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5.0 ECONOMIC ANALYSIS

This section compares costs associated with the No-Action Alternative (existing condition) with costs associated with Alternative 1 for the Middle Fork American River Project (MFP or Project). This analysis includes a comparison of economic benefits; costs of new environmental programs, measures, and facilities; and power generation. All costs are provided in 2010 United States dollars and all analyses are predicated on a new license with a 50-year term being granted. Table 5-1 provides a summary of the assumptions used to prepare this economic analysis.

5.1 NO-ACTION ALTERNATIVE COSTS

The No-Action Alternative represents the existing condition. The No-Action Alternative is described in Placer County Water Agency's (PCWA) Application for New License (PCWA 2011). Under this alternative, there will be no change in the current operation or maintenance of the MFP. PCWA will not provide any additional environmental programs, measures, or facilities above those provided in the existing license. The annualized operating cost of the existing MFP is approximately $25,985,000 (Table 5-2).

5.2 ALTERNATIVE 1 COSTS

Alternative 1 includes modification of existing Project facilities, and construction of new Project facilities and Project recreation facilities and features (capital costs); and implementation of new environmental programs, measures, and facilities, as described in Section 2.0 – Elements Analyzed. The annualized operating costs associated with Alternative 1 are $28,359,610 (Table 5-3).

5.2.1 Capital Improvements

Under Alternative 1, several construction projects will be implemented to modify existing facilities or develop new facilities to improve operations and maintenance of the MFP, enhance environmental resources, and/or meet the requirements specified in new environmental programs and measures. These projects include:

- Hell Hole Reservoir Seasonal Storage Increase Improvement;
- Modification of Duncan Creek, North Fork Long Canyon, and South Fork Long Canyon diversion dams;
- Outlet works modifications at French Meadows, Hell Hole, and Middle Fork Interbay dams;
- Construction of four new gages;
- Construction of new recreation facilities and features; and
- Replacement of existing recreation facility water supply systems.

Total capital costs associated with Hell Hole Reservoir Seasonal Storage Increase Improvement and the small diversion modifications, including permitting, are $11,980,000. Capital costs associated with outlet works modifications, construction of new gages, construction of new recreation facilities and features, and replacement of existing recreation facility water supply systems are captured within new environmental programs, measures, and facilities, as described below. As a result of MFP capital improvements under Alternative 1, depreciation costs increase by $291,600 annually over the term of the new license, as shown on Table 5-3.

5.2.2 New Environmental Programs, Measures, and Facilities

Under Alternative 1, new environmental programs, measures, and facilities will be implemented, which are designed to protect or enhance environmental and cultural resources over the term of the new license. The annualized costs associated with implementation of the new environmental programs, measures, and facilities are $1,843,410. This includes additional operation and maintenance costs and capital and one-time costs associated with implementation of new environmental programs, measures, and facilities. A summary of these costs is included in Table 5-4.

5.3 COMPARISON OF GENERATION PRODUCTION AND BENEFIT

Under the No-Action Alternative, the MFP will continue to generate an annual average of 1,039,078 megawatt hours (MWh) of electricity, which results in a gross annual benefit of $47,548,964 and a net annual benefit of $21,563,964 (Table 5-5).

Conditions included in Alternative 1 result in a 5.12% loss of generation. As a result, Alternative 1 will produce an annual average of 985,877 MWh of electricity (an annual average energy generation loss of 53,201 MWh compared to the No-Action Alternative). This results in a gross annual benefit of $45,527,334 and a net annual benefit of $17,167,724. Compared to the No-Action Alternative, this represents an annual reduction in net annual benefit of $4,396,240 (Table 5-5).

LITERATURE CITED

Placer County Water Agency (PCWA). 2011. Application for New License. Filed with FERC February 23, 2011.

TABLES

Table 5-1. Summary of Assumptions Used in the Economic Analysis.

Assumption	Value
Base Year for Costs and Benefits	2010
2009 Energy Value ($/MWh)[1]	$38/MWh
2010 Capacity Value ($/kW-year)[2]	$36/kW-year
Period of Analysis[3]	50 Years
In-Service Period	2013
Incremental Cost of Capital	4.8%
Capitalized Interest Rate	6.2%

[1]The energy price Cal-ISO reported in its Annual Report on Market Issues and Perfomance for 2009 is $37.69 (rounded to $38/MWh). Refer to Table 3.1 - Monthly Wholesale Costs: 2009, page 3.4, Total 2009 Average Cost of Energy ($/MWh load), 2009 Annual Report on Market Issues and Performance, California Independent System Operator (Cal-ISO), Department of Market Monitoring, Folsom, CA, April 2010.

[2]Verbal communication between PCWA and staff of the Northern California Power Agency, 651 Commerce Drive, Roseville, CA. August 5, 2010.

[3]PCWA is requesting a 50-year license term for the Middle Fork American River Project. Assuming a March 2013 in-service period, this results in a new license expiration of February 28, 2063.

Table 5-2. No-Action Alternative – Costs Associated with the Middle Fork American River Project (2010 Dollars).

Cost Component	Middle Fork American River Project
	Annualized Cost (2010$)
Relicensing Costs	$725,000
Capital Costs[1]	$0
New Environmental Measures[2]	$0
Operations and Maintenance	$14,040,000
Depreciation[3]	$10,000,000
Interest Expense Paid[4]	$220,000
Insurance	$1,000,000
Total Expenses	$25,985,000

[1]Any capital costs associated with existing MFP facilities are included in Operations and Maintenance.

[2]Any existing environmental measures are included in Operations and Maintenance.

[3]Refer to Exhibit D of PCWA's Application for New License (February 2011) for a description of the method used for determining depreciation.

[4]Interest expense incurred to complete relicensing process.

Table 5-3. Alternative 1 – Costs Associated with the Middle Fork American River Project (2010 Dollars).

Cost Component	Middle Fork American River Project
	Annualized Cost (2010$)
Relicensing Costs	$725,000
Capital Costs (modified/new facilities)[1]	$239,600
New Environmental Measures[2]	$1,843,410
Operations and Maintenance	$14,040,000
Depreciation[3]	$10,291,600
Interest Expense Paid[4]	$220,000
Insurance	$1,000,000
Total Expenses	$28,359,610

[1]Includes one-time capital costs for Hell Hole Reservoir Seasonal Storage Increase Improvement, small diversion dam modifications, and permitting costs. Total capital costs for these construction projects are $11,980,000.

[2]Cost of additional operation and maintenance and one-time capital costs associated with new environmental measures.

[3]Depreciation increases under Alternative 1 to account for new capital improvements. Refer to Exhibit D of PCWA's Application for New License (February 2011) for a description of the method used for determining depreciation.

[4]Interest expense incurred to complete relicensing process. Capital improvements in Alternative 1 are expected to be funded from power sales revenue, therefore, no additional interest expenses will be incurred.

Table 5-4. Alternative 1 – Cost of Environmental Programs, Measures, and Facilities for the Middle Fork American River Project (2010 Dollars).

Environmental Program, Measure, or Facility	Total Capital and One-time Costs (2010$)	Annual O&M Costs[1] (2010$)	Total Annualized Costs[2] (2010$)
COMPLIANCE			
Additional PCWA Compliance Staff		$420,000	$420,000
Subtotal	$0	$420,000	$420,000
WATER AND AQUATIC RESOURCES			
Implement Instream Flow and Reservoir Minimum Pool Measures[3]	$2,500,000	$60,000	$110,000
Subtotal	$2,500,000	$60,000	$110,000
Implement Streamflow and Reservoir Elevation Gaging Plan[4]	$100,000	$120,000	$122,000
Subtotal	$100,000	$120,000	$122,000
Implement Aquatic Monitoring Plans			
Water Temperature	$56,000	$43,200	$44,320
Fish Population		$57,000	$57,000
Hardhead Sampling	$34,000	$7,000	$7,680
Entrainment	$25,000	$5,000	$5,500
Foothill Yellow-legged Frog		$60,300	$60,300
Special Purpose - Annual Maintenance Surveys		$1,890	$1,890
Geomorphology		$25,200	$25,200
Riparian		$16,800	$16,800
Benthic Macroinvertebrate Monitoring Plan		$5,600	$5,600
Bioaccumulation Monitoring Plan		$17,000	$17,000
Water Quality Monitoring		$22,500	$22,500
Western Pond Turtle Monitoring Plan		$20,000	$20,000
Subtotal	$115,000	$281,490	$283,790
Implement Sediment Management Plan			
Overall Cost Savings		($78,230)	($78,230)
Monitoring and Reporting, Annual Consultation		$12,000	$12,000
Post-construction Effectiveness Monitoring		$300	$300
Ralston Afterbay Methylmercury Monitoring	$5,500	$4,800	$4,910
Channel Sediment Conditions Monitoring		$18,000	$18,000
Ralston Afterbay Hardhead Monitoring		$3,500	$3,500
Foothill Yellow-legged Frog Protection Measures		$700	$700
Subtotal	$5,500	($38,930)	($38,820)

Table 5-4. Alternative 1 – Cost of Environmental Programs, Measures, and Facilities for the Middle Fork American River Project (2010 Dollars).

Environmental Program, Measure, or Facility	Total Capital and One-time Costs (2010$)	Annual O&M Costs[1] (2010$)	Total Annualized Costs[2] (2010$)
TERRESTRIAL RESOURCES			
Implement Bald Eagle Management Plan			
Power Pole Replacement/Retrofit	$33,000		$660
Annual Active Nest Monitoring		$17,700	$17,700
5-year Nest and Winter Roost Surveys and Reporting		$11,550	$11,550
Mortality Monitoring and Reporting		$2,000	$2,000
Annual Agency Consultation		$1,800	$1,800
Subtotal	$33,000	$33,050	$33,710
Implement Vegetation and Integrated Pest Management Plan			
Vegetation Management			
Trimming by Hand and with Equipment		$24,800	$24,800
Herbicide and Fungicide Use		$10,100	$10,100
Noxious Weed Management			
Manual and Chemical Treatment		$19,350	$19,350
Monitoring and Reporting of Treated Noxious Weed Populations		$5,700	$5,700
Monitoring Following Ground Disturbing Activities		$3,760	$3,760
Manual and Chemical Treatment Following Ground Disturbing Activities		$10,105	$10,105
Revegetation		$2,350	$2,350
Truck and Equipment Cleaning		$18,500	$18,500
Noxious Weed Training Program		$4,800	$4,800
Pest Management			
Physical Control and Over-the-Counter Rodenticide Use		$500	$500
Rodenticide Use - Fumigants		$7,700	$7,700
Special-Status Plant and Noxious Weed Inventory Surveys		$60,000	$60,000
Water Quality Monitoring		$3,636	$3,636
Environmental Training Program		$6,800	$6,800
Annual Agency Consultation		$9,000	$9,000
Subtotal	$0	$187,101	$187,101
RECREATION RESOURCES			
Implement Recreation Plan			
Routine Operation, Maintenance, and Administration		$225,000	$225,000
Heavy Maintenance		$90,000	$90,000
Specific Modifications and Enhancements at Existing Project Recreation Facilities			
Upper Hell Hole Campground	$34,775		$696
Hell Hole Campground	$67,100		$1,342
Big Meadows Campground	$149,045		$2,981
Hell Hole Vista	$23,855		$477
Hell Hole General Parking Area and Hell Hole Boat Ramp Parking Area	$52,450		$1,049
Hell Hole Boat Ramp Potable Water Supply Near Hell Hole Reservoir	$35,400		$708
Hell Hole Boat Ramp Extension	$225,000	$2,250	$6,750
Ahart Campground	$220,000		$4,400
French Meadows Campground	$750,000		$15,000
Lewis Campground	$80,000		$1,600
Poppy Campground	$110,000		$2,200
Coyote Group Campground	$200,000		$4,000
Gates Group Campground	$184,925		$3,699

Table 5-4. Alternative 1 – Cost of Environmental Programs, Measures, and Facilities for the Middle Fork American River Project (2010 Dollars).

Environmental Program, Measure, or Facility	Total Capital and One-time Costs (2010$)	Annual O&M Costs[1] (2010$)	Total Annualized Costs[2] (2010$)
RECREATION RESOURCES (continued)			
Implement Recreation Plan			
Specific Modifications and Enhancements at Existing Project Recreation Facilities			
French Meadows Picnic Area	$30,000		$600
French Meadows Boat Ramp Extension	$130,000	$5,200	$7,800
French Meadows RV Dump Station	$16,900		$338
McGuire Boat Ramp	$26,325		$527
Consolidation of Poppy Campground Trailhead and McGuire Boat Ramp Parking Areas	$150,000		$3,000
McGuire Picnic Area Conversion to Group Campground	$260,000		$5,200
Ralston Picnic Area	$24,895		$498
Indian Bar Rafting Access	$184,340		$3,687
French Meadows South Shore Water Supply (French Meadows Campground Water Supply)	$75,000		$1,500
French Meadows North Shore Water Supply (Dolly Creek Water Supply)	$75,000		$1,500
New Project Recreation Facilities			
Duncan Creek Diversion Primitive Recreation Site	$100,800		$2,016
Ralston Afterbay Sediment Removal Access Point Boat Ramp	$20,475	$1,500	$1,910
Ellicott Bridge Parking Area	$100,000		$2,000
Trail Improvements			
Hell Hole Reservoir Trail	$300,000		$6,000
Poppy Trail	$25,000		$500
French Meadows Reservoir Trail	$188,591		$3,772
Middle Fork American River Gage above Ralston Afterbay Access Trail	$20,050		$401
Duncan Creek Gage below Diversion Dam Access Trail	$19,010		$380
Middle Fork American River Access Trail below Middle Fork Interbay	$250,000		$5,000
Trail-related Enhancements (self-registration boxes)	$15,000	$3,000	$3,300
Other Costs			
Visitor Surveys and Vehicle Counts		$4,500	$4,500
Dissemination of Real-time Flow and Reservoir WSE Information		$20,500	$20,500
Recreation Opportunity Marketing (maps, brochures)		$8,500	$8,500
Fish Stocking		$59,000	$59,000
Annual Consultation and Reporting		$12,000	$12,000
6-year Reporting		$4,800	$4,800
Recreation Use Monitoring and Reporting		$27,120	$27,120
Subtotal	$4,143,936	$463,370	$546,249
Implement Visual Resource Management Plan			
Landscape Rehabilitation Plan		$1,700	$1,700
Painting		$900	$900
Periodic Visual Condition Assessment		$2,400	$2,400
Annual Coordination Meeting		$4,500	$4,500
Subtotal	$0	$9,500	$9,500

Table 5-4. Alternative 1 – Cost of Environmental Programs, Measures, and Facilities for the Middle Fork American River Project (2010 Dollars).

Environmental Program, Measure, or Facility	Total Capital and One-time Costs (2010$)	Annual O&M Costs[1] (2010$)	Total Annualized Costs[2] (2010$)
LAND MANAGEMENT			
Implement Transportation System Management Plan			
Annual and Periodic Maintenance of Project Roads, Project Recreation Facility Access Roads, and Project Trails	$2,100,000	$50,000	$92,000
Periodic Condition Assessment		$15,000	$15,000
Consultation and Reporting		$12,000	$12,000
Subtotal	$2,100,000	$77,000	$119,000
Implement Fire Suppression and Prevention Plan			
Annual Activities		$6,000	$6,000
Update of the Fire Plan		$3,000	$3,000
Subtotal	$0	$9,000	$9,000
CULTURAL RESOURCES			
Implement Historic Properties Management Plan			
Employee Education		$6,800	$6,800
Public Education		$6,150	$6,150
Avoidance of NRHP-eligible Sites (consultation and buffers)		$6,000	$6,000
Monitoring During Heavy Maintenance of Project Recreation Facilities		$3,600	$3,600
Cultural Resources Site Condition Monitoring		$6,100	$6,100
Additional Cultural Resource Survey		$730	$730
Annual Consultation and Reporting		$12,500	$12,500
Subtotal	$0	$41,880	$41,880
TOTAL	**$8,997,436**	**$1,663,461**	**$1,843,410**

[1]Operation and maintenance costs annualized over the term of the new license (50 years).

[2]Total one-time capital costs plus total operation and maintenance costs annualized over the term of the new license (50 years).

[3]Capital costs associated with infrastructure modifications necessary to implement new instream flow measures (i.e., outlet works modifications).

[4]Capital costs associated with infrastructure modifications necessary to implement Streamflow and Reservoir Elevation Gaging Plan (i.e., installation of four new gages).

Table 5-5. Comparison of Annual Project Benefits and Costs for the No-Action Alternative and Alternative 1.

Item	No-Action Alternative (2010$)	Alternative 1 (2010$)
Dependable Operating Capacity (MW)	224	224
Average Annual Energy Production (MWh)[1]	1,039,078	985,877
Annual Energy Production Benefit ($)	$39,484,964	$37,463,334
Annual Capacity Benefit ($)	$8,064,000	$8,064,000
Gross Annual Benefit ($)	$47,548,964	$45,527,334
Annual Cost ($)	$25,985,000	$28,359,610
Net Annual Benefit ($)	$21,563,964	$17,167,724
Change in Net Annual Benefit from No-Action Alternative ($)[2]		$4,396,240
Reduction in Annual Energy Production (MWh)[3]		53,201
Percent Reduction of Annual Energy Production (%)[4]		5.12%

[1]Generation from French Meadows, Middle Fork, Ralston, and Oxbow powerhouses is averaged over a 40-year period of record (1967–2006). Hell Hole Powerhouse began operation in 1983; therefore, annual net generation is averaged over a 24-year period of record (1983–2006). The average annual energy production under the No-Action Alternative represents the sum of the average net generation for the five Project powerhouses based on their respective period of record. The average annual energy for Alternative 1 reflects the reduced generation that would have occurred if the new measures were in effect.

[2]The change in net annual energy benefits is calculated by subtracting the net annual benefit under Alternative 1 from the net annual benefit under the No-Action Alternative.

[3]The reduction in annual energy is calculated by subtracting the average annual energy production under Alternative 1 from the average annual energy production under the No-Action Alternative.

[4]The percent reduction of annual energy is calculated by dividing the reduction in annual energy produced under Alternative 1 by the average annual energy produced under the No-Action Alternative.