

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Post Falls Project's and Spokane River Developments' use of the Spokane River for hydropower purposes to see what effects various environmental measures would have on the Project's cost and power benefits.

4.1 INTRODUCTION

The Proposed Action includes a variety of environmental PME measures. These measures include changes to the Project operations that would decrease the annual electric power output for the Post Falls Project and Spokane River Developments while also increasing their operating costs. Consistent with the Commission's approach to economic analysis, the power benefit of the Post Falls Project and Spokane River Developments is determined by estimating the cost of obtaining the same amount of energy and capacity using the likely alternative generating resources available in the region. In keeping with Commission policy as described in Mead, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing hydropower project power benefits¹.

Our analysis includes (1) an estimate of the net power benefit of the Project for each of the licensing alternatives, and (2) an estimate of the costs of individual measures considered in this DEIS for the PME of environmental resources affected by the Project. To determine the net power benefit for each of the licensing alternatives, we compare Project costs to the value of the power output as represented by the cost of the alternative source of power. For any alternative, a positive net annual power benefit indicates that the Project power costs less than the current cost of alternative generation resources, and a negative net annual benefit indicates that the Project power costs more than the current cost of alternative generating resources. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, Project economics is only one of the many public interest factors the Commission considers in determining whether to issue a license, and if so, under what conditions.

¹ See Mead Corporation, Publishing Paper Division, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of cost of electricity.

4.2 BASIS FOR POWER AND COSTS OF THE PROJECTS

For our economic analysis of alternatives, we used the assumptions, values, and sources shown in Table 4.2-1. This information was provided by Avista in its license application.

Table 4.2-1. Assumptions for economic analysis of the Post Falls Project and Spokane River Developments

Assumption	Value	Source
Base year for costs and benefits	2007	Staff
Period of analysis	30 years	Staff
Short-term interest rate	9.72%	Avista
Long-term interest rate	8.75%	Avista
Discount rate	8.22%	Avista
Term of financing	20 years	Staff
Federal and state tax rate	35.00%	Avista
Local tax rate	1.25%	Avista
Long term inflation	0.00%	Staff
Insurance	0.25%	Staff
Weighted cost of capital	9.72%	Avista
Return on equity	10.64%	Avista
Debt ratio	49%	Avista
Energy value (\$/MWh)	50 ^a	Avista
Capacity value (\$/kW)	Included in energy value	

a. Energy value is based on Avista's estimate of short-term forward pricing and is consistent with alternative power costs based on a combined cycle combustion turbine operating at a 92 percent plant factor.

We find that the values provided by Avista are reasonable for our analysis. Cost items common to all alternatives include taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; relicensing costs; normal O&M costs; and Commission fees.

The Post Falls Project has a total installed capacity of 14.75 MW and a dependable capacity of 5.85 MW. Based on 23 years of record, from 1979 through 2003, the Post Falls Project, as currently operated, generates an average of 77,281 MWh annually (Avista, 2005). Current costs are presented in Table 4.2-2.

Table 4.2-2. Current capital and annual costs for Post Falls Project

	Capital Cost (\$)	Annual Cost (\$)
Total net investment ^a	6,578,800	
Total relicensing cost ^b	7,874,100	
Total future investment ^c	10,603,000	
Total net investment ^d	25,055,900	
O&M ^e		814,100
Annual FERC fees ^f		59,600

- a. Net investment is the depreciated project investment.
- b. This value is based on relicensing costs expended through December 31, 2004, and projected budget to completion. Avista's estimate is that 50 percent of relicensing costs accrue to the Post Falls Project and the balance to the other four developments.
- c. Avista has estimated the cost of future upgrades that will be necessary to maintain the Project at its current capacity. The cashflow is irregular between 2007 and 2016.
- d. This value is the sum of basic project net investment and Avista's relicensing costs.
- e. O&M costs are based on 2003 values escalated at 2.5 percent per year to a 2007 cost basis. More than \$84,000 is spent on environmental measures under the current license for all four Spokane River developments and the Post Falls Project.
- f. FERC fees include both federal lands fees of \$12,400 and FERC charges of \$43,700, escalated at 2 percent per year from 2004 to 2007.

Source: Compiled by Avista

The Spokane River Developments have a total installed capacity of 122.92 MW and a dependable capacity of 69.47 MW. Based on 23 years of record, from 1979 through 2003, the Spokane River Developments, as currently operated, generate an average of 796,639 MWh annually (Avista, 2005). Current costs are presented in Table 4.2-3.

4.3 COSTS

4.3.1 Cost of Environmental Measures

The Proposed Action includes a number of environmental and recreational PME measures. Tables 4.3-1 and 4.3-2 present the capital and annual costs of these measures and other agency- and stakeholder-recommended measures by major

Table 4.2-3. Current capital and annual costs for Spokane River Developments

	Capital Cost (\$)	Annual Cost (\$)
Total net investment ^a	68,732,000	--
Total relicensing cost ^b	7,874,100	--
Total future investment ^c	46,336,000	--
Future rubber dam ^d	1,410,000	
Total net investment ^e	124,352,100	--
O&M ^f	--	3,375,500
O&M savings ^g		-45,400
Annual FERC fees ^h	--	436,600

- a. Basic project net investment is the depreciated project investment allocated to power purposes.
- b. This value is based on relicensing costs expended through December 31, 2004, and projected budget to completion. Avista's best estimates are that 50 percent of relicensing costs accrue to the Post Falls Project and the balance to the other four developments.
- c. Avista has estimated the cost of future upgrades that would be necessary to maintain the Project at its current capacity. This figure includes estimated cost for replacing flashboards at Nine Mile Development with a rubber dam because it is anticipated some improvement would be necessary over the next 20 years.
- d. Estimated capital cost of the future rubber dam at Nine Mile Development.
- e. This value is the sum of basic Project net investment and Avista's relicensing costs.
- f. O&M costs are based on 2003 values, escalated at 2.5 percent per year to a 2007 cost basis. More than \$84,000 is spent on environmental measures under the current license for all five Spokane River developments.
- g. O&M savings are based on lower labor costs and maintenance associated with a rubber dam at Nine Mile Development in lieu of flashboards.
- h. FERC fees include FERC charges of \$411,400, escalated at 2 percent per year from 2005 to 2007.

Source: Compiled by Avista

resource type and area for the Post Falls Project and Spokane River Developments, respectively. Measures that would affect energy generation at the Post Falls Project include the addition of aesthetic flows (energy reduction of 19.2 MWh) and minimum flows (energy reduction of 406.8 MWh). Measures that would affect energy generation at the Spokane River Developments include aesthetic flows at Upper Falls Development (energy reduction of 690 MWh) and aesthetic flows at Monroe Street Development (energy gain of 12 MWh).

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Water Resource Measures					
<i>Total Dissolved Gas Control and Mitigation Program (PF-WQ-1)</i>	Avista, Staff	\$0	\$5,400	\$5,400	Yes
Coeur d’Alene Water Quality Monitoring Program	Staff	\$0	\$41,700 ^a	\$41,700	Yes
Spokane River Water Quality Monitoring Program	Staff	\$0	\$12,500 ^b	\$12,500	Yes
<i>Idaho Water Quality PME (PF-WQ-2)</i>	Avista	\$15,000	\$25,000	\$27,300	No
Implement operational changes to eliminate Project effects on Coeur d’Alene Lake water quality	DOI BIA (4e)	--	--	Indeterminate	No
Prepare, fund, and implement a Water Quality Monitoring Plan to document the influence of the Project on water quality within the Coeur d’Alene Indian Reservation	DOI BIA (4e)	\$0	\$347,700 ^c	\$347,700	No
Undertake a Water Rights Protection Program	Sierra Club	--	--	Indeterminate	No
Install and operate water quality monitoring station downstream of Post Falls Dam	Sierra Club	\$90,300	\$38,000	\$51,500	No
TDG Compensation Program	Sierra Club, Lands Council	--	--	Indeterminate	No
Obtain NPDES permit for dam	Sierra Club	--	--	Indeterminate	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Aquatic Resource Measures					
<i>Post Falls Fish Protection, Mitigation, and Enhancement Program (PF-AR-1)</i>					
Part 1: Maintain 600-cfs minimum flow release at Post Falls Dam with allowance for 500 cfs during July 1 – September 15 of each year (PF)	Avista, Staff	\$0	\$20,300	\$20,300 ^d	Yes
Part 2: Spawning and emergence plan compliance	Avista, WDFW, IDFG, Staff	\$0	\$10,000	\$10,000	Yes
Part 3: Maintain a maximum allowable per-hour discharge downramping rate at Post Falls Dam that corresponds to a no more than 4-inch drop per hour in downstream water levels	Avista, USFWS, IDFG, Staff	\$0	\$0	Indeterminate	Yes
Part 4: Provide for a Population and Habitat Protection and Enhancement Program for westslope cutthroat trout and bull trout in the Coeur d’Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam	Avista	\$0	\$86,700	\$86,700	No
Part 5: Provide support for population and habitat assessments and monitoring for westslope cutthroat trout and bull trout in the Coeur d’Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam	Avista	\$0	\$86,700	\$86,700	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Part 6: Provide assistance and support for a Public Information, Education, and Law Enforcement Program specific to bull trout and westslope cutthroat trout in the Coeur d'Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam	Avista	\$0	\$86,700	\$86,700	No
Implement a Population and Habitat Protection and Enhancement Program for westslope cutthroat trout and bull trout in the Coeur d'Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam, with annual priorities and implementation efforts to be determined during joint consultations between Avista, IDFG, Coeur d'Alene Tribe, USFWS, and WDFW	IDFG	\$0	\$86,700	\$86,700	No
Undertake population and habitat assessments and monitoring for westslope cutthroat trout and bull trout in the Coeur d'Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam, with annual priorities and implementation efforts to be determined during joint consultations between Avista, IDFG, Coeur d'Alene Tribe, USFWS, and WDFW	IDFG	\$0	\$86,700	\$86,700	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Implement and provide assistance for a Public Information, Education, and Law Enforcement Program specific to bull trout and westslope cutthroat trout in the Coeur d'Alene Lake Basin and native rainbow trout in the free-flowing reach of the Spokane River downstream of Post Falls Dam, with annual priorities and implementation efforts to be determined during joint consultations between Avista, IDFG, Coeur d'Alene Tribe, USFWS, and WDFW	IDFG	\$0	\$86,700	\$86,700	No
Implement a 5-year adaptive management approach	WDFW, WDOE, Lands Council, Northwest Whitewater	\$25,000	\$22,400 ^e	\$26,200	No
Native Trout Enhancement Program	Sierra Club/The Lands Council	--	--	Indeterminate	No
Provide spring flows for incubation and emergence of trout in the Spokane River April 15 through June 7 of each year at Post Falls Dam	WDFW	\$0	\$0	Indeterminate	No
Release approximately 770 cfs minimum instream flow from Post Falls to provide 500 cfs at Barker Road	Sierra Club	\$0	\$0	Indeterminate	No
Release sufficient water from Post Falls Dam to achieve a flow of 500 cfs at Barker Road	The Lands Council	\$0	\$0	Indeterminate	No
Collect and compare real-time flow data at Barker Road for 5 years	The Lands Council	\$25,000	\$2,100 ^f	\$6,000	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Recommend not having a 500-cfs minimum instream flow at Post Falls when Coeur d'Alene Lake drops 0.25 foot. Recommend generally higher releases of 700 to 800 cfs to achieve a minimum flow of 500 cfs at Barker Road	Northwest Whitewater	\$0	\$0	Indeterminate	No
Provide ramping rate flows from Post Falls of no more than 2 inches per hour as measured at the USGS gage (12415500) ^g	WDFW, Sierra Club	Indeterminate	Indeterminate	Indeterminate	No
Mandate ramping rate of no more than 1 inch per hour at Post Falls Dam from June 16 to October 31 and 2 inches per hour from November 1 to February 15 ^g	Sierra Club, Lands Council	Indeterminate	Indeterminate	Indeterminate	No
<i>Coeur d'Alene Lake Aquatic Weed Management Program (PF-AR-2)</i>	Avista	\$0	\$50,000	\$50,000	No
Develop and implement a Coeur d'Alene Lake Aquatic Weed Management Program	Staff	\$0	\$50,000	\$50,000	Yes
Develop a Salmonid Fisheries Plan	USFWS, DOI BIA (4e)	\$20,000	Indeterminate ^h	\$3,000 ⁱ	No
Post Falls Fish Protection, Mitigation, and Enhancement Program with different priorities	IDFG (10j)	\$0	\$255,000	\$255,000	No
Develop a Fish Migration Corridor and Tributary Restoration Plan for 33 miles of the St. Joe River upstream from the upper extent of the Project	USFWS(10j)	\$20,000	Indeterminate ^h	\$3,000 ⁱ	No
Develop a mitigation program to address Project effects to the benthic community in the Spokane River	Sierra Club	\$2,500 ^j	Indeterminate ^h	\$400 ⁱ	No
Establish a Habitat Restoration/Mitigation Trust Fund	Sierra Club	-	-	Indeterminate	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Develop and implement an Aquatic Weed Management Plan to eradicate exotic and noxious aquatic weeds in the water affected by the Project that are within the Coeur d'Alene Indian Reservation	DOI BIA (4e)	\$20,000	Indeterminate ^h	\$3,000 ⁱ	No
Monitor instream flows using real-time gages	Avista, CELP, WDFW, Staff	\$20,000	\$6,000	\$9,000	Yes
Quality Assurance Project Plan	WDOE	\$5,000	Indeterminate ^h	\$800 ⁱ	No
Develop and implement a Large Woody Debris Management Plan	WDFW	\$0	\$15,000	\$15,000	No
Terrestrial & Geologic Resource Measures					
<i>Coeur d'Alene Lake and Tributary Erosion Control and Wetlands and Riparian Habitat Protection and Enhancement (PF-TR-1)^k</i>	Avista, USFWS (10j), Staff	\$0	\$500,000	\$500,000	Yes
Prepare, fund, and implement a Coeur d'Alene Indian Reservation Shoreline Erosion Control Plan ^l	DOI BIA (4e), Staff	--		No additional costs	Yes, in part, with costs included in PF-TR-1
Implement PF-TR-1 (Coeur d'Alene Lake and Tributary Erosion Control and Wetland and Riparian Habitat Protection and Enhancement Plan) with modifications: (1) unused funds accumulate, (2) prioritize sites independent of cultural resources, (3) allocate funds for erosion vs. wetlands, and (4) modify project selection process	IDFG (10j)	\$0	\$0	\$0	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Implement PF-TR-1 (Coeur d'Alene Lake and Tributary Erosion Control and Wetland and Riparian Habitat Protection and Enhancement Plan) with modifications: (1) restore 532 acres of PFO1 wetlands, and (2) restore 250 acres of PSS wetlands	USFWS (10j)	\$2,350,000	\$80,000	\$431,800	No
Implement PF-TR-1 (Coeur d'Alene Lake and Tributary Erosion Control and Wetland and Riparian Habitat Protection and Enhancement Plan) with modifications: (1) restore 445 acres of PFO1 wetlands, and (2) restore 49 acres of PSS wetlands in lower St. Joe River, river mile 0.0 – 7.2	USFWS (10j)	\$1,500,000	\$49,000	\$273,600	No
Implement PF-TR-1 (Coeur d'Alene Lake and Tributary Erosion Control and Wetland and Riparian Habitat Protection and Enhancement Plan) with modifications: (1) priority given to natural levees in lower St. Joe River excluding areas covered by other USFWS recommendations.	USFWS (10j), Staff	\$0	\$0	\$0	Yes
Develop and implement a Coeur d'Alene Indian Reservation Wetland and Riparian Habitat Plan	DOI BIA (4e)	\$20,000	Indeterminate ^h	\$3,000 ⁱ	No
Survey Project lands and develop a plan to control noxious weeds	USFWS (10j), Staff	\$25,000 ^j	\$7,500 ^j	\$11,200	Yes
Annually monitor bald eagle nests for occupancy and nesting productivity on Project lands	Avista, USFWS (10j), Staff	\$0	\$10,000 ^j	\$10,000	Yes
Annually survey for new bald eagle nests on Project lands	Avista, USFWS (10j), Staff	\$0	\$10,000 ^j	\$10,000	Yes

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Develop a Bald Eagle Educational and Interpretive Program	USFWS (10j), Staff	\$25,000 ^j	\$2,500 ^j	\$6,200	Yes
Develop Bald Eagle Nest Management Plans and monitor actual bald eagle use on Project lands	Avista, USFWS (10j), Staff	\$25,000 ^j	\$2,500 ^j	\$6,200	Yes
Aesthetic Resource Measures					
<i>Post Falls Project Aesthetic Flows (PF-AES-1)</i>	Avista, NPS, IDFG, Northwest Whitewater, Staff	\$0	\$12,100 ^m	\$12,100 ^m	Yes
Land Use Measures					
<i>Post Falls Project Land Use Management Plan Implementation PME (PF-LU-1)</i>					
Land Use Management Plan implementation on Project lands	Avista	\$0	\$5,000	\$5,000	No
Add 2,352 acres (currently within the 2,128-foot contour) and remove 0.5 acre of private land east of the abandoned Corbin Ditch	Avista, Staff	\$0 ⁿ	\$0	\$0	Yes
Provide assistance and financial support for enforcement of land and water-based laws and regulations administered by federal, state, local, and tribal governments within their jurisdiction on lands near the Project	Avista/WDOE	\$0	\$12,500	\$12,500	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Add approximately 107 acres of USDA Forest Service lands to Post Falls Project area	Staff	\$0	\$4,500	\$4,500	Yes
Develop and implement final Land Use Management Plan	Staff	Indeterminate	Indeterminate	Indeterminate	Yes
Recreation Resource Measures					
<i>Post Falls Project Recreation Plan (PF-REC-1)</i>	Avista, Stakeholders	\$15,000	\$5,000	\$7,300	No
<i>Coeur d'Alene Lake Recreation PME (PF-REC-2)</i>					
Future recreation project construction or rehabilitation of existing projects at Post Falls Project	Avista, Stakeholders	\$0	\$26,300	\$26,300	No
Planning and construction of recreation projects, O&M, and continued public access	Avista, Stakeholders	\$982,250	\$181,500 ^o	\$328,900	No
<i>Post Falls/Spokane River Recreation PME (PF-REC-3)</i>					
Whitewater boating flow releases	Avista, Northwest Whitewater, Staff	\$215,000	\$17,500	\$49,700	Yes
Trailer Park Wave access site	Avista, Staff	\$150,000	\$15,000	\$37,500	Yes
<i>Post Falls Project Public Outreach (PF-REC-4)</i>					
Interpretation and Education Plan	Avista, Staff	\$25,000	\$6,900 ^p	\$10,700	Yes
Visitor surveys	Avista, Staff	\$0	\$14,300 ^q	\$14,300	Yes
Post Falls Project recreation plan	Staff	Indeterminate	Indeterminate	Indeterminate	Yes

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Cultural Resource Measures					
<i>Historic Properties Management Plan (HPMP) (PF-CR-1)</i>	Avista, IDFG, Staff	\$30,000 ^f	\$0	\$3,900	Yes
In the HPMP, address any TCPs that are determined to be affected by the Project and conduct monitoring for cultural resources located within the APE on reservation lands	Avista, Staff	\$0	\$24,000	\$24,000	Yes
Determine National Register eligibility and resolve impacts to historic properties located on the Coeur d'Alene Indian Reservation within the Project boundary and other lands within the established APE	Avista, Staff	\$0	\$168,500	\$168,500	Yes
Determine National Register eligibility and resolve impacts to historic properties located on the Coeur d'Alene Indian Reservation within the Project boundary and buffer area beyond the established APE	DOI BIA (4e)	\$500,000	\$168,500	\$243,400	No
Other Items					
Purchase and maintain boat for PME measure implementation (total cost shared 50/50 with Spokane River Developments)	Avista	\$25,000 ^j	\$2,500 ^j	\$5,800	No
Support office staff time and expenses associated with new PME measures	Avista	\$0	\$406,000	\$406,000	No
Provide for administrative overhead costs for new PME measures	Avista	\$0	\$52,700	\$52,700	No

Table 4.3-1. Summary of costs of environmental measures for Post Falls Project (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
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Notes:

- a. This is an equivalent annual cost based on an annual cost of \$100,000 for each of the first 5 years and no costs thereafter.
- b. This is an equivalent annual cost based on an annual cost of \$30,000 for each of the first 5 years and no costs thereafter.
- c. This is an equivalent annual cost based on a cost of \$339,600 per year. However, every fifth year, an additional \$50,000 would be needed for water quality modeling.
- d. Annual costs include a reduction in annual energy benefits of \$20,300 per year, which equates to an energy loss of 406.8 MWh for minimum flow.
- e. This cost includes \$20,300 per year due to the reduction in annual energy benefits as a result of the minimum flow and a levelized annual value of \$2,100 for the Adaptive Management Plan. The Adaptive Management Plan has a \$5,000 annual cost for the first 5 years, and no costs thereafter.
- f. This is an equivalent annual cost based on a cost of \$5,000 per year for the first 5 years, and no costs thereafter.
- g. There is no loss in net generation. However, to achieve ramping rates of less than 4 inches per hour, modifications to the dam would be needed. The costs for these modifications are indeterminate.
- h. Only cost to develop plan is included. Costs to implement the measures of the plan could not be determined.
- i. The total average annual costs may be greater than what is shown in the table because the annual costs are indeterminate.
- j. Cost for this measure has been split between the Post Falls Project and the Spokane River Developments.
- k. The PF-TR-1 plan has two components; one component is a \$100,000 annual Erosion Control Program, and the other is a \$400,000 annual Wetland and Riparian Habitat Plan, for a total cost of \$500,000 per year. Staff proposes to implement PF-TR-1 with minor no-cost modifications.
- l. Costs are indeterminate but would be included as part of Avista’s estimated original O&M costs for the Project.
- m. These annual costs include a reduction in annual energy benefits of \$1,000 per year, which equates to an energy loss of 19.2 MWh for aesthetic flows.
- n. Since the land is already owned by the applicant, there would be no additional cost to implement the measure.
- o. This is an equivalent annual cost based on a cost of \$159,500 per year with an additional \$60,000 per year in year 10, and every year thereafter.
- p. This is an equivalent annual cost based on a cost of \$5,000 per year with an additional \$15,000 every 6 years to update the plan.
- q. This is an equivalent annual cost based on a cost of \$75,000 every sixth year beginning in 2008.
- r. The total capital cost of the HPMP would be \$60,000 for the Post Falls Project and the Spokane River Developments, divided equally between the Projects.

Source: Compiled by Avista and Staff

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Water Resource Measures					
<i>Total Dissolved Gas Control and Mitigation Program (SRP-WQ-1)</i>	Avista, Staff	\$0	\$50,000	\$50,000	Yes
Develop and implement a Long Lake Oxygen Monitoring and Enhancement Program	Staff	\$50,000	\$0	\$6,500	Yes
<i>Washington Water Quality PME (SRP-WQ-2)</i>	Avista	\$50,000	\$0	\$6,500	No
Install and operate water quality monitoring stations upstream and downstream of Long Lake Dam	Sierra Club	\$180,600	\$76,000	\$99,600	No
Conduct monitoring and feasibility study of measures to improve DO in Long Lake Reservoir	Sierra Club	--	--	Indeterminate	No
Implement a TDG Compensation Program	Sierra Club, Lands Council	--	--	Indeterminate	No
Modify Long Lake Dam to reduce TDG levels	Sierra Club, Lands Council	--	--	Indeterminate	No
Limit drawdown of Lake Spokane to 14 feet, except under emergency conditions	Avista, Staff	\$0	\$0	\$0	Yes
Aquatic Resource Measures					
<i>Spokane River Fish Protection, Mitigation, and Enhancement Program (SRP-AR-1)</i>	Avista	\$0	\$125,000	\$125,000	No

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
<i>Lake Spokane Aquatic Weed Management Program PME (SRP-AR-2)</i>	Avista	\$0	\$25,000	\$25,000	No
Develop and implement a Lake Spokane Weed Management Plan	Staff	\$0	\$25,000	\$25,000	Yes
Develop a mitigation program to address Project impacts to the benthic community in the Spokane River	Sierra Club	\$2,500 ^a	Indeterminate ^b	\$300 ^c	No
Establish a Habitat Restoration/Mitigation Trust Fund	Sierra Club	--	--	Indeterminate	No
Prepare, fund, and implement a Salmonid Fisheries Management Plan	WDFW (10j)	\$5,000	Indeterminate ^b	\$700 ^c	No
Implement a Fisheries Stock Status Monitoring Program	WDFW (10j)	\$0	\$13,300 ^d	\$13,300	No
Prepare and provide a baseline assessment and data analysis of fish populations in the Spokane River between Upriver Dam and Monroe Street Dam	WDFW (10j)	\$180,000	\$0	\$23,500	No
Prepare, fund, and implement a radio telemetry survey of trout in the lower Little Spokane River and upper Lake Spokane	WDFW (10j)	\$240,000	\$0	\$31,400	No
Prepare, fund, and implement a program to assess and restore large woody debris in the Spokane River and reservoirs	WDFW (10j)	\$10,000	Indeterminate ^b	\$1,300 ^c	No
Prepare, fund, and implement a program to enhance and create spawning habitat in the free-flowing sections of the Spokane River through gravel augmentation	WDFW (10j)	\$10,000	Indeterminate ^b	\$1,300 ^c	No
Prepare, fund, and implement a program to remove fish barriers in the Little Spokane River drainage	WDFW (10j)	\$10,000	\$25,000	\$26,300	No

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Prepare, fund, and implement a Fishery Enhancement Supplementation Program primarily for the recreational fisheries	WDFW (10j)	\$20,000 ^a	Indeterminate ^b	\$2,600 ^c	No
Prepare, fund, and implement an Aquatic Weed Management Plan focused on control of Eurasian watermilfoil, and other invasive plant species in the Nine Mile and Lake Spokane areas	Avista, WDFW (10j)	\$5,000	Indeterminate ^b	\$700 ^c	No
Long Lake Reservoir Dissolved Oxygen Mitigation Program Development	Sierra Club	--	--	Indeterminate	No
Long Lake Dam Dissolved Oxygen Mitigation Program Development	Sierra Club	--	--	Indeterminate	No
Prepare, fund, and implement a Fisheries Public Outreach, Education, and Compliance Program specific to the protection of wild trout in the Spokane River	WDFW	\$0	\$15,000	\$15,000	No
Total Dissolved Gas Mitigation Program	Sierra Club	--	--	Indeterminate	No
Obtain NPDES	Sierra Club	--	--	Indeterminate	No
Native Trout Enhancement Program	Sierra Club	--	--	Indeterminate	No
Sediment Reduction Program	Sierra Club	--	--	Indeterminate	No
Monitor Instream Flow with Real-time Gages	CELP	--	--	Indeterminate	No
Stock trout in Upper Falls Reservoir, Nine-Mile Reservoir, and Lake Spokane	Staff	\$0	\$25,000	\$25,000	Yes

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Terrestrial & Geologic Resource Measures					
<i>Lake Spokane-Nine Mile Terrestrial, Riparian and Wetland Habitat Protection (SRP-TR-1)</i>					
Purchase or acquire easement for new wetland and subsequent restoration	Avista, Staff	\$350,000	\$0	\$45,700	Yes
200-foot buffer for Avista Project lands ^e	Avista, Staff	\$0	\$20,000	\$20,000	Yes
Financial support for watershed restoration	Avista, Staff	\$0	\$10,000	\$10,000	Yes
<i>Project Transmission Line Management Program PME (SRP-TR-2)</i>					
	Avista, WDFW, USFWS (10j), Staff	\$0	\$6,100	\$6,100	Yes
Implement SRP-TR-1 with modifications: prepare an Upland Habitat Protection and Enhancement Plan to protect shoreline and enhance at least 24 acres of upland habitat	USFWS (10j)	\$72,000	\$2,500	\$11,200	No
Annually monitor bald eagle nests for occupancy and nesting productivity on Project lands	Avista, USFWS (10j), Staff	\$0	\$10,000 ^a	\$10,000	Yes
Annually survey for new bald eagle nests on Project lands	Avista, USFWS (10j), Staff	\$0	\$10,000 ^a	\$10,000	Yes
Develop a Bald Eagle Educational and Interpretive Program	USFWS (10j), Staff	\$25,000 ^a	\$2,500 ^a	\$6,200	Yes
Develop Bald Eagle Nest Management Plans and monitor actual bald eagle use on Project lands	Avista, USFWS (10j), Staff	\$25,000 ^a	\$2,500 ^a	\$6,200	Yes

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Survey Project lands and develop a plan to control noxious weeds	USFWS (10j), Staff	\$25,000 ^a	\$7,500 ^a	\$11,200	Yes
Provide funds to purchase 300 acres of shoreline property and wetland habitat contiguous with Lake Spokane or other Avista-owned property	WDFW (10j)	\$900,000	\$23,000	\$140,600	No
Prepare, fund, and implement an Erosion Control, Prevention, and Restoration Program for Lake Spokane and Nine Mile Reservoir ^f	WDFW (10j)	\$0	\$0	\$0	No
Prepare, fund, and implement a Sediment Management Plan in Nine Mile Reservoir and Lake Spokane	WDOE, WDFW, Staff	\$5,000	Indeterminate	\$700 ^c	Yes
Protect and manage all Avista-owned lands (about 1,976 acres) around Lake Spokane for wildlife	WDFW (10j)	\$0	\$30,000	\$30,000	No
Monitor wetlands on Lake Spokane after installation of rubber dam and mitigate any net loss of wetlands	Staff	\$0	\$4,200	\$4,200	Yes
Aesthetic Resource Measures					
<i>Spokane River Developments Aesthetic Flows (SRP-AES-1)</i>					
Aesthetic flows at Upper Falls	Avista, NPS, Northwest Whitewater, Staff	\$0	\$65,400 ^e	\$65,400 ^e	Yes

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Aesthetic flows at Monroe Street	Avista, NPS, Northwest Whitewater, Staff	\$0	-\$600 ^h	-\$600 ^h	Yes
Aesthetic flows until midnight	Sierra Club	\$0	\$130,800 ^g	\$130,800 ^g	No
Land Use Measures					
<i>Project Land Use Management Plan Implementation PME (SRP-LU-1)</i>					
Land Use Management Plan implementation on Project lands	Avista, Staff	\$0	\$15,000	\$15,000	Yes
Assistance and financial support for enforcement of land and water-based laws and regulations administered by federal, state, local, and tribal governments within their jurisdictions	Avista	\$0	\$12,500	\$12,500	No
Develop and implement final Land Use Management Plan	Staff	Indeterminate	Indeterminate	Indeterminate	Yes
Recreation Resource Measures					
<i>Spokane River Project Recreation Plan (SRP-REC-1)</i>					
	Avista, Stakeholders	\$10,000	\$5,000	\$6,300	No
<i>Spokane River Recreation (SRP-REC-2)</i>					
Huntington Park	Avista, Staff	\$0	\$10,000	\$10,000	Yes
Water Avenue access	Avista, Stakeholders	\$20,000	\$5,000	\$7,600	No

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
<i>Spokane River Public Outreach (SRP-REC-3)</i>					
Interpretation and Education Plan	Avista, Staff	\$25,000	\$4,800 ⁱ	\$8,000	Yes
Visitor surveys	Avista, Staff	\$0	\$13,300 ^j	\$13,300	Yes
<i>Lake Spokane/Nine Mile Reservoir Recreation PME (SRP-REC-4)</i>					
Nine Mile Resort development	Avista, Staff	\$250,000	\$0	\$32,700	Yes
Planning and construction of recreation projects including O&M and continued public access	Avista, Stakeholders	\$790,000	\$133,600 ^k	\$236,800	No
Spokane River Developments recreation plan	Staff	Indeterminate	Indeterminate	Indeterminate	Yes
Cultural Resource Measures					
<i>Historic Properties Management Plan (SRP-CR-1)</i>					
In the HPMP, address any traditional cultural properties that are determined to be affected by the Project and conduct monitoring for cultural resources located within the APE on reservation lands	Avista, Staff	\$0	\$24,000	\$24,000	Yes
Determine National Register eligibility and resolve impacts to historic properties located within the Project APE	Avista, Staff	\$0	\$75,000	\$75,000	Yes

Table 4.3-2. Summary of costs of environmental measures for Spokane River Developments (continued)

Environmental Measures	Entity	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)	Adopted by Staff?
Other Items					
Purchase and maintain boat for PME measure implementation (total cost shared 50/50 with Post Falls Project)	Avista	\$25,000 ^a	\$2,500 ^a	\$5,800	No
Support office staff time and expenses associated with new PME measures	Avista	\$0	\$363,700	\$363,700	No
Provide for administrative overhead costs for new PME measures	Avista	\$0	\$47,300	\$47,300	No

Notes:

- a. Cost for this measure has been split between the Spokane River Developments and the Post Falls Project.
- b. Only the cost to develop the plan is included. Costs to implement the measures of the plan could not be determined.
- c. The total average annual costs may be greater than what is shown because the annual costs are indeterminate.
- d. This is an equivalent annual cost based on a survey data collection cost of \$46,250 every 3 years over a 25-year period.
- e. Avista estimates that a 200-foot buffer would add about 320 acres of land to the Project. Avista estimates the value of these 320 acres to be between \$1.6 million and \$6.5 million dollars. Since Avista already owns this land, we assign no capital cost to the 320 acres.
- f. Costs are included as part of the original O&M costs for the Project.
- g. Annual cost includes a reduction in annual energy benefits of \$34,500 per year, which equates to an energy loss of 690 MWh for aesthetic flows at Upper Falls; estimated to double for Sierra Club measure.
- h. There is a \$600 per year gain in energy revenue, which equates to an energy gain of 12 MWh for aesthetic flows at Monroe Street. Hence the negative sign.
- i. This is an equivalent annual cost based on a cost of \$3,500 per year, with an additional \$10,000 every 6 years to update the plan.
- j. This is an equivalent annual cost based on a cost of \$75,000 every 6th year beginning in 2008.
- k. This is an equivalent annual cost based on a cost of \$85,000 per year, with an additional \$300,000 every 10th year.
- l. The total capital cost of the HPMP is \$60,000 for the Post Falls Project and the Spokane River Developments. The cost is divided equally between the Projects.

Source: Compiled by Avista and Staff

4.3.2 Cost of Alternative 4(e) Conditions

DOI filed preliminary 4(e) conditions on July 18, 2006. Avista proposed 12 alternative conditions for the Post Falls Project in its August 17, 2006, filing. Only 4 of the 12 alternative conditions involve Avista proposing something new. The four new measures and associated costs are under appeal. They are summarized in Table 4.3-3.

4.4 COMPARISON OF ALTERNATIVES

4.4.1 No-Action Alternative

The existing Projects represent the No-Action Alternative. Under this alternative, there would be no change in Project facilities or operations (beyond life extension of structures and equipment), and no new enhancement measures would be provided.

The annual operating cost of the existing Post Falls Project is about \$3,446,100 (\$44.59/MWh). The Post Falls Project would generate an average of 77,281 MWh of electricity annually and have an annual power value of \$3,864,100 (\$50.00/MWh). This would result in a net annual benefit of \$417,900 (\$5.41/MWh).

The annual operating cost of the existing Spokane River Developments is about \$18,847,700 (\$23.66/MWh). The Spokane River Developments would generate an average of 796,639 MWh of electricity annually and have an annual power value of \$39,832,000 (\$50.00/MWh). This would result in a net annual benefit of \$20,984,200 (\$26.34/MWh).

4.4.2 Proposed Action

Tables 4.4-1 and 4.4-2 compare the power value, annual costs, and net benefits under the No-Action Alternative to the power value, annual costs, and net benefits under the Proposed Actions for the Post Falls Project and the Spokane River Developments, respectively.

The annual operating cost of the Post Falls Project under the Proposed Action would be about \$6,678,200 (\$86.89/MWh), as summarized in Table 4.4-1. Under the Proposed Action, the Post Falls Project would generate an average of 76,855 MWh of electricity annually and have an annual power value of \$3,842,800 (\$50.00/MWh). This would result in a negative net annual benefit of -\$2,835,400 (-\$36.89/MWh).

Table 4.3-3. Summary of Avista’s alternatives to DOI environmental measures for the Post Falls Project under appeal

Environmental Measure	Appealed Measure	Capital and One-time Costs (2007\$)	Annual Costs (2007\$)	Total Average Annual Cost (2007\$)
<p>Terrestrial and Geological Measures: Avista’s proposed alternative to BIA’s erosion control measure would have Avista prepare and implement a plan to ameliorate Project-caused shoreline erosion on lands within the Coeur d’Alene Indian Reservation as identified in erosion study reports and relicensing workgroups in 2006 and 2004, respectively.</p>	DOI BIA Condition No. 2			Same measure Avista proposed in license application
<p>Water Resource Measures: Avista’s proposed alternative to BIA’s water quality monitoring measure would have Avista prepare and implement a Water Quality Monitoring Plan for areas of Coeur d’Alene Lake with the Project boundary that occupy the Coeur d’Alene Indian Reservation for periodic monitoring of water temperature, DO, and percent saturation.</p>	DOI BIA Condition No. 3	\$5,000	\$50,000	\$50,800
<p>Cultural Resources: Avista’s proposed alternative to DOI BIA’s cultural resources measure would have Avista prepare and implement a HPMP for NHPA-eligible cultural resources only within the APE of Coeur d’Alene Indian Reservation.</p>	DOI BIA Condition No. 4			Same measure Avista proposed in license application
<p>General Measure: Avista’s proposed alternative to DOI’s reserved authority for the BIA to review Avista’s compliance is to have the Secretary of Interior reserve the authority to review Avista’s compliance with requirements of the 4(e) conditions, and if Avista is found to not be in compliance, the Secretary may seek “permissible remedies as provided by the Federal Power Act and other applicable law”.</p>	DOI BIA Condition No. 15	\$0	\$0	No cost associated with this item

Source: Staff

Table 4.4-1. Summary of costs, power benefits, and net benefits of the Post Falls Project alternatives

	No-Action	Proposed Action	Staff Recommended Alternative	Staff Recommended with Mandatory Conditions
Installed Capacity	14.75 MW	14.75 MW	14.75 MW	14.75 MW
Annual Generation	77,281 MWh	76,855 MWh	76,855 MWh	76,855 MWh
Annual Power Value	\$3,864,100 (\$50.00/MWh)	\$3,842,800 (\$50.00/MWh)	\$3,842,800 (\$50.00/MWh)	\$3,842,800 (\$50.00/MWh)
Annual Cost	\$3,446,100 (\$44.59/MWh)	\$6,678,200 (\$86.89/MWh)	\$5,622,100 (\$73.15/MWh)	\$6,216,800 (\$80.89/MWh)
Net Annual Benefit	\$417,900 (\$5.41/MWh)	-\$2,835,400 (-\$36.89/MWh)	-\$1,779,400 (-\$23.15/MWh)	-\$2,374,000 (-\$30.89/MWh)

Table 4.4-2. Summary of costs, power benefits, and net benefits of the Spokane River Developments alternatives^a

	No-Action	Proposed Action	Staff Recommended Alternative
Installed Capacity	122.9 MW	122.9 MW	122.9 MW
Annual Generation	796,639 MWh	795,960 MWh	795,960 MWh
Annual Power Value	\$39,832,000 (\$50.00/MWh)	\$39,798,100 (\$50.00/MWh)	\$39,798,100 (\$50.00/MWh)
Annual Cost	\$18,847,700 (\$23.66/MWh)	\$22,202,700 (\$27.89/MWh)	\$21,437,300 (\$26.93/MWh)
Net Annual Benefit	\$20,984,200 (\$26.34/MWh)	\$17,595,300 (\$22.11/MWh)	\$18,360,700 (\$23.07/MWh)

a. Since there are no federal lands within the Project, there is no agency with mandatory conditioning authority.

The annual operating cost of the Spokane River Developments under the Proposed Action is about \$22,202,700 (\$27.89/MWh), as summarized in Table 4.4-2. Under the Proposed Action, the Spokane River Developments would generate an average of 795,960 MWh of electricity annually and have an annual power value of \$39,798,100 (\$50.00/MWh). This would result in a net annual benefit of \$17,595,300 (\$22.11/MWh).

4.4.3 Staff Recommended Alternative

Tables 4.4-1 and 4.4-2 compare the power value for the Staff Recommended Alternative. The value remains constant because no operational changes would affect generation.

The annual operating cost of the Post Falls Project under the Staff Alternative would be about \$5,622,100 (\$73.15/MWh), as summarized in Table 4.4-1. Under the Staff Alternative, the Post Falls Project would generate an average of 76,855 MWh of electricity annually and have an annual power value of \$3,842,800 (\$50.00/MWh). For the Staff Alternative, this would result in a negative net annual benefit of -\$1,779,400 (-\$23.15/MWh).

The annual operating cost of the Spokane River Developments under the Staff Alternative would be about \$21,437,300 (\$26.93/MWh), as summarized in Table 4.4-2. Under the Staff Alternative, the Spokane River Developments would generate an average of 795,960 MWh of electricity annually and have an annual power value of \$39,798,100 (\$50.00/MWh). This would result in a net annual benefit of \$18,360,700 (\$23.07/MWh).

4.4.4 Staff Alternative with Preliminary Mandatory Conditions

Table 4.4-1 compares the power value for the Staff Alternative with Preliminary Mandatory Conditions. The value remains constant because no operational changes would affect generation.

The annual operating cost of the Post Falls Project under the Staff Alternative with Preliminary Mandatory Conditions would be about \$6,216,800 (\$80.89/MWh), as summarized in Table 4.4-1. However, it should be noted that the costs of the mandatory conditions are unknown; therefore, our estimate of the costs of this alternative likely underestimates its true costs. Under the Staff Alternative with Preliminary Mandatory Conditions, the Post Falls Project would generate an average of 76,855 MWh of electricity annually and have an annual power value of \$3,842,800 (\$50.00/MWh). Based upon the costs we could identify for the Staff Alternative with Preliminary Mandatory Conditions, this alternative would result in a negative net annual benefit of -\$2,374,000 (-\$30.89/MWh).

4.4.5 Summary of Alternatives

Table 4.4-1 summarizes the annualized costs, benefits, and net benefits of the No-Action Alternative, the Proposed Action, the Staff Recommended Alternatives, and the Staff Alternatives with Mandatory Conditions at the Post Falls Project.

Table 4.4-2 summarizes the annualized costs, benefits, and net benefits of the No-Action Alternative, the Proposed Action, and the Staff Recommended Alternatives at the Spokane River Developments.