

Contents

Section	Page
1 Summary	1-1
1.1 Introduction	1-1
1.2 Purpose and Need for the Project	1-1
1.3 Description of Alternatives.....	1-2
1.3.1 Proposed Action.....	1-9
1.3.2 Impacts of Proposed Action	1-10
1.3.3 Alternatives Considered	1-12
1.3.4 Mitigation Measures.....	1-14
1.4 Significant Adverse Impacts.....	1-15
1.5 Significant Areas of Controversy or Uncertainty	1-15
2 Proposed Action and Alternatives.....	2-1
2.1 Introduction	2-1
2.1.1 Background.....	2-1
2.1.2 Project Components and Jurisdictional Overview.....	2-1
2.1.3 The Applicant.....	2-6
2.1.4 Cross-Reference Guidance Table to 463-42 WAC	2-6
2.1.5 List of Preparers	2-13
2.2 Description of the Proposed Action	2-14
2.2.1 Purpose and Need	2-15
2.2.2 Location.....	2-16
2.2.3 SPP Facilities.....	2-23
2.2.4 Construction Activities	2-40
2.2.5 Operation and Maintenance.....	2-57
2.2.6 Schedule and Workforce.....	2-96
2.2.7 Costs and Revenues.....	2-105
2.2.8 Mitigation Measures Inherent in the SPP Design	2-110
2.2.9 General Mitigation Measures.....	2-113
2.3 Description of the No Action Alternative.....	2-113
2.4 Alternatives to the Proposed Action	2-115
2.4.1 Alternative Generation Plant Locations	2-115
2.4.2 Northwest Site Alternative.....	2-120
2.4.3 Alternative Generation Plant Designs	2-120
2.5 Benefits or Disadvantages of Reserving SPP Approval for a Later Date	2-131
2.6 Pertinent Federal, State, Local, and Other Requirements	2-132
2.6.1 Federal Permit Requirements.....	2-135
2.6.2 State Permit Requirements	2-138
2.6.3 Local Permits: Columbia County	2-143
2.6.4 Other Permits	2-145
2.7 Coordination and Consultation with Agencies, Native American Tribes, the Public, and Nongovernmental Organizations	2-145

Section	Page
Attachments	
A	Performance Data
B	Water Pipeline Memorandum
C	Certificate of Land Use Consistency
D	Tribal Letters
3	Existing Conditions, Impacts, and Mitigation Measures 3.1-1
3.1	Earth 3.1-1
3.1.1	Existing Conditions 3.1-1
3.1.2	Environmental Impacts of the Proposed Action 3.1-18
3.1.3	Environmental Impacts of Alternatives 3.1-21
3.1.4	Mitigation Measures 3.1-22
3.1.5	Cumulative Impacts 3.1-23
3.1.6	Significant Unavoidable Adverse Impacts 3.1-23
3.2	Air Quality 3.2-1
3.2.1	Existing Conditions 3.2-1
3.2.2	Environmental Impacts of the Proposed Action 3.2-6
3.2.3	Environmental Impacts of Alternatives 3.2-20
3.2.4	Mitigation Measures 3.2-21
3.2.5	Cumulative Impacts 3.2-22
3.2.6	Significant Unavoidable Adverse Impacts 3.2-22
3.3	Water Resources 3.3-1
3.3.1	Existing Conditions 3.3-1
3.3.2	Environmental Impacts of the Proposed Action 3.3-8
3.3.3	Environmental Impacts of Alternatives 3.3-15
3.3.4	Mitigation Measures 3.3-16
3.3.5	Cumulative Impacts 3.3-19
3.3.6	Significant Unavoidable Adverse Impacts 3.3-19
	Attachment A Water Right Application
3.4	Wetlands and Vegetation 3.4-1
3.4.1	Existing Conditions 3.4-1
3.4.2	Environmental Impacts of the Proposed Action 3.4-9
3.4.3	Environmental Impacts of Alternatives 3.4-10
3.4.4	Mitigation Measures 3.4-10
3.4.5	Cumulative Impacts 3.4-11
3.4.6	Significant Unavoidable Impacts 3.4-11
3.5	Agricultural Crops and Livestock 3.5-1
3.5.1	Existing Conditions 3.5-2
3.5.2	Environmental Impacts of the Proposed Action 3.5-2
3.5.3	Environmental Impacts of Alternatives 3.5-6
3.5.4	Mitigation Measures 3.5-7
3.5.5	Cumulative Impacts 3.5-8
3.5.6	Significant Unavoidable Adverse Impacts 3.5-8

Section	Page
3.6 Wildlife	3.6-1
3.6.1 Existing Conditions	3.6-1
3.6.2 Environmental Impacts of the Proposed Action	3.6-8
3.6.3 Environmental Impacts of Alternatives.....	3.6-11
3.6.4 Mitigation Measures.....	3.6-12
3.6.5 Cumulative Impacts	3.6-13
3.6.6 Significant Unavoidable Adverse Impacts.....	3.6-13
3.7 Fisheries Resources	3.7-1
3.7.1 Existing Conditions	3.7-1
3.7.2 Environmental Impacts of the Proposed Action	3.7-2
3.7.3 Environmental Impacts of Alternatives.....	3.7-6
3.7.4 Mitigation Measures.....	3.7-7
3.7.5 Cumulative Impacts	3.7-8
3.7.6 Significant Unavoidable Adverse Impacts.....	3.7-8
3.8 Energy and Natural Resources.....	3.8-1
3.8.1 Energy and Natural Resource Consumption, Rate of Use, and Efficiency	3.8-1
3.8.2 Energy Sources and Availability	3.8-4
3.8.3 Nonrenewable Resources	3.8-8
3.8.4 Conservation and Renewable Resources.....	3.8-9
3.9 Noise	3.9-1
3.9.1 Existing Conditions	3.9-1
3.9.2 Environmental Impacts of the Proposed Action	3.9-12
3.9.3 Environmental Impacts of Alternatives.....	3.9-24
3.9.4 Mitigation Measures.....	3.9-24
3.9.5 Cumulative Impacts	3.9-25
3.9.6 Significant Unavoidable Adverse Impacts.....	3.9-25
3.10 Land Use.....	3.10-1
3.10.1 Existing Conditions	3.10-1
3.10.2 Environmental Impacts of the Proposed Action	3.10-8
3.10.3 Environmental Impacts of Alternatives.....	3.10-9
3.10.4 Cumulative Impacts	3.10-10
3.10.5 Significant Unavoidable Adverse Impacts.....	3.10-10
3.11 Visual Resources/Light and Glare	3.11-1
3.11.1 Evaluation Methods	3.11-1
3.11.2 Existing Conditions	3.11-1
3.11.3 Environmental Impacts of the Proposed Action	3.11-16
3.11.4 Environmental Impacts of Alternatives.....	3.11-30
3.11.5 Mitigation Measures.....	3.11-32
3.11.6 Cumulative Impacts	3.11-33
3.11.7 Significant Unavoidable Adverse Impacts.....	3.11-33

Section	Page
3.12 Population, Housing, and Economics.....	3.12-1
3.12.1 Introduction	3.12-1
3.12.2 Existing Conditions.....	3.12-2
3.12.3 Impacts of the Proposed Action	3.12-12
3.12.4 Summary of Socioeconomic Impacts.....	3.12-24
3.12.5 Environmental Justice.....	3.12-25
3.12.6 Environmental Impacts of Alternatives	3.12-25
3.12.7 Mitigation Measures	3.12-26
3.12.8 Cumulative Impacts.....	3.12-26
3.12.9 Significant Unavoidable Adverse Impacts	3.12-26
3.13 Public Services and Utilities.....	3.13-1
3.13.1 Existing Conditions.....	3.13-1
3.13.2 Environmental Impacts of the Proposed Action.....	3.13-29
3.13.3 Environmental Impacts of Alternatives	3.13-35
3.13.4 Mitigation Measures	3.13-36
3.13.5 Cumulative Impacts.....	3.13-37
3.13.6 Significant Unavoidable Adverse Impacts	3.13-37
3.14 Cultural Resources	3.14-1
3.14.1 Existing Conditions.....	3.14-1
3.14.2 Environmental Impacts of the Proposed Action.....	3.14-9
3.14.3 Environmental Impacts of Alternatives	3.14-10
3.14.4 Mitigation Measures	3.14-11
3.14.5 Cumulative Impacts.....	3.14-12
3.14.6 Significant Unavoidable Adverse Impacts	3.14-12
3.15 Traffic and Transportation	3.15-1
3.15.1 Existing Conditions	3.15-1
3.15.2 Environmental Impacts of the Proposed Action.....	3.15-12
3.15.3 Environmental Impacts of Alternatives	3.15-18
3.15.4 Mitigation Measures	3.15-19
3.15.5 Cumulative Impacts.....	3.15-20
3.15.6 Significant Unavoidable Adverse Impacts	3.15-20
3.16 Health and Safety	3.16-1
3.16.1 WAC Requirements	3.16-1
3.16.2 Emergency Plan.....	3.16-15
3.16.3 Other Requirements.....	3.16-16
 Attachments	
A	Listed Fish and Wildlife Species
B	Certificate of Compliance—Land Use Plans and Zoning Ordinances
4	References..... 4-1
5	Acronyms and Abbreviations..... 5-1

Section	Page
6 List of Preparers	6-1
Tables	
1.3-1 Summary Of Proposed Action, Impacts, And Mitigation Measures	1-5
2.1-1 Cross-Reference Guidance Table for 463-42 WAC.....	2-7
2.2-1 Construction Water Usage Profile	2-51
2.2-3 Criteria Pollutant Emissions from Diesel-Fuel-Fired Fire Pump	2-62
2.2-2 Criteria Pollutant Emissions from Combustion Turbines and Heat Recovery Steam Generators under Different Operating Conditions	2-63
2.2-4 Summary of TAP and HAP Emissions from Combustion Turbines, Duct Burners Associated with HRSGs, and Diesel-Fuel-Fired Fire Pump	2-65
2.2-5 Results of Criteria Pollutant Air Quality Analysis.....	2-67
2.2-6 Class I Ambient Air Quality Results for the Generation Plant.....	2-67
2.2-7 Visibility Analysis Results	2-68
2.2-8 Summary of Total Nitrogen (N) and Sulfur (S) Deposition Results.....	2-68
2.2-9 Results from Toxic Air Pollutants Analysis *	2-69
2.2-10 CO ₂ Emission Rates Based on Data Provided in Table 3.2-12	2-71
2.2-11 Water Source Analyses.....	2-74
2.2-12 Water Mass Balance.....	2-75
2.2-13 Water Consumptive Use.....	2-77
2.2-13 Schedule for Construction and Operation (by Date)	2-96
2.2-14 Schedule For Construction And Operation (By Month)	2-97
2.2-15 Capital Costs, Starbuck Power Project.....	2-105
2.2-16 Typical EPC Breakdown	2-106
2.2-17 Estimated Sales and Use Tax.....	2-108
2.2-18 Impact of Property Tax Reduction on Average Household in Starbuck	2-110
2.3-1 No Action Alternative	2-114
2.4-1 Advantages and Disadvantages of Potential Sites	2-119
2.4-2 Comparison of Proposed Action and Other Alternatives.....	2-121
2.6-1 Applicable Federal, State, Local, and Other Permit Requirements	2-132
2.6-2 State of Washington Noise Regulations (173-60 WAC).....	2-140
2.6-3 In-Use Motor Vehicle Noise Performance Standards	2-140
3.1-1 Historical Seismic Events That Have Occurred within 100 Miles of the Generation Plant Site	3.1-2
3.2-1 Ambient Air Quality Standards.....	3.2-5
3.2-2 PSD Ambient Air Increments.....	3.2-6
3.2-7 Results of Criteria Pollutant Air Quality Analysis.....	3.2-15
3.2-8 Class I Ambient Air Quality Results for SPP	3.2-15
3.2-9 Visibility Analysis Results	3.2-16
3.2-10 Summary of Total N and S Deposition Results	3.2-16

Tables	Page
3.2-11	Acceptable Source Impact Analysis For Toxic Pollutants3.2-17
3.2-12	Combustion Turbine Design and Operation Information.....3.2-18
3.2-13	CO ₂ Emission Rates Based on Data Provided in Table 3.2-8.....3.2-19
3.3-1	Chemical Composition: Bar-Z and Columbia County Well Water.....3.3-7
3.6-1	Migratory Birds That Potentially Nest at the Generation Plant Site.....3.6-4
3.7-1	Special-Status Fish Species Likely to Be Present in the Generation Plant and Water Pipeline Vicinity3.7-3
3.8-1	1999 Natural Gas Consumption in California, Idaho, Oregon, and Washington 3.8-6
3.8-2	Proposed Large Gas-Fired Power Projects within BPA Service Area3.8-7
3.9-1	Definitions of Acoustical Terms3.9-1
3.9-2	Typical Sound Levels Measured in the Environment and Industry3.9-3
3.9-3	State of Washington Noise Regulations (173-60-040 WAC).....3.9-4
3.9-4	Monitoring Location and Description.....3.9-6
3.9-5	Summary of Hourly Measurement at M1 – Generation Plant Site January 12 through 13, 2001 (dBA).....3.9-11
3.9-6	Summary of Measurement at M2 – Boat Ramp (dBA)3.9-11
3.9-7	Summary of Measurement at M3 – Hatchery (dBA)3.9-12
3.9-8	Summary of Measurement at M4 – Campground (dBA).....3.9-12
3.9-9	Construction Equipment and Composite Onsite Noise Levels (dBA)3.9-13
3.9-10	Average Construction Noise Levels at the Nearest Residential Receptor (dBA).....3.9-14
3.9-11	Maximum Noise Levels from Common Construction Equipment and Resultant Receptor Noise Levels (dBA).....3.9-15
3.9-12	Anticipated Equipment Sound Level Specifications for Standard Packaged Equipment.....3.9-19
3.9-13	Octave Band Sound Power Levels3.9-20
3.9-14	Modeling Results.....3.9-21
3.9-15	Oregon Median Octave Band Standards for Industrial and Commercial Noise Sources (OAR 340-035-0035).....3.9-23
3.9-16	Facility Sound Level at the Marina Location.....3.9-23
3.11-1	Summary of Visual Resource Inventory3.11-15
3.11-2	Power Plant Visual Impacts Summary3.11-19
3.12-1	Historical and Projected Population Estimates.....3.12-2
3.12-2	Demographic Breakdown of Population by Race3.12-3
3.12-3	Poverty Status by County3.12-4
3.12-4	Housing Units Estimate3.12-5
3.12-5	1999 Employment by County3.12-6
3.12-6	Major Employers in Columbia County3.12-7
3.12-7	Unemployment Rate by County and Study Area, and for Washington State....3.12-8
3.12-8	Per Capita Income, 1996-1998.....3.12-9
3.12-9	Assessed Property Value and Property Tax Collection in 20003.12-9
3.12-10	Taxable Retail Sales, 1996-1999.....3.12-10

Tables	Page
3.12-11 Town of Starbuck General Fund Revenues	3.12-11
3.12-12 Columbia County Tax Revenues.....	3.12-11
3.12-13 Temporary Housing within 1 Hour of the Generation Plant Site.....	3.12-13
3.12-14 Central and Eastern Washington Union Halls for Crafts	3.12-19
3.12-15 Estimated Staff Needs, Generation Plant	3.12-20
3.12-16 Estimated Sales and Use Tax.....	3.12-22
3.12-17 Impact of Property Tax Reduction on Average Household in Starbuck	3.12-24
3.13-1 Law Enforcement Staff and Equipment	3.13-3
3.13-2 Fire Services	3.13-10
3.13-3 School Enrollment and Expansion Capacity.....	3.13-19
3.13-4 Parks, Recreational Facilities, and Activities within 75 Miles of the Generation Plant Site.....	3.13-21
3.13.5 Emergency Services for Industrial Accident: Worst-Case Scenario, 105 injured	3.13-30
3.15-1 Average Daily Traffic Volumes and Estimated Percent Trucks	3.15-2
3.15-2 2000 Conditions of Affected Roadways	3.15-7
3.15-3 Existing Unsignalized Intersection Level of Service.....	3.15-8
3.15-4 Accident History, January 1995 to April 2000	3.15-8
3.15-5 Existing, Future Daily, and Peak-Hour Traffic Volumes and LOS without Generation Plant	3.15-12
3.15-6 Total P.M. Peak Hour and LOS Construction Impacts to the Roadways	3.15-16
3.15-7 Estimated Truck Traffic at the Generation Plant during Operation.....	3.15-17
3.15-8 Existing, Future Daily, and Peak-Hour Roadway Segment Traffic Volumes and LOS with and without Generation Plant Impacts	3.15-18
3.15-9 Future Unsignalized Intersection Analysis.....	3.15-19
3.16-1 Compressed Gases Present during Construction	3.16-4
3.16-2 Compressed Gases Present during Operation and Maintenance	3.16-5
3.16-3 Hazardous or Toxic Materials to Be Used during Construction.....	3.16-9
3.16-4 Hazardous Wastes That May Be Produced during Construction	3.16-10
3.16-5 Hazardous or Toxic Materials to Be Used during Operation and Maintenance	3.16-12
3.16-6 General Codes and Standards.....	3.16-14

Figures

1.1-1 Area Map.....	1-3
2.1-1 Project Components.....	2-3
2.2-1 Vicinity Map	2-17
2.2-2 Property Boundaries.....	2-19
2.2-3 Property Ownership.....	2-21
2.2-4 Generation Plant Site Map.....	2-25

Figures	Page
2.2-5 Site Arrangement.....	2-27
2.2-6 Computer Rendering of Generation Plant.....	2-29
2.2-7 Access Road Commercial Approach.....	2-35
2.2-8 Gas Piping Diagram.....	2-38
2.2-9 Transmission Tower Design.....	2-41
2.2-10 Proposed Railroad Spur.....	2-49
2.2-11 Heat Balance.....	2-58
2.2-12 Water Mass Balance Flow Diagram.....	2-79
2.2-13 Grading and Drainage.....	2-85
2.2-14 Total Workers Onsite Over Time.....	2-101
2.2-15 Construction Workers Onsite per Month per Job Activity.....	2-101
2.4-1 Alternative Generation Plant Sites.....	2-117
2.4-2 Water Pipeline.....	2-127
3.1-1A Seismotectonic Map: Magnitude of Earthquake Epicenters within 100 Miles of the Generation Plant.....	3.1-7
3.1-1B Seismotectonic Map: Intensity of Earthquake Epicenters within 100 Miles of the Generation Plant.....	3.1-9
3.1-2 Geologic Cross Section.....	3.1-13
3.1-3 Soil Boring Locations.....	3.1-15
3.1-4 Grading and Drainage.....	3.1-25
3.2-1 Wind Speed and Direction at the Generation Plant Site.....	3.2-3
3.3-1 Generation Plant Floodplain Locations.....	3.3-5
3.3-2 Conceptual Well Construction Diagram.....	3.3-11
3.4-1 Map Series Index – Wetlands and Streams.....	3.4-3
3.5-1 Existing Agricultural Activities within 25 Miles.....	3.5-3
3.8-1 Demand Profile per Month.....	3.8-2
3.8-2 Energy Profile per Month.....	3.8-2
3.9-1 Area of Potential Noise Effect.....	3.9-7
3.9-2 Project Noise Monitoring Locations.....	3.9-9
3.9-3 A-Weighted Sound Pressure Levels.....	3.9-17
3.10-1 Land Use Plan Designations and Zoning Districts within the 25-Mile Study Area.....	3.10-3
3.11-1 Key Viewpoints.....	3.11-5
3.11-2 Viewpoint 1 – Lyons Ferry State Park.....	3.11-7
3.11-3 Viewpoint 2 – Snake River.....	3.11-9
3.11-4 Viewpoint 3 – Columbia County Grain Growers Grain Elevator.....	3.11-11
3.11-5 Viewpoint 4 – SR-261.....	3.11-13
3.11-6 Simulation 1 – Lyons Ferry State Park.....	3.11-21
3.11-7 Simulation 2 – Snake River.....	3.11-23
3.11-8 Simulation 3 – Columbia County Grain Growers Grain Elevator.....	3.11-25
3.11-9 Simulation 4 – SR-261.....	3.11-27

Figures	Page
3.12-1 Total Workers Onsite Over Time.....	3.12-17
3.12-2 Construction Workers Onsite per Month.....	3.12-17
3.12-3 Comparison of Average Hourly Wage (2001\$) for Construction	3.12-16
3.13-1 Fire Districts within 25 Miles.....	3.13-7
3.13-2 Public Services and Utilities within 50 Miles.....	3.13-13
3.13-3 Recreational Areas within 75 Miles.....	3.13-25
3.15-1 Generation Plant Site and Surrounding Roadway Network.....	3.15-3
3.15-2 Existing Traffic Volumes.....	3.15-5
3.15-3 Intersection Traffic Pattern Analysis.....	3.15-9
3.15-4 Heavy-Haul Transporter.....	3.15-15