economy of scale, the need for power in the Pacific Northwest, and the limited environmental impacts due to increasing the power plant size to 1,300 MW.

2.4.3 Alternative Power Generation Technologies

Alternative power generating technologies considered were those that could provide both base load power and peaking power to economically sell electricity in the deregulated market at the lowest cost, yet take advantage of rapidly changing market conditions. A power plant designed as either a base load or a peaking plant only would expose the project to the risk of market changes since the types of demand and competition change over time in the deregulated market. Two intermittent technologies, solar and wind, were also examined to determine if they were economically viable in the deregulated electricity market. The following selection criteria were used to compare the various alternatives.

- Commercial availability – The technology must prove to be commercially available at an acceptable cost.
- Feasibility – The technology must meet environmental, public safety, public acceptability, fuel availability, financial acceptability, and system integration requirements.
- Cost effectiveness – The technology must be cost-competitive with existing power-generating facilities and facilities that are expected to enter the market near the time the proposed project begins commercial operation and for a 30- to 35-year period thereafter.

2.4.3.1 Alternative Turbine-Generator Technologies

Various turbine-generator technologies were evaluated and rejected based on all or some of the following: lower plant efficiency, higher emissions per kilowatt-hour generated, higher capital costs, increased labor costs to operate and maintain the facility, and commercial availability. Technologies that were evaluated include

- oil/natural gas-fired conventional furnace/boiler steam turbine-generator;
- natural gas-fired supercritical boiler steam turbine-generator;
- natural gas-fired single-cycle combustion gas turbine;
- Kalina combined cycle; and
- advanced combustion gas turbine.

2.4.3.2 Fuel Cells and Magnetohydrodynamics

Fuel cells use an electrochemical process to combine hydrogen and oxygen to liberate electrons and provide a flow of current. High-temperature combustion gas is ionized and passed through a magnetic field to directly produce electricity. Neither of these technologies is cost competitive with conventional combined-cycle technologies. These technologies were rejected.

2.4.3.3 Coal

Various coal technologies were evaluated and rejected due to all or some of the following: increased costs for capital installation, higher labor costs, higher operating costs, higher emissions, lower plant efficiency, and commercial availability. Technologies that were evaluated include

- coal or other solid fuel fired conventional furnace boiler steam turbine-generator;
- atmospheric and pressurized fluidized bed combustion;
- integrated gasification combined cycle; and
- direct and indirect fired combustion turbines.

2.4.3.4 Nuclear Power

Much controversy remains over the storage of nuclear waste fuel and radioactive contaminated materials, with the result that no new nuclear fission plants have been built in the U.S. in the last 25 years. Further, the large capital cost and long time to license, design, and construct make this technology economically unsuitable for meeting the near-term, low-cost energy needs of the Pacific Northwest, thus eliminating this technology from further consideration.

2.4.3.5 Hydroelectric

This technology uses falling or flowing water to turn turbines that are connected to generators that produce electric energy for sale. A dammed or flowing river is required to obtain the falling or flowing water. This technology is commercially available. However, most sites within the State of Washington that are ideal for hydroelectric technology of the plant size required to make the Wallula Power Project economically feasible have already been developed. The costs and environmental licensing problems this technology presents, especially relative to fish passage, make it infeasible for the proposed project.

2.4.3.6 Geothermal

This technology uses steam or high-temperature water obtained from naturally occurring geothermal resources to power steam turbines to produce electric energy for sale. However, there are no geothermal resources of a sufficient size and quality in the project area, making this technology infeasible for the proposed project.

2.4.3.7 Solar and Wind Power

In general, these technologies require large land areas in order to generate the proposed 1,300 MW net output. For example, centralized solar projects using parabolic-trough technology require approximately 5 acres per megawatt. The land requirements to produce 1,300 MW for a parabolic-trough project are 6,500 acres, compared with the present project that uses about 97 acres**.** Photovoltaic arrays require similar acreage per megawatt.

Photovoltaic generation may be economical in the future when sufficient research is performed and photovoltaic cells are mass-produced. To further this effort, the applicant is an investor and partner in the Hanford Photovoltaic Solar Project.

While wind supplies energy, it is unreliable for base load requirements due to the variability of wind speeds. This technology will not produce base load energy 24 hours per day, 365 days per year.

2.4.4 Cooling System Alternatives

All steam cycle power plants condense steam at the exhaust of the steam turbine. The preferred alternative is a water-cooled surface condenser with a wet mechanical-draft cooling tower. Two other cooling system alternatives considered were combination wet/dry cooling systems and the air-cooled condenser.

2.4.4.1 Combination Wet/Dry Cooling Systems

The wet/dry mechanical-draft cooling tower is similar in design to the wet mechanical-draft cooling tower except for the dry portion of the design. A closed loop circulating water system removes heat from the condenser and supplies the hot water to the cooling tower. Wet/dry mechanical-draft cooling towers have design, engineering, and construction costs that are higher than any of the other cooling systems.

An alternative to a wet/dry mechanical-draft cooling tower is a wet mechanical-draft cooling tower/dry air-cooled condenser hybrid cooling system. The plan area for both the wet mechanical-draft cooling tower and an air-cooled condenser is greater than that of an air-cooled condenser, since they both must have substantial open area around their perimeters to prevent interference with the air inlet path.

Although water consumed for wet/dry cooling at maximum consumption rates is approximately a third of that consumed for water-cooled systems, these alternatives were rejected due to a readily available supply of water, and the high capital costs and larger physical size of the dry cooling component.

2.4.4.2 Air-Cooled Condenser (Dry Cooling)

To cool the exhaust steam exiting the steam turbine generators, an air-cooled condenser does not use an intermediate system of cooling water, thus eliminating the need for a circulating water system and reducing the size of the power plant makeup water supply and treatment system. The condensor cools the steam into water ("condensate") which is then directed to a collection tank and pumped to the HRSGs for reuse to generate steam. However, an air cooling system uses large quantities of fin tubes for the heat transfer surface. Large fans are used to transfer the heat from the finned tubes (cooling water inside the tubes) to the atmosphere. Compared to a water cooling system, the efficiency of an air cooling system can be reduced by temperature extremes, and an air cooling system has higher auxiliary power consumption than a water cooling system (which reduces the power available for export), has a higher fan noise, and requires a larger capital investment. Given the availability of water rights, and the increased capital costs and very large size of the dry cooling tower (that would be a visual impairment), this alternative was rejected.

2.4.5 Makeup Water Supply Alternatives

Five alternatives to the preferred alternative for water procurement were assessed and rejected due to water rights availability and year-round availability. These consisted of

- purchase of Boise Cascade Corporation shallow groundwater rights currently used for a fiber (tree) farm for indirect use at the power plant;
- purchase of third-party (not Boise Cascade Corporation or J.R. Simplot Company) shallow groundwater rights for indirect use at the power plant;
- purchase of existing Legrow Irrigation District Columbia River surface water rights for direct use at the power plant;
- purchase of other existing Snake River or Columbia River surface water rights for indirect use at the power plant; and
- purchase of a portion of Boise Cascade Corporation water rights for direct use through water efficiency projects at its Wallula Mill.

2.4.6 Alternative Transmission Line Routes

Bonneville considered the possibility of crossing the Walla Walla River 200 feet east of the existing Lower Monumental–McNary transmission line as opposed to the preferred alternative of crossing 200 feet to the west of the existing Lower Monumental–McNary transmission line. The alternative was considered due to concerns of the USFWS that the western alignment may lead to disruption of bird flight patterns entering and leaving the marshes and ponds near the mouth of the Walla Walla River and possibly creating additional bird strikes.

An eastern alignment for the new transmission line would create significant difficulties for Bonneville during construction. The existing Lower Monumental–McNary transmission line would need to be crossed twice to allow the rest of the alignment to remain to the west and north of the existing transmission lines. Crossing existing 500 kV transmission lines is difficult, expensive, and potentially dangerous to overall system reliability.

The alternative route was assessed through literature research and site environmental analyses. It was determined that habitat value along both potential alignments (one 200 feet west of the existing transmission line and one 200 feet east of the existing transmission line) was essentially identical. A site containing cultural/historical artifacts was identified along the eastern alignment.

Additional discussions were held with USFWS and the Corps, the landowner for the Walla Walla River wildlife management unit. It was jointly decided that the western alignment was preferable to the eastern alignment when all aspects of the potential for environmental degradation were considered. As a result, the eastern alignment option was dropped from further consideration.

An alternate Wallula-Smiths Harbor segment was considered early in project planning but was dropped because it crossed too near to a large farm building and too close to the ponds near the J.R. Simplot feedlot where bald eagles have been observed hunting.

2.4.7 Site Access Alternatives

Alternatives for project site access were considered based on discussions between the applicant, the county, the Port of Walla Walla, and WSDOT officials. The preferred temporary and permanent access alternatives are described in Section 3.15, Traffic and Transportation. Alternatives considered and rejected are discussed below.

2.4.7.1 Dodd Road

This alternative has been rejected by the applicant but is favored by WSDOT. It would include the continued use of Dodd Road as the primary access route both during construction and long-term operations. Access to the project would require a 90-degree turn to the east from U.S. Highway 12 onto Dodd Road then another 90-degree turn to the south from Dodd Road onto the project site. The Dodd Road access is already heavily traveled with large tractor-trailers servicing the J.R. Simplot Company feedlot and Iowa Beef slaughterhouse. The average traffic volume is 3,500 vehicles per day, and the anticipated project-generated peak traffic volume is 433 construction worker vehicles per day and 389 construction deliveries (Wallula Generation 2001). The applicant feels that traffic from this alternative is unacceptable because of an increased probability of traffic accidents and, therefore, supports the U.S. Highway 12 access alternative.

Section 3.15, Traffic and Transportation, analyzes traffic conditions for the peak construction month for two scenarios, one without the proposed temporary construction access from U.S. Highway 12 and one with it.

2.4.7.2 At-Grade Intersection North of Depot Road

This alternative involves the construction of an at-grade intersection located 1,400 feet north of Depot (Attalia) Road with acceleration and deceleration lanes added to the U.S. Highway 12 four-lane widening project. This alternative would provide congestion relief to Dodd Road and would assist Walla Walla County in further developing roadway infrastructure within the Attalia Industrial Urban Growth Area. WSDOT is implementing a long-range program to upgrade this section of U.S. Highway 12 by eliminating direct access onto the highway and directing traffic to upgraded intersections and ultimately interchanges.

A fully developed permanent intersection at Depot Road would be inconsistent with WSDOT's desire to ultimately control U.S. Highway 12 access through controlled interchanges. WSDOT has indicated that it will oppose this permanent access alternative and thus this alternative was rejected.

2.4.7.3 Interchanges at Boise Cascade Corporation and North of Dodd Road

This alternative involves the construction of two controlled interchanges with one interchange located several hundred feet north of Dodd Road and the other interchange located south of the project site in the vicinity of the main Boise Cascade Corporation Wallula Mill entrance. The interchanges would be connected by a north-south industrial arterial. All existing access points to U.S. Highway 12 between the two interchanges would be eliminated.

WSDOT does not have the interchanges in its 5-year or 10-year plans and it is not anticipated that any progress toward construction of these interchanges would be made in the near future. While this option may be preferable to at-grade intersections, the interchanges would not be completed in time to relieve the project construction congestion. For this reason, the alternative was rejected as a near-term access solution. However, the applicant has expressed a willingness to grant the county an easement traveling south to north through the project site to facilitate long-term arterial planning associated with future interchange construction. The applicant also committed to help fund a transportation study in conjunction with Walla Walla County, WSDOT, and a regional tri-county transportation group. The applicant is designing the power plant layout with project site access from a north-south road that could be part of the north-south industrial arterial. The north-south road is being designed to county collector or arterial standards.

2.4.8 Alternative Natural Gas Pipeline Routes

One alternate gas transmission pipeline route was assessed in addition to the proposal. The alternate route (5.75 miles) would extend from the southeast end of the project site and parallel the section line to the east until it intersects with the Chevron Products Pipeline easement. The route would then traverse southeasterly and east to the interconnection point with the existing GTN natural gas pipelines. This route crosses active farming irrigation circles and makes 10 irrigation pipeline crossings. The potential for interference from cathodic protection systems between the proposed natural gas pipeline, the Chevron oil products pipeline and the irrigation systems, as well as the disruption to farming activities, led to the rejection of this alternative.

2.5 Benefits or Disadvantages of Reserving Project Approval for a Later Date

The need for energy in the Pacific Northwest and adjoining regions has led to recent sizable fluctuations in energy price and periodic shortfalls in available energy versus demand. Projections of future demand suggest that the demand for power will continue to increase with time even with significant efforts to improve energy conservation. The governor's emergency proclamation and declaration of energy supply alert acknowledges the immediate need for additional power generation resources in the State of Washington.

The science and politics of greenhouse gas emissions and their potential impacts on global warming are still evolving. Later approval might come at a time when greenhouse gas emission mitigation is mandatory. However, without near-term requirements, delay would result in another facility being built in lieu of the proposal.

The natural resources needed to power the proposed plant are available at this time. The needed transmission capacity to deliver the generated power to market would be provided by Bonneville and fully paid for directly and indirectly by the applicant. Delays in addressing the need for additional power resources in the region could be disadvantageous to the community, and would do nothing to address current supply and demand issues for electrical power. They would delay all impacts, direct, indirect, and cumulative.

2.6 Regulations and Permits

If a power generation project is approved, EFSEC specifies the conditions of construction and operation, issues a Site Certification Agreement in lieu of any other individual state or local agency authority, and manages the environmental and safety oversight program of project operations. As part of EFSEC's permitting process, Wallula Generation, LLC submitted an Application for Site Certification on August 20, 2001. EFSEC is the sole nonfederal agency authorized to permit the proposed generation plant project. Federal agency approvals are also needed.

For informational purposes, Table 2-4 lists the major state and local permit requirements preempted by EFSEC, as well as federal requirements.

As a federal agency, Bonneville is constitutionally prohibited from complying with the procedural requirements associated with obtaining state and local land use approvals or permits. The agency would, however, strive to meet or exceed the substantive standards and policies of the environmental regulations listed in Table 2-4.

Table 2-4. Overview of Permit, Approval, and Consultation Requirements for Wallula Power Project

Agency	Permit/Authority
Federal Government	
Advisory Council for Historic Preservation	Consultation under Section 106/National Historic Preservation Act. Historic and cultural resources also protected under Archeological Resources Protections Act, American Indian Religious Freedom Act, National Landmarks Program, World Heritage List, and Native American Graves Protection and Repatriation Act
Bonneville Power Administration	Bonneville is co-lead agency with EFSEC for preparation of the EIS, to ensure the compliance of the project with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality regulations for implementing NEPA
	Under Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, federal agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations
Bureau of Land Management	BLM manages Baker Resource Management Area under 1989 Resource Management Plan
Federal Aviation Administration	Establishes aviation regulations and lighting. Determines whether a Notice of Proposed Construction or Alteration is required for potential obstruction hazards
Federal Energy Regulatory Commission	FERC would be responsible for siting of the 5.9-mile natural gas pipeline. Environmental impacts associated with the proposed natural gas pipeline would be assessed under a separate NEPA document
National Marine Fisheries Service	Provides consultation for essential fish habitat (EFH) under the Magnuson-Stevens Act, amended by Public Law 104-297, the Sustainable Fisheries Act of 1996
Natural Resources Conservation Service	Identifies and quantifies adverse impacts of federal programs on farmlands under the Farmland Protection Act
U.S. Army Corps of Engineers	Wallula Habitat Management Area is owned by the Corps and managed by USFWS; Juniper Canyon Wildlife Management Unit is owned and managed by the Corps
	Authorization from the Corps is required in accordance with the provisions of the Clean Water Act, Section 404 when there is a discharge of dredged or fill material into waters of the U.S., including wetlands
	Under Section 10 of the Rivers and Harbors Act, authorization would be required for the transmission line crossing of the Walla Walla River.
U.S. Department of Energy	Administers compliance with Floodplains/Wetlands Environmental Review and Executive Orders 11988 and 11990
U.S. Environmental Protection Agency	The Clean Water Act establishes requirements to prevent or contain discharges or threat of discharges into navigable waters or adjoining shorelines and to prepare a spill prevention, control, and containment plan

Agency	Permit/Authority
	The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) establishes reporting requirements for reportable releases of CERCLA-designated hazardous substances
	The Accidental Release Prevention Program specifies required procedures for plant design, operation, and maintenance to reduce potential for accidental spills of ammonia
	Emergency Planning and Community Right to Know requires annual submittal of a Toxic Release Inventory report describing use and discharge of ammonia via air emissions and wastewater discharges
	The Resource Conservation and Recovery Act, as amended, provides a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal facilities
	The Federal Insecticide, Fungicide and Rodenticide Act registers and regulates pesticides
U.S. Fish and Wildlife Service	Division of Migratory Bird Management establishes specific lighting guidelines for the siting, construction, operation, and decommissioning of communication towers (which are applicable to tall stacks)
	USFWS would provide a biological opinion on wildlife and plant species that are federally listed under the Endangered Species Act
	Migratory Bird Treaty Act, as amended, protects migratory birds against the act of "taking," killing, or possessing
U.S. Department of Transportation, Office of Pipeline Safety	Governs the design, construction, testing, maintenance, and operation of natural gas piping systems. Provides for gas pipeline safety approval
State Government (EFSEC has single permit authority over all Washington state and local permits)	
Washington Energy Facility Site Evaluation Council (EFSEC)	EFSEC is co-lead agency with Bonneville for preparation of the EIS and issues the Site Certification Agreement. EFSEC's responsibilities derive from the Revised Code of Washington (RCW) 80.50. EFSEC has been delegated authority by the U.S. Environmental Protection Agency to issue permits under the federal Water Pollution Control Act and the federal Clean Air Act for facilities under its jurisdiction. EFSEC provides a single permit authorization to all other Washington state and local permits; incorporates equivalent requirement and reviews National Pollutant Discharge Elimination System (NPDES), Hydraulic Project Approval (HPA), 401 Certification, and all other Washington state and local permits and approvals.
Washington Department of Ecology	Notice of Construction (NOC) approval
	Prevention of Significant Deterioration (PSD) permit
	Air operating permit
	Acid rain permit
	Water quality certification
	Coastal zone management program consistency certification for Washington (administered through state Shoreline Management Act)
	NPDES and state waste discharge baseline general permit for stormwater discharge associated with construction and industrial activities
	Waste discharge permit for wastewater discharges to on-site sewer system
	Water rights permitting and review
	Permit for reuse of stormwater

Agency	Permit/Authority
	Review and approval of design, construction, operation, and maintenance of dams
	Noise standards (173-60 WAC)—daytime construction noise is exempt
Washington Department of Fish and Wildlife Oregon Department of Fish and Wildlife	The Fish and Wildlife Conservation Act of 1980 encourages federal agencies to conserve and promote conservation of nongame fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act requires federal agencies undertaking projects affecting water resources to coordinate with the USFWS and the state agency responsible for fish and wildlife resources. For the proposed project, the relevant state agencies are the Washington Department of Fish and Wildlife and the Oregon Department of Fish and Wildlife.
Washington Department of Labor and Industries	Ensures compliance of structures with electrical contracting and certification laws, as well as safety of construction workers
Washington State Department of Transportation	WSDOT is required to reasonably accommodate utilities within its right-of-way corridors and issues utility permits and franchises
	WSDOT ensures compliance with roadway design criteria, including limited access standards.
Washington Utilities and Transportation Commission	WUTC regulates privately owned utilities offering service to the public, primarily through rate and other economic reviews, but also has some public safety responsibilities for in-state pipelines and railroads. It would provide for natural gas pipeline construction approval
Local Government	
Umatilla County	Umatilla County Comprehensive Plan (1983-2003)
	Umatilla County Comprehensive Plan Amendment
	Umatilla County Code of Ordinances
Walla Walla County	Walla Walla County Comprehensive Plan 2000-2020
	Western Walla Walla County Development Plan (1968-1988 superceded by Walla Walla County Comprehensive Plan 2000-2020
	Walla Walla County Zoning Regulations (17.12.040-Establishment of districts—Designated—General Purposes)
	Walla Walla County Shoreline Management Master Program (1975)
	Walla Walla County Code 15.04 (Building Codes)
	Walla Walla County Code Titles 8.12 and 8.16 (Sewage Disposal Installation and Design, Septic Tank Cleaning Regulations)
	Walla Walla County Code Title 9.20 (Noise Regulations)
	Walla Walla County Code Title 8.24 (Hazardous Weeds, Rubbish, and Debris)
	Walla Walla County Code Title 18.08 (Wetland Protection)

2.7 Coordination and Consultation with Agencies, Indian Tribes, the Public, and Nongovernment Organizations

The applicant and Bonneville, along with their consultants, attended two public meetings planned and hosted by EFSEC for the proposed project. These meetings were held in Burbank, Washington on October 18, 2000 at the Columbia Middle School, and at the Garrison Middle School in Walla Walla, Washington on October 19, 2000. In addition, Bonneville hosted public meetings jointly with EFSEC in Umatilla, Oregon on June 7, 2001 and at the Columbia Middle School in Burbank, Washington on October 2, 2001.

The applicant and Bonneville, along with their consultants, also attended an agency meeting hosted by EFSEC on October 19, 2000 at the Columbia Basin Community College in Pasco, Washington. On October 2, 2001, EFSEC and Bonneville cohosted another agency meeting, again at the community college in Pasco. Agencies, Indian Tribes, and organizations represented at the meetings included the following.

- Bonneville;
- EFSEC;
- USFWS;
- WSDOT;
- Ecology;
- Washington Department of Natural Resources (WDNR);
- Washington Department of Agriculture;
- Washington Department of Fish and Wildlife;
- U.S. Bureau of Reclamation;
- Confederated Tribes of the Umatilla Indian Reservation (CTUIR);
- Walla Walla County Fire District 5; and
- Walla Walla County Sheriff's Department.

The applicant and Bonneville, along with their consultants, have consulted with the National Marine Fisheries Service (NMFS) to identify whether any fish species listed or potentially listed as threatened, endangered, or candidate under the Endangered Species Act occur within the project area. Project site-specific information on federal status species and state priority species and habitats was also requested from the USFWS, the Washington Department of Fish and Wildlife (WDFW), and the WDNR Natural Heritage Program.

Bonneville and its consultants have also consulted with local Indian Tribes and other interested parties. Bonneville initiated a number of meetings with the local Indian Tribes during the development of the transmission line proposal. The proposed transmission line also falls within the ceded lands of the CTUIR. Other interested Tribes include the Yakama Nation, the Nez Perce, and the Wanapum Band of the Yakama Nation. Additional Indian Tribes consulted include the Confederated Tribes of the Colville Indian Reservation and the Warm Springs Indians. The CTUIR have entered into contractual agreements with Bonneville consultants and participated in archeological fieldwork and oral histories. Other interested Tribes have yet to sign contracts, although they were invited to participate.

Bonneville and its consultants have consulted with both the Washington and Oregon state historical preservation officers (SHPOs), as required under Section 106 of the National

Historic Preservation Act. Bonneville has notified the SHPOs that the proposed transmission line is an "undertaking" as defined in 36 CFR 800.16(Y), and that Bonneville is the lead federal agency.

Consultations with the public, agencies, Indian Tribes, and interested parties will continue through the EIS process.