

TYEE LAKE HYDROELECTRIC PROJECT

FERC No. 3015

EXHIBIT D

STATEMENT OF COSTS AND FINANCING

**TYEE LAKE HYDROELECTRIC PROJECT
(FERC No. 3015)**

**APPLICATION FOR LICENSE AMENDMENT
FOR MAJOR PROJECT – EXISTING DAM**

**EXHIBIT D
STATEMENT OF COSTS AND FINANCING**

TABLE OF CONTENTS

| | | |
|------|--|---|
| 1.0 | ESTIMATED COST OF NEW DEVELOPMENT | 1 |
| 1.1 | Land and Water Rights | 1 |
| 1.2 | Cost of New Facilities | 1 |
| 2.0 | ORIGINAL COST OF EXISTING UNLICENSED FACILITIES..... | 3 |
| 3.0 | ESTIMATED AMOUNT PAYABLE UPON TAKEOVER PURSUANT TO SECTION 14 OF THE FEDERAL POWER ACT..... | 3 |
| 4.0 | ESTIMATED AVERAGE ANNUAL COST OF THE PROJECT | 3 |
| 4.1 | Capital Costs..... | 3 |
| 4.2 | Taxes..... | 3 |
| 4.3 | Depreciation and Amortization | 3 |
| 4.4 | Operation and Maintenance Expenses | 3 |
| 4.5 | Costs of Proposed Environmental Measures..... | 3 |
| 5.0 | ESTIMATED ANNUAL VALUE OF PROJECT POWER | 4 |
| 6.0 | ENERGY SOURCE ALTERNATIVES..... | 5 |
| 7.0 | CONSEQUENCES OF DENIAL OF THE APPLICATION | 6 |
| 8.0 | SOURCES AND EXTENT OF FINANCING | 6 |
| 9.0 | COST OF DEVELOPMENT OF AMENDMENT APPLICATION..... | 6 |
| 10.0 | ON-PEAK AND OFF-PEAK VALUE OF PROJECT POWER | 6 |
| 11.0 | REFERENCES | 7 |

1.0 ESTIMATED COST OF NEW DEVELOPMENT

1.1 Land and Water Rights

The Tyee Lake Hydroelectric Project (Tyee Lake Project or Project) was licensed, designed, and constructed with provisions for a third turbine; no ground-disturbing activities are proposed. There are no costs associated with land purchase or fees for the proposed development. The Tyee Lake Project occupies 1,174 acres of federal lands administered by the U.S. Forest Service within the Tongass National Forest (transmission only), and 1,418 acres of Federal Power Act section 24 lands (256 acres transmission and 1,162 acres non-transmission). The proposed development would occur on state land within the project boundary.

There are no costs associated with water rights for the proposed development. The Southeast Alaska Power Agency (SEAPA) has two permits from the Alaska Department of Natural Resources (ADL100887 and LAS 27045) for a total use of 135,000 acre-feet (ac-ft) of Tyee Lake water annually for purposes of hydroelectric power generation and a maximum flow of 254 cfs. Operation of the third unit would occur within SEAPA's existing permitted water rights.

1.2 Cost of New Facilities

The cost of the new development work is:

Tyee Lake Hydroelectric Project FERC Project No. 3015
Statement of Costs and Financing – Exhibit D

| Item or Task | Totals |
|--|---------------------|
| 30% Design Station Service (SS) and 15 kilovolt (kV) Switchgear (SWGR) | \$96,817 |
| 90% Design SS and 15 kV SWGR | \$99,131 |
| 100% Design SS and 15 kV SWGR | \$69,183 |
| 30% Design Turbine/Gen | \$165,000 |
| 90% Design Turbine/Gen | \$170,000 |
| 100% Design Turbine/Gen | \$65,575 |
| 480V Switchgear Install | \$2,382,228 |
| 15kV Switchgear | \$1,020,954 |
| Unit 3 Transformer/Structure | \$2,500,000 |
| Powerhouse Structural and Second Stage Concrete | \$975,000 |
| Piping (all mechanical piping) | \$877,500 |
| Turbine Shut-off Valve | \$1,100,000 |
| Turbine-rotating Parts and Bearings and Shaft | \$2,100,000 |
| Turbine-nozzle Piping | \$256,000 |
| 15kV Generator | \$5,000,000 |
| Ancillary equipment (external filters, high lift pump etc.) | \$400,000 |
| Governor | \$750,000 |
| Excitor | \$800,000 |
| Controls, Protective Relays, Misc. Wiring | \$635,000 |
| Buss Work Switch Gear and Unit Breaker | \$418,000 |
| Turbine Bypass Valve and Air | \$900,000 |
| Licensing, Engineering, Legal, and Administrative | \$1,673,904 |
| Total | \$22,454,292 |

Note: SS – Substation, SWGR – Switchgear

2.0 ORIGINAL COST OF EXISTING UNLICENSED FACILITIES

This section is not applicable.

3.0 ESTIMATED AMOUNT PAYABLE UPON TAKEOVER PURSUANT TO SECTION 14 OF THE FEDERAL POWER ACT

This section is not applicable.

4.0 ESTIMATED AVERAGE ANNUAL COST OF THE PROJECT

4.1 Capital Costs

No borrowing debt.

4.2 Taxes

SEAPA is a Joint Action Agency under the laws of the state of Alaska, and is not subject to local, state, and federal taxes.

4.3 Depreciation and Amortization

SEAPA is tax-exempt, and therefore, this section is not applicable.

4.4 Operation and Maintenance Expenses

SEAPA's budget for operation and maintenance of the Tyee Lake Project with two turbines averages \$1,274,758 annually. The total annual cost is anticipated to increase by about \$350,000 for the operation and maintenance of the proposed third unit.

4.5 Costs of Proposed Environmental Measures

The Tyee Lake Project was designed and constructed originally with provisions for a third turbine and the effects of installation and operation are expected to be *de minimis*. Installation of the proposed development would not require any new ground-disturbing activities, and the recreational opportunities and aesthetic appearance of the facility would not be affected. Installation of the third turbine unit and appurtenant equipment is not expected to result in any additional costs associated with environmental measures during construction. Best Management Practices (BMPs) associated with the installation of the third unit (e.g., contractor use of facilities and vehicles, waste disposal, spill

prevention and control plans, erosion and sediment control measures) are included within the capital costs noted in Section 4.1.

SEAPA agreed to require in its construction contract(s) the National Marine Fisheries Service (NMFS) recommended mitigation measures for protection of the ESA-listed Mexico Distinct Population Segment of the Humpback Whale. These measures would have negligible costs to the Licensee since many of the measures are standard practices during vessel operation. Following the completion of construction of the third unit, these mitigation measures would no longer be necessary.

Following consultation with the agencies, SEAPA agreed to implement two monitoring plans recommended by the United States Fish and Wildlife Service (USFWS) and NMFS to protect environmental resources. The USFWS recommended a Tailrace Scour and Deposition Monitoring Plan (Tailrace Monitoring Plan) to monitor potential changes in bed scour and downstream deposition of fines in the tailrace that may result from operating all three turbines at higher rates than current operations of the two existing turbines. The Tailrace Monitoring Plan would begin before operation of the third unit to gather baseline data and after operation of the third turbine to evaluate changes to the tailrace bed and substrate composition. Monitoring would be time limited once enough data is collected to validate assumptions. The estimated capital cost of the Tailrace Monitoring Plan would be approximately \$150,000.

NMFS recommended a Hidden Creek Flow Monitoring Plan (Flow Monitoring Plan) to ensure Hidden Creek received enough flow to maintain Essential Fish Habitat (EFH) in the lowermost approximately 460 feet of Hidden Creek. The Flow Monitoring Plan would begin following the operation of the third unit and would continue until adequate data is collected to confirm year-round flows are maintained in Hidden Creek. The estimated capital cost of this Flow Monitoring Plan would be approximately \$150,000.

These estimates are preliminary and are dependent on the outcome of consultation with the agencies. Further details on the BMPs and the mitigation and monitoring plans are discussed in detail in Section 2.2.2 of the Preliminary Draft Environmental Assessment.

5.0 ESTIMATED ANNUAL VALUE OF PROJECT POWER

Over the last 5 years (2019-2023), the Tyee Lake Project has generated an average of approximately 100,000 megawatt hours (MWh) of energy annually. Based on United State Energy Information Administration (USEIA 2024), in 2022, the average number of kilowatt hours (kWh) generated from diesel generation liquid was 12.90 kWh per gallon or 0.08 gallons per kWh. The exact amount per specific generator or power plant can vary

considerably (USEIA 2024). The average annual cost of equivalent diesel generation, assuming 0.08 gallons per kWh and \$4.70/gallon in Wrangell and Petersburg, would be \$37,600,000.

SEAPA would continue to coordinate the operations of the Tyee Lake Project with its Swan Lake Hydroelectric Project to maximize generation from available water resources and optimize efficiency. The amount of annual power produced by the third unit would vary greatly from year to year, depending on Swan Lake generation, the amount of water available, water elevations at Tyee Lake, and demand. Operation of the third unit would allow power to be generated from inflow that would have otherwise spilled during high runoff periods when Tyee Lake was full and only two units were operating. Spill typically occurs in response to precipitation events, the frequency and intensity of which are influenced by the El Nino Southern Oscillation and the Pacific Decadal Oscillation, as is the air temperature and demand for power. Spill does not occur during low water years and may or may not occur during average water years. In addition to natural variability in water availability and amount of spill, project operations are constrained by the allowable Tyee Lake draft limit and SEAPA's existing water rights. Over the past 5 years (2019-2023), the amount of power that could have been produced from spill without any limitations, ranged from 2 MWh to approximately 67,000 MWh annually and averaged approximately 30,000 MWh. Assuming operation of the third unit produced 30,000 MWh of additional power annually, and 0.08 gallons of diesel per kWh at a cost of \$4.70/gallon, the average annual cost of equivalent diesel generation of the additional power generated by the third unit would be \$11,280,000.

In addition to the value of the energy produced, the third unit would provide hydro generating redundancy and operational flexibility. Maintenance could be done on a unit while still meeting energy demands. During the summer shutdown, all operating units are taken off-line to perform routine maintenance. Minimizing the length of time of this shutdown directly correlates to a reduction in diesel generation.

6.0 ENERGY SOURCE ALTERNATIVES

Load that is not met by hydropower generation is provided by diesel generators. Diesel is expected to be the primary alternative source of energy in the near future.

7.0 CONSEQUENCES OF DENIAL OF THE APPLICATION

A denial of the amendment application would result in increased diesel generation by the SEAPA member communities (i.e., the municipalities of Petersburg, Wrangell, and Ketchikan), increasing cost to customers. Unstable diesel fuel prices vary, creating unstable electric rates that hinder economic development. In addition, diesel generation emits nitric oxide and particulate matter negatively affecting air quality in the vicinity of the diesel powerhouses and human health. Carbon discharges would also increase because of increased diesel consumption.

8.0 SOURCES AND EXTENT OF FINANCING

Anticipated Project Funding:

- \$4M, state of Alaska, Alaska Energy Authority Round 16 Renewable Energy Grant;
- \$5M, Department of Energy Section 247 Grant (In negotiation phase with Grid Deployment Office; Wiseman 2024);
- \$5M, state of Alaska Legislative Grant Match;
- \$2.5M Inflation Reduction Act tax incentives program (\$2-3M);
- \$6M, existing SEAPA reserves.

9.0 COST OF DEVELOPMENT OF AMENDMENT APPLICATION

SEAPA anticipates spending \$1.2M on tasks related to preparing the amendment application, inclusive of engineering design.

10.0 ON-PEAK AND OFF-PEAK VALUE OF PROJECT POWER

There is no on-peak versus off-peak price differential for Tyee Lake Project power.

11.0 REFERENCES

United State Energy Information Administration. 2024. How much coal, natural gas, or petroleum is used to generate a kilowatt hour of electricity? Available Online: Frequently Asked Questions (FAQs) - U.S. Energy Information Administration (EIA). Access Date: September 19, 2024.

Wiseman, Shana. 2024. "Negotiation for Maintaining and Enhancing Hydroelectricity Incentive Section 247 of EPO Act 2005 (DE-FOA-0003088)." September 5, 2024.