4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Project's use of the Columbia River for hydropower purposes to see what effect various environmental measures would have on the Project's costs and power benefits. Consistent with the Commission's approach to economic analysis, the "power benefit" of the project is defined as the cost of obtaining the same amount of energy and capacity using the likely alternative generating resources available in the region. The "power value" is the unit cost of the selected alternative generating resource and is usually expressed in terms of dollars per megawatt hour ($/MWh) for energy and dollars per kilowatt-year ($/kW-yr) for capacity. The combined value (or cost) of energy and capacity can also be expressed in terms of $/MWh for a given amount of energy and capacity. Reducing the cost of licensing alternatives to an average cost per unit of electricity generated provides a convenient metric for assessing the public benefit of the project for power production.

In keeping with Commission's 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 the hydropower project's power benefits.[115] 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 cost of individual measures considered in the EIS for the protection, mitigation and enhancement of environmental resources affected by the Project.

To determine the net power benefit for each of the licensing alternatives, we subtract the cost of producing power at the Project from the total power benefit, which, as we said above, is the cost of obtaining the same amount of power using a likely alternative source of power. For any alternative, a positive net annual power benefit indicates that the Project costs less than the current cost of alternative generation resources; a negative net annual benefit indicates that project power costs more than the current cost of alternative generation resources. The net benefit helps to support an informed decision concerning what is in the public interest with respect to a proposed licensing alternative, or proposed license condition. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

In the comprehensive development section, we use the estimated cost of individual measures to help us decide if the environmental benefit to the resource (usually described

[115] 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 the cost of electricity production.

in qualitative, or non-dollar valuation terms) justifies the cost of the measure. For this purpose, we convert the capital and annual cost of individual measures to equal annual amounts spread over a 30-year period of analysis.

4.1 POWER AND ECONOMIC BENEFITS OF THE PROJECT

For the Project, we assume the energy value is similar to the cost of purchasing the equivalent generation from BPA at its new resource rate for firm power.[116] Using the average of the monthly high and low load hourly energy rates for BPA customers buying power for all 5 years of the 5-year rate period, we calculate an average energy value of $34/MWh. We use BPA's new resource capacity demand rate schedule to value the project's 1,535,000 kW of dependable capacity at $24 per kW per year (kW-yr). Using the average energy value of $34/MWh and a capacity value of $24/kW-yr, the combined power value is $39/MWh based on the current average annual net generation of 8,608,799 MW.

The current cost economic analysis is not entirely a first-year analysis in that certain costs, such as major capital investments, would not be expended in a single year. The maximum period we use to annualize such costs is 30 years. Also, some future expenses, such as taxes and depreciation, are known and measurable and are, therefore, incorporated in our cost analysis.

Table 39 summarizes the assumptions and economic information we use in our analysis. Most of this information was provided by Grant PUD in its license application. We find that the values provided by Grant PUD are reasonable for the purposes of 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); relicensing costs; normal O&M cost; and Commission fees.

Table 39. Summary of key parameters for economic analysis of the Priest Rapids Project (Source: as noted).

Parameter	Value	Source
Existing Capacity/Net Dependable Capacity:		
Wanapum (MW)	1038/842	Grant PUD[a]
Priest Rapids (MW)	855/805	
Total (MW)	1,893/1,647	

[116] Bonneville Power Administration, 2002 Wholesale Power Rate Schedules (Revised May 2004).

Parameter	Value	Source
Proposed Capacity/Net Dependable Capacity:		
Wanapum (MW)	1038/842	Grant PUD[a]
Priest Rapids (MW)	956/900	
Total (MW)	1,994/1,742	
Existing Average Annual Generation:		
Wanapum (MWh/yr)	5,121,289	Grant PUD[b]
Priest Rapids (MWh/yr)	4,558,338	
Less Rock Island Tailwater benefit	-639,993	
Total (MWh/yr)	9,039,634	
Proposed Average Annual Generation:		
Wanapum (MWh/yr)	5,121,289	Grant PUD[b]
Priest Rapids (MWh/yr)	5,258,690	
Less Rock Island Tailwater benefit	-626,301	
Total (MWh/yr)	9,753,677	
Energy value	$34/MWh	Grant PUD/staff [c]
Capacity value	$24/kW-year	Staff [c]
Overall cost of money	7 percent	Grant PUD/Staff
Discount rate	7 percent	Staff
Term of financing	20 years	Staff
Period of analysis	30 years	Staff
Annual Operation & Maintenance cost	$35,745,586	Grant PUD/staff [e]
Net Investment	$416,904,355	Grant PUD[f]

[a] From Exhibit B of license application; net dependable capacity is based on summer flow and load conditions.

[b] From Exhibit B of license application; adjustment compensates for Wanapum reservoir encroachment at Rock Island Project's tailwater.

[c] Based on BPA's new resource energy and capacity rate schedule.

[e] From Grant PUD's 2004 Annual Report: $17,606,837 for Wanapum (p. 140) and $18,138,749 for Priest Rapids (p.109).

[f] Net plant investment estimated by staff from information contained in Grant PUD's 2004 Annual Report; includes total plant investment less accumulated depreciation for Priest Rapids and Wanapum ($142,029,777 and $160,886,947, respectively), plus costs for construction in progress ($62,107,121) and licensing costs ($51,880,510), all as of December 31, 2004.

4.2 COMPARISON OF ALTERNATIVES

Table 40 summarizes the annual cost, power benefits, and annual net benefits for the three alternatives considered in this final EIS: no-action, Grant PUD's proposal, and the staff alternative.

Table 40. Summary of the annual cost, power benefits, and annual net benefits for three alternatives for the Priest Rapids Hydroelectric Project (Source: staff).

	No Action	Grant PUD's Proposal	Staff Alternative
Installed capacity (MW)	1,893	1,994	1,994
Annual generation (MWh)	9,039,634	9,753,677	9,753,677
Annual power value	$329,546,000	$377,346,000	$377,346,000
($/MWh and mills/kWh)	38.28	38.69	38.69
Annual cost	$69,341,000	$146,722,690	$145,669,980
($/MWh and mills/kWh)	8.06	15.04	14.93
Annual net benefit	$260,205	$230,623,310	$231,676,020
($/MWh and mills/kWh)	30.22	23.64	23.75

4.2.1 No-Action Alternative

Under the no-action alternative, the project would continue to operate as it does now. On July 23, 2004, the Commission issued an order[117] amending Grant PUD's license and authorizing the replacement of the 10 turbines at the Wanapum development with ten new, upgraded turbines over a period of about 8 years. The order authorized the replacement of one turbine, followed by a study to test the effect of the advanced turbine design on fish passage survival. Replacement of the remaining 9 turbines would be allowed to proceed only after the Commission informed the licensee that test results were satisfactory. On October 11, 2005, Grant PUD filed a report on fish survival through the first installed turbine and, subsequently, on December 14, 2005, the Commission issued an order[118] authorizing the installation of the remaining nine advanced design hydro turbines. The new turbines increase the capacity of each turbine generator set by 13.8 MW. The Commission's order approving the installation of the remaining 9 turbines increased the authorized capacity of the Wanapum Development from 900 to 1,038 MW. Grant PUD expects to replace the remaining 9 turbines at the rate of about one every 9 months. The capacity and average annual generation for the no-action alternative in this final EIS represents the conditions after replacement of all approved turbine units at the Wanapum Development. Likewise, the cost of the Wanapum turbine replacements is included in the no-action alternative. Grant PUD estimates it will cost $124,630,387 to replace the Wanapum turbines with the advanced design turbines.

[117] 108 FERC ¶ 62,075 (2004).
[118] 113 FERC ¶ 62,205 (2005)

Under the no-action alternative, the planned replacement of the 9 remaining turbines at the Wanapum Development would occur, but Grant PUD would not replace the turbines at the Priest Rapids Development or implement new environmental measures. Upon completion of the approved turbine replacements at Wanapum, the project would have a total authorized installed capacity of 1,893 MW and annually generate an average of 9,039,634 MWh of electricity. Based on our estimate of the current cost of replacing this amount of power with no consideration of inflation over the 30-year period of our analysis, the average annual power value of the project under the no-action alternative would be $346,876,000 (about $38.4/MWh). The average annual cost of producing this power would be $78,380,000 (about $8.7/MWh), resulting in an average annual net benefit of $268,495,000 (about $29.7/MWh).

4.2.2 Grant PUD's Proposal

Grant PUD proposes to replace the 10 existing turbines at the Priest Rapids development with the same advanced turbine design being used for the Wanapum Development. Based on its assessment of the remaining useful life of the existing Priest Rapids turbines, Grant PUD proposes to replace the turbines beginning in 2017 and extending through 2023. The total cost of Priest Rapids turbine replacement is estimated at $155,374,804. We include this cost and the resulting capacity and generation increases in the proposed action alternative. Upon completion of the replacement of all 10 turbines, the total capacity at the Priest Rapids development would increase from 855 to 955.6 MW, the rated capacity of the existing generators.

Upon completion of the proposed turbine replacement upgrades at both developments, the total Project capacity would increase to about 1,994 MW, an increase of about 225 MW from the current installed capacity of 1,768.8 MW. With a total capacity of 1,994 MW, a dependable capacity of 1,742 MW and an average annual generation of 9,753,677 MWh, the Project would have an annual power value of $377,346,000 ($38.69/MWh), an annual production cost (levelized over the 30-year period of our analysis) of $146,722,690 ($15.04MWh), and an annual net benefit of $230,623,310 ($23.64/MWh).

4.2.3 Staff Alternative

The staff alternative includes the same developmental upgrades as Grant PUD's proposal and, therefore, would have the same capacity and energy attributes. Based on a total capacity of 1,994 MW, a dependable capacity of 1,742 MW and an average annual generation of 9,753,677 MWh, the Project would have an annual power value of $377,346,000 ($38.69/MWh). Since the staff alternative includes costs of additional measures, the annual production cost (levelized over the 30-year period of our analysis) is

about $145,669,980 ($14.93/MWh), yielding an annual net benefit of about $231,676,020 ($23.75/MWh).

4.3 COST OF ENVIRONMENTAL MEASURES

Certain measures proposed by Grant PUD and other parties would affect project economics because they can increase the production cost by requiring new capital expenditures or additional annual costs for O&M. Other measures would affect the project's power production capability or average annual generation. Table 41 summarizes the costs of environmental measures proposed by Grant PUD, staff or others. For measures where all or a portion of the cost is based on the cost of replacing project power benefits, the amount and assumed value of foregone power is given in the table footnotes. Measures that do not greatly affect the project economics or have unknown costs are *not* listed in the table.

Table 41. Cost of environmental protection, mitigation and enhancement measures proposed by Grant PUD, resource agencies, others, and staff for the Priest Rapids Hydroelectric Project (Source: Grant PUD, 2003a, modified by staff.)

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Water Quantity and Quality				
TDG and GBT monitoring (part of Water Quality Monitoring Plan)	Grant PUD, Staff	N/A	$48,000	$48,000
Temperature monitoring plan(part of Water Quality Monitoring Plan)	Grant PUD, Staff	N/A	$140,000	$140,000
Aquatic macrophyte monitoring plan (called AIS plan in Terrestrial Resource section and part of Water Quality Monitoring Plan)	Grant PUD, Staff, Washington DFW	N/A	$25,000	$25,000
Nuisance aquatic macrophyte removal (part of AIS and Water Quality Monitoring Plans)	Grant PUD, Staff, Washington DFW	N/A	$7,000	$7,000
Zebra mussel monitoring (part of AIS and Water Quality Monitoring Plans)	Grant PUD, Staff, Washington DFW	N/A	$2,000	$2,000
Tailrace pumping to replace gravity fishway attraction water supply	Grant PUD, Staff	$3,676,450	N/A	$296,000
Aquatic Resources				
Develop a detailed fishery operations plan	CRITFC, Staff	$7,500	N/A	$600

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Adult trapping facilities at Priest Rapids	Settlement Parties[1], Staff	$980,878	$5,000	$84,000
Hatchery effectiveness monitoring	Settlement Parties[1], Staff	N/A	$100,000	$100,000
Fishways automation, improvements and junction pool modifications	Settlement Parties[1], Staff	$2,700,000	N/A	$217,600
Video fish counting systems at both dams	Settlement Parties[1], Staff	$1,250,000	$200,000	$300,700
Downstream bypass system at Wanapum dam	Settlement Parties[1], Staff	$26,874,403	$11,124,864[3]	$13,290,000
Sluiceway spill for fallback at Priest Rapids and Wanapum dams	Settlement Parties[1], Staff	N/A	$2,204,370[2]	$2,204,370
Study of Wanapum gate seals	Staff	$50,000	N/A	$4,030
Northern pikeminnow removal program	Settlement Parties[1], Staff	N/A	$199,990	$199,990
Gatewell exclusion screen study	NMFS, Staff	$100,000	N/A	$8,060
Avian predator control program	Settlement Parties[1], Staff	N/A	$166,520	$166,520

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Biological assessment and management plan program development and ancillary facilities	Settlement Parties[1], Staff	$9,000,000	$200,000	$925,300
Priest Rapids habitat mitigation fund	Settlement Parties[1], Staff	N/A	$1,096,550	$1,096,550
Habitat mitigation plan (part of habitat mitigation fund)	Settlement Parties[1], CRITFC, Staff	$5,000	N/A	$430
Adult PIT-tag facilities at Priest Rapids dam	Settlement Parties[1], Staff	$319,830	$10,000	$35,800
Anadromous fish monitoring and evaluation studies	Settlement Parties[1], Staff	N/A	$2,000,000	$2,000,000
Spill at both dams for downstream passage	Settlement Parties[1], Staff	N/A	$18,000,000 (temporary)	Unknown
Fall Chinook spawning habitat modifications at Wanapum dam	Settlement Parties[1], Staff	N/A	$50,000	$50,000
Hanford Reach Agreement	Settlement Parties[1], Staff	N/A	$4,346,610	$4,346,610
Bull trout monitoring plan	Washington DFW, Staff	$5,000	N/A	$430

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Fishway telemetry study (part of the Pacific lamprey management plan)	Interior, Washington DFW, Staff	$200,000 (four instances at $50,000 each)	N/A	$16,100
Modify diffusion chambers on fishways at Priest Rapids to improve adult lamprey passage	Grant PUD, Staff	$219,122	$10,000	$27,700
Priest Rapids and Wanapum fishways	Settlement Parties[1], Staff	N/A	$771,690	$771,690
Fishway stranding protocol (part of the Pacific lamprey management plan)	Interior, Staff Washington DFW	$5,000	N/A	$430
White sturgeon management plan	Interior, CRITFC, Washington DFW, Staff	N/A	$50,000	$50,000
Final white sturgeon conservation aquaculture plan	Staff	$7,500	N/A	$600
Spring Chinook hatchery supplementation program	Settlement Parties[1], Staff	$10,722,172	$700,000	$1,564,000
Summer Chinook hatchery supplementation program	Settlement Parties[1], Staff	$8,756,339	$800,000	$1,505,000
Priest Rapids hatchery fall Chinook program	Settlement Parties[1], Staff	$11,754,801	$881,166	$1,828,000

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Sockeye hatchery feasibility or alternative program	Settlement Parties[1], Staff	$12,119,304	$218,834	$1,195,000
Steelhead hatchery supplementation program	Settlement Parties[1], Staff	$3,870,181	$200,000	$511,900
Acclimation and broodstocking facilities	Settlement Parties[1], Staff	$9,939,694	N/A	$801,000
White sturgeon restoration & enhancement program	Grant PUD, Staff	$1,905,368	$150,000	$303,550
Priest Rapids fisheries forum	Washington DFW, Staff	N/A	$5,000	$5,000
Crab Creek/Burkett Lake enhancement plan	Staff	$20,000	N/A	$1,720
PIT tag detection at Wanapum	CRITFC, Alaska DFG	$319,830	$10,000	$35,800
Study of peaking effects on passage	CRITFC	$200,000	N/A	$16,100
Adult fallback and kelt passage studies	American Rivers	$500,000-$1,000,000	N/A	$40,300-$80,590
No Net Impact fund	Settlement Parties[1]	N/A	$1,112,500	$1,112,500
Flows to protect rearing fall Chinook salmon (10 kcfs fluctuation limit)	CRITFC Yakama	$46,200,000[4]	$112,500,000[4]	$136,000,000

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Annual orthophotographic spawning surveys	Interior, CRITFC, Alaska DFG	$100,000	N/A	$8,060
White Bluffs spawning surveys	Umatilla, Alaska DFG	$20,000	N/A	$1,720
Spawning behavior studies	Interior, CRITFC, Alaska DFG	$200,000	N/A	$16,100
Primary and secondary production studies	Interior, CRITFC	$450,000	N/A	$36,200
Conduct annual stranding and entrapment surveys in Hanford Reach	CRITFC, Alaska DFG	N/A	$150,000	$150,000
Develop and implement a bull trout management plan	Interior, Washington DFW	$575,000	N/A	$46,300
Pacific lamprey studies	Interior, CRITFC, Washington DFW	$1,200,000	N/A	$96,720
Lamprey management plan – Hydraulic study	Interior	$100,000	N/A	$8,060
Lamprey management plan – Modifications to fish ladders	Interior	$700,000	N/A	$56,400
Alternative lamprey passage methods – dedicated fishway	Interior	$2,000,000	Unknown	$161,200

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Alternative lamprey passage methods – capture and haul	Interior	N/A	$80,000	$80,000
Lamprey biologist	Washington DFW	N/A	$30,000	$30,000
Regional coordination and white sturgeon biologist	Washington DFW, Interior, CRITFC	N/A	$30,000	$30,000
Columbia basin hatchery funding	Grant PUD	$1,000,000	$100,000	$180,600
Pikeminnow removal/resident fish study	CRITFC	$600,000 (3 year study)	N/A	$48,300
Gatewell exclusion screens at both dams	Grant PUD	$500,000	$20,000	$60,300
Trophic dynamics study	Washington DFW	$750,000	N/A	$60,430
Terrestrial Resources				
Development of Wildlife Habitat Management Plan which includes:	Staff	$2,000 every 5 years	N/A	$960
Lower Crab Creek management plan	Grant PUD, Staff	$7,200,000	$30,000	$610,200
Colockum, Whiskey Dick, and Quilomene wildlife areas enhancements	Grant PUD, Staff	$2,000,000	$70,000	$231,200
Land acquisition fund for wildlife areas	Grant PUD, Staff	$1,000,000	N/A	$80,600

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Fire suppression program	Grant PUD, Staff	N/A	$60,000	$60,000
Perch pole and duck box maintenance	Grant PUD, Staff	N/A	$15,500	$15,500
Fund Washington DFW operation and maintenance of wildlife area lands ($15/ac)	Washington DFW	$0	$1,494,750	$1,494,750
Fund replacement of Crescent Bar habitats	Washington DFW	$2,160,000	$36,000	$673,000
Habitat mitigation projects: a) Royal Lake excavation project; b) Crab Creek water diversion project; and c) Lower Crab Creek farm ground renovation project	Washington DFW	a) $181,000 b) $230,000 c) $126,000	a) $5,000[5] b) $5,000 c) $5,000 [5]	a) $15,000 b) $ 19,000 c) $10,000
Habitat acquisition fund	Washington DFW	$4,500,000	N/A	$363,000
Wildlife Habitat Monitoring and Information & Education Program	Washington DFW, Staff	$15,000[5]	N/A	$1,000
Transmission line avian protection measures	Grant PUD, Staff	$500,000	N/A	$40,300
Northern wormwood conservation plan	Grant PUD, Staff	N/A	$40,000	$40,000
Transmission line RTE botanical protection	Grant PUD, Staff	N/A	$7,000	$7,000
RTE plant monitoring programs	Grant PUD, Staff	N/A	$35,000	$35,000
RTE plant research programs	Grant PUD, Staff	N/A	$13,500	$13,500

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Bald eagle perch and roosting tree enhancements	Grant PUD, Staff	N/A	$17,500	$17,500
Implement AIS plan (as proposed by Grant PUD in Water Quality) with 3 additional components: Identifying and recommending any additional measures for detecting future AIS infestations, detailed information and education program, and implementation schedule	Washington DFW, Staff	$10,000[5]	$7,000	$8,000
Cultural Resources				
Implementation of the HPMP, associated additional Staff-recommended tasks, and maintain cultural resource management facilities	Grant PUD, Staff	$20,000,000	$3,750,000	$5,362,000
Recreation Resources				
Implementation of Recreation Plan which includes:	Grant PUD, Staff	N/A	$26,000	$26,000
Interpretation and education plan	Grant PUD, CRITFC, Staff	$86,100[6]	$8,000	$14,930
Recreation monitoring (including recreation monitoring on 748.8 acres of BLM-administered land in the Project area)	Grant PUD, BLM, Staff	$225,000[7]	N/A	$21,150
Dispersed recreation site maintenance/ management	Grant PUD, Staff	$15,000	$3,000	$4,200

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Airstrip site (New)	Grant PUD, Staff	$7,892,500	N/A	$636,000
Apricot orchard boat launch	Grant PUD, Staff	$156,400	$2,000	$14,600
Beverly sand dunes OHV park	Grant PUD, Staff	$5,000	$3,000	$3,400
Buckshot ranch boat launch	Grant PUD, Staff	$42,200	$1,500	$4,900
Crab Creek corridor	Grant PUD, Staff	$452,320	$8,000	$44,450
Crescent Bar	Grant PUD, Staff	$1,800,850	$12,500	$157,600
Desert Aire	Grant PUD, Staff	$705,450	$3,250	$60,100
Frenchman Coulee boat launch	Grant PUD, Staff	$224,100	$1,500	$19,600
Getty’s cove	Grant PUD, Staff	$511,750	N/A	$41,240
Huntzinger Road boat launch	Grant PUD, Staff	$684,000	$3,000	$58,100
Huntzinger Road fishing access site	Grant PUD, Staff	$88,500	$2,000	$9,100
Kittitas County boat launch	Grant PUD, Staff	$138,900	$15,000	$26,200
Wanapum dam lower boat launch	Grant PUD, Staff	$64,000	$3,000	$8,100
Mattawa RV park (New)	Grant PUD, Staff	$830,410	$2,500	$69,400
Priest Rapids park (New)	Grant PUD, Staff	$656,500	$11,000	$63,900

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Quilomene dune and bay/West Bar	Grant PUD, Staff, CRITFC, Yakama	N/A	$3,000	$3,000
Rocky Coulee	Grant PUD, Staff	$193,700	$6,000	$21,600
Sand Hollow – North	Grant PUD, Staff	$127,000	$3,000	$13,200
Sand Hollow – South	Grant PUD, Staff	$1,223,500	$13,000	$111,600
Shoreline below Priest Rapids dam	Grant PUD, Staff	$96,000	$3,000	$10,700
Sunland estates boat launch	Grant PUD, Staff	$90,900	$6,000	$13,300
Sunland estates day-use area (New)	Grant PUD, Staff	$412,500	$4,000	$37,200
John Wayne pioneer trail river crossing (50% of total capital cost)	Grant PUD	$445,000	N/A	$35,900
Vantage area trail	Grant PUD, Staff	$67,250	$5,000	$10,400
Wanapum dam upper boat launch	Grant PUD, Staff	$71,400	$3,000	$8,800
Vernita bridge boat launch	Grant PUD, Staff	$500,000	N/A	$40,300
Wanapum dam heritage center	Grant PUD, Staff	$112,000	$4,000	$13,000
Wanapum dam overlook	Grant PUD, Staff	$66,500	$2,000	$7,400
Wanapum dam picnic area	Grant PUD, Staff	$80,900	$4,000	$10,600

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Wanapum recreation area	Grant PUD, Staff	$1,853,300	N/A	$149,300
In a final Recreation Plan, include a provision (*e.g.*, signs) at Quilomene Dune and Bay to address wake size by boaters	CRITFC, Yakama, Staff	$3,000	N/A	$240
Provide funding for 1 FTE to Washington DFW enforcement program and 1 FTE to be divided equally between Grant PUD and Kittitas County Sheriff's offices; continue to provide a boat at Wanapum dam for local law enforcement officers.	Grant PUD	N/A	$100,000	$100,000
Provide funding for 2 FTE law enforcement officers to Washington DFW and funding for 0.5 FTE each to Kittitas and Grant County sheriffs	Washington DFW	N/A	$270,000	$270,000
Provide to Washington DFW $73,500 for a reservoir patrol vessel, $2,200 for a trailer, and replace on 10-year cycle	Washington DFW	N/A	$18,000	$18,000
Provide funding to Kittitas County for 1 Sheriff Deputy, 2 staff (May-Oct), and a vessel	Kittitas County	N/A	$100,000	$100,000
Dredge and lengthen the Kittitas County boat launch at Vantage	Kittitas County, Public Works, Pat Kelleher, Staff	$200,000[8]	N/A	$16,100
Fund 100% of the restoration and maintenance of the Beverly Bridge (John Wayne Pioneer Trail)	Washington DNR, Pat Kelleher, IAC	$890,000	$26,000	$102,540

Environmental Measure	Recommending Entities	Capital and One-time Costs	Annual Costs, Including O&M	Total Annualized Cost
Land Use				
Shoreline Management Plan	Grant PUD, Staff, Pat Kelleher	N/A	$300,000	$300,000

[1] Settlement Parties include: Grant PUD, NMFS, Interior, Washington DFW, the Yakama, and the Colville.
[2] Based on the cost of replacing 59,578 MWh of power at $37/MWh.
[3] Based on the cost of replacing 300,672 MWh of power at $37/MWh.
[4] Based on the cost of providing 1,320-MW Simply Cycle Combustion Turbine for operation from March 1 - June 15 and gas prices of $4/MMBtu (currently gas prices are over $6/MMBtu). See, also pages 57-58 of Grant PUD's July 8, 2005 letter responding to Interior's recommended terms and conditions.
[5] Staff estimated cost.
[6] Cost includes 2 interpretive displays/kiosks of $13,000 each.
[7] Required every 12 years at $75,000/survey; assumed by staff to occur 3 times over the 30-year period of our analysis.
[8] Grant PUD estimated cost from draft Recreation Plan.