APPLICATION FOR FINAL LICENSE

SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC NO. P-13563

VOLUME 6 OF 8

FINAL LICENSE APPLICATION

PDEA Appendices Z Preliminary Plans

Juneau Hydropower Inc.

MAY 2014

SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

APPENDIX Z

JHI PRELIMINARY PLANS

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

Appendix Z JHI – Preliminary Plans

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sediment Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

Solid Waste and Wastewater Plan (SWWP)

Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)
B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)
B. Stream Flow Management Plan (SFMP)
C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

ACCESS MANAGEMENT PLAN (AMP)

PREPARED BY:

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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

ACCESS MANAGEMENT PLAN (AMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: c) Access and Road Management and Maintenance Plan. JHI concurs that an access plan is a necessary plan and is submitting this preliminary Access Management Plan (AMP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and

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communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies, and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

2.1. Appendix Z – JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

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Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)

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B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

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A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 ACCESS MANAGEMENT PLAN (AMP) INTRODUCTION

3.1. Background

This Access Management Plan (AMP) provides Juneau Hydropower, Inc.'s (JHI's) procedures to control access to the Sweetheart Lake Hydroelectric Project facilities during construction and post-construction operations. The Project uplands (above mean high water [MHW]) are administered by the U.S. Forest Service (Forest Service), Tongass National Forest. The tidelands and submerged lands (below MHW) are State of Alaska lands administered by the Alaska Department of Natural Resources (Alaska DNR).

JHI has applied for a license (FERC No. P-13563) to operate a hydroelectric generating facility on these public lands under the authority of the Federal Energy Regulatory Commission (FERC). With this right comes the obligation to both allow public access and encourage recreation and the responsibility to protect the safety of the public and the generating and transmission facilities. The authority to regulate access comes from FERC and the landowners: the Forest Service and the Alaska DNR.

4.0 CURRENT PROJECT AREA USE

The proposed facility is isolated from any road system and is accessible only by aircraft (floatplanes and helicopters) or boats, and there are no residences or other occupied inholdings in the Project boundary. The closest population area and the distribution area for the generated power is the City of Juneau, 34 miles northwest of Sweetheart Lake (the Project is in the City & Borough of Juneau).

There is no scheduled transportation service to the area, and all transportation is by personal craft or chartered service. There are commercial fishing boats that fish the

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waters of Gilbert Bay and Port Snettisham for crab, shrimp, groundfish, and salmon at certain times during the year. There is a personal-use sockeye salmon fishery that is used by Alaskan residents by permit in July through August with up to 360 participants annually. There are a few licensed Alaska guides that hunt Gilbert Bay for bear. The dam site on Sweetheart Lake has no documented public visits, recreation, or commercial usage.

5.0 PROPOSED FACILITIES

The JHI Sweetheart Lake proposed hydroelectric Project facilities include the Sweetheart Lake reservoir, dam, inlet and control works; fish collection and transport systems; tunnel, powerhouse; tailrace; switchyards; transmission lines; control systems; access road/trail; caretaker facilities; and boat and seaplane floats.

5.1. Unrestricted Areas

Public access is to be unrestricted to areas that do not pose a risk to the public or the facilities. Facilities shall be marked such that users know to avoid danger to themselves or to the facilities. Facilities that are dangerous to enter will be marked and secured from access. Facilities that are open to the public will be maintained safe and serviceable.

All Project facilities accessible to the public will be maintained to safe and serviceable standards. Please reference the Recreation Management Plan (also in Appendix Z of the PDEA) for additional details.

In the event there are compliance issues with the public, JHI will request assistance from the Forest Service or the Alaska State Troopers.

5.2. Restricted Areas

Public access to Forest Service lands through Project facilities will be restricted to nonmotorized and noncommercial users to mitigate Project impacts to lands and wildlife. On Gilbert Bay, the dock will only be made available for public access for the limited permit holders of the personal-use sockeye fishery during the season. The short (4,400-foot) access road/trail will only be available for foot traffic and gated for all other public use. The powerhouse and switchyard will be gated and securely fenced, the transmission lines will be marked, and the Snettisham intertie switchyard fenced. There will be on-site caretakers to monitor the facilities near the dock. The dam site facilities on Sweetheart Lake will be signed to note dangers and that entry is prohibited to all facilities. Electronic monitoring will be installed at all major facilities.

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During construction, all active construction sites will have restricted access for safety reasons. They will be marked and access blocked as appropriate for the location.

6.0 DOCUMENTATION

A report will be filed annually with the Forest Service by January 15 to document the condition and effectiveness of all measures.

7.0 COMPLIANCE

For the construction period, compliance will be documented and enforced by the Environmental Compliance Manager. Upon the start of commercial operations, compliance will be the responsibility of JHI management.

8.0 AGENCY COMMENTS

Comments will be shown by date

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

AQUATIC HABITAT RESTORATION AND MONITORING PLAN (AHRMP) & FISH MITIGATION & MONITORING PLAN (FMMP)

PREPARED BY:

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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

AQUATIC HABITAT RESTORATION AND MONITORING PLAN (AHRMP) & FISH MITIGATION & MONITORING PLAN (FMMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: Aquatic Habitat Restoration and Monitoring Plan (AHRMP). JHI concurs that this is a necessary plan and is submitting this preliminary AHRMP Plan with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line

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extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

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3.0 AQUATIC HABITAT RESTORATION AND MONITORING PLAN (AHRMP)

This Aquatic Habitat Restoration and Monitoring Plan (AHRMP) establishes the standards and guidelines for the minimization of impacts to the aquatic habitat within the Project area.

This AHRMP has been prepared for the Sweetheart Lake Hydroelectric Project, FERC No. P-13563. This plan describes the steps JHI will take to meet the requirements of the Forest Service license conditions. It establishes the goals and objectives for aquatic habitat restoration, management, monitoring, and the guidelines for the consultation that will occur over the term of the license. This plan was prepared collaboratively by JHI and the Alaska Department of Fish and Game (Alaska DFG).

This plan includes:

- Review of the license article to ensure that the plan meets the requirements of the article.
- Statements of the purpose, goals, and objectives of the plan.
- Any regulatory references and definitions to maintain consistency between the plan and other pertinent laws, regulations, and policies.
- Plan measures describing the site-specific and species-specific criteria and actions that will be taken under this plan.
- Reporting mechanisms related to proposed measures for this plan including implementation of the Terms and Conditions of the Forest Service and the Alaska DFG.

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3.1. Sweetheart Creek Anadromous Reach Proposed Measures

JHI will perform an assessment of the relative presence of spawning gravel available for fish. At the end of the third year of commercial operations, changes in spawning habitat will be assessed. If it is determined that there is a net reduction in the area of available spawning habitat, a prescriptive plan will be prepared in cooperation with Alaska DFG to take measures to provide a similar level of spawning habitat to baseline conditions. Actions are anticipated to include:

- Identification of zones with hydrology suitable for spawning.

- Augmentation with gravel suitable for spawning. The locations, volumes, and size of substrate to be injected into the anadromous reach (Reach 1) will be developed in cooperation with Alaska DFG using assessment findings to inform the proposed prescriptions. The location where gravel could feasibly be injected will be partially based on equipment access considerations. A tentative injection location is shown on Figure 2 of Appendix W and would require temporary chutes to deliver gravel to the stream.

  A template for the gravel augmentation program is recommended as follows:

- For the first 5 years after the Commercial Operations Date (COD), spawning habitat assessment and reporting will occur by JHI in the spring. Alaska DFG may have one or more representatives present at its own expense during the JHI annual gravel assessment.

- Within 30 days of the annual assessment, JHI will provide to Alaska DFG a two- to three-page report documenting assessment results.

- In the third year after COD, JHI and Alaska DFG will meet to review the assessments and determine whether there has been a reduction in the area of suitable spawning habitat, and whether a gravel augmentation event is to be prescribed based on the year 3 review. Note: based on the periodicity of salmon species, mid-May through June appears to be the least obtrusive time to implement a gravel augmentation event. These tentative dates are suggested to comply with Alaska DFG Preliminary Recommendation #10, Timing of Instream Activities. Timing windows for instream construction activities and stream crossings shall be established by the Alaska DFG Habitat Biologist assigned to the Project. Timing windows will be conditioned in the Alaska DFG-issued Title 16 permit. The suggested timing windows are intended to ensure that instream activities do not adversely impact aquatic resources.

- Upon the sixth and every successive fifth-year anniversary of COD, JHI and Alaska DFG will meet to analyze the spawning habitat assessment and

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prescriptive gravel augmentation program and determine the necessity of continuing these actions for the next 5 years.

4.0 FISH MITIGATION AND MONITORING PLAN (FMMP)

The purpose of this Fish Mitigation and Monitoring Plan (FMMP) is to describe proposed measures to mitigate possible Project-related effects to fish in the waterways in the Project areas and to describe the monitoring of the relative presence of fish and agency reporting mechanisms.

This FMMP has been prepared as part of the AHRMP for the Sweetheart Lake Hydroelectric Project, FERC No. P-13563. This plan describes the steps JHI will take to meet the requirements of the Forest Service license conditions. It establishes the goals and objectives for aquatic habitat restoration, management, monitoring, and the guidelines for the consultation that will occur over the term of the license. This plan was prepared collaboratively by JHI and the Alaska DFG.

This plan includes:

- Review of the license article to ensure that the plan meets the requirements of the article.
- Statements of the purpose, goals, and objectives of the plan.
- Any regulatory references and definitions to maintain consistency between the plan and other pertinent laws, regulations, and policies.
- Plan measures describing the site-specific and species-specific criteria and actions that will be taken under this plan.
- Reporting mechanisms related to proposed measures for this plan including implementation of the Terms and Conditions of the Forest Service and the Alaska DFG.

4.1. Regulatory Considerations

Forest Service – This FMMP is part of Forest Service License Article 22 requiring the creation of Resource Management Plans, including an FMMP.

Alaska DFG – From DFG Article 9: The Alaska DFG asked for the creation of a biotic plan:

The plan shall address monitoring salmon escapement and spawning in the anadromous reach of Sweetheart Creek, and monitoring Dolly Varden and

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rainbow trout spawning and recruitment in Sweetheart Lake and its inlet streams. The plan shall include defined sampling protocols, schedules, and effort, as well as evaluation metrics.

Monitoring shall continue for 5 years, or less if ADF&G and other requesting agencies determine that project operations have not been shown to adversely impact aquatic resources.

Rationale: *Post-licensing monitoring of fisheries resources is needed to ensure that the regulated instream flow regime is sufficient to support salmon use of habitat in the anadromous reach of Sweetheart Creek, and that Dolly Varden and rainbow trout are successfully spawning and recruiting in Sweetheart Lake and its inlet streams post-project.*

4.2. General Geography of the Sweetheart Creek Basin

The Sweetheart Creek basin is approximately 36.3 square miles and can be divided into three distinct units: the upper watershed, including the high peaks and ridges of the basin that flow into Sweetheart Lake; Sweetheart Lake and Sweetheart Creek; and the anadromous reach of Sweetheart Creek and Gilbert Bay.

Upper Watershed – The upper watershed consists of high peaks and ridges ranging in elevation from 2,500 to 4,500 feet, many containing glaciers and ice fields that drain down steep canyon walls and avalanche chutes into Upper Sweetheart Lake and tributaries that flow into Sweetheart Lake. The tributaries to the upper lake are relatively short, consisting of either steep cascades or, in many cases, avalanche chutes. The main stream that drains into the upper lake is at the lake's head and is >7,500 feet in length.

Sweetheart Lake and Sweetheart Creek – Sweetheart Lake is a narrow, glacial-formed basin. The lake is approximately 5.4 miles long (8.6 km) and 0.6 mile wide (0.9 km). The lake consists of three basins: 1) Upstream Basin, which is 1 mile long and has a maximum depth of 131 feet (40 m); 2) Large Middle Basin, which is 3.5 miles long (6 km) with mostly steep sides and a maximum depth of 509 feet (155 m); 3) Small Lower Basin, which is 0.5 mile long (0.9 km) and has a maximum depth of 72 feet (22 m). The total surface area of the lake is 1.9 square miles (1,223 acres) with a drainage area of 35 square miles (22,674 acres) (Forest Service, 1979; Koenings et al., 1987).

Steep, cascading tributaries and avalanche chutes form small alluvial fans or cones supporting wetland habitats along the lake's shoreline. Due to the steep terrain and glacial scouring, there is very little developed soil. The canyon walls surrounding the lake are covered with spruce-hemlock forest. The watershed provides habitat for a variety of wildlife species; however, fish habitat is limited due to the steepness of the streams.

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Access to the lake is limited to floatplane or helicopter, and visitors to the area are the rare guided angler or hunter. Sweetheart Lake is used as a nursery area for sockeye salmon. Approximately 500,000 sockeye fry raised at the Douglas Island Pink and Chum, Inc. (DIPAC) Snettisham hatchery are air-transported into the lake annually by DIPAC, where they grow and then migrate to Gilbert Bay by way of Sweetheart Creek. Sweetheart Lake drains into Sweetheart Creek at the southwest end of the lake.

Sweetheart Creek Bypass Reach – The outlet from the Lower Sweetheart Lake, Sweetheart Creek, has a 544-foot (166-m) vertical fall over a 2-mile (3.5-km) horizontal course that passes through a narrow v-shaped canyon with 1,000- to 2,000-foot (300 to 600-m) sidewalls before discharging into Gilbert Bay. The narrowest section is about 300 feet downstream from the outlet, where the width of the creek is less than 40 feet. Sweetheart Creek has a mean annual flow of 336 cubic feet per second (cfs) at the lake outlet. The bypass reach flow is swift and highly turbulent throughout its entire course until it reaches tidewater. Several cascades and falls block upstream migration of fish, as well as threaten the survival of fish descending the creek (Reaches 2 and 3).

The anadromous reach of the creek is approximately 1,500 feet long that terminates at barrier falls at its upstream limit. These falls are the first of many such barrier falls up to the lake (Reach 1).

The steepest part of the falls of Sweetheart Creek resides between the 200- and 400-foot elevation (MLLW). The falls create a barrier to anadromous fish spawning migration. Figure 1 provides an aerial photograph of Sweetheart Creek with the barrier falls and reaches identified.

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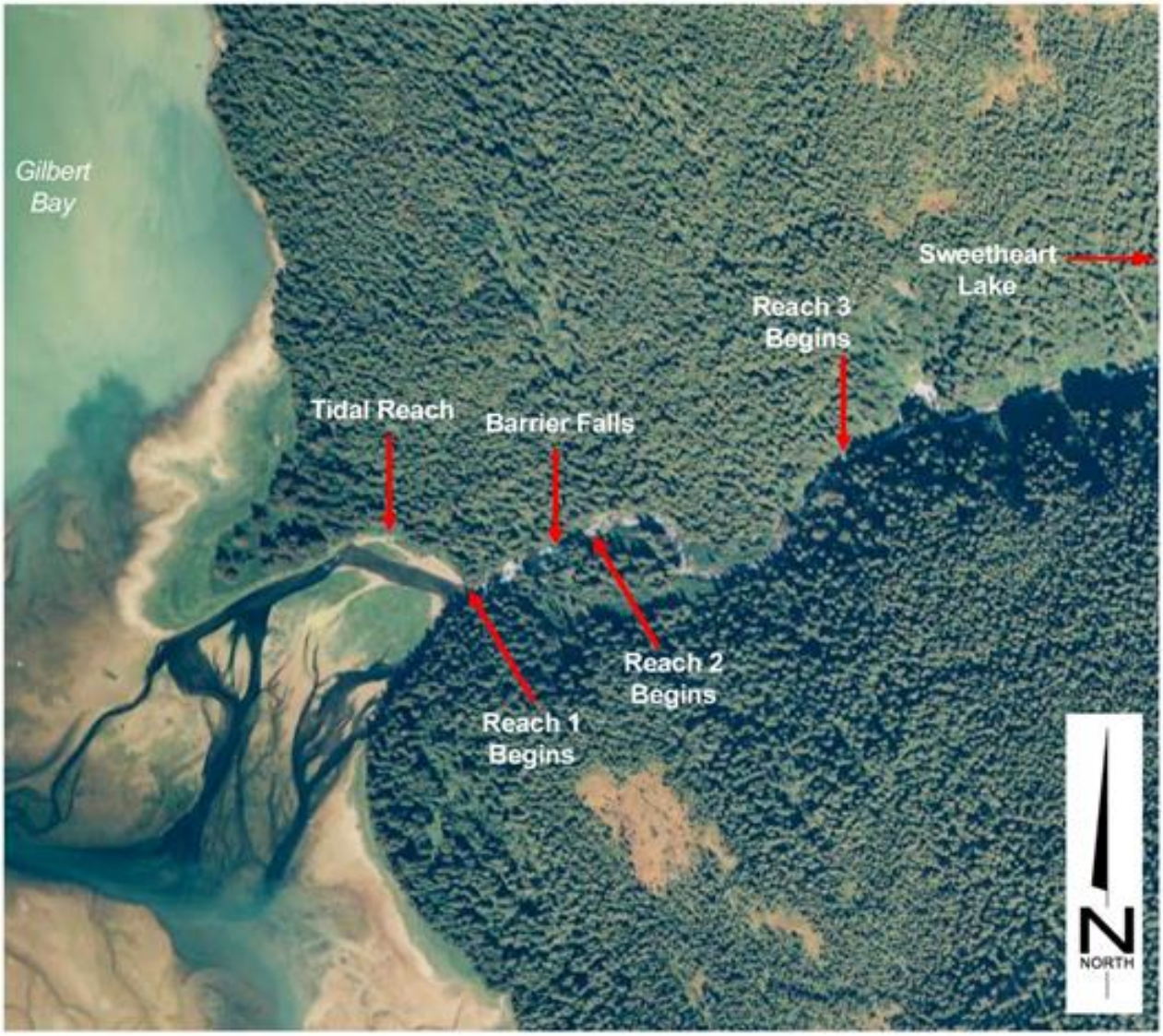
Figure 1 Sweetheart Creek Features



Sweetheart Creek Below the Anadromous Barrier – Sweetheart Creek consists of two stream segments, which are separated by an anadromous barrier. From the stream's mouth runs an intertidal reach classified as Large Estuarine Channel (LEC)). The intertidal reach has an average channel width of 131 feet (40 m) with low gradient (<1%), incision depth <6.6 feet (<2 m) and therefore fits the LEC category. The reach extends from the bay 984 feet (300 m) to the macro pool below the first waterfall and consists predominantly of low-gradient, shallow riffle habitat with 3- to 6-inch gravel.

Between the intertidal reach and the first anadromous barrier falls is a 459-foot-long (140 m) reach. This reach begins at the macro pool below the first waterfall and continues through two more macro pools separated by cascades and waterfalls up to the anadromous barrier falls.

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Gilbert Bay – Gilbert Bay extends from the mouth of Sweetheart Creek on the eastern side of Gilbert Bay to Port Snettisham and Whiting River confluence. Port Snettisham enters Stephens Passage from the east. Gilbert Bay, according to navigation charts, reaches a maximum depth of about 450 feet (NOAA, 2009).

4.3. Fish populations proposed measures

4.3.1. Sweetheart Lake

JHI will perform an assessment of the relative presence of both rainbow trout and Dolly Varden char after 3 years of commercial operation. Thereafter, JHI will perform an assessment at least once every 5 years. This assessment and the subsequent reports will be developed in conjunction with Alaska DFG. Should results indicate no significant effect, then the assessments will be discontinued. Should the results indicate a significant negative effect, then measures may be proposed in consultation with Alaska DFG.

4.4. Reporting

JHI will prepare an initial report and thereafter a quinquennial report that summarizes activities taken under this plan, including Alaska DFG consultation, conservation measures, and implementation of the terms and conditions carried out the previous period. The quinquennial report on the implementation of the FMMP will provide a comprehensive framework for Alaska DFG consultation and will serve as a tracking system regarding the implementation of the measures, if developed.

4.4.1. Reporting Schedule

JHI will provide a draft FMMP report to the Alaska DFG for a 30-day review by March 31 of the year following the reporting period. Revised annual reports, incorporating Alaska DFG comments, will be submitted to the FERC by May 1 of that year.

4.4.2. Reporting Format

The report will include:

- A summary of Alaska DFG consultation.
- A summary of activities conducted in response to Alaska DFG consultation.
- A summary of any issues and concerns raised by JHI or Alaska DFG and how they were addressed.
- Any proposed modifications to the plan.

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5.0 AGENCY COMMENTS

Comments will be shown by date.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

BEAR SAFETY PLAN (BSAFE)

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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

BEAR SAFETY PLAN (BSAFE)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The Alaska Department of Fish and Game (Alaska DFG) reviewed these documents and issued comments and recommended preliminary terms and conditions. Article 13 of their recommended terms and conditions is for a Bear Safety Plan. The Alaska DFG is responsible for the management, protection, maintenance of Alaska's fish and game resources, including bears. The Project areas are all in Alaska game management Unit 1C. JHI concurs that this is a necessary plan and is submitting this plan for comment.

JHI has had numerous conversations with the Alaska DFG and the U.S. Forest Service (Forest Service) regarding bears and this Project. The area has an active bear population, especially during salmon spawning season (July-September). JHI has cooperated and assisted Alaska DFG in a bear sampling and genetic testing plan in 2013. JHI has consulted with the Forest Service on bear issues regarding the recreational trails accessing the Sweetheart Creek sockeye fishery. JHI has also reviewed other approved local area Bear Safety Plans (Hecla Greens Creek Mine, Allison Creek, and Blue Lake) to develop this specific plan.

1.1. Project Description

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-

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foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

1.2. Appendix Z – JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

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C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

2.0 BEAR SAFETY PLAN (BSAFE) INTRODUCTION

This Bear Safety Plan (BSAFE) provides Juneau Hydropower, Inc. (JHI) with procedures to construct and operate the Sweetheart Lake hydroelectric facility in a location frequented by both brown and black bears, safely. This plan:

- Outlines JHI's goals for operating the facility with minimum disruption to bear habitat and health.
- Provides a design for construction and operations that minimizes damage and risk from bear encounters.
- Provides information and education for employees, contractors, and visitors in methods to protect themselves, the facilities, and the bears from dangerous and harmful interactions.
- Outlines procedures for JHI management to plan, implement, and enforce a safe environment for construction and operations.

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- Requires implementation of this plan in coordination with the Forest Service and the Alaska DFG.

- Provides procedures for documenting and reporting all incidents of damage to property, injury, or death of persons or bears.

This plan implementation and enforcement will be documented by the Environment Compliance Monitor (ECM) during construction and by JHI management upon the start of operations.

JHI is committed to building the Sweetheart Lake hydroelectric facility safely and with minimum disruption to the existing ecosystem. Bears are a large presence in the Lower Sweetheart Creek ecosystem, especially during the salmon spawning season (July-September). The area in the vicinity of the powerhouse and tailrace is heavily populated at the peak spawning season. Bears may be around at any season.

The design team has committed to supporting the strong runs of both native and introduced fish at the site. These represent a popular subsistence fishery for Alaskan residents and a large source of food for the bears. The powerhouse and tailrace have been located to return the water to Lower Sweetheart Creek at the base of the barrier falls in order to protect the spawning and rearing habitat. This facility will be located in an excavated area behind a large berm to shield it from view and reduce impact on the fishing areas. The building will be constructed of durable materials to reduce the chance of bear harm or damage to the structure. The power tunnel is underground and will not affect the bears' normal travel routes. The caretaker's facilities and dock area are located 4,400 feet north of the power plant and away from Sweetheart Creek. The coastal road/trail will minimize disruption to the bears' normal and customary travel routes and provide alternate access to boaters accessing the site to fish. The Sweetheart Lake dam site does not have the same intensity of bear activity and is not in a heavy travel route, but bears will be present.

The Gilbert Bay construction temporary facilities are designed to locate the offices, quarters, dining facilities, repair facilities, and storage away from the bears' most heavily frequented areas, more than 4,400 feet north of the creek on the coastal road/trail in Temporary Staging Area #1 (Exhibit F-2 [4]). The Sweetheart Lake camp is also located at the same site used for Project studies, 2,400 feet northeast of the existing lake outlet/dam site, and shown not to have heavy bear use, Temporary Staging Area "C" (Exhibit F-3 [1]).

This plan borrows many features of the nearby Hecla Greens Creek Mining Co. (Greens Creek) plan that has been implemented and run for many years inside the Admiralty Island National Monument, a place with a very dense brown bear population and a large workforce.

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3.0 INITIAL TRAINING SESSION

All JHI employees and contractors will be required to attend a training session prior to coming on site. The training will include education related to:

- bear behavior - methods to reduce risk in an encounter, methods to reduce risk of an encounter.
- operating practices when in bear country that minimize possible conflict
- minimizing encounters and avoiding areas often used by bears, if possible
- keeping construction sites and refuse areas clean
- Use of bear-proof garbage receptacles and other measures to prevent bears from obtaining food or garbage
- Removal of garbage to an approved disposal site as soon as practicable
- Rules, policies, and procedures required on site and documentation of the agreement to abide by the rules, policies, and procedures.

Agreement with the rules/procedures is a requirement of hire. The policies will include:

- No hunting, or trapping will be allowed by employees or contractors while living on site during construction.
- No personal firearms will be allowed on site.
- No bears (or other animals) shall be fed.
- Personnel are to avoid certain areas, particularly the south side of Sweetheart Creek, to allow bears an undisturbed area.
- Waste disposal and storage requirements must be followed to restrict bear access.
- Notification systems and warning systems to alert workers to bear activity inside a safe zone are to be integrated into construction communication systems.
- Policies to deal with bears in defined work safe zones will be discussed. They include work stoppage and, if necessary, hazing (by ECM officer or designee).
- Methods to deal with problem bears will be discussed.

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- Documentation methods to record incidents will be discussed.

The training and procedures will be approved by the Forest Service in consultation with Alaska DFG. Copies of plans and training will be in file in JHI's Juneau, Alaska, office. The ECM will document, report, and resolve issues in accordance with the adopted policies and, at least annually through construction, review them with the Forest Service and update the policies and procedures if required.

Additional information updates and information related to bears will be disseminated by:

- Informing workers about bear safety procedures at safety "tailboard" meetings
- Posting signs notifying the public that bears are frequent in the area, suggesting the use of designated pathways, and to be alert.

4.0 OPERATING PRACTICES IN BEAR COUNTRY TO MINIMIZE POSSIBLE CONFLICT

4.1. Bear Conflicts

The primary purpose of this plan is to prevent bear conflicts. Bear conflicts are defined as direct or indirect negative contact with bears caused by the presence of Project workers in the bears' places of usual habitation and use.

In most serious cases of bear conflict, it is the bear that eventually suffers. The policy of the Alaska DFG is to kill problem bears, not to relocate them. If a bear conflict results in the bear having to be killed, however, Alaska DFG will investigate the incident. In the majority of investigations, it has been found that the incident was caused by human factors. In such cases, relative to a Sweetheart Lake Project worker, the Alaska DFG would hold the worker responsible for the incident, potentially resulting in fines and charges.

By far the most prevalent cause of bear-human conflict is improper management of human food and waste. Bears learn from experience, and once they have been successful in obtaining human food, they become conditioned to it. In addition, bears that forage on human food may become habituated to the presence of humans. Once human-food conditioned and habituated to the presence of humans, these bears often end up being killed in defense of human life or property. When the bears do not seek to avoid or are not afraid of humans, there is a corresponding increase in the risk of injury to humans.

THEREFORE, THE CENTRAL THEME OF THIS PLAN IS AVOIDANCE OF BEAR CONFLICT.

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Potential conflicts are discussed below.

4.1.1. Property Damage

Bears can be very destructive of property. They are capable of damaging metal and wood structures, frequently chew on plastic and rubber items, and have been known to bite through electrical cable sheathing, tear off substantial wood or metal doors, and destroy large food caches. Measures to prevent property damage are presented in this plan.

4.1.2. Interference with Project-related Work

Presence of bears near the Project construction area may disrupt work progress by requiring that work be temporarily suspended, or simply through worker curiosity and attention to the bear instead of the business at hand. It is extremely important to follow habits that do not needlessly attract bears to the worksite.

4.1.3. Attacks

Bears will and do attack humans; encounters sometimes result in serious injury and occasionally death. Bear attacks are generally avoidable, and measures to avoid them are discussed in this plan.

4.1.4. "Bear Country"

Based on casual observations during field surveys, one may reasonably expect to encounter bears virtually anywhere in the Sweetheart Project area.

Therefore, provisions of this bear safety plan apply to all workers in all areas at all times after arrival on all construction sites. There are, however, certain locations within the Project area where one might be more likely to encounter bears or be at greater risk because of topography and/or vegetative cover characteristics. These areas will be designated in on-site orientation.

5.0 BEAR CONFLICT MINIMIZATION

5.1. Interpretive Display Panels

In order to provide safety, educational, and interpretive information about the Project and Sweetheart Creek fishing areas, JHI would design and build permanent interpretive display panels at the head of the Sweetheart Creek Trail. Exhibits would include Project information, bear safety measures, current ADFG personal use regulations, and trail identification/maps.

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Users would be requested to remain on the northern shore side of Sweetheart Creek to allow bears to habituate themselves to the southern shore side of Sweetheart Creek for bear-human interaction management.

The interpretative display exhibits would be completed by year 1 of the Commercial Operations Date (COD) of the Project**.** Interpretative display design and exhibits are subject to change over the life of the Project based on site conditions, permitting, and cost.

JHI would be responsible for the design, construction, and maintenance of the bear safety and interpretative displays for the term of the license. Forest Service and ADFG would be responsible to provide and approve their agency information that would be displayed at the interpretative display for the term of the license.

5.2. General Guidelines for Project Workers

Project workers will abide by the following guidelines at all times:

- **Keep A Clean Work Area, Particularly Regarding Food and/or Garbage.** Food disposal recommendations are discussed in Section 5.3.1 of this plan), and workers will be required to adhere to food disposal protocols on a daily basis.

- **DO NOT FEED THE BEARS.** This should be self-evident and explanatory, but it is amazing how many visitors to bear country create serious problems by intentionally baiting or feeding bears.

- **When Traveling on Foot in Bear Country, Make as Much Noise as Possible.** Try to avoid surprising bears, particularly in areas where it is very quiet, or when steady background noise (e.g., from nearby construction or the sound of a stream) makes it hard for a bear to hear your approach. Generally, near construction sites, disturbance from human activity, machinery, and vehicles should keep bears away, but bears often tolerate considerable human disturbance, and it should not be assumed that, just because there is a lot of human activity in an area, there will be no bears.

- **Be Alert and on the Lookout for Bears**. Early detection of a bear offers the best avoidance. Surprising a bear is dangerous and can often be avoided by keen observation of the countryside into which you are moving. Look for movement, the horizontal line of a bear's back and belly, and different colors. Other signs of bear use include tracks, fresh scat, beaten down or broken berry bushes, grazed sedges, foul odors, or a gathering of scavenging birds such as ravens, jays, or magpies. Bears that may in the

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Project area range in color from pure black to light blond but are generally different than the colors of the surrounding vegetation.

If you are walking along the access road or any trail, watch ahead and approach blind spots slowly and carefully. As you approach a blind corner in an area of limited visibility, make a lot of noise, by yelling or yipping, or clanging metal objects together. Observe the brush near the trail closely; bears often move and feed on berries in brush just off the trail and are easily surprised. Be aware of the wind direction; you can easily startle a bear upwind of you that has not caught your scent.

5.3. If You Encounter a Bear, Follow These Suggestions

- If the bear is more than about 50 yards away, or if it is close but does not appear to have seen you, back slowly away from it, increasing the distance between you and the bear. Do not run, even if the bear is some distance away.

- If a bear is at some distance (over 50 yards) and sees you, wave your arms, stand as tall as possible, and yell at the bear. Try to help the bear identify you as a human. If you are with others, stay together as group. A bear is less likely to attack a group of people.

- If the bear is quite close (less than 20 or 30 yards), and is coming at you rapidly, speak in low soothing tones as you back slowly away. The bear may bluff charge, stopping within 10 yards of you. If you have a firearm, prepare to shoot the bear if it does not stop its charge. If you must shoot the bear, aim for the center of mass, just below the head. If you shoot the bear, continue firing until the bear is dead; a wounded bear is extremely dangerous to all personnel.

- If a bear attacks, fall into the fetal position with your knees pulled over your stomach area and hands clasped behind your neck. Pull your head to your chest, and keep your elbows over your eyes. Try to remain silent and motionless in this position until the attack has stopped and the bear has left the area.

5.4. Instructions for Keeping Construction Sites and Refuse Areas Clean

5.4.1. Food Disposal.

It is expected that the powerhouse site construction workers will have all meals in the construction camp on Gilbert Bay. Tunnel, dam, and transmission line workers will have lunch on the site of the work. Garbage, food-contaminated utensils, paper, etc. will

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be collected on a daily basis, placed in bear-proof containers, and removed from the Project site for proper disposal. Food-related items left at the worksite even for short periods may draw bears from great distances. Food items left overnight during high bear population periods will almost ensure a bear encounter the following morning. Bears that are able to get even a small amount of food will return to the area repeatedly to search for food, may show little or no fear of humans, may become aggressive, and will likely have to be destroyed.

The Construction Foreman at each Project construction location will be responsible on a daily basis for policing his/her construction site for food after each meal, and at the end of each construction day. The objective will be to leave no food-related or contaminated items whatever around the Project site. If construction crews leave daily, they will take their food scraps with them daily.

Performance of each Construction Foreman relative to daily food cleanup will be monitored by the Environmental Construction Monitor.

5.4.2. Feeding Bears

Simply and emphatically, **DO NOT FEED THE BEARS.** Bears fed by humans generally have to be destroyed. If a bear incident resulting in human or bear injury or death shows evidence of bear feeding, the Alaska DFG will likely consider the incident human caused.

6.0 RECREATIONAL ACTIVITIES OF PROJECT WORKERS

The Gilbert Bay and Sweetheart Lake areas have recreational opportunities, which might create potential for bear encounters. These are discussed below.

6.1.1. Fishing, Hiking, and Boating

Fishing and hiking in the construction and nearby areas are available recreation activities for Project workers. Food disposal and bear-avoidance measures listed above apply to workers during recreational pursuits, including cleaning of fish (never discard fish viscera in the construction area) and hiking (pack out all leftover food, containers, and utensils).

Note: Anyone intending to fish in the Project area or elsewhere in the state must obtain a valid State of Alaska fishing license and permission from the on site licensee operations personnel.

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6.1.2. Firearms

No firearms will be routinely allowed in the construction area, unless permitted in writing by the Construction Manager. It will be the responsibility of the Construction Manager to arrange for, securely store and distribute firearms in the construction area. Such firearms will be permitted only for the purpose of bear protection, and not for control of problem bears or hunting. The Construction Superintendent will have access to nonlethal means of bear protection, such as bear pepper spray, cracker shells, flares, rubber or plastic bullets or baton loads, which will generally be encouraged as the primary means of bear defense. Firearms will be used as a lethal deterrent to stop a bear attack when nonlethal techniques are unsuccessful or impractical.

6.1.3. Hunting/Trapping

Project workers will be prohibited from hunting and trapping within Project lands at any time during Project construction, unless permission by licensee and a permit from Alaska DFG is granted. Hunting or trapping on Forest Service lands must be done no closer than a mile to the construction site.

7.0 PROCEDURES TO DEAL WITH PROBLEM BEARS

If a bear is, or it seems likely to become a problem, the following procedures should be followed.

7.1.1. Report Potentially Problematic Incidents Promptly

If a bear is seen consistently in a work area and shows threatening behavior (false charges, failure to flee) the appropriate Construction Foreman will report the incident immediately to the ECM or designee.

Before calling, try to establish any identifying features of the bear(s), the location of the incident, and time of day. Deciding whether an incident is "potentially problematic" or not is up to the discretion of the workers and Construction Foreman, but it is better to report an incident than not.

7.2. Report Bear Attacks

If there is a bear attack, the nearest person to the victim should contact the ECM or designee.

Decisions on what to do with problem bears will be made by the Alaska DFG, Division of Wildlife Conservation; and the Alaska State Troopers, Fish and Wildlife Protection Division. No independent actions should be taken by Project workers to kill a problem bear unless there is a clear and immediate threat and the action is justifiable

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under State of Alaska legal provisions for defense of life and property (5 Alaska Administrative Code [AAC] 92.410).

7.3. State Law Regarding Attractants

Alaska state law (5 AAC 92.230) makes it illegal for any person to feed or intentionally leave food or garbage in a manner that attracts a bear, wolf, fox, or wolverine. Under the state's policy for managing bear-human conflicts, individuals who take a bear under "defense of life or property" provisions **will be warned or cited** if the take is brought about by the improper disposal of garbage or a similar attractive nuisance.

7.4. What to Do if a Bear Is Shot in "Defense of Life or Property"

Any person who takes a bear in "defense of life or property" shall notify his supervisor and the Alaska DFG immediately, and shall submit a written report of the circumstances of the take to his supervisor and the Alaska DFG with 15 days of the take. The bear hide and skull must be salvaged and then "sealed" and an affidavit completed.

Brown Bear – The hide (including the claws) and the skull must be salvaged and surrendered to the Alaska DFG.

I have read, understood, and hereby agree with and will follow the conditions and restrictions of this Bear Safety Plan.

Signature	**Date**

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

CONSTRUCTION PLAN (CP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

CONSTRUCTION PLAN (CP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: a) Construction Plan. FERC has requested in their comments additional information on the construction camp(s) and this information is provided in this plan. JHI concurs that this is a necessary plan and is submitting this preliminary Construction Plan (CP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line

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C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 CONSTRUCTION PLAN (CP) INTRODUCTION

This document provides a description of the means and methods that will be used to construct the Sweetheart Lake Hydroelectric Project (Project) described in the prior section. This plan is compiled from information provided by Juneau Hydropower, Inc.'s (JHI's) selected contractors and consultants. This plan will be worked in compliance with the above-listed environmental and safety plans developed for the Project (Appendix Z). Construction shall be in accordance with design specifications and drawings (Exhibit Fs). JHI and its contractors will comply with all permits and federal, state, and local laws.

4.0 SCHEDULE

The Project schedule (Exhibit C, Figure C-1, of the PDEA) is driven by the commitment of JHI to not build an access road from the powerhouse to the dam site and instead to use the power tunnel to access the dam site for construction. The schedule is further limited by the steep, avalanche-prone terrain at the dam site that may drive dam construction activities to summer months (April-October).

5.0 ACCESS

No part of the Project site is accessible by road. The dam site is only accessible by floatplane and helicopter until the power tunnel is completed. The powerhouse is only accessed by a 4,400-foot coastal road/trail from a dock that will be constructed to serve this Project (see Exhibit F). That dock will have seaplane service, helicopter landing area, small boat dock, and a freight barge landing to bring in all personnel, equipment, supplies, and materials. There is very limited area available for construction activities and materials storage at the site, so close supply coordination will be required. It is expected that there will be weekly barge service during the summer months (April –

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October) to supply most freight needs and daily floatplane service for personnel and small goods. Winter freight and passenger traffic would be much less with expected monthly barge traffic and daily seaplane flights as weather allows.

6.0 COMMUNICATIONS

No part of the construction site is covered by land or cell phone service. A satellite phone and data system will be installed for the construction duration at both the dam site and the powerhouse site. In addition, two-way radios will be at all construction sites linking the remote workers to the camp/office sites. The Gilbert Bay offices will monitor VHF radio channels to all marine operations.

7.0 CONSTRUCTION POWER

All construction activities will need generated electric power. The power at all sites (dam, power tunnel, powerhouse, construction camps) will be generated by diesel-powered generators. Generators will be operated at the Gilbert Bay caretaker's, powerhouse site, dam site, and Sweetheart Lake camp. All sites will have primary and full standby facilities. Fuel will be delivered by barge to the dock staging area for all fuel needs and stored in U.S. Department of Transportation (DOT) ISO containers. Fuel for the Sweetheart Lake site will be transported as needed by helicopter.

8.0 CONSTRUCTION CAMPS

Due to the remote location of Sweetheart Lake Hydropower construction sites, workers will be transported by seaplane(s) from the closest town, Juneau. The dam and powerhouse sites will each have temporary camp and offices constructed to serve the workers necessary for all construction operations at the respective sites. Each camp will have office staff and commissary workers. The number of workers will vary as dictated by scheduled tasks. The number of workers on site will be kept to a minimum to reduce impacts and cost.

- Gilbert Bay Camp (Bay Camp) located 900 feet south of the dock at Staging Area #1 (Exhibit F-2 [4]) will contain three adjacent buildings consisting of modular transportable housing, with dining, kitchen, toilets, showers, laundry, bedrooms, lounge, office, and storage areas. The preconstructed units will be assembled onto a temporary steel foundation. The site was chosen to minimize bear-human interaction by distancing it from Sweetheart Creek. The camp will support 20 workers and then ramp up to 60 at peak load. The camp will have offices supporting site safety, logistics, construction management, engineering, and compliance. All persons arriving at the construction site will sign in and receive site training at this location. All persons leaving the site will check out before

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departing at this site. This camp will be placed as soon as blasting at the adjacent caretaker's site is complete and removed 1 year after start of commercial operations.

- Sweetheart Lake Camp (Lake Camp) will be located where JHI's current field camp is located 2,500 feet northeast of the dam site at Construction Staging Area "C" (Exhibit F-3 [1]) This site was chosen as the closest relatively flat area outside known avalanche areas and having a freshwater source. This site will have a helicopter landing site and seaplane access a short distance away. This camp will be constructed of lightweight modular transportable structures, with kitchen, toilets, showers, dining area, bedrooms, offices, and storage areas. The 20-person camp will have offices supporting site safety, logistics, construction management, engineering, and compliance. All persons arriving at this construction site will sign in and receive site training at this location. All persons leaving the site will check out before departing at this site. The Lake Camp will be developed at the start of construction and removed upon completion of operations testing.

8.1. Water and Sewer

Water and sewer systems would be designed and permitted for both campsites. The Bay Camp would be supplied by the wells that will be drilled to supply the permanent caretaker's quarters. The wells will be located 300 feet east of the caretaker's building at 150-foot MLLW elevation (Exhibit F-2 [1]). The Lake Camp will be supplied by treated water from an unnamed creek adjacent to the site. The treatment will include filters and ultraviolet light. Both sites will have water tanks, electric pressure pumps, pressure tanks, and propane gas water heaters. Bay Camp sewer system preliminary design (by Richard H. Smith, PE) is to use two Whitewater D150FF systems (up to 3,000 gallons per day) and a marine outfall. The lake system will be designed for a much lower flow and seasonal shutdown and will discharge to lower Sweetheart Lake.

9.0 CONSTRUCTION PHASES

The extensive geotechnical site investigation was conducted with nondestructive (no mechanized drilling or excavation) methods in accordance with U.S. Forest Service (Forest Service) use permits. The geotechnical exploration was done by geologists and engineers experienced in the local geology. (Snettisham and Lake Dorothy Projects). Upon receiving a License (FERC) and Permits (Forest Service and U.S. Army Corps of Engineers [USACE]), the design assumptions will be field checked by drilling and excavation under the supervision of the geotechnical and engineering personnel.

The construction is planned to start as soon as the permits are received and weather conditions are safe. The major phases will be: Gilbert Bay powerhouse access, Sweetheart Lake diversion tunnel, power tunnel, transmission lines, powerhouse and

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tailrace, dam and inlet structures, electrical, control, and monitoring systems, recreational, visual, and environmental features.

9.1. Road/Trail

The Gilbert Bay caretaker's site and powerhouse site would be excavated concurrently with the placement of rock for the barge dock and access road/trail. This initial work would proceed quickly to allow for the start of power tunnel construction. As the power tunnel work begins, the access site work will slow to a steady pace and support the tunnel work. The road/trail would not be complete until all tunnel, dam, and powerhouse work is complete. The major excavation and rock-processing operations would include Project best management practices (BMPs) and be done in accordance with the above-listed plans and procedures (Appendix Z). Gilbert Bay operations would also provide support for the lake operations and transmission construction. Caretaker's facilities and camp construction would be done as soon as resources are available after blasting operations conclude.

9.2. Diversion Tunnel

In order to effectively construct the dam, a diversion tunnel will have to be installed to divert the water around the dam construction footprint. This tunnel will be a nominal 10-foot-wide by 10-foot-tall straight-leg horseshoe, and it will be 525 feet long (Exhibit F-6). The diversion tunnel will be excavated using conventional drill and blast methods. The tunnel will be driven from one heading and will be excavated with a top and bottom bench. Blast hole drilling will be executed with jack-leg drills. Anticipated drill depths are 6 feet, with the leading top bench height being approximately 5 feet, and the trailing bottom bench height being approximately 5 feet. Muck handling and removal for the diversion tunnel will be with small load-haul-dump (LHD) loaders and/or large skid steer loaders. The machinery needs to be small enough so that it can be transported to the Sweetheart Lake site by heavy-lift helicopter. The tunnel rock produced from the diversion tunnel will be processed for future roller-compacted concrete (RCC) aggregate at the Sweetheart Lake site. Muck bays will not be used for construction of the diversion tunnel.

9.3. Power Tunnel

The power tunnel will be nominally 15 feet tall by 15 feet wide and horseshoe-shaped. The lower 862 feet of the tunnel that connects with the powerhouse will be lined with a steel penstock pipe (Exhibits F-1, F-7, and F-8). The annulus between the penstock pipe and the tunnel will be backfilled with cement grout.

The power tunnel will be excavated using conventional drill and blast methods. The tunnel will be driven with two headings, upstream and downstream. The downstream heading will be the primary heading and will commence after the

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downstream portal is developed. Blast hole drilling at the downstream heading will be executed with a two-boom drilling jumbo. Anticipated drill depths are 12 feet, which will result in an approximately 11-foot round pull. It is anticipated that the downstream heading will be taken full face. The upstream heading will commence from the design inlet portal at Lower Sweetheart Lake. This heading will be secondary and will only be active when the Lower Sweetheart Lake site is accessible. Blast hole drilling will be executed with jack-leg drills. Anticipated drill depths are 6 feet, and the heading will be excavated with a leading top bench and a trailing bottom bench with bench heights of approximately 6 feet and 9 feet, respectively. Muck handling and removal methods for the downstream tunnel heading are:

- Rolling stock muck removal: This would be executed with a combination of low-profile haul trucks and LHD loaders. To increase efficiency of the mucking operation, muck/passing bays will be excavated in the tunnel at prescribed stations. The bays consist of a widened tunnel cross section that allows for temporary storage of tunnel muck. These bays also provide a location for machinery to pass in the tunnel.

- Conveyor muck removal: This would be executed with a combination of electric conveyors and LHD loaders. As the tunnel excavation proceeds, conveyor sections will be installed. It is anticipated that the conveyors will be maintained to within 200 to 500 feet of the active tunnel face. Muck bays will still likely be incorporated to increase the efficiency of the tunnel mucking operations.

Muck handling and removal for the upstream tunnel heading will be with small LHD loaders and/or large skid steer loaders. Muck bays will also be employed in the upstream tunneling operations. The machinery needs to be small enough so that it can be transported to the Sweetheart Lake site by heavy-lift helicopter. Tunnel rock produced from the downstream heading will be used to build the coastal road and dock areas. The tunnel rock produced from the upstream heading will be processed for future RCC aggregate at the Sweetheart Lake site. All tunnel rock will be used at the Project site. No export of tunnel muck material is anticipated.

Once the power tunnel is completely excavated and prior to the installation of the penstock pipe, it will be used to transport equipment and personnel to and from the site for RCC dam construction activities.

9.3.1. Tunnel Shoring

Geologic investigations indicate that the rock that the power tunnel and diversion tunnel will be constructed in is generally quite competent. Nevertheless, it is anticipated that local tunnel shoring or rock stabilization methods will need to be employed at certain locations as encountered. A variety of tunnel shoring or rock stabilization methods are available and will be executed based on the level of stabilization required (Exhibit F-8

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[2]). Specific application of the method will be determined in the field between the tunnel contractor and the tunnel design engineer. The shoring/stabilization methods are listed in Table 1 below:

Table 1 Stabilization Methods

Method		Severity
1.	Tunnel Wall Scaling	All tunnel walls will be scaled to remove loose materials from blasting
2.	Rock Bolting	Mild
3.	Rock Bolting and Rock Fall Fabric	Moderate
4.	Rock Bolting, Rock Fall Fabric, and Shotcreting	High
5.	Steel Ribs and Lagging	Extreme
6.	Rock Grouting	Will be employed if rock is producing large amounts of water.

9.4. Steel Penstock Liner

The final steel penstock liner would be placed in the power tunnel after all upstream activities are complete. The liner would be pulled into the tunnel in sections and set to the proper line and grade. Once set, the next successive liner will be brought in and aligned with the previously set liner section. Once in place, the joint would be welded.

Bulkheads would be constructed in the annular space between the excavated tunnel and the penstock pipe at the upstream of the penstock and at the downstream tunnel portal. Bulkheads would also be constructed at prescribed locations throughout the length of the penstock as the penstock is being placed. This would create grouting "cells" that will help control the penstock pipe backfill grouting process.

The penstock pipe will be fabricated with grout port locations in the pipe. There will be a minimum of a 4-port array equally spaced around the diameter of the penstock pipe. These arrays will be stationed at a minimum of every 20 feet in the penstock alignment. These ports will be used for backfill grouting as well as for witness and control during the backfill grouting process. If additional pressure grouting is required, it will be executed through these port locations as well.

Once the penstock is in place and grouted, all grout ports will be plugged and seal welded, internal temporary bracing or shoring will be removed, and the pipe surface will be inspected and any surface anomalies will be repaired.

The preliminary blast plan drawings and calculations for the power tunnel and diversion tunnel are depicted on Figure 1 and Figure 2 below:

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Figure 1 Sweetheart Lake Penstock Tunnel Round Design

Sweetheart Lake Penstock Tunnel Round Design

Primary Chg.:	Emulsion	Density:	1.25	g/cc	Chg. Dia.:	1.500 in
Buffer Chg.:	Emulsion	Density:	1.25	g/cc	Chg. Dia.:	1.500 in
Trim Explos.:	Trim Emul.	Density:	1.20	g/cc	Chg. Dia.:	0.875 in

Drilling Summary:

4 - 3" open cut holes
31 - Blastholes
11 - Buffer Holes
17 - Smoothwall Holes

63 Holes Total

Shape of Round: Select One and Fill in Dimensions

		Height (ft)	Width (ft)	Area (sq-ft)	Area (sq-m)	Blast Volume cu-yd	cu-m
Drill Depth:	12.00 ft	15	15	214	19.89	87.2	66.71
Pull Depth:	11.00 ft						

Hole Type	Number of Holes	Typical Burden (ft)	Typical Spacing (ft)	Collar (ft)	Spacing /Chg-Dia Ratio	Burden /Chg-Dia Ratio	Wt/Hole (lb)	Weight Totals (lb)	Percent
BLAST	31	2.46	2.46	2.00	19.7	19.7	10.39	322.1	62.47%
BUFFER	11	2.46	2.50	1.17	19.7	20.0	10.43	114.7	22.25%
TRIM	17	2.46	1.97	1.17	N/A	N/A	4.64	78.8	15.28%
TOTALS:	59.0							515.7	

Powder Factor:	5.91 lb/yd^3	3.51 kg/m^3	*Includes energy and rock portion from Smoothwall Holes
Smoothwall Trim Factor:	0.21 lb/ft^2	1.05 kg/m^2	
Unit Explosive Consumption:	46.9 lb/ft	69.89 kg/m	

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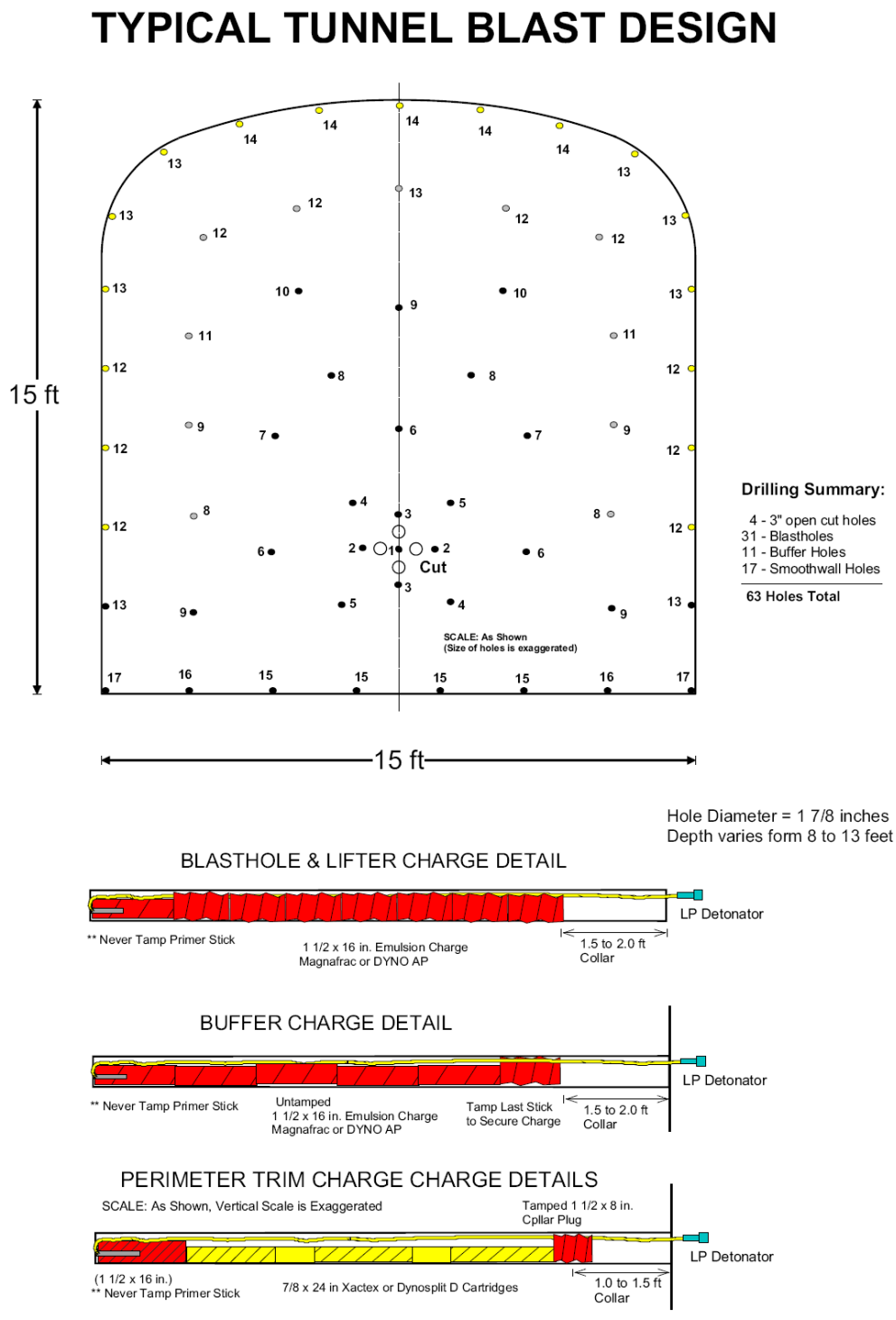
Figure 2 Sweetheart Lake Penstock Typical Tunnel Blast Design Dock



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The barge ramp, boat float, and seaplane float would be constructed as soon after Project mobilization as permits allow. The pile driving for the float mooring and the barge support dolphins would be done from an anchor barge with a crane. The work would take 2 to 3 weeks to complete. The access ramp to the seaplane float and boat float will be constructed after placement of enough of the rock barge ramp is completed, estimated to be 2 months after start of construction.

9.5. Transmission Lines

Most segments of the power transmission line system are not on the critical path of the Project. To keep them off the critical path, the clearing of the overhead line on the east shore of Gilbert Bay would start concurrently with the Sweetheart Lake geotechnical work (Exhibit F-13). This would allow shared use of the necessary helicopter. The clearing operations would be followed by the construction of the tower foundations. Many of these sites would be able to use hydraulic equipment to assist with lifting and excavating and close helicopter support. The towers would be set the next spring and line pulled by June of 2016.

The submarine cable installation is not on the critical path and could install safely in the late summer of 2015 or the early summer of 2016. This will depend primarily on the cable availability and the equipment to lay the cable. The cable will be received in the port of Seattle, WA, and loaded onto a large barge that is outfitted with all required support equipment. The barge is then moved on-site by tug boat(s) and positioned by use of real-time kinematic (RTK) Global Positioning System (GPS) navigation systems. The cable is controlled load lowered into the determined bottom position starting from a marine transition terminal vault and proceeding at around one knot speed to the next marine transition terminal, where the cable will be pulled into the vault. This procedure is repeated across the next segment. The cable laying is expected to take 2 weeks on site. The barge and equipment are then demobilized to Seattle. The cable is then protected in the intertidal and shallow reaches, as well as any areas of concern with clean shot rock cover placed from a barge.

The final legs are the buried segments from the powerhouse switchyard 4,800 feet to the dock and the leg from the existing Snettisham power connection switchyard 400 feet to the marine transition terminal on the north side of Port Snettisham. These will be the final connection points.

9.6. Powerhouse Construction

The powerhouse foundation excavation would be done concurrently with power tunnel construction and will include the afterbay and wildlife overpass arch. The excavation would be drill and blast to the required depths with large excavators to sort and trucks to haul. As the deepest excavation is completed, it is expected that infiltrating

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water would need to be pumped by electric or diesel pumps to the treatment pond (Exhibit F-2 [7]).

The powerhouse foundation would be constructed of reinforced cast-in-place (CIP) concrete. A portable batch plant would be set up in Staging Area #4, 400 feet west of the foundation, and trucked and pumped to place. The aggregates are expected to be barged on site along with all cements and reinforcing. A crane would be on site for the construction of the powerhouse. The foundation is expected to be complete in 3-4 months.

If rock conditions allow, the arched wildlife overpass will be tunneled to reduce disturbed area and minimize sedimentation. This will be determined by the geotechnical engineer and tunnel design team. If the rock is not competent, the site will be excavated and a concrete arch constructed over the channel and filled and vegetated as shown in Exhibit F-12 [2]).

The powerhouse would be constructed of CIP concrete and precast concrete panels. Turbine and generator components will be cast in as required. The permanent overhead crane will be installed. Roof structure would be installed and roof completed as soon as practical. This would allow all interior systems to be installed while protected from the weather. Exterior doors and windows would be installed by June and the building secured. Building construction continues through the summer of 2016.

9.7. Diversion Dam (Upper and Lower)

Following construction of the diversion tunnel and prior to the start of the RCC dam, a diversion dam will be constructed at the outlet of Sweetheart Lake. The diversion tunnel will route the existing Sweetheart Creek around the dam construction site during construction. Reference Exhibits F-3 (2) plan view, F-5 section "E" for location and design. Sweetheart Creek is to be diverted during a period of lower flow into the diversion tunnel using rock-filled fabric bags to minimize sedimentation release. When the flow is routed out of the current channel, the design section will be constructed with rock and impermeable liner. The temporary bags will then be removed. The diversion dam will be left in place as the lake is flooded. The lower dam will be similarly constructed and is needed to keep the bypassed water from coming upstream to the dam site (Exhibit F-5 section "F"). Water in the dam construction area will be drained or pumped through a fabric filter back to the creek.

9.8. Tailrace

The tailrace will be constructed in May and June to avoid impacting salmon spawning or eggs. From the wildlife overpass (station 101+68) to the merge with Lower Sweetheart Creek (station 104+93) is 325 feet of open-cut drill and blast construction (Exhibits F-9 and F-12 [2]). On-site geology would be taken into account to provide a

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channel that will, after vegetation has returned, look similar to the rest of lower Sweetheart Creek. A temporary cofferdam constructed of 1-cubic-yard fabric bags filled with rock supporting an impermeable liner would be installed at the downstream side of the work at station 104+27. This cofferdam will be removed prior to initiating flow through the power tunnel.

9.9. Power Dam

To create a reliable reservoir of sufficient capacity to generate hydropower at the Sweetheart Lake Hydroelectric Project, a dam must be constructed at the west end of Lower Sweetheart Lake (Exhibits F-3, F-4, and F-5). The dam would be an RCC structure constructed on a competent bedrock foundation. Aggregate materials for the RCC would be produced from on-site sources while cementitious materials (cement and pozzolan) would be imported from off-site sources. These materials will be mixed in an on-site batch plant to produce RCC in the prescribed proportions. The general configuration of the dam will include a vertical upstream face and a stepped downstream face with a slope. Both upstream and downstream faces will be protected against freeze-thaw damage by a 12- to 18-inch-wide zone of grout-enriched RCC. The crest of the spillway will be constructed of conventional structural concrete (Exhibits F-4 and F-5).

The RCC mixes anticipated for the Project will require a combination of coarse aggregates (crushed rock), fine aggregates (manufactured or natural sand), cement, pozzolan (flyash), admixtures, and water. The type of coarse aggregate available at the site, its chemical properties, the properties and availability of off-site required materials, temperature requirements of the RCC, and many other factors are issues that impact the RCC mix design requirements and properties. Based on site investigations, it is believed that suitable aggregates will be produced from on-site sources, including the tunnel excavations (power and diversion). As the design progresses, engineering analyses will be prepared comparing the suitability and costs of using off-site sourced fine aggregates versus on-site materials and/or blends. Cement, flyash, and admixtures will be purchased from commercial sources and transported to the site. Water for batching will be drawn from Sweetheart Lake and treated as required.

Early in the construction schedule, the contractor will mobilize an initial crew and equipment to the Lower Sweetheart Lake area and begin preparing areas for aggregate processing and RCC batch plant equipment installation. Storage areas for aggregates will be established within the footprint of the future reservoir shoreline. As material is removed from the diversion tunnel and the power tunnel, it will be stockpiled in these staging areas (A and B) for processing (Exhibit F-3 [1]). Mobile crushing equipment will be used to produce the aggregates to be used in the RCC. The RCC mix design will consider many engineering properties established during the dam design (compressive strength, tensile strength, potential alkali-silica reactivity, workability, nonsegregation during transportation and placement, etc.).

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9.9.1. Dam Foundation

The dam site location has steep abutments on both the left and right sides of the river valley. The dam footprint will require clearing and grubbing of trees and brush, as well as overburden soils removal. With the exception of topsoil, overburden will be disposed at the site. Standard excavation equipment (e.g., excavators, dozers, front-end loaders, and haul trucks) will be used for the overburden excavation and disposal. It is anticipated that large random boulders will be present in the excavation for the dam. These and any loose rock material, weathered rock, and other material unsuitable for a dam foundation as determined by the design engineer will also be removed prior to construction of the dam via blasting and/or mechanical means.

Preliminary geotechnical information indicates that the dam will be founded on a competent rock foundation. The rock foundation and RCC interface is a critical area for proper dam stability and to reduce the potential for excessive seepage at this contact. Therefore, special procedures will be used to clean the rock prior to installing the RCC. These special procedures may include air-blast cleaning the existing rock to remove any loose soils, water blasting to further identify cracks and joints in the rock formation, joint sealing with mortar, and dental concrete. These approaches are commonly used to prepare rock foundations for RCC and mass concrete dams. The extent of foundation treatment and dental concrete will be determined by the design engineer during construction as the foundation is uncovered and cleaned. Additionally, a foundation grout curtain is an anticipated component of the design. The grout curtain will prevent seepage through the bedrock beneath the dam. The extent of the grouting program will be defined during final design of the dam.

9.10. Roller-Compacted Concrete (RCC) Mixing Plant

A portable RCC batch-type mixing plant would be mobilized and erected at a staging area adjacent to Lower Sweetheart Lake. This plant would be equipped with up to four aggregate bins for the coarse and fine aggregate size groups.

9.10.1. RCC Batching

Cement and pozzolan will be stored in individual vertical silos. Aggregate, cementious materials, and batch water will all be weight-batched in individual scales, and liquid admixtures will be metered and delivered into the batched concrete. The RCC plant will be equipped with computerized batch-controls to ensure that the material is accurately proportioned. RCC mixing will be accomplished with a horizontal twin-shaft mixer. All RCC and conventional concrete will be produced in this plant.

After batching, the RCC will be transported to the dam through a combination of conveyors and dump trucks.

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9.10.2. RCC Placement

Placement of the RCC will progress from the lowest level of the foundation excavation and proceed upward in 12-inch compacted lifts. After foundation treatment, the RCC will be delivered to the dam by a system of conveyors and haul trucks. These trucks will drive on the dam footprint to the point of placement and discharge the fresh RCC on the lift. Spreading of the RCC will be done with a dozer and compacted by using vibratory smooth drum rollers. The dozer will have a grade-laser level or GPS control to ensure that appropriate RCC lift thickness is maintained. The preliminary dam design calls for grout-enriched RCC facing elements on both upstream and downstream faces of the dam. This is accomplished by introducing a grout mixture into the region of the RCC adjacent to the facing forms. The grout mixture is blended in a standard concrete grout mixer and placed onto uncompacted RCC. Once placed, the grout mixture is vibrated into the RCC with a gang immersion vibrator unit, consisting of three (or more) hydraulic concrete vibrators attached to a small excavator or skid steer loader. Immersion vibration occurs until the grout is fully blended into the RCC, resulting in a material with the consistency of low-slump concrete. Grout-enriched facing is also placed in areas where the RCC contacts the rock foundation at the bottom and abutments of the dam.

9.10.3. RCC Formwork

Forming of the upstream and downstream faces of the RCC dam will be required. The upstream face will be vertical for its full height. Upstream forms will consist of large panel form faces with structural ribs and stiffeners for panel support. These panels are normally built in 8-foot-high gang-sections and advanced upward as the RCC lifts are completed and achieve suitable strength to continue construction. The forming system will extend from abutment to abutment to allow for continuous RCC placement for the full length of the dam on each lift.

Step forming on the downstream face of the dam will require a different type of forming system. These forms will be designed and built to accommodate the intended lift height. The preliminary design shows a step height of 4 feet. Panels will be built to fully form one step height for the full length of the dam. These forms will be "jumped" from step to step as the RCC placements advance upwards. Typically two sets of these forms are made so the next step can begin forming while the lower step is finishing the cure process. Forms are supported by an internal load-gathering rod-tie system that is embedded in the RCC as lists are placed.

9.10.4. RCC Conventional Concrete Spillway Crest

The RCC dam will have a conventional concrete primary/auxiliary spillway. The spillway will be formed using conventional radius forms on both the upstream and

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downstream faces. Conventional reinforced concrete will be produced on site and transported and placed via conventional methods.

9.10.5. RCC Conventional Concrete Dam Topping and Parapet Walls

Similar to the spillway crest, reinforced conventional concrete will be placed along the crest of the dam to construct a parapet wall also at the crest of the dam. After RCC completion at the top elevations, the forming of the topping slab will be installed. After placement of the topping slab, the parapet walls will be formed placed.

10.0 AGENCY COMMENTS

FERC January 16, 2014, Comments on Subsequent Draft License, attachment B-17, requested additional information regarding installation and disposition of construction cofferdams for dam and tailrace construction.

JHI has addressed these comments in the SWPPP drawings and this Construction Plan.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

ENVIRONMENTAL COMPLIANCE MONITORING PLAN (ECMP)

PREPARED BY:

Juneau Hydropower, Inc.
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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

ENVIRONMENTAL COMPLIANCE MONITORING PLAN (ECMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 21, requested the following plan: Environmental Compliance Monitor (ECM). The Alaska Department of Fish and Game (Alaska DFG) also recommended in their preliminary conditions, Article No. 20, an ECM. JHI concurs and is submitting this preliminary Environmental Compliance Monitoring Plan (ECMP) with the Final License Application and PDEA for additional comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line

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in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

2.1. Appendix Z – JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

Solid Waste and Wastewater Plan (SWWP)

Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

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A. Invasive Species Management Plan (ISMP)

B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 ENVIRONMENTAL COMPLIANCE MONITORING PLAN (ECMP) INTRODUCTION

This Environmental Compliance Monitoring Plan (ECMP) provides a description of the means and methods that will be used to handle the environmental compliance monitoring for the Sweetheart Lake Hydroelectric Project (Project) described in the prior section. Specifically, this plan outlines the roles and responsibilities of the Environmental Compliance Monitor (ECM).

To assure compliance with license and permit conditions, as well as regulations, and to document compliance issues, Juneau Hydropower, Inc. (JHI) will implement this Environmental Compliance Monitoring Plan (ECMP) prior to on-site construction. The plan continues through final construction and initial operations.

4.0 ENVIRONMENTAL COMPLIANCE MONITOR (ECM)

A qualified Environmental Compliance Monitor (ECM) will be hired to implement and manage the ECMP. JHI will select the ECM and submit his or her resume as an amendment to this plan. The ECM will ensure that adequate staffing is available for all duties of the plan.

The ECM shall be issued a letter of authority, delegating authority to direct changes to the Project Manager This authority shall include the right to direct a Stop Work Order if necessary. The manager may delegate his or her authority to other on-site personnel as needed.

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4.1. Qualifications, Duties, and Responsibilities

4.1.1. Qualifications

The ECM will have the following qualifications:

- Knowledge of environmental laws (statutes and regulations) in the State of Alaska.
- Experience with field construction techniques and environmental oversight.
- A thorough and current knowledge of sediment and erosion control techniques, water quality testing, and sound construction practices.
- Able to identify historical/cultural resources.
- A background in the Biological Sciences or a proven track record as an ECM.

4.1.2. Duties and Responsibilities

The duties and responsibilities of the ECM will be as follows:

- Review and be familiar with the approved environmental plans, permits, and the proposed construction.
- Observe all construction and provide guidance to the Construction Manager to ensure that all activities are planned, conducted, and maintained in compliance with approved environmental plans and all permits; and to monitor maintenance effectiveness, and functionality of the mitigation measures and permit stipulations.
- Meet with the Construction Manager, JHI and the agencies to discuss compliance issues, including attending the monthly construction meetings held by the Construction Manager.
- Report all violations to the Construction Manager and require immediate remedial action. The ECM shall maintain a written log of all violations, including all pertinent information.
- If necessary, issue Stop Work Orders to the Construction Manager to ensure compliance with all environmental plans and permits.

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- Direct changes to the Construction Manager, as necessary, to comply with the intent of all environmental plans and permits.

- Make and keep diligent field notes regarding observations, discussions with the Construction Manager, compliance issues, recommendations, diagrams, and photographs. Prepare a monthly report detailing all violations, incidents, situations, and other activities relative to environmental plans and permit compliance. The monthly report shall be completed and made available to the public, the agencies, and the Construction Manager by the 5th of the month following the month the report covers.

- The ECM shall be the main point of contact for agency personnel on matters concerning construction compliance, site conditions, and inspections. The ECM should make all reasonable efforts to accommodate agency requests for inspections on site.

5.0 COMMUNICATIONS

5.1. Documentation

The ECM will be provided with the following documents before construction begins:

- All Plans listed above (Appendix Z of the PDEA).

- Design drawings and specifications.

- Construction schedule.

- Copies of all permits, including updates.

- JHI and relevant agencies contact list.

5.2. Meetings

A meeting will be held in Juneau prior to the start of construction to be attended by the ECM, other JHI representatives, the Construction Manager, other senior contractor representatives, and, at their discretion, agency personnel. The meeting will be held to acquaint all of the parties with each other and with the proposed construction and to provide a forum for discussing the respective expectations for the construction and compliance monitoring. The ECM will prepare meeting notes that will be shared with all attendees.

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The ECM will meet on a regular, weekly basis with the Construction Manager to discuss compliance-monitoring issues. If the ECM is unable to attend, he/she may attend via teleconference. The ECM will prepare notes of the weekly meetings or phone conversations and include them, as necessary, in the monthly reports.

JHI will arrange for an annual meeting at a time and location suitable to all participating parties to:

- Review and evaluate results of all monitoring activities during the relevant time period;
- Make necessary adjustments to the construction and/or monitoring programs; and,
- Decide on the need for continuation of monitoring.

The ECM will record or otherwise transcribe the meeting and distribute draft meeting minutes to the attendees and other participating parties on request.

It is the intent of JHI that there be open, respectful, and cooperative communication between the ECM, JHI, and the Contractor personnel on a routine basis. JHI believes such a relationship between all of the parties will minimize construction difficulties and environmental impacts.

5.2.1. Consultation

6.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

January 20, 2014 – Alaska DFG commented that the ECM should have a background in the biological sciences with experience in water quality monitoring and erosion/sediment control measures.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

EROSION AND SEDIMENT CONTROL PLAN (ESCP) & STORM WATER AND POLLUTION PREVENTION PLAN (SWPPP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

EROSION AND SEDIMENT CONTROL PLAN (ESCP) & STORM WATER AND POLLUTION PREVENTION PLAN (SWPPP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The Alaska Department of Fish and Game (Alaska DFG) recommends as a preliminary condition, Article 17, that the licensee develop and file an Erosion and Sediment Control Plan (ESCP) to reduce soil disturbances and events that could adversely impact aquatic resources. The Alaska Region U.S. Department of Agriculture (USDA) Forest Service (Forest Service) as Preliminary 4(e) Condition No. 22 e) has requested an Erosion Control Plan be developed and submitted. JHI submitted a draft ESCP in October 2013 and received comments from FERC requesting additional information. JHI concurs this plan is necessary and submits this revised draft plan after consultation for additional comments and review. The Storm Water and Pollution Prevention Plan (SWPPP) is a component of the ESCP.

1.1.1. Project Description

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert

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Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

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Solid Waste and Wastewater Plan (SWWP)

Spoil Disposal Plan (SDP)

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- Acid Rock Disposal Contingency Plan (ARDCP)

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B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

2.0 SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1. Project/Site Information

Project/Site Name: Sweetheart Lake – Juneau Hydropower		
Project Street/Location: Sweetheart Lake		
City: Juneau	State: AK	ZIP Code: 99803
County or Similar Subdivision:		
Latitude/Longitude (Use **one** of three possible formats, and specify method)		
Latitude: (degrees, minutes, decimal) 57º 56.706' N	Longitude: (degrees, minutes, decimal) 133º 38.221' W	
Method for determining latitude/longitude: ☒ USGS topographic map (specify scale: 1 inch = 2 miles) ☐ EPA Web site ☐ GPS ☐ Other (please specify):		
Is the project located in Indian country? ☐ Yes ☒ No If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable."		
Is this project considered a federal facility? ☐ Yes ☒ No		
NPDES project or permit tracking number*:		
What is the function of the construction activity? ☐ Residential ☐ Commercial ☒ Industrial ☐ Road Construction ☐ Linear Utility		

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☐ Other (please specify):	
Estimated Project Start Date:	3/1/2015
Estimated Project Completion Date:	7/1/2018

** This is the unique identifying number assigned to your project by your permitting authority after you have applied for coverage under the appropriate National Pollutant Discharge Elimination System (NPDES) construction general permit.*

2.2. Contact Information of Responsible Parties

2.2.1. Operator

Juneau Hydropower, Inc.
P.O. Box 22775
Juneau, AK 99802
P: 907-789-2775; F: 907-375-2973

2.2.2. Project Manager

Duff Mitchell
P.O. Box 22775
Juneau, AK 99802
P: 907-789-2775; F: 907-375-2973

2.2.3. SWPPP Contacts

Western Marine Construction, Inc. (WMC)
Joseph Zech, P.E., and Patrick McHugh
2775 Harbor Ave. SW Suite A
Seattle, WA 98126
P: 206-622-9161; F: 206-622-9170

2.2.4. This SWPPP Was Prepared by

Western Marine Construction, Inc. (WMC)
Joseph Zech, P.E., Max Schillinger, P.E., and Patrick McHugh
2775 Harbor Ave. SW Suite A
Seattle, WA 98126
P: 206-622-9161; F: 206-622-9170

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2.2.5. Emergency 24-Hour Contact

Western Marine Construction, Inc. (WMC)
Patrick McHugh
P: 866-622-9161, Cell: 206-599-9666

Joseph Zech
P: 206-622-9161, Cell: 206-849-4816

2.3. Soils, Slopes, Vegetation, and Current Drainage Patterns

Soil type(s): A detailed survey of Juneau soils was completed by the Soil Conservation Service (SCS, 1974) (now called the Natural Resource Conservation Service) in 1974, but did not extend to the Project area. However, low-elevation soils in the Project area may be expected to be similar to those mapped along the northeast shore of Gastineau Channel due to their similar parent rock, slope orientation, and climatic exposure.

The northeast shore and mountain slope of Gastineau Channel have been mapped as a Tolstoi-McGilvery complex (very stony silt loam to very gravelly sandy loam) on steep slopes (35 to 75 percent), Kupreanof gravelly silt loam in isolated locations on less steep slopes (less than 35 percent), and a Wadleigh gravelly silt loam on the lowest slopes (12 to 20 percent). Only the Wadleigh soil type is considered to be hydric by the Natural Resource Conservation Service. The Wadleigh Series consists of somewhat poorly drained soils that occur on lower mountainous slopes. These soils are composed of very gravelly loamy material underlain by glacial till, and covered by a forest mat. Coarse fragments and cobbles dominate the soil below 10-inch soil depths. Firm substratum is usually reached within 25 inches of the surface forest mat. These soils support western hemlock and scattered Sitka spruce.

The U.S. Forest Service (Forest Service) soil inventory, conducted in the area of the Project and summarized in the 1980 "Forest Service Final Environmental Impact Statement FEIS): Proposed Recreational Development and Independent Timber Sale Gilbert Bay/Holkam Bay," presented the following information. Shallow mineral soils (less than 4 feet) on steep, V-notch dissected sideslopes are common in glacially formed U-shaped valleys of southeast Alaska, such as Gilbert Valley. Local sideslope soils are formed from colluvium, residium, and glacial till. Inclusions of fine textured (clay) soils of glacial origin occur infrequently along lower sideslopes. Small areas of organic solids are found on sideslope benches where subsurface drainage is impaired. Sideslope soils, other than clay soils, pose few hazards to developmental activities. These soils have low susceptibility to mass erosion on slopes less than 65 percent and are resistant to surface erosion and surface disturbance due to a thick (greater than 6 inches) organic layer. Valley bottom soils, such as near the shoreline at Gilbert Bay, are comprised of coarse

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glacial outwash and morainal gravels with inclusions of alluvial deposits and organic soils. The glacial gravel soils are youthful, have relatively shallow (less than 6 inches) surface organic layers, and occur on nearly level (less than 10 percent) terrain.

Observations in July and August 2012 in the proposed access road and powerhouse area indicate the presence from ground surface of these soil layers:

- Moss, spruce needles, and leaves – Approximately 0 to 12 inches thick.
- Mineral soil, very stony to gravelly sandy loam – Approximately 0 to potentially several feet thick. Includes colluvium.
- Talus – Gravel to very large boulders, often covered with Layer 1 and likely mixed with Layer 2 near the base. Common near outcrops and on steep valley slopes.
- Stream deposits – Gravel to boulder-sized rock in drainages and streams, typically at the base of slope and extending below the water surface of Sweetheart Lake.
- Glacial till – Identified by the presence of rounded tonalite gravel to boulders. Observed along access road alignment.

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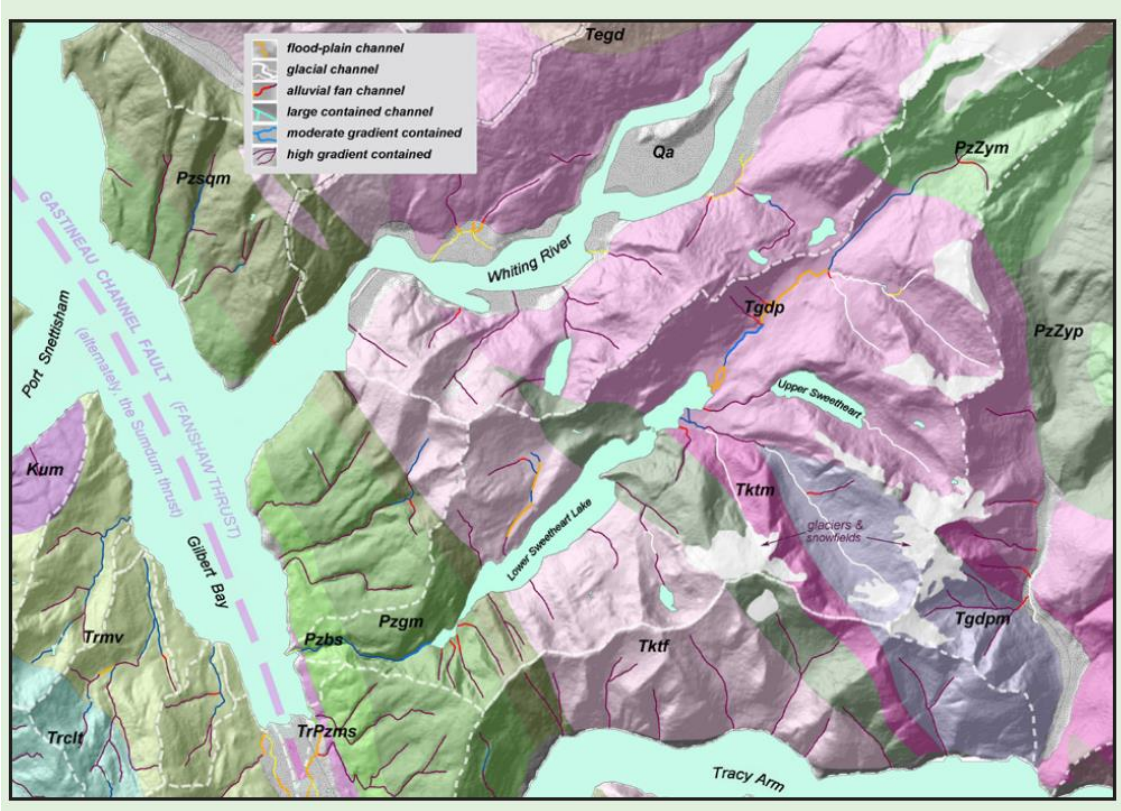
Figure 5 Geology Map of Sweetheart Lake and Gilbert Bay



Slopes: Topography in the Project watershed area is primarily steep and mountainous with dense spruce-hemlock forests extending from rock and glacial areas to tidewater. Maximum mountain elevations above Lower and Sweetheart Lakes are over 4,000 feet, while the average elevation is about 2,000 feet.

Topography between the Sweetheart Creek powerhouse and extending to the Gilbert Bay marine terminal/dock area is rocky and forested on the upland and has lower elevation forest and rock beach fringe at the lower elevations along the shoreline.

Drainage Patterns: Current drainage flow is based on natural topography. With the exception of a couple road crossings (culverts), the intent will be to leave existing drainage patters as they exist.

The area of work has been previously stripped of vegetation for mining. Current conditions include exposed rock with very little soils or vegetation, riprap slopes and drainage swales.

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2.4. Construction Site Estimates

The following are estimates of the construction site.

Total Project boundary: .....2,189.4 acres

Construction site area to be disturbed: .....18.79 acres

Percentage impervious area before construction:.....<1 %

Description of unique features that are to be preserved:

The anadromous reach of lower Sweetheart Creek downstream of the tailrace. Estuarine wetlands, designated es2, in the wetland delineation (Appendix L, Bosworth). This area will be marked and protected from Project traffic (construction and permanent)

Runoff coefficient before construction: ..... .10

Percentage impervious area after construction:.....<1 %

Runoff coefficient after construction ..... .10

2.5. Receiving Waters

Description of receiving waters: ..... Gilbert Bay

Description of storm sewer systems: ..... N/A

Description of impaired waters or waters subject to total maximum daily loads (TMDLs):

There are no impaired waters or TMDLs.

2.6. Site Features and Sensitive Areas to Be Protected

Sensitive sites and specific protections are:

- The anadromous reach of lower Sweetheart Creek adjacent to the new tailrace. This area will have the trails improved to avoid erosion.
- The anadromous reach of Sweetheart Creek just below the new tailrace. Powerhouse area drainage will be kept out of the reach (both during and after construction).

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2.7. Potential Sources of Pollution

Potential sources of sediment to stormwater runoff: Include suspended fines produced by exposed soils, rock excavation, and processing. Tunnel excavation, powerhouse excavation, dam site excavation, and associated work will produce sediments. Concrete construction activities will produce sediments.

Potential pollutants and sources, other than sediment, to stormwater runoff are listed in Table 1.

Table 1 Potential Pollutants and Sources Other Than Sediment

Trade Name Material	Stormwater Pollutants	Location
Diesel	Petroleum	Earthwork/Tunneling Equipment
Gas	Petroleum	Trucks and Boats
Oils and Lubrications	Petroleum	Equipment/Machinery
Aviation Fuels	Petroleum	Planes and Helicopters

2.8. Endangered Species Certification

Are endangered or threatened species and critical habitats on or near the project area?

☐ Yes ☒ No

2.9. Historic Preservation

Are there any historic sites on or near the construction site?

☐ Yes ☒ No

Describe how this determination was made:

Register of Historic Places and State Historic Preservations Office

2.10. Applicable Federal, Tribal, State, or Local Programs

None.

2.11. Maps

See the Storm Water and Pollution Prevention Plan (SWPPP) drawings, Attachment A (Section 8 of this Plan) sheets 1-7.

3.0 EROSION AND SEDIMENT CONTROL BMPS

3.1. Minimize Disturbed Area and Protect Natural Features and Soil

Only the areas necessary for construction activities and Project facilities will be disturbed during Project construction. All existing vegetation will be maintained

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wherever possible to minimize soil movement. Clearing activities will be limited to only those areas that can be graded and stabilized during that season. Disturbed areas will be revegetated after construction is complete, see Vegetation & Invasive Species Management Plan, Appendix Z, for details of planting, maintaining, and monitoring.

3.2. Phase Construction Activity

The construction on site will continue year around until completed. The Sweetheart Lake areas of dam and tunnel construction will be secured for the heavy snow and avalanche activity.

3.3. Control Stormwater Flowing onto and through the Project

The areas surrounding the Project have established native vegetation. Surface water that flows from higher elevations will be diverted around exposed soil and settling ponds.

3.4. Stabilize Soils

Exposed soils will be stabilized to prevent erosion. For further information, please reference the Project Spoil Disposal Plan (SDP) and the Vegetation Management Plan (VMP) (both in Appendix Z). Attached SWPPP drawings show the design for stabilizing the majority of Project soils on sheet 5, note 11 in Attachment A (in Section 8 of this Plan).

3.5. Protect Slopes

Exposed slopes that may erode will be protected using a combination of rock riprap and vegetation. Most Project excavation is in rock with drilling and blasting required. Most slopes will not produce sediment other than initial fines.

3.6. Protect Storm Drain Inlets

The only storm drain inlet will be inside the powerhouse switchyard, and it will be installed after all other construction is complete. It will drain to a sediment trap.

3.7. Establish Perimeter Controls and Sediment Barriers

Brush barriers, check dams, fence, and other methods with be utilized as sediment barriers and perimeter control. For further information, reference the attached SWPPP drawings, sheet 2.

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3.8. Retain Sediment On Site

All sediment collected on site will be stabilized, placed as fill, and covered with topsoil and vegetation.

3.9. Establish Stabilized Construction Exits

The construction site is remotely located where no vehicles or equipment can exit and track pollution outside the Project limits. Prior to barge shipment, equipment will be cleaned of sediment in an established area with containment.

3.10. Additional BMPs

Maintain check dams in effective condition. Perform maintenance on check dams as soon as possible if needed. If BMPs need modification, they will need to be modified before the next storm event. Remove sediment from ponds/traps when design capacity hits 50 percent.

Details are included in the SWPPP drawings with BMPs on sheets 1-7 in Attachment A (in Section 8 of this Plan).

Cofferdams will be installed to allow construction of the Sweetheart Lake dam and for the Sweetheart Creek tailrace. Both cofferdams will be constructed using rock-filled fabric bags to hold an impervious liner.

The cofferdam at the outlet of Sweetheart Lake will divert Sweetheart Creek into the diversion tunnel and around the construction site for the roller-compacted concrete (RCC) dam. Construction of the diversion cofferdam will be done with clean rock contained in 1-cubic-yard fabric bags placed onto the existing rock in the lake outlet. This process will generate minimal sediment. The impervious liner will be placed downstream of the bag diversion and will be protected with clean shot rock. The cofferdam at the downstream side of the dam will be constructed similarly with fabric bags on the downstream side and a liner and rock on the upstream side. This cofferdam will be left in place and inundated when the resovoir is filled.

The tailrace cofferdam will be installed at the junction of the tailrace and lower Sweetheart Creek. This cofferdam will keep Sweetheart Creek water out of the tailrace area during construction. The cofferdam will be constructed entirely of clean rock-filled fabric bags holding an impervious liner. The Sweetheart Creek area where this dam will be constructed is bedrock and clean rounded rock streambed, and no significant sediment is expected. Any water entering the tailrace construction area will be pumped by electric pumps into the powerhouse site to run into the settling ponds and discharge to Gilbert Bay. This cofferdam is expected to be used for 30 days of construction. Upon

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completion of the tailrace, this cofferdam will be removed and disposed of and materials reincorporated into other project elements.

To monitor the effectiveness of the above measures, daily monitoring of turbidity will be conducted upstream and downstream of active construction on Sweetheart Creek. The test results will be used to assess if water quality standards are being met, and if not, to adjust to appropriate controls quickly. These test will be conducted by the Environmental Control Monitor.

Transmission Towers: Measures will be developed in conjunction with JHI contractors and will be monitored by the ECM or designee.

Water Quality: Short-term construction phase shifts in pH, specific conductivity, and turbidity would be controlled by the following two-pronged approach.

1. Build the diversion tunnel and structure as designed to minimize the need to work within flowing water. Plan and schedule soil-disturbing work within the Project area to reduce and control sediment from the immediate work area to the extent practical. Measures will be reviewed and developed as neccesary in coordination with ECM and relavant regulatory agencies.

2. Execute construction work in all areas of soil-disturbing activities according to plan and in accordance with the Alaska Pollutant Discharge Elimination System Construction General Permit. Use procedural (e.g., construction phasing, etc.), as well as structural best management practices during construction. Measures will be reviewed and developed as neccesary in coordination with ECM and relavant regulatory agencies.

4.0 GOOD HOUSEKEEPING BMPS

4.1. Material Handling and Waste Management

Do not allow trash receptacles to be overfilled. Solid waste containment must be properly maintained to prevent spillage. For waste handling, storage, and disposal, refer to the Project Solid Waste and Wastewater Plan (SWWWP), Appendix Z.

4.2. Establish Proper Building Material Staging Areas

Areas are established and designated for building material storage and equipment on the attached SWPPP drawings for both Gibert Bay sites and Sweetheart Lake sites.

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4.3. Designate Washout Areas

Due to the remote location of the site, there will not be equipment or vehicles entering or leaving the Project limits. Equipment will be cleaned in the powerhouse site, and water will be treated in the sediment pond (SWPPP drawing 5 note 8).

4.4. Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Site equipment will be fueled by on-site lube and fuel trucks. The trucks will be outfitted with spill containment kits in case of emergencies.

4.5. Control Equipment/Vehicle Washing

Vehicles and equipment will not be washed on site on a regular basis. If equipment needs to be cleaned before demobilization, this activity shall take place in the powerhouse area near Staging Area #4 (sheet 5, area note 2) where all runoff will be collected and treaded as required in the sediment traps.

4.6. Any Additional BMPs

Please reference notes on sheets 1-7 SWPPP drawings in Attachment A (Section 8 of this Plan).

4.7. Allowable Non-Stormwater Discharge Management

Concrete wash and waste will be contained and discharged to the settlement pond adjacent to the powerhouse construction site.

5.0 SELECTING POST-CONSTRUCTION BMPS

Following the completion of the Project, the owner/developer will have a site presence to maintain the facility. Review of the grounds for erosion and stabilization will be one of the responsibilities of the facility manager.

6.0 INSPECTIONS

6.1. Inspection Personnel

Patrick McHugh – Certified Erosion Control Lead

Kurt Larson – Certified Erosion Control Lead

Joe Zech – Certified Erosion Control Lead

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Max Schillinger – Certified Erosion Control Lead

6.2. Inspection Schedule and Procedures

An inspection report shall be completed and posted in the site office. Inspections shall take place every 7 days. During rain events, inspections shall be made daily.

See Appendix E of this plan for a sample inspection report.

6.3. Delegation of Authority

Duly Authorized Representative(s) or Position(s):

Western Marine Construction, Inc. (WMC)
Patrick McHugh
2775 Harbor Ave. SW Suite A
Seattle, WA 98126
P: 206-622-9161; F: 206-622-9170

Attach a copy of the signed delegation of authority form in Appendix K of this plan.

6.4. Corrective Action Log

See Attachment F (in Section 8 of this Plan).for the Corrective Action Log.

7.0 RECORDKEEPING AND TRAINING

7.1. Recordkeeping

Records will be retained for a minimum period of 3 years after the permit is terminated.

7.2. SWPPP Amendment Log

See Attachment G (in Section 8 of this Plan) for the SWPPP Amendment Log.

7.3. Training

Individual(s) responsible for training are:

- Joe Zech – WMC, Certified Erosion and Sediment Control Lead
- Patrick McHugh - WMC, Certified Erosion and Sediment Control Lead

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See Attachment J (in Section 8 of this Plan) for training logs.

8.0 SWPPP APPENDICES

The following documentation is attached to this SWPPP:

- Attachment A – General Location Map and Site Map with BMPs
- Attachment B – General BMPs
- Attachment C – Construction General Permit
- Attachment D – Notice of Intent (NOI) and Acknowledgement Letter from EPA/State
- Attachment E – Inspection Reports
- Attachment F – Corrective Action Log
- Attachment G – SWPPP Amendment Log
- Attachment H – Subcontractor Certifications/Agreements
- Attachment I – Grading and Stabilization Activities Log
- Attachment J – Training Log
- Attachment K – Delegation of Authority

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8.1. Attachment E – Stormwater Construction Site Inspection Report

General Information			
Project Name	Juneau Hydropower		
NPDES Tracking No.		Location	Sweetheart Lake, AK
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			
Type of Inspection: ☐ Regular ☐ Pre-storm event ☐ During storm event ☐ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ☐ Yes ☐ No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ High Winds ☐ Other: Temperature:			
Have any discharges occurred since the last inspection? ☐ Yes ☐ No If yes, describe:			
Are there any discharges at the time of inspection? ☐ Yes ☐ No If yes, describe:			

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Site-Specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.

- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

Corrective Action Log

No.	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		☐ Yes ☐ No	☐ Yes ☐ No	
2		☐ Yes ☐ No	☐ Yes ☐ No	
3		☐ Yes ☐ No	☐ Yes ☐ No	
4		☐ Yes ☐ No	☐ Yes ☐ No	
5		☐ Yes ☐ No	☐ Yes ☐ No	
6		☐ Yes ☐ No	☐ Yes ☐ No	
7		☐ Yes ☐ No	☐ Yes ☐ No	
8		☐ Yes ☐ No	☐ Yes ☐ No	
9		☐ Yes ☐ No	☐ Yes ☐ No	
10		☐ Yes ☐ No	☐ Yes ☐ No	
11		☐ Yes ☐ No	☐ Yes ☐ No	
12		☐ Yes ☐ No	☐ Yes ☐ No	
13		☐ Yes ☐ No	☐ Yes ☐ No	
14		☐ Yes ☐ No	☐ Yes ☐ No	
15		☐ Yes ☐ No	☐ Yes ☐ No	
16		☐ Yes ☐ No	☐ Yes ☐ No	
17		☐ Yes ☐ No	☐ Yes ☐ No	
18		☐ Yes ☐ No	☐ Yes ☐ No	
19		☐ Yes ☐ No	☐ Yes ☐ No	
20		☐ Yes ☐ No	☐ Yes ☐ No	

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Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

Site Issues List

No.	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	☐ Yes ☐ No	☐ Yes ☐ No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	☐ Yes ☐ No	☐ Yes ☐ No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	☐ Yes ☐ No	☐ Yes ☐ No	
4	Are discharge points and receiving waters free of any sediment deposits?	☐ Yes ☐ No	☐ Yes ☐ No	
5	Are storm drain inlets properly protected?	☐ Yes ☐ No	☐ Yes ☐ No	
6	Is the construction exit preventing sediment from being tracked into the street?	☐ Yes ☐ No	☐ Yes ☐ No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	☐ Yes ☐ No	☐ Yes ☐ No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	☐ Yes ☐ No	☐ Yes ☐ No	
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	☐ Yes ☐ No	☐ Yes ☐ No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	☐ Yes ☐ No	☐ Yes ☐ No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ No	☐ Yes ☐ No	
12	(Other)	☐ Yes ☐ No	☐ Yes ☐ No	

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Noncompliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

_____

Signature: _____

Date: _____

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8.2. Attachment F – Corrective Action Log

Project Name: Juneau Hydropower, Inc. – Sweetheart Lake

SWPPP Contact: Patrick McHugh

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

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8.3. Attachment G – SWPPP Amendment Log

Project Name: Juneau Hydropower – Sweetheart Lake

SWPPP Contact: Patrick McHugh

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

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8.4. Attachment H – Subcontractor Certifications/ Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above-designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company _____

Address: _____

_____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____ Date: _____

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8.5. Attachment I – Grading and Stabilization Activities Log

Project Name: Juneau Hydropower – Sweetheart Lake

SWPPP Contact: Patrick McHugh

Date Grading Activity Initiated	Description of Grading Activity	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures are Initiated	Description of Stabilization Measure and Location

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8.6. Attachment J – Stormwater Pollution Prevention Training Log

Project Name:	Juneau Hydropower – Sweetheart Lake
Project Location:	Juneau, AK
Instructor's Name(s):	
Instructor's Title(s):	

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

☐ Erosion Control BMPs ☐ Emergency Procedures

☐ Sediment Control BMPs ☐ Good Housekeeping BMPs

☐ Non-Stormwater BMPs

Specific Training Objective: _____

_____

Attendee Roster: (attach additional pages as necessary)

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

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8.7. Attachment K – Delegation of Authority Form

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the Sweetheart Lake construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)

_____ (company)

_____ (address)

_____ (city, state, zip)

_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in _____ (Reference State Permit), and that the designee above meets the definition of a "duly authorized representative" as set forth in _____(Reference State Permit).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

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9.0 AGENCY COMMENTS:

FERC January 16, 2014, Comments on Subsequent Draft License, Attachment B-17 requested addition information regarding installation and disposition of construction cofferdams for dam and tailrace construction.

JHI has addressed these comments in the SWPPP drawings and the Construction Plan (Appendix Z of the PDEA).

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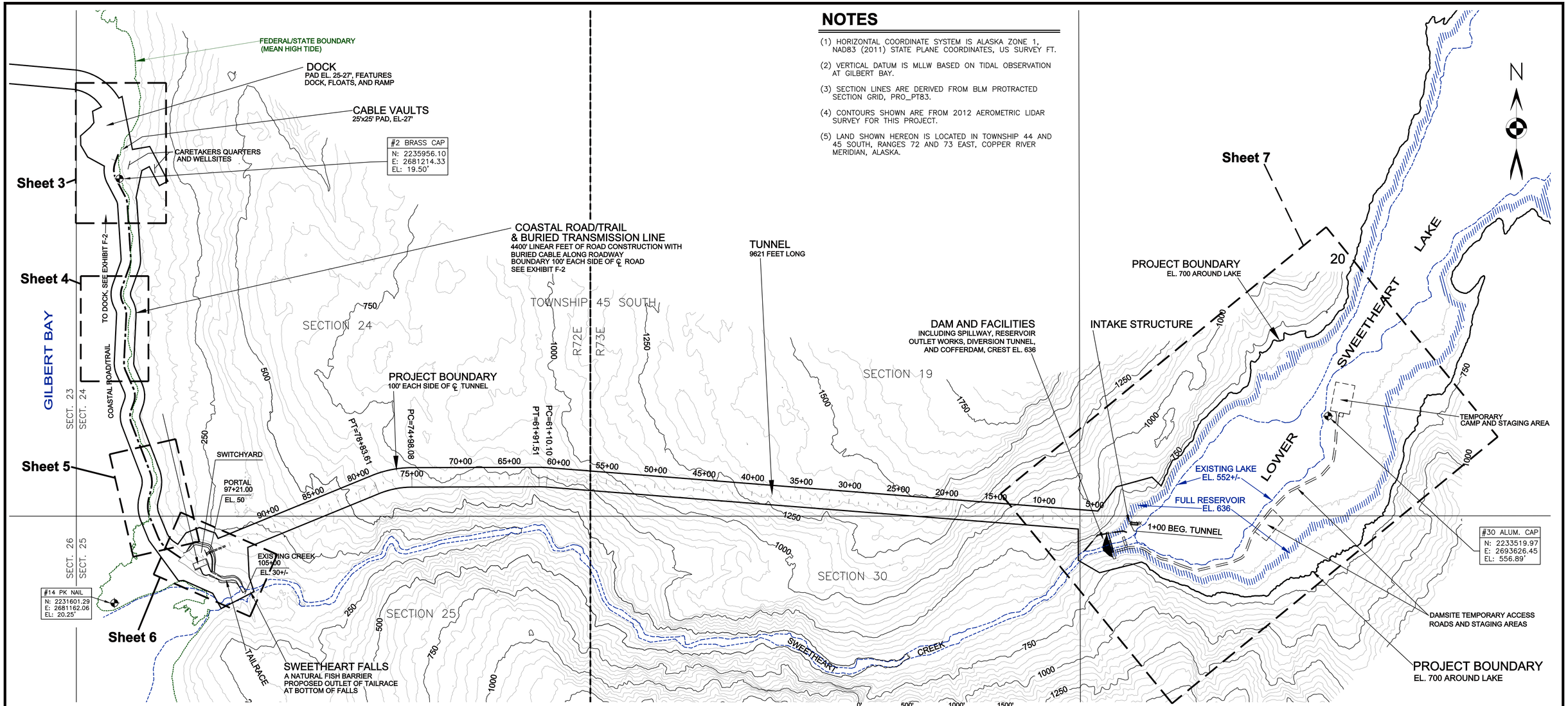

SITE OVERVIEW PLAN

NOTES

(1) HORIZONTAL COORDINATE SYSTEM IS ALASKA ZONE 1, NAD83 (2011) STATE PLANE COORDINATES, US SURVEY FT.

(2) VERTICAL DATUM IS MLLW BASED ON TIDAL OBSERVATION AT GILBERT BAY.

(3) SECTION LINES ARE DERIVED FROM BLM PROTRACTED SECTION GRID, PRO_PT83.

(4) CONTOURS SHOWN ARE FROM 2012 AEROMETRIC LIDAR SURVEY FOR THIS PROJECT.

(5) LAND SHOWN HEREON IS LOCATED IN TOWNSHIP 44 AND 45 SOUTH, RANGES 72 AND 73 EAST, COPPER RIVER MERIDIAN, ALASKA.

GENERAL PROJECT NOTES

1. Minimize Disturbed Areas to Protect Existing Vegetation
   Minimizing disturbed areas is not only one of the most effective erosion control BMP, but it is also consistent with Juneau Hydropower's overall philosophy to reduce environmental impacts and aesthetic change caused by the project.

2. Phase Construction Activities.
   The project will attempt to limit areas of disturbance only to places where construction activities are currently underway. This reduces the time that bare soil is exposed to the elements, thereby reducing the likelyhood of sediment transport. Exposed areas should be stabilized as soon as possible after the end of of immediate construction activities. This is not only consistent with Juneau Hydropower's philosophy, the permit requires stabilization within 14 days in portions of the site where construction activities have ceased.

3. Proactively Manage Storm Events.
   The project is situated in a very rainy climate. The project will plan for potential storm water by installing drainage diversions around major excavation sites, and adequately sizing culverts and sediment control BMPs for the climatic conditions. Sediment control BMPs include sediment traps, sediment basins, rock check dams, brush berms, and other materials. Being prepared and anticipating stormwater events is easier than attempting to repair failed BMP's during a storm events.

4. Utilize Natural BMPs where possible.
   The project will have preference in using onsite natural BMPs where possible is preferred over man-made BMPs. The site is remote, and has an abundance of natural vegetation and rocky soil. Where possible during excavations, toposoil and vegetation should be separated from rock such that the rock can be used in roads, ditchlines, check dams, and docks, and the topsoil can be re-applied to areas ready for final stabilization. Natural BMP's include rock check dams, brush barriers, and aggressive re-planting with native vegetation. Any non-biodegradable man-made BMP's shall be removed from the site at the completion of final stabilization.

5. Inspect and Maintain Erosion and Sediment Controls.
   The project will adequately inspect and maintain the installed BMPs, and take corrective action where required. Inspection and corrective actions for insufficient controls are part of the requirements of the Construction General Permit.

SHEET INDEX

1. SITE OVERVIEW PLAN
2. TYPICAL DETAILS
3. DOCK AND QUARRY PLAN
4. TYPICAL COASTAL ROAD/TRAIL PLAN
5. END OF COASTAL ROAD/TRAIL PLAN
6. POWERHOUSE SITE PLAN
7. LAKE LEVEL PLAN

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL® CPESC® #6537

Juneau Hydropower Inc.

PROJECT CONTACT:
DUFF MITCHELL
PO BOX 22775
JUNEAU AK. 99802
ph. 907-789-2775
fax. 907-375-2973

DATE: 4/2/2014

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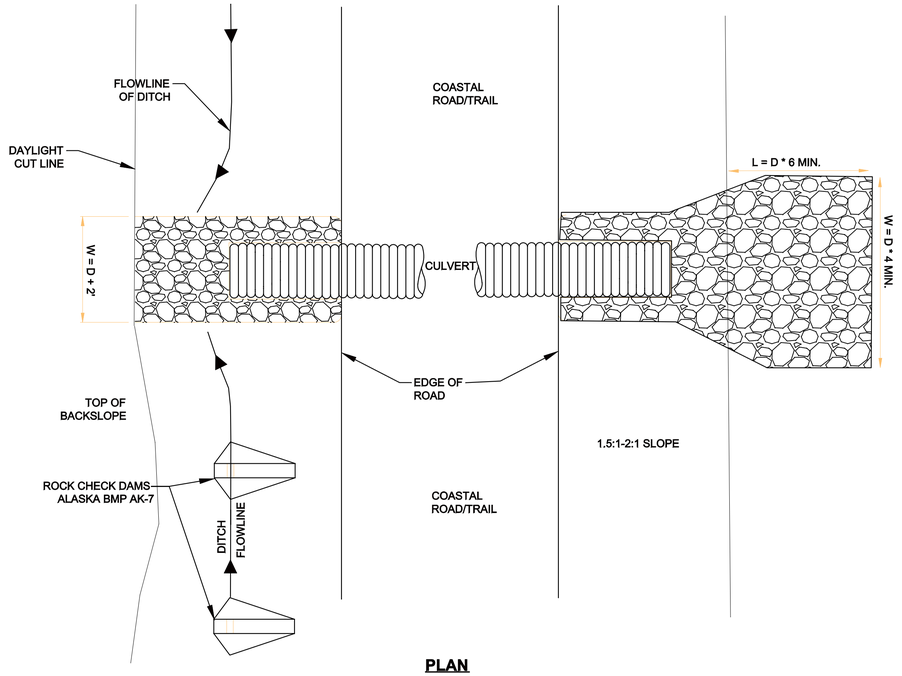
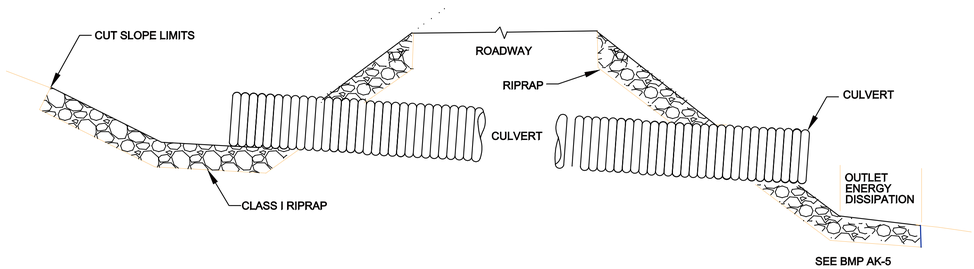
SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 1 OF 7
SITE OVERVIEW PLAN

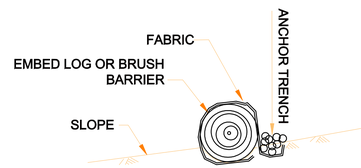


PLAN

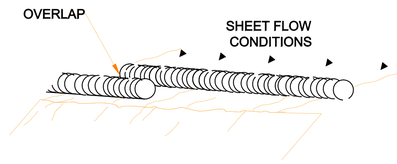


PROFILE

TYPICAL DITCH AND CULVERT PROTECTION
SEE ALASKA STANDARD BMP AK-2, AK-5, AK-6, AND AK-11



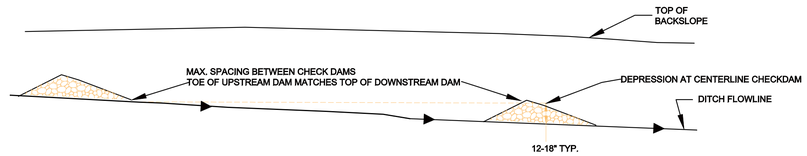
SECTION



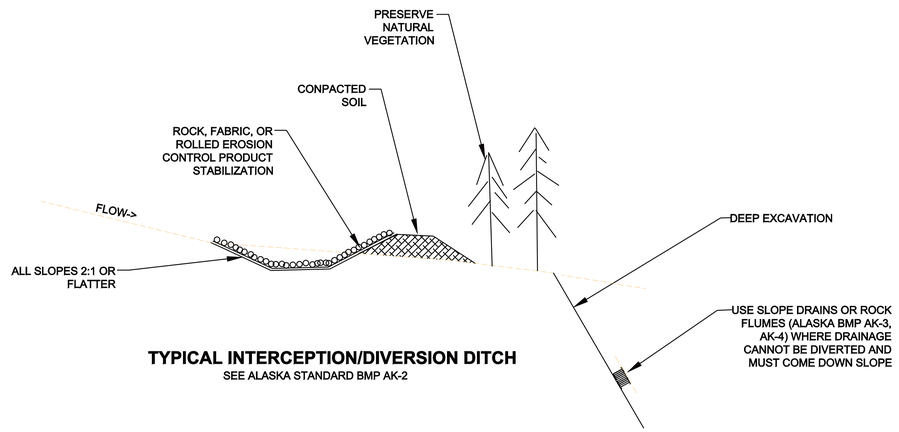
PERSPECTIVE

NOTE: APPLY LINEAR SEDIMENT BARRIERS ALONG EVEN CONTOURS, AND NEVER IN CONCENTRATED FLOW CONDITIONS. LINEAR SEDIMENT BARRIERS ARE INTENDED FOR SHEET FLOW CONDITIONS. IN AREAS OF CONCENTRATED FLOW, USE ROCK CHECK DAMS, SEDIMENT TRAPS, OR OTHER BMPs.

TYPICAL LINEAR SEDIMENT BARRIERS
SEE ALASKA STANDARD BMP AK-8, AK-18, OR AK-20



TYPICAL ROCK CHECK DAM PROFILE
SEE ALASKA STANDARD BMP AK-7



TYPICAL INTERCEPTION/DIVERSION DITCH
SEE ALASKA STANDARD BMP AK-2

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fax. 907-375-2973

DATE: 4/2/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 2 OF 7
TYPICAL DETAILS

SHEET 3 NOTES (including Alaska Standard BMP Number)

1. Dock is constructed with clean rock fill and will not be re-seeded. Construction materials, fuels, lubricants, etc. will be unloaded from barges, and non-stormwater BMP's such as inspection of offloaded materials will be necessary. (See all Alaska "good housekeeping" BMPs)

2. Caretakers area. Caretakers shop and lodging will be constructed. Site grading will be required. Topsoil will be spread on reconstructed slopes to allow re-vegetation. Reconstructed slopes will be graded at 2:1 (or flatter) to allow re-seeding and planting with trees. Rolled erosion control products may be required to prevent erosion until vegetation grows. (See BMP AK-10, AK-12, AK-14)

3. Caretaker's shop and lodging will require a water source for sanitation. A well site above the Caretakers area is shown. Construction to access the well site will be minimized and existing vegetation/topography will be preserved where possible. (See BMP AK-1)

4. Typical stream diversions above the excavation area will prevent surface water from running over exposed soil. (See BMP AK-6)

5. Where stream diversion drop slopes steep slopes, rock flumes or slope drains will be required to prevent erosion. (See BMP AK-3, AK-4)

6. Construction along Gilbert Bay is built with Rip-Rap and clean rock, see coastal road/trail typical section on sheet 4. Coastal Road/Trail is graded towards land such that runoff must pass trough sediment traps and check dams before exiting to Gilbert Bay. All culvert crossings will require inlet and outlet protection (See BMP AK-5).

7. Rock Check Dams and Sediment Traps as required (See Alaska AK-7, BMP AK-15)

8. Use linear sediment barriers throughout the construction process where required. They are effective in sheet flow conditions along level contours of gentle slopes (See BMP AK-18, AK-20)

PROJECT BOUNDARY
PROPOSED WATER SUPPLY FOR CAMP & RESIDENCE
WELL #1
WELL #2
WELL #3
APPROXIMATE CENTERLINE ROUTE OF BURIED ELECTRICAL AND WATERLINE TO 3 WELLS; EXCAVATION ACCESS TO CONTRUCT WELLS SHALL BE MINIMIZED.
FEDERAL LAND
STATE LAND
MHT=+15 (mllw datum)
PROJECT BOUNDARY
Buried Transmission Line
Diverted Flow
PROJECT BOUNDARY
EDGE OF WATER AT TIME OF SURVEY (EL. 4+/-)
MLLW EL. 0 (BASIS OF ELEVATIONS)
CABLE VAULTS PAD
25'x25' PAD, EL. 27+/-
TRANSMISSION LINE
SEE EXHIBIT F12
SUBMARINE TRANSMISSION LINE
ALASKA TIDELAND EASEMENT
ALASKA TIDELAND LEASE LIMITS
SEE DOCK DETAILS ON SHEET 2
GILBERT BAY
SEAPLANE FLOAT 20'x30'
LOADING FLOAT (24'x100')
RAMP (14'x100')
DOCK ALIGNMENT
PROJECT BOUNDARY
AK TIDELAND EASEMENT
AK TIDELAND LEASE
SEE TIDELAND NOTE
GILBERT BAY
PROJECT BOUNDARY
EL. 0 (=MLLW)
GILBERT BAY
PAD EL. 50
TRAIL
STEPS
BUILDING BACKFILLED TO EL. 35.0
24'x44' LODGING
SHOP PAD EL. 27.0
44'x48' SHOP
24'x44' LODGING
GARAGE ENTRANCE
COASTAL ROAD/TRAIL
17+98.77PT
17+15.45PC
15+13.59PT
MHT=+15
PROJECT BOUNDARY
EDGE OF WATER AT TIME OF SURVEY (EL. 4+/-)
CULVERT NOTE
TYPICAL SHEETS 3--7: CULVERT CROSSING LOCATIONS AND DETAILS TO BE SPECIFIED BY THE PROJECT ENGINEER AT A LATER DATE.

0' 40' 80' 120'

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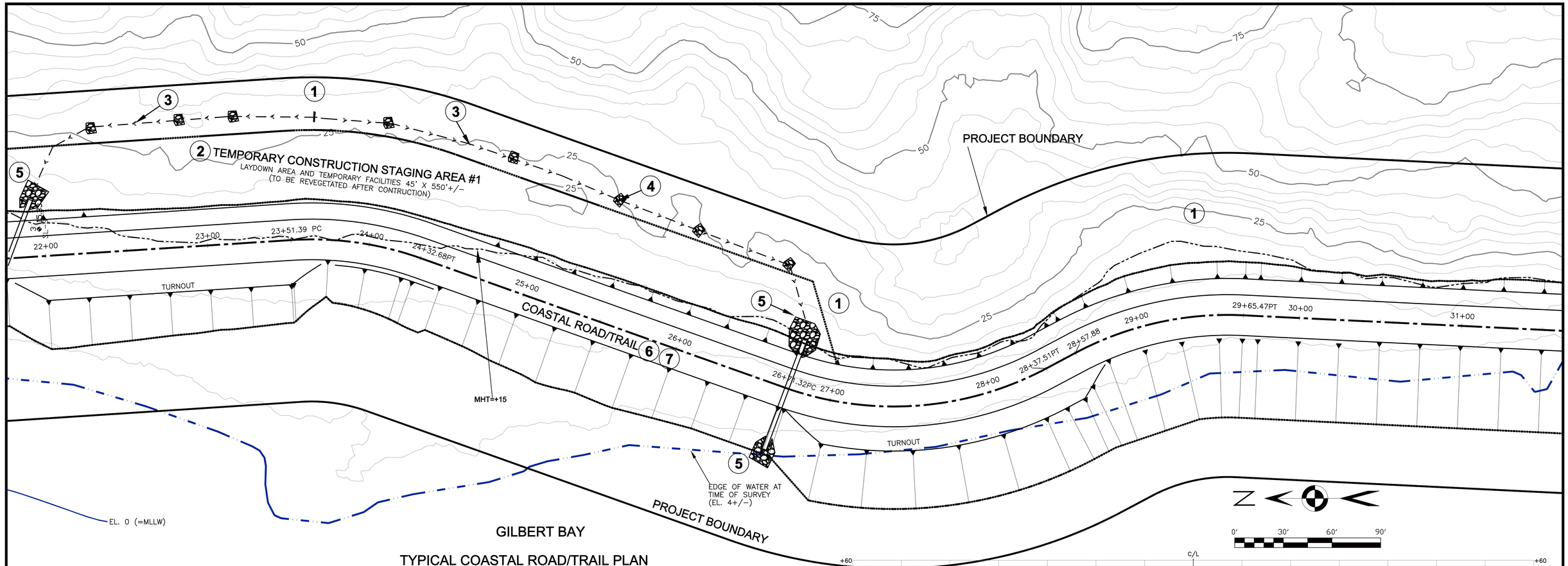
PO BOX 22775
JUNEAU AK. 99802
ph. 907-789-2775
fax. 907-375-2973

DATE: 5/4/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

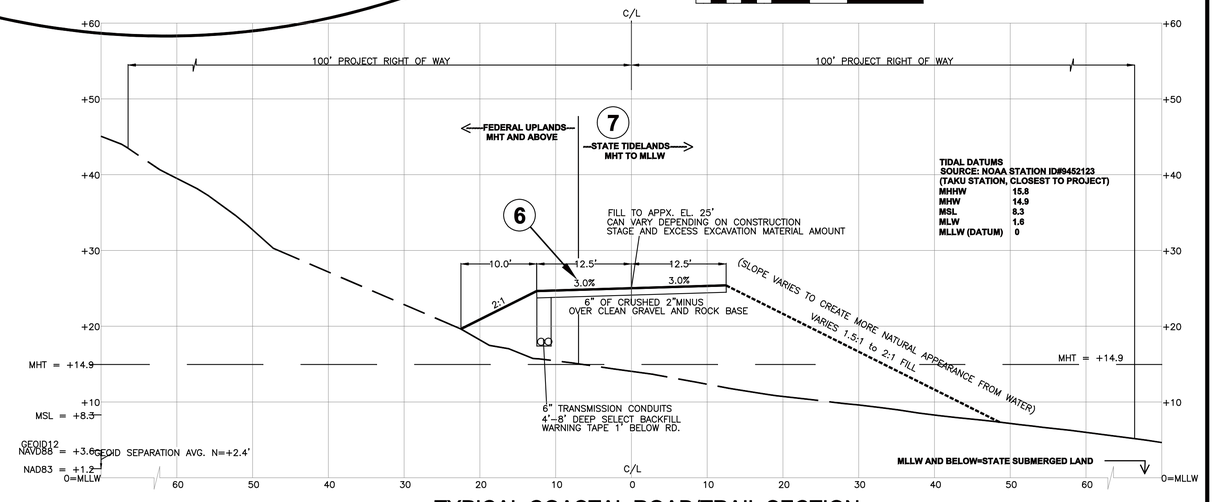
SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 3 OF 7
MARINE ACCESS AREA PLAN



GILBERT BAY

TYPICAL COASTAL ROAD/TRAIL PLAN



TYPICAL COASTAL ROAD/TRAIL SECTION

SHEET 4 NOTES (including Alaska Standard BMP Number)

1. Preserve existing vegetation wherever possible. (See BMP AK-1)
2. This staging area is temporary, to be re-seeded and re-planted after construction. All materials storage and good housekeeping BMP's apply.
3. Divert drainage around pad (See BMP AK-2)
4. Rock Check Dams and Sediment traps in areas of concentrated flow (See BMP AK-7, AK-15)
5. Inlet/outlet protection required for all culverts (See BMP AK-5)
6. Road is graded towards land such that runoff can be intercepted in ditchlines and rock check dams. This also lessens the visual impact of the road as viewed from Gilbert Bay.
7. Road is constructed with clean rock fill predominantly on State tidelands. This measure helps reduces road areas on U.S. forest service land, and lessens the vegetative impact of the road (thereby reducing land erosion).

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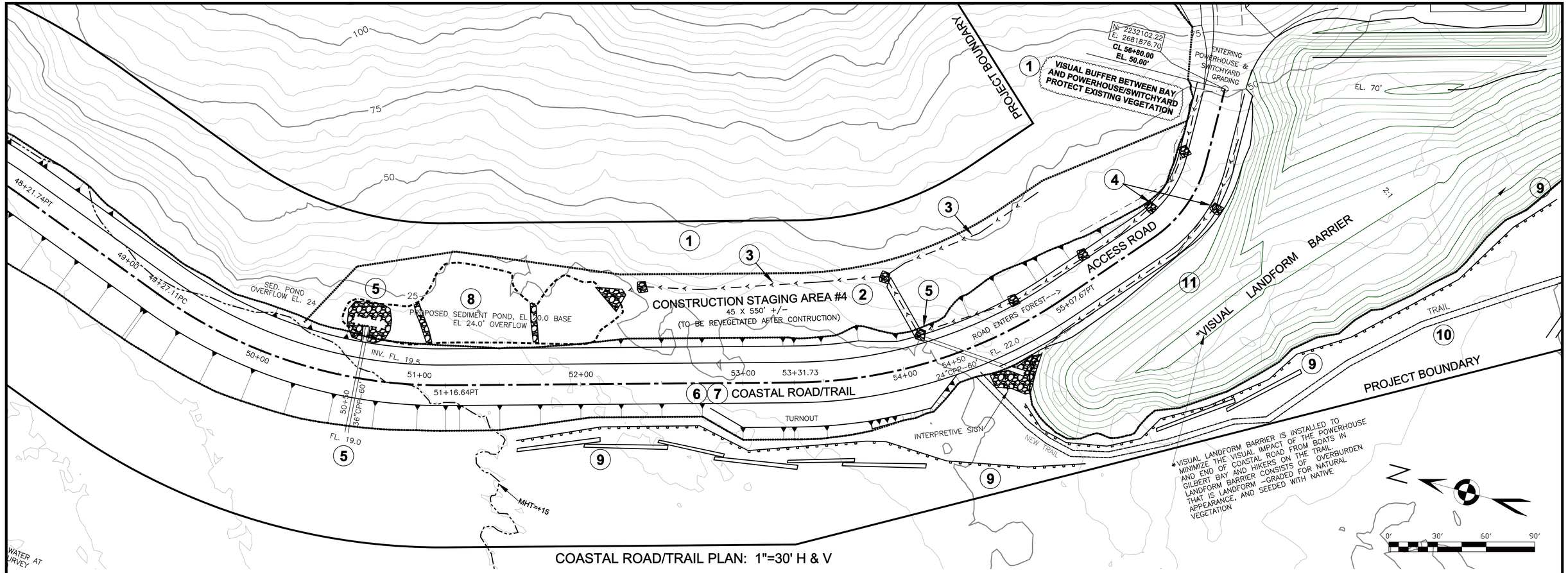
DATE: 4/2/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 4 OF 7
TYPICAL COASTAL ROAD/TRAIL PLAN



COASTAL ROAD/TRAIL PLAN: 1"=30' H & V

SHEET 5 NOTES (including Alaska Standard BMP Number)

(1) Preserve existing vegetation wherever possible. This is especially important in the end of the road area as it is the primary visual buffer of the powerhouse and switchyard. (See BMP AK-1)

(2) This staging area is temporary, to be re-seeded and re-planted after construction. All materials storage and good housekeeping BMP's apply.

(3) Divert drainage on towards sediment pond (See BMP AK-2)

(4) Rock Check Dams and Sediment traps in areas of concentrated flow (See BMP AK-7, AK-15)

(5) Inlet/outlet protection required for all culverts (See BMP AK-5)

(6) Road is graded towards land such that runoff can be intercepted in ditchlines and rock check dams. This also lessens the visual impact of the road as viewed from Gilbert Bay.

(7) Road is constructed with clean rock fill predominantly on State tidelands. This measure helps reduces road areas on U.S. forest service land, and lessens the vegetative impact of the road (thereby reducing land erosion).

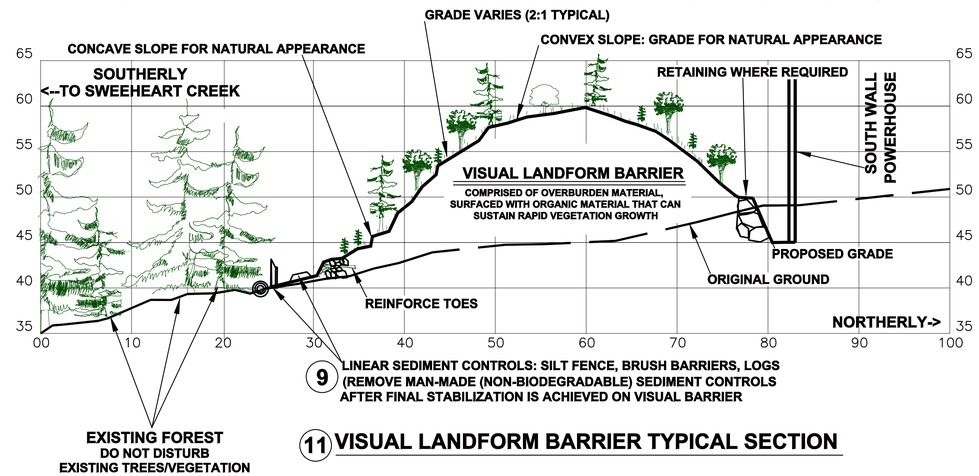
(8) Sediment Pond Area, water velocity in pond must be slowed enough to allow suspended sediment to settle on bottom of the pond. Upon completion of project and final stabilization. Sediment pond can be a permanent BMP of the project.

(Continued)

(9) Use linear sediment barriers throughout the construction process where required. Linear sediment barriers include silt fence, wattles, brush barriers, and other structures that follow the contours. Remove non-biodegradable linear barriers once their use is not required. They are effective in sheet flow conditions along level contours of gentle slopes. Excess logs can be embedded in landscape for natural appearance. (See BMP AK-18, AK-20)

(10) Trail improvements are defined on the Recreation Plan and Drawings which were created in correspondance with the U.S. Forest Service. Do not disturb existing vegetation along trails.

(11) Visual Landform Barrier, See Typical Section



11 VISUAL LANDFORM BARRIER TYPICAL SECTION

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DATE: 3/2/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 5 OF 7
END OF COASTAL ROAD/TRAIL PLAN

TUNNEL
15' HORSESHOE TO LAKE

Re-Seed and Plant Trees on Bench

PROJECT BOUNDARY

SWITCH YARD

POWERHOUSE

SMOLT RE-ENTRY ACCLIMATION POOL

VISUAL BUFFER BETWEEN BAY AND POWERHOUSE/SWITCHYARD PROTECT EXISTING VEGETATION

N= 2531105
E= 2581876.30
CL 55+90.00
EL. 50.00'

ENTERING POWERHOUSE-SWITCHYARD & GRADING

ACCESS ROAD
55+07.67PT

EL. 70'

*VISUAL LANDFORM BARRIER

2:1

TRAIL

EXISTING TRAIL

100' SPUR TRAIL

70' SPUR TRAIL

SWEETHEART FALLS

SWEETHEART CREEK

305 189.26 rebar
304 148.85 rebar
303 142.87 nail
108 101.04 spk
107 59.44 spk
108 59.74 spk
104 48.70 rebar
106 40.39 rebar
116 18.68 rebar
105 26.93 pk
113 21.27 pk

0' 30' 60' 90'

N

*VISUAL LANDFORM BARRIER IS INSTALLED TO MINIMIZE THE VISUAL IMPACT OF THE POWERHOUSE AND END OF COASTAL ROAD FROM BOATS IN GILBERT BAY AND HIKERS ON THE TRAIL. LANDFORM BARRIER CONSISTS OF OVERBURDEN THAT IS LANDFORM —GRADED FOR NATURAL APPEARANCE, AND SEEDED WITH NATIVE VEGETATION

SHEET 6 NOTES (including Alaska Standard BMP Number)

1. Preserve existing vegetation along trail. (See BMP AK-1)
2. Divert water around excavations. (See BMP AK-2)
3. Slope Drain or Rock Flume on steep diversions. (See BMP AK-3, AK-4)
4. Use Rock Check Dams in areas of concentrated flow. (See BMP AK-7)
5. See previous page for Visual Landform Barrier Typical Section.
5. See previous page for Visual Landform Barrier Typical Section.
6. Linear sediment barriers include silt fence, wattles, brush barriers, as described on previous page (See BMP AK-18, AK-20)
7. Tailrace wildlife crossing. Cut in tailrace, install culverts and re-cover to original topography. Re-deed and plant with native trees.
8. Tailrace open excavation will be constructed with riprap to prevent erosion.

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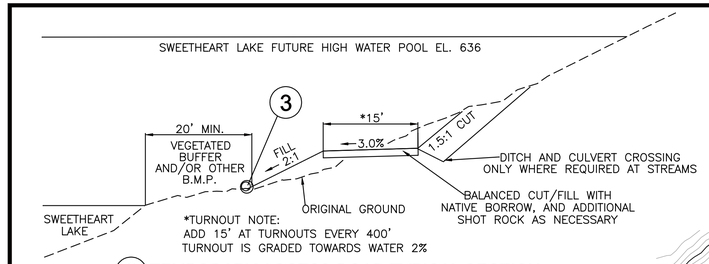
DATE: 4/2/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 6 OF 7
POWERHOUSE AREA PLAN



2 TEMPORARY ACCESS ROAD TYPICAL SECTION

EL. 636'

EL. 700 AROUND LAKE PROJECT BOUNDARY 1

EXISTING STREAMS

#30 ALUM. CAP
N: 2233519.97
E: 2693626.45
EL: 556.89'

TEMPORARY CONSTRUCTION STAGING AREA "C" AND TEMPORARY CAMP 6

HELIPAD

PROJECT BOUNDARY

EXISTING LAKE EDGE

SUBMERGED ANCHOR AND MOORING BUOY

SPACE FOR BOAT ACCESS AROUND LOG BOOM

TUNNEL

TEMPORARY CONST. STAGING AREA "A" 6

INTAKE STRUCTURE AND TUNNEL

PERMANENT RAMP INTO RESERVOIR FOR ACCESS

DIVERSION TUNNEL

DAM & COFFERDAMS

LOWER SWEETHEART LAKE

800' LOG BOOM

HIGH OPERATING POOL LEVEL=
DAM SPILLWAY CREST ELEVATION 636.00'

LAND ANCHOR

TEMPORARY CAMP ACCESS ROAD
SEE TYPICAL SECTION

EXISTING LAKE OUTLET
MLLW EL. 551+/-

TEMPORARY CAMP ACCESS ROAD
SEE TYPICAL SECTION

EXISTING LAKE EDGE

2 SEE TYPICAL SECTION

TEMPORARY CONSTRUCTION STAGING AREA "B" 6

EL. 700 AROUND LAKE PROJECT BOUNDARY

SHEET 7 NOTES (including Alaska Standard BMP Number)

1. Preserve existing vegetation above el. 650 is Mandatory as that is the project limits. Below el. 636 (lake high fill line), vegetation preservation near excavations will reduce sediment load into the lake. (See BMP AK-1)
2. Temporary access road provides access to laydown area and camp and will be inundated when project is complete.
3. Use linear sediment controls along roadway, such as brush barrier (BMP AK-20). Preserve a vegetative buffer between road and surface waters to allow for sediment mitigation and minor spill response.
4. Divert water around laydown pads (See BMP AK-2)
5. Use inlet and outlet protection, and sediment traps as necessary (See BMP AK-15)
6. All materials storage ("Good Housekeeping") BMPs apply to laydown areas.

N

0' 100' 200' 300'

SCALE: 1"=100' (22"x34" sheet)

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DATE: 4/2/2014

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563

SWPPP

STORMWATER POLLUTION CONTROL DRAWINGS
SHEET 7 OF 7
LAKE LEVEL PLAN

SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

FIRE PREVENTION PLAN (FPP)

PREPARED BY:

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Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FIRE PREVENTION PLAN (FPP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: h) Fire Prevention Plan (FPP). JHI concurs and is submitting this preliminary Fire Prevention Plan with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and

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communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

2.1. Appendix Z – JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

Solid Waste and Wastewater Plan (SWWP)

Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)

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B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 FIRE PREVENTION PLAN (FPP) INTRODUCTION

This document provides a description of the means and methods that will be used to construct the Sweetheart Lake Hydroelectric Project (Project) described in the prior section. JHI and its contractors will comply with all permits and federal, state, and local laws.

4.0 FIRE PREVENTION PRACTICES

The following are the fire prevention practices that will be used during Project construction and will apply to all open-flame activities:

- During high fire danger periods resulting from weather conditions, any spark-emitting equipment operation may be suspended, and campfires will be prohibited.
- Smoking and building of any fires will be prohibited, except at the established construction camp, locations for slash spoil disposal, and other safe locations.
- Burning of slash or other woody debris will require written approval from the Forest Service.
- There will be no burning of plastics, garbage, petroleum products on or near the Project site. Discarding of matches or cigarettes is prohibited; they must be carried off the construction site and discarded in a safe receptacle.
- Construction personnel will initiate fire suppression immediately if the fire is small (i.e., of manageable size) and personnel can remain safe.

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- JHI shall restrict operations in accordance with the Emergency Fire Precautions Schedule (Table 1 in Section 7.0 of this FPP).

- Personnel shall follow the fire reporting instructions in the Section 6.0 of this FPP.

5.0 PREDICTED FIRE PRECAUTIONS CLASS

JHI shall obtain the predicted Fire Precautions Class (B.C. Fire Danger Ratings) from:

Juneau Ranger District
8510 Mendenhall Loop Road
Juneau, AK 99801
District Ranger: Chad VanOrmer
Phone: 907-586-8800 Voice; 907-790-7444 TTY
Fax: 907-586-8808

Capital City Fire/Rescue
820 Glacier Avenue
Juneau, AK 99801
Phone: 911, or Non-Emergency: 907-586-5322
Fax: 907-586-8323

6.0 FIRE REPORTING

JHI shall provide and maintain a communication system during a Fire Precautionary Period.

In the event of a fire, construction personnel will contact the agencies below. JHI manager Duff Mitchell will also be notified of any fire.

Tongass National Forest Office
8510 Mendenhall Loop Road
Juneau, AK 99801
907-586-8800

Capital City Fire/Rescue
820 Glacier Avenue
Juneau, AK 99801
Phone: 911, or Non-Emergency: 907-586-5322

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7.0 EMERGENCY FIRE PRECAUTIONS

The following fire precautions (shown in Table 1) for the appropriate class will be followed:

Table 1 Emergency Fire Precautions Schedule

Fire Precaution Class ***B.C. Fire Danger Rating***	**Fire Precautions**
M.A.C. I & M.A.C. II *B.C. - Low*	Normal fire precautions only. Spark arresters installed. Necessary fire equipment at each site. Communications available. *Low fire danger.*
M.A.C. III *B.C. - Moderate*	All prior fire precautions required. No warming or lunch fires permitted. Power saw operators required to carry fire extinguishers. Smoking materials permitted only in designated areas. A shovel and pulaski at each site. *Carry out any forest activities with caution.*
M.A.C. IV *B.C. - High*	All prior fire precautions required. Shut down all equipment without spark arresters, from 1200 (12 p.m.) until 2000 (8 p.m.) local time. *Fire hazard is serious. Extreme caution must be used in any forest activities. Burning permits and industrial activities may be restricted.*
M.A.C. V *B.C. - Extreme*	Shut down all operations. *Extremely high fire hazard. General forest activities may be restricted, including burning permits, industrial activities and campfires.*

7.1. Fire Prevention and Suppression Equipment Requirements

Following are the minimum fire protection/suppression equipment requirements:

- A fire extinguisher, Class A type, will be on hand to address any fire started by Project construction. A Class A type fire extinguisher is meant for organic material such as wood, paper, etc.

- In addition to having a fire extinguisher on hand, the following tools (Table 2) per number of workers will also need to be on hand.

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Table 2 Required Tools per Number of Personnel

Kind of Tool	Number of People Working in Area			
	1-4	5-9	10-15	16-20
Axe, double blade, chopping, 32 inches (800 millimeters) minimum length handle	1	1	2	3
Shovels, L.H., R.P. #0 or larger	1	3	6	7
Pulaski, 32 inches (80 centimeters [cm]) minimum length handle	2	3	7	10
File, 10 inches (25 cm)	1	1	1	2
Pumps, backpack cans, 5 gallons (19 liters) filled with water	1	2	2	3

- Backpack cans shall be located inside or immediately adjacent to the toolbox in a safe, readily available area.
- Fire tools shall be placed at the following locations:

  a. Each construction campsite.

  b. Each operating site, where mechanized equipment is operating.

- Each internal combustion engine (e.g., chainsaw, excavator) shall be equipped with a spark arrester qualified and rated under Forest Service Standard 5100-1.
- Each gasoline power saw shall be provided with one chemical-pressurized fire extinguisher of not less than 8-ounce capacity by weight. The extinguisher shall be maintained in good working order and will remain on the worksite at all times.
- During periods of critical fire danger, additional precautionary measures, such as a round-pointed shovel, may be required when such saws are used. Any fueling of power equipment shall be done in an area that has first been cleared of material that will carry fire; fueling will take place via fuel truck using guidelines proposed in the Hazardous Substances Plan (HSP) (in Appendix Z of the PDEA). Fueling will take place in cleared areas where woody fuels are not within 3 feet.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

HAZARDOUS SUBSTANCES PLAN (HSP)

PREPARED BY:

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Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

HAZARDOUS SUBSTANCES PLAN (HSP)

1.0 AGENCY PLAN REQUESTS

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extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

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- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)

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B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 HAZARDOUS SUBSTANCES PLAN (HSP)

This HSP is meant to address hazardous substances storage and spill prevention and cleanup. This HSP outlines JHI's procedures for reporting and responding to releases of hazardous substances, including names and phone numbers of all emergency response personnel.

3.1. Policies

JHI's policies, set forth in this HSP, are that the following will be done to ensure hazardous substance safety on site:

- Ensure that Forest Service Best Management Practices (BMPs) are observed to help prevent spills

4.0 SPILL PREVENTION AND COUNTERMEASURE PROCEDURES

4.1. Past Spill Experience

This is a new facility, and JHI has no spill history.

5.0 Current Procedures

JHI will ensure that an approved Hazardous Substances Plan (HSP) is in place for construction and that all personnel receive training in spill prevention procedures. The purpose of this plan is to track materials on-site, ensure proper transportation, storage, use, and disposal. Another purpose is to prepare for incidents that may involve the materials including spills and fire. This includes assuring that response materials and

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safety equipment are readily available and personnel are trained to respond correctly. Another important function of the plan is to document and correctly report incidents.

In the event of a spill during construction, the general course of action will be:

- First – minimize or stop the spill and contain the product safely
- Second – report the spill to appropriate agency
- Third – clean up the spill
- Fourth – document the spill (nature, location, time, date, size, action taken)
- Fifth – take appropriate measures to prevent further spills

5.1. Notification of Hazardous Materials and Response Available

JHI will annually inform the U.S. Forest Service (Forest Service) of the location of the spill cleanup equipment on National Forest System lands and of the location, type, and quantity of oil and hazardous substances stored in the Project area

5.2. Notification of Incident Reporting

JHI will inform the Forest Service immediately of the nature, time, date, location, and action taken for any spill affecting National Forest System lands and Licensee (JHI) adjoining fee title property.

Additional agencies to be notified in the event of a major spill or discharge are listed below. Some reporting is mandatory and requires immediate notification. Details and report forms will be in the HSP. The JHI contact information is listed below the agency details.

5.2.1. Agency Contact Information

Alaska Dept. of Environmental Conservation (ADEC)	(907) 465-5340
ADEC Spill Response Center	(800) 478-9300
U.S. Forest Service, Juneau Ranger District	(907) 586-8800
U.S. Environmental Protection Agency, Alaska Operations Office	(907) 586-7619

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5.2.2. JHI Contact Information

JHI Response Personnel – Juneau Office	(907) 789-2775
Duff Mitchell – Business Manager	(907) 723-2481

5.3. Hazardous Material Best Management Practices (BMPs)

The following are the hazardous material best management practices that will be used to reduce the risk of spill or other accidental exposure of materials.

5.3.1. Good Housekeeping

The following good housekeeping practices will be followed on site during the construction project:

- An effort will be made to store only enough hazardous products to do the job;
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers;
- Products will be kept in their original containers with the original manufacturers' labels;
- Manufacturers' recommendations for proper use and disposal will be followed;
- The site will be inspected daily to ensure proper use and disposal of materials.
- Fueling will be conducted in accordance with safe operating practices to minimize the potential for spills.

5.3.2. Hazardous Products

These practices are used to reduce the risk associated with hazardous materials:

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets will be retained on site
- If surplus product must be disposed of, manufacturers' approved methods for proper disposal will be followed.

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6.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

Alaska DFG commented on January 20, 2014, that a Hazardous Substances Plan was necessary to prevent and minimize any impacts associated with the handling of hazardous substances during construction and operation. The Alaska DFG stated that petroleum products can have a significant adverse impact on aquatic resources.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

HERITAGE RESOURCE PLAN (HRP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

HERITAGE RESOURCE PLAN (HRP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: i) Heritage Resources Protection Plan. JHI is submitting this preliminary Heritage Resource Protection Plan (HRP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and

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communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

2.1. Appendix Z – JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

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Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 HERITAGE RESOURCE PROTECTION PLAN (HRP)

JHI has conducted archaeological surveys in the Project Area and within the surrounding area. This plan is limited to the Project Boundaries. JHI shall not initiate any work other than that specifically authorized in this license unless it has (1) consulted with the Forest Service, the State Historic Preservation Officer (SHPO), and Douglas Indian Association (DIA), (2) conducted a cultural resources survey of these areas, and (3) obtained approval from consulting agencies.

No significant cultural resources were located within the Project construction area and the Area of Project Effect (APE) at the time of the archaeological surveys.

JHI shall make the Project area available for reconnaissance with a designated member of the DIA, if requested.

4.0 CULTURAL RESOURCE POLICIES

4.1. Cultural Resource Discoveries

If JHI discovers any previously unidentified cultural resources during Project construction, the Forest Service archaeologist, SHPO and DIA will be notified immediately. JHI shall immediately stop all land clearing, land disturbing, or spoil-producing activities in the vicinity of any discovery. If JHI discovers any previously unidentified cultural resources not in the path of construction, but within the APE, JHI shall safeguard and discreetly identify the site and immediately contact the Forest Service, SHPO, and DIA. However, an inadvertent discovery that is off the path of a construction activity will not in itself require a stop of construction unless mutually agreed to by JHI and consulting parties.

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4.2. Ground Disturbance during Construction and Operation

Potential Project-related effects on cultural resources include the direct and indirect ground disturbance or alteration due to Project facilities, including the penstock and powerhouse footprints, temporary and permanent access roads, and transmission line. Because archaeological materials, features, and other potentially significant cultural remains are commonly buried, they may not be identifiable from the surface or revealed in limited subsurface sampling.

Should indications of potentially significant cultural resources be encountered during ground-disturbing activities, procedures as outlined in this plan shall be executed.

4.3. Hazardous Materials, POLs, Contamination of Cultural Resources

Any reportable spills as defined in 40 Code of Federal Regulations (CFR) 110 will be reported as required. The contractor would be required to comply with the Hazardous Substances Plan (HSP) (in Appendix Z of the PDEA) to address use of any hazardous material, including petroleum, oil, and lubricants (POLs), during Project construction. The HSP details measures to control discharges of such materials into waters of the United States. It is anticipated that appropriate response will limit impacts of any accidental spills and that cultural resources would be unlikely to be affected. Overall impacts of spills to buried or unknown cultural resources are considered to be minor to negligible in the Project area.

4.4. Illicit Artifact Collection

A program of worker education and contractor operating requirements is an effective method to prevent illicit artifact collection by unauthorized personnel. JHI requires construction contractors and their subcontractors to adhere to a condition that prohibits workers from damaging, removing, or destroying cultural resources. Before site work begins, a worker education-orientation program about cultural resources will be conducted to provide the tools for workers to know their responsibilities and to identify cultural resources for avoidance until a cultural resource specialist can examine the materials.

Newly hired employees and contractors will receive a Heritage Resources Briefing that explains that any employee or contractors conducting or participating in illicit artifact collection can be terminated from employment or lose their contract, as well as the possibility of legal action taken against any such employee or contractors.

4.4.1. Human Remains/Burials

Alaska state law governs the procedures to be followed in the event of a human remains discovery, regardless of land status. JHI shall use the State of Alaska Guidelines

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on inadvertent discovery/human remains protocol to follow in the event of the inadvertent discovery of cultural resources or human remains. The Guidelines are included as Section 6.0 of this Plan. The internal procedure is as follows:

- Workers and supervisors are to follow and adhere to a communications tree with contact names and numbers. A copy of contact numbers will be located in contractor and employee sleeping quarters' common areas. (See Section 6.3 of this document for contact names and phone numbers.)

- Familiarization with the procedures would be included in worker orientation (Heritage Resources Briefing) and made part of the contractor operating requirements.

- In the event that human remains or other indications of burials are found on federal or tribal lands during ground-disturbing activities, the protocol established under the Native American Graves Protection and Repatriation Act (NAGPRA) must be followed. In all cases, JHI and contractors would take immediate steps to secure and protect the human remains and cultural items, including stabilization or covering, as appropriate.

- JHI's Construction Manager would immediately notify the Alaska State Troopers and follow the Alaska Guidelines and Protocol (Section 6.0 of this Plan) for reporting remains. JHI would also contact the SHPO, FERC, and the DIA (a federally recognized tribe likely to be culturally affiliated with the discovered remains).

4.5. Memorandum of Understanding (MOU)

If cultural resources are encountered during Project construction ground disturbance and impacts to the resources cannot be avoided, JHI shall first take protective actions of the site and then as a first measure develop a Memorandum of Understanding (MOU) in consultation with the SHPO, Forest Service, and the DIA to mitigate any adverse effects. Signatories on the MOU will be the Forest Service, Douglas Indian Association, the Licensee (JHI), and the SHPO.

As a secondary measure, and if appropriate and requested by all parties, a Cultural Resource Management Plan may be developed by a qualified cultural resource management specialist in conjunction with the Forest Service and DIA and will be submitted to SHPO for concurrence. Thereupon, JHI shall file for Commission approval of any produced Cultural Resource Management Plan. Development of a future Cultural Resource Management Plan, if any, will not preempt in itself work or create a construction work stoppage in areas unaffected at the site, but JHI, with consultation of consulting parties, will implement a temporary plan to protect and safeguard any inadvertent discovery.

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The MOU will be incorporated by JHI into the developed Cultural Resource Management Plan (if required) and will include instructions to mitigate current and future adverse effects to cultural resources. The MOU and Cultural Resource Management Plan, if appropriate and required, shall list procedures to document any discoveries in a report that shall contain the following:

- Documentation of each site discovered.
- An evaluation of National Register eligibility of each site discovered.
- A description of the potential effect on each discovered site.
- Proposed measures for avoiding or mitigating the effects to each site.
- Documentation of the consultation with all interested parties.
- A schedule for mitigating effects and conducting additional studies.

JHI shall not begin land-clearing, land-disturbing, or spoil-producing activities other than those specifically authorized in this license.

Newly hired employees will receive a Heritage Resources Briefing that will cover all elements of this HRP and will provide a chain of command to report any inadvertent finds. The employee Heritage Resources Briefing will be documented and recorded.

5.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

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6.0 GUIDELINES: LAWS AND PROTOCOLS PERTAINING TO THE DISCOVERY OF HUMAN REMAINS IN ALASKA

This document is from the State of Alaska[1] and is current as of 1/27/14

The treatment of human remains following inadvertent discovery is governed by state and federal laws, land status, postmortem interval (time since death), and biological/cultural affiliation. First and foremost, the site of discovered remains should be regarded a potential "crime scene" until a person with appropriate expertise and authority determines otherwise.

6.1. State Laws

Several State laws are applicable to the discovery of human remains in Alaska. The State Medical Examiner (SME) has jurisdiction over all human remains in the state (with rare exceptions, such as military aircraft deaths), regardless of age.

AS 12.65.5 requires immediate notification of a peace officer of the state (police, Village Public Safety Officer, or Alaska State Trooper [AST]) and the State Medical Examiner when death has "been caused by unknown or criminal means, during the commission of a crime, or by suicide, accident, or poisoning."

In this regard, contact the AST Missing Persons Bureau first. (See list of contacts on following page.) The AST has interpreted notification procedures as applicable to all remains, including ancient remains.

AS 11.46.482(a)(3), which applies to all lands in Alaska, makes the "intentional and unauthorized destruction or removal of any human remains or the intentional disturbance of a grave" a class C felony.

AS 41.35.200, which applies only to state lands, makes the disturbance of "historic, prehistoric, and archeological resources" (including graves, per definition) a class A misdemeanor.

AS 18.50.250, which applies to all lands in Alaska, requires permits for the transport, disinterment, and reinterment of human remains. Guidance and permits are available from the Bureau of Vital Statistics (see attached list of contacts).

[1] http://dnr.alaska.gov/parks/oha/humanremainshandout.pdf

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6.2. Federal Laws

On federal lands and federal trust lands, the unauthorized destruction or removal of archaeological human remains (i.e., more than 100 years old) is a violation of **16 U.S. Code (U.S.C.) 470ee** (Archeological Resources Protection Act). If human remains on federal or federal trust lands are determined to be Native American, their treatment and disposition are also governed by the Native American Graves and Repatriation Act (NAGPRA) of 1990 (Public Law [**PL] 101-601; 25 U.S.C. 3001-30013**; 104 Stat. 3048-3058; 43 CFR 10). NAGPRA also applies to Native American human remains from any lands if the remains are curated in any institution that receives federal funds.

6.3. General Guidance

Generally, your first contacts should be the AST/Missing Persons Bureau, the Alaska State Medical Examiner's Office, local law enforcement, and the Alaska Office of History and Archaeology.

In many instances, the field archaeologist must make a judgment call regarding the age of the remains, his/her level of confidence in the evaluation, and whether further investigation by a specialist is warranted. While notification under State Law is required, peace officers and the SME generally regard archaeologists competent to make these type determinations and welcome input that may assist with the investigation. With regard to ancient remains (>100 years old), the SME and AST will generally defer to the opinion of the field archaeologist and require no further criminal investigation. However, the remains and a surrounding buffer area should not be disturbed until appropriate reporting and consultation have occurred.

Richard VanderHoek, Acting State Archaeologist Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, AK 99501
(907) 269-8728 or richard.vanderhoek@alaska.gov

6.4. Contact Information for State Officials Involved with Human Remains Issues in Alaska

6.4.1. Alaska State Troopers, Missing Persons Bureau

Phone: (907) 269-5477
Fax: (907) 338-7243

Sgt. Kid Chan
Phone: (907) 269-5058
e-mail: choong.chan@alaska.gov

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Stephanie Johnson
Phone: (907) 269-5497
e-mail: steph.johnson@alaska.gov

(Please send e-mail to Sgt. Chan w/cc to Stephanie, with relevant information and photos.)

6.4.2. Alaska State Medical Examiner's Office

Reporting Hotline (Death Hotline):
Phone: (907) 334-2356
1-888-332-3273 (Outside Anchorage)

Stephen Hoage, Operations Administrator
Phone: (907) 334-2202
Fax: (907) 334-2216

e-mail: stephen.hoage@alaska.gov

Dr. Katherine P. Raven, Chief Medical Examiner
Phone: (907) 334-2200
Fax: (907) 334-2216
e-mail: katherine.raven@alaska.gov

6.4.3. Alaska Office of History and Archaeology (State Historic Preservation Office)

Judith E. Bittner, Chief/State Historic Preservation Officer (SHPO)
Phone: (907) 269-8721
Fax: (907) 269-8908
E-mail: judy.bittner@alaska.gov

Richard VanderHoek, Acting State Archaeologist/Deputy SHPO
Phone: (907) 269-8728
Fax: (907) 269-8908
E-mail: richard.vanderhoek@alaska.gov

6.4.4. Alaska Bureau of Vital Statistics

Phillip Mitchell, Chief
Phone: (907) 465-8604/465-8643
e-mail: phillip.mitchell@alaska.gov

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For questions regarding burial transit permits:

Margo Meyer
Phone: (907) 465-8610
e-mail: margo.meyer@alaska.gov

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

RECREATIONAL MANAGEMENT PLAN (RMP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

RECREATIONAL MANAGEMENT PLAN (RMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. FERC in its January 16, 2014, Comments (B-15), Recreation and Land Use, requested that a Recreational Management Plan (RMP) be submitted. JHI concurs that this is a necessary plan and is submitting this plan for comment.

1.1. Project Description

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet mean lower low water (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

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To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts to the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together, these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

1.2. Appendix Z - JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

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Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

2.0 EXECUTIVE SUMMARY

The Recreational Management Plan (RMP) describes Juneau Hydropower, Inc.'s (JHI's) plan for operations and maintenance, design, and development of Sweetheart Creek Hydroelectric Project (Project) recreation facilities within the Project boundary. The goal of the RMP is to sustain recreational opportunity at the Project throughout the term of the FERC license in accordance with the relevant FERC requirements and the needs of the Project. This RMP provides guidance for addressing current recreational uses and opportunities in the Project area and provides a process for identifying the need over time for any new measures to enhance the use and enjoyment of the recreational resources associated with the Project.

Measures proposed within this plan are based on the recreational resources available at the Project. Proposed measures are defined within two programs: 1) the Recreation Facility Improvement Program; and 2) the Recreation Facility Operation, Maintenance and Monitoring Program.

3.0 INTRODUCTION

The development of the RMP is an important component of the licensing of the Project. The RMP will be used during the term of the license and incorporates a large investment by JHI to preserve and enhance the recreational aspects of the Project Area near Sweetheart Creek. This investment is intended to offset all non-wetland environmental effects associated with the Project. The RMP has two major components: These two major components are as follows:

- Recreation Facility Improvement Program (Section 8.0); and

- Recreation Facility Operation, Maintenance, and Monitoring Program (Section 9.0).

Additionally, the RMP establishes a schedule for providing improvements for recreational facilities during the term of the license.

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JHI developed this plan based on agency comments and in consultation with the U.S. Forest Service (Forest Service), Alaska Department of Fish and Game (Alaska DFG), National Park Service (NPS), and other stakeholder members involved in the Alternative Licensing Process for FERC licensing.

4.0 BACKGROUND

JHI gathered information from printed and published resources on the types of recreational facilities and opportunities in the Project area and region to establish a regional context for the recreation study. Major sources included area recreation guidebooks, historical reports, regional maps, Forest Service reports, Alaska Department of Fish and Game (Alaska DFG) sources, and Internet research. These resources are listed in the References section of the PDEA.

Electronic surveys of **Personal-use Fishermen** permit holders were collected and analyzed. JHI received a list of all 2010 and 2011 Sweetheart Creek Personal-use Fishermen Permit holders from the Alaska DFG. JHI sent multiple letters of invitation to participate in this survey to each permit holder. Cassie Thomas of the National Park Service (NPS) suggested that JHI offer incentives to help increase survey participation. As a result, JHI developed a survey incentive program. Each survey participant was entered into a lottery for gift certificates to Western Auto in Juneau for cast nets that are sold there and used specifically in the personal-use fishery. Gift certificates for cast nets were awarded to randomly selected participants as an incentive to participate. This survey had 140 participants and represents a 39% survey response rate, which is considered a highly successful response rate for any survey.

JHI also used a list of all registered **Guides and Outfitters** that was obtained from the Forest Service Juneau Ranger District for guides and outfitters registered and authorized to operate in the JHI Project area. JHI sent multiple mailed invitations to participate to all valid guide and outfitter registrants. A second invitation was sent to any potential survey participant who failed to respond via the first invitation. Guides and outfitters were encouraged to participate with a survey incentive drawing for a submersible VHF hand-held radio. This survey had five participants, representing a 16% response rate. It should be noted that registered guides and outfitters have wider areas to operate in beyond the Project area, so it is likely that while some guides and outfitters could operate in and around the Project area, most do not or have not historically used the Project area.

JHI conducted personal interviews with the six Juneau-based commercial **air charter** companies to determine the number, frequency, and purpose of flights arriving to or leaving from the proposed Project area by recreational users. All of the air charter operators queried participated.

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JHI also contacted and interviewed **commercial fishers** who use Gilbert Bay for a livelihood. Commercial fishermen's data and identity are protected as confidential information and cannot be disclosed per Alaska regulations. JHI observed fishing activity during the summer of 2012 and contacted 100% of the Dungeness fishermen known (by JHI) to use the Gilbert Bay area. Additionally, JHI interviewed two long-term fishermen who have gillnetted in the Port Snettisham drift gillnet fishery for several decades.

JHI contractors conducted multiple (25+) extended **site visits** to the proposed Project area, including Sweetheart Lake, Sweetheart Creek, and Gilbert Bay. During these visits, scientific observations were performed by qualified personnel from multiple scientific disciplines. Various data were collected that encompassed site habitat, geology, wildlife, and hydrology. Additional data collected included site photographs and in-field observations, as well as information relating to site conditions, operations, and recreational activities.

These sources along with agency comments provide the basis for the RMP.

5.0 RMP PURPOSE, PRINCIPLES, AND GOALS

5.1. Purpose

The purpose of the RMP is to describe JHI's role and responsibilities related to the management of the recreation resources of the Project during the term of the license. This RMP contains a comprehensive list of measures (in Section 7.0) for the maintenance and development of Project-related recreation facilities during the term of the license. The RMP also describes the process and procedures for managing recreation resources identified in PDEA Section 3.3.6 and monitoring recreation use and trends over the term of the new license.

5.2. Principles

The following principles were used to guide the development of the RMP:

- Recreation at the Project is an important resource that must be actively managed;
- JHI shall provide adequate access to Project lands and waters for recreational purposes in a manner that is consistent with responsibilities for protecting other resources at the Project;
- Management of the Project requires a balancing of energy, environmental, and social values;

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- There is a desire to maintain and/or improve the experience now enjoyed by recreation users at the Sweetheart Creek area;

- It is acknowledged that capital improvements to recreation facilities can be costly and require adequate time to design, permit, and implement;

- JHI is responsible for the implementation of the RMP. The RMP does not include commitments by other agencies or organizations; and

- Other entities may propose and fund recreation site improvements and maintenance on Project lands with JHI approval and the approval of the Forest Service.

5.3. Goals

The goal of the RMP is to provide recreational opportunity at the Project throughout the term of the new Federal Energy Regulatory Commission (FERC) license in accordance with the relevant FERC and Forest Service requirements and the needs of the Project. This includes providing for current recreational uses and opportunities within the Project Boundary and identifying the need for any new measures or improvements to enhance recreational opportunity at the Project over the term of the license. This management plan provides a list of measures to support recreation uses and opportunities at the Project. This plan also serves as the roadmap for operating and maintaining recreational improvements.

The goal of the RMP will be met through the implementation of two major components that encompass JHI's overall approach to managing recreation resources for the term of the license. These two major components are as follows:

- Recreation Facility Improvement Program (Section 8.0); and

- Recreation Facility Operation, Maintenance, and Monitoring Program (Section 9.0).

6.0 EXISTING RECREATIONAL CONDITIONS

The Project area primarily concentrated around Sweetheart Creek provides recreational opportunities for local residents and personal-use fishermen participating in the Alaska DFG's Sweetheart Creek Personal-use Fishery. Alaska residents must secure a personal-use permit to participate in this fishery. Recreational infrastructure and facilities are nonexistent.

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6.1. Gilbert Bay and Sweetheart Creek

Local residents have access to Gilbert Bay and Sweetheart Creek by vessel from Juneau, the closest community to the Project. This requires a 34-mile vessel ride to the location that requires open water crossing of Taku River and Stephens Passage.

Recreation surveys revealed that air travel to the Project area for recreational and personal-use fishers was nonexistent. The sockeye salmon run is the primary recreation target for visitors to the Project area.

There are no trail improvements or any form of recreational infrastructure at the Project area. Typically, vessels moor at the Gilbert Bay tidal flats and then come ashore via an inflatable or skiff. Bears have been known to investigate and puncture inflatable vessels left on the beach.

There are numerous animal and human trails leading from the beach area to the prime fishing areas approximately ¼ mile upstream. These trails are unimproved and become worn very quickly with traffic.

6.2. Sweetheart Lake

There is no trail leading to Sweetheart Lake, and cross-country routes are extremely difficult. Sweetheart Lake can only be accessed by plane or helicopter. Air charter surveys revealed that there are no recreational visitors to the lake, and there are no existing recreation sites at Sweetheart Lake. The lake does contain a 1950s-stocked rainbow trout population and naturally occurring Dolly Varden, but sport fishers are not drawn to Sweetheart Lake since there are more productive lakes with larger rainbow as practical and more cost-effective alternatives. There are no public facilities or watercraft available at the lake. Due to steep slopes, high banks, and cliffs around the lake, it is a difficult to impossible to traverse the lake shoreline. There are no planned trails by the Forest Service or JHI from tidewater to the lake expected during the term of the license.

7.0 RMP MEASURES

The RMP measures are provided in two components. One Program focuses on recreational facilities and infrastructure to be provided by the Project. The other program focuses on these facilities Operation, Maintenance and Monitoring. Below Figure 1 provides a map of the areas of concentrated recreation that exists in the Project Area.

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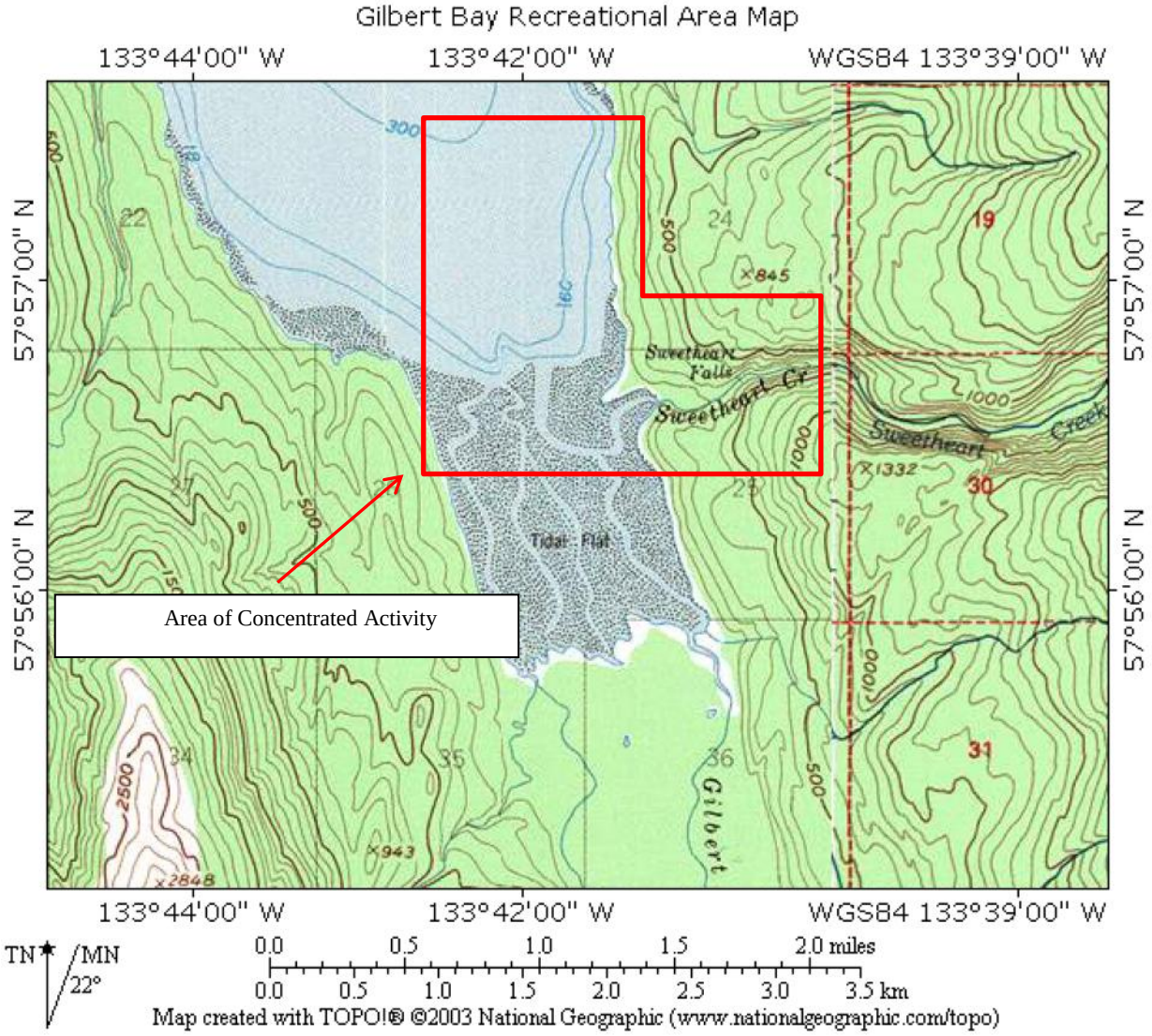
Figure 1 Area of Concentrated Recreation within or near the Project Boundaries



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8.0 RECREATION FACILITY IMPROVEMENT PROGRAM

The location of all proposed recreational facilities and measures are identified on a map included in Appendix A of this plan. Below are the narrative descriptions of the facilities and measures of the Recreational Facility Improvement Program.

These combined recreational features and measures as part of the Project are intended to meet, conform to, and support the recreational and other management prescriptions for a Semi-Remote Recreation Land Use Designation (LUD).

8.1. Sweetheart Creek Bear Safety and Interpretive Displays

In order to provide safety, as well as educational and interpretive information about the Project and Sweetheart Creek fishing areas, JHI will design and build permanent interpretive display panels at the head of the Sweetheart Creek Trail. Exhibits will include Project information; bear safety measures, current Alaska DFG personal-use regulations, and trail identification maps.

Appendix A of this plan includes conceptual designs of the proposed interpretive exhibits. Designs are subject to change over the life of the Project based on site conditions, permitting, and cost.

JHI will be responsible for the design, construction, and maintenance of the bear safety and interpretative displays for the term of the license. The Forest Service and the Alaska DFG will be responsible to design and approve their agency information that will be displayed for the term of the license.

8.2. Coastal Road/Trail and Hardened Trail System at Sweetheart Creek

To provide ease of travel, safety, and environmental protection from soil erosion that can come from human impact on wet trails, JHI will create a sloped hardened trail system to channelize traffic away from the creek and toward the traditional fishing areas located at Sweetheart Creek. JHI will design, construct, and maintain trails to Forest Service standards and in compliance with Alaska DFG Habitat permit for trails that are within stream buffers.

JHI will provide a gated one-lane road that will act as a trail from the boat float location to the powerhouse location. This route will allow boaters a deep-water route to access the trail to Sweetheart Creek. The coastal road/trail will not allow public use of motorized vehicles.

Trail users entering the forested area near Sweetheart Creek will be provided with direct access to primary fishing locations to alleviate and minimize the multiple trails that

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occur during the personal-use fishery season. JHI plans to use crushed compacted rock to provide trails that can withstand the traffic with minimal maintenance.

JHI, upon guidance from the Forest Service, will not improve any trails on the southern shore of Sweetheart Creek to discourage human traffic in that areas to habituate bears to use the southern shore side of the creek and decrease human/bear interactions.

Appendix B of this plan includes designs and a map outline of the proposed trails. Designs are subject to change based on annual consultation with the Forest Service.

JHI will be responsible for the design, construction, maintenance, and cost of the improved trails for the term of the license.

8.3. Mooring Buoys

To provide safer moorage for noncommercial recreational visitors, JHI will place up to three moorings of sufficient size to anchor typical sport fishing vessels in Gilbert Bay near the mouth of Sweetheart Creek.

JHI will be responsible for the design, construction, maintenance, and cost of the moorings for the term of the license.

8.4. Visually Obscured Powerhouse and Switchyard Area

The powerhouse and switchyard as proposed are designed to decrease the infrastructure impact on the recreational environment.

JHI will be responsible for the design, construction, maintenance, and cost of the visual berms to be placed at the powerhouse and switchyard area.

8.5. Sockeye Collection and Transportation System

The personal-use sockeye fishery that was developed and is regulated by the Alaska DFG and maintained by the Douglas Island Pink and Chum, Inc. (DIPAC) hatchery is the most important recreational draw to the Sweetheart area. The hatchery raised sockeye smolt are released into Sweetheart Lake annually by DIPAC. JHI, collaborating with DIPAC, has designed a system to collect and transfer sockeye smolts from Sweetheart Lake to a reentry pool below the powerhouse for return to Lower Sweetheart Creek.

The construction and development of the fish collection barge and smolt reentry pool will take place during the construction phase of the Project. The smolt collection and transportation system will be fully functional 1 year after the commercial operations date. JHI also has made arrangements with DIPAC that DIPAC would assist JHI in

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providing smolts should problems exist with the smolt collection barge. This measure is to ensure adequate release for the personal-use fishery.

JHI will be responsible for the design, construction, operations, maintenance, and cost of the smolt collection and transportation system for the life of the Project.

8.6. Rock Tailrace

JHI will construct a rock tailrace that is aesthetic and compatible with the surroundings. The Project tailrace serves two purposes. The primary purpose is to safely return water from the power tunnel and powerhouse to Sweetheart Creek. The tailrace must meet engineering standards. The other purpose is to increase the areas available for fishing. Currently, the fishing positions are located on steep bluffs above Sweetheart Creek. These locations will be retained, but the increase in fishing areas may decrease congestion. JHI will place rock to provide slope and trail stabilization.

8.7. Subsurface Transmission Lines

The 138-kilovolt (kV) high-voltage transmission cable and the 12.47-kV distribution cable in the Sweetheart Creek area will be buried. The transmission line crossing Gilbert Bay from the float dock will be a submarine cable. Buried and submarine transmission lines minimize visual landscape disturbances for recreational users and visitors to the area with the additional benefit of removing overhead transmission line hazards in the waterfowl sensitive area of southern Gilbert Bay.

JHI is responsible for the design, development, construction, operations, maintenance, and safety for all transmission line segments.

8.8. Dock and Ramp Access

JHI will construct a private dock and intertidal ramp on the eastern shore of Gilbert Bay north of the confluence of Sweetheart Creek. In our design, JHI has placed the dock and marine facility in a location that provides close deep water and will not intrude on the traditional mooring area of Gilbert Bay used by recreational boaters.

Limited (no overnight) noncommercial public access for the personal-use fishery on a use-at-your-own-risk basis will be allowed at the float and ramp.

JHI will be responsible for the design, construction, operation, maintenance, and cost of the dock facility for the life of the Project.

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8.9. Litter Control

At no time, will there be public trash receptacles or other public access trash containers allowed on the Project area, particularly for bear safety. Visitors will be encouraged to adhere to the "pack it in, pack it out" philosophy. However, JHI will be responsible and provide limited litter collection to remove obvious trail litter and debris.

9.0 RECREATION FACILITY OPERATION, MAINTENANCE, AND MONITORING PROGRAM

For the term of the license, JHI will operation and maintain the recreation facilities described in this RMP. Table 1 provides a general description of the type of operations, maintenance, and monitoring activities anticipated to occur at each of the recreation facilities.

Table 1 General Recreational Maintenance Activities Performed by JHI

Maintenance Activity	Frequency
Visual Berm: Rock berm structures will be safe and maintained in good repair. If a structure is deemed in need of repair, it will be scheduled for repair.	Visual berms will be inspected and maintained annually for 5 years following commercial operations date (COD).
Barge Ramp: Surfaces are to be kept in serviceable condition and free of debris.	Boat ramps will be inspected and maintained annually by June.
Boat Docks: Dock surfaces, hardware, bumper strips, and other components will be maintained to provide safe and effective use.	Docks will be inspected and maintained annually by June. Maintenance and repairs will be performed on an as-needed basis.
Sweetheart Creek Bear Safety and Interpretive Displays: Signage and support structure will be kept in good and serviceable condition.	Bear safety and interpretative displays will be inspected and maintained annually by June and inspected weekly during the remainder of the summer.
Trash/Litter Collection: No trash containers will be provided to eliminate bear interaction. JHI will provide limited litter collection.	Limited litter collection will be conducted during the months of July and August.
Coastal Access Road/Trail: The Access Road/Trail will be maintained in good and passable condition.	The Access Road/Trail will be inspected annually by June and repaired as needed.
Trails: Trail surfaces will be maintained in good condition, and barriers will be removed to allow use of the trail. Trees and shrubs along the trails will be trimmed or removed seasonally, and weeds will be controlled as needed.	Trails will be inspected and maintained annually by June. Brush will be trimmed annually by mid-July.
Mooring Buoys: Moorings will be maintained in good condition.	Mooring buoys will be inspected annually by June.

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10.0 RECREATION RESOURCES MONITORING AND EVALUATION PROGRAM

Recreation use monitoring will be an important component in determining when changes are required at Project recreation facilities to ensure adequate recreation access during the license term. JHI will collect recreation data in the Project area as needed to complete the FERC Form 80 requirement[1]. JHI will use appropriate monitoring and analysis techniques to complete FERC Form 80 reporting. Recreation facility condition will be determined by periodic on-site inspections of each facility managed under this RMP. Every 20 years during the term of the license, JHI will conduct a comprehensive recreation review with the Forest Service Juneau Ranger District and the Alaska DFG to assess recreation use and needs related to the Project. The scope of the recreational review will be similar to assess and determine any collectively agreed-upon changes by all three parties.

Any changes to the RMP must be based on documented changes in use patterns, visitor needs (including facility upgrades), new Forest Service Tongass Land Management Plan standards, or new state mandates or regulations that are relevant to recreation in the Project area during the license term. Any disagreements regarding revisions to the RMP will be submitted to FERC for resolution.

11.0 RMP IMPLEMENTATION SCHEDULE AND BUDGET

The RMP will become effective following FERC approval and issuance of a FERC license.

A summary of the specific implementation measures and schedule is provided in Table 2. A summary of capital and annual budget for specific implementation measures is provided in Table 3.

[1] The FERC Form 80, *Licensed Hydropower Development Recreation Report*, is a brief summary of the existing recreation conditions and facilities associated with a FERC licensed hydroelectric project. Based on current FERC regulations, the forms must be completed every six years to document current public recreation use within the Project area.

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Table 2 RMP Implementation Schedule

Action	Timeline
Visual Berms: Construct visual berms to provide scenic, sound, and light barrier between the powerhouse and switchyard area from Sweetheart Creek recreational areas.	By commercial operations date.
Barge Ramp: Construct a vessel ramp and make available for limited noncommercial use to the public.	1 year after commercial operations date.
Boat Dock: Construct a boat dock and make available for limited seasonal, noncommercial use to the public.	1 year after commercial operations date.
Sweetheart Creek Bear Safety and Interpretive Displays: Construct signage and a signage support structure for public display.	Installed during first year of construction.
Trash/Litter Collection: Provide limited litter collection on access road and side trails.	Commence during the first year of construction.
Access Road/Trail: Allow limited public access to road/trail.	1 year after commercial operations date,
Trails: Construct trails and maintain surfaces in good condition. Trees and shrubs along the trails will be trimmed or removed seasonally, and weeds will be controlled as needed.	Commence during the first year of construction.
Mooring Buoys. Mooring buoys will be constructed, emplaced, and maintained in good working condition.	One year after commercial operations date.
Recreation Resources Monitoring and Evaluation Program: FERC Form 80 reports and any relevant monitoring data, will be provided to the Forest Service and the Alaska DFG.	Every 6 years or as determined by FERC.
Recreation Resources Monitoring and Evaluation Program: Conduct a Recreation Use/Needs Review to document changes in recreation use and needs.	Every 20 years.

Table 3 RMP Budget

Measure or Infrastructure	Capital	Annual
Fish Collection Barge system and smolt pool	$1,270,000	$65,000
Mooring Buoys	$25,000	$5,000
Trails and Landform barrier maintenance	$50,000	$10,000
Sign Display	$5,000	$1,000
Dock signage and safety	$5,000	$1,000
Litter Control	$0	$10,000
Insurance-Limited Liability		$25,000
	$1,355,000	$117,000

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12.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

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13.0 APPENDIX A: RECREATIONAL FACILITIES, MEASURES MAP & TRAIL DESIGN

Maps of proposed recreational facilities and measures follow.

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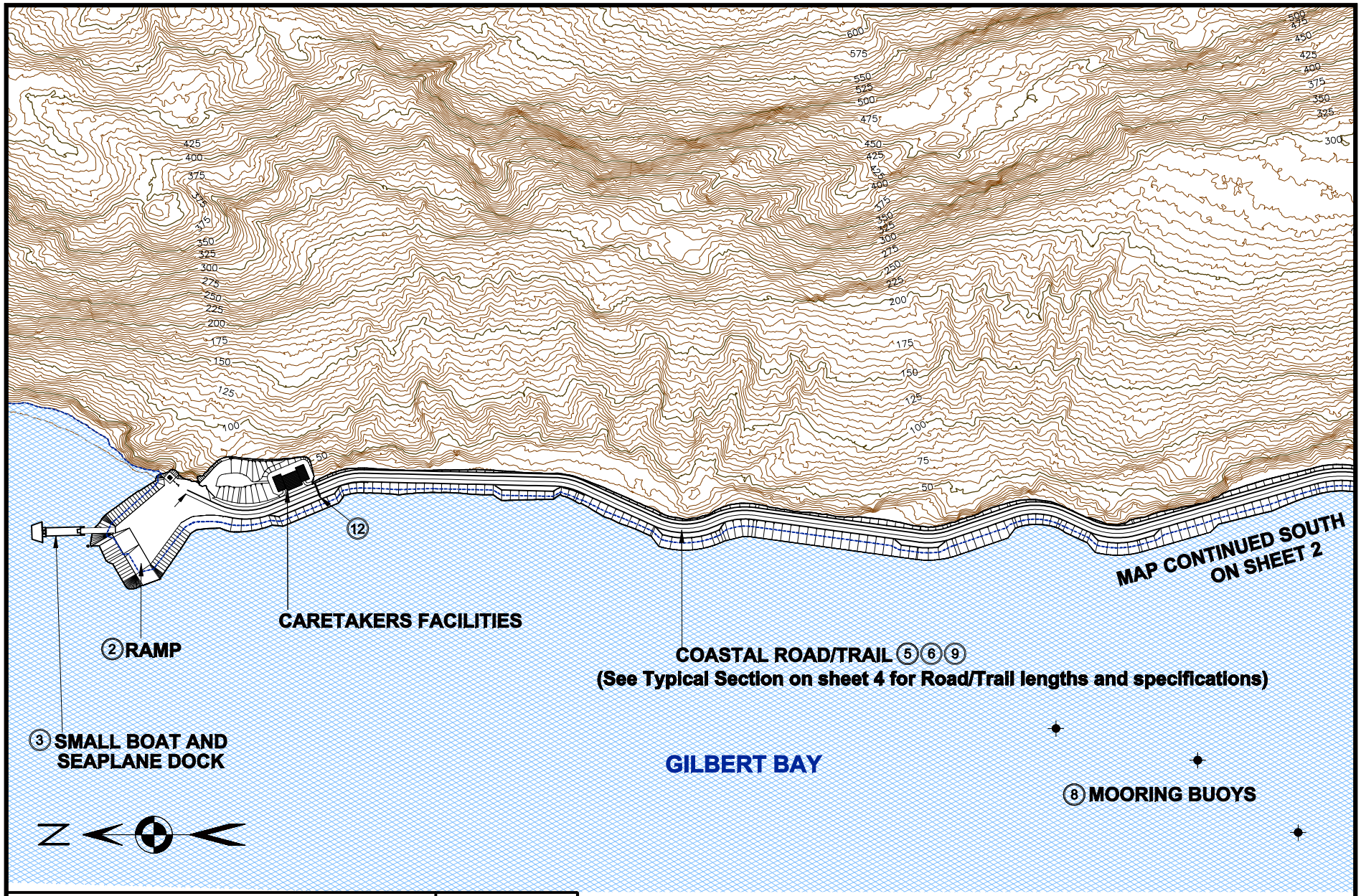

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ph. 907-789-2775
fax. 907-375-2973

DATE: 4/10/2014

SITE PLAN

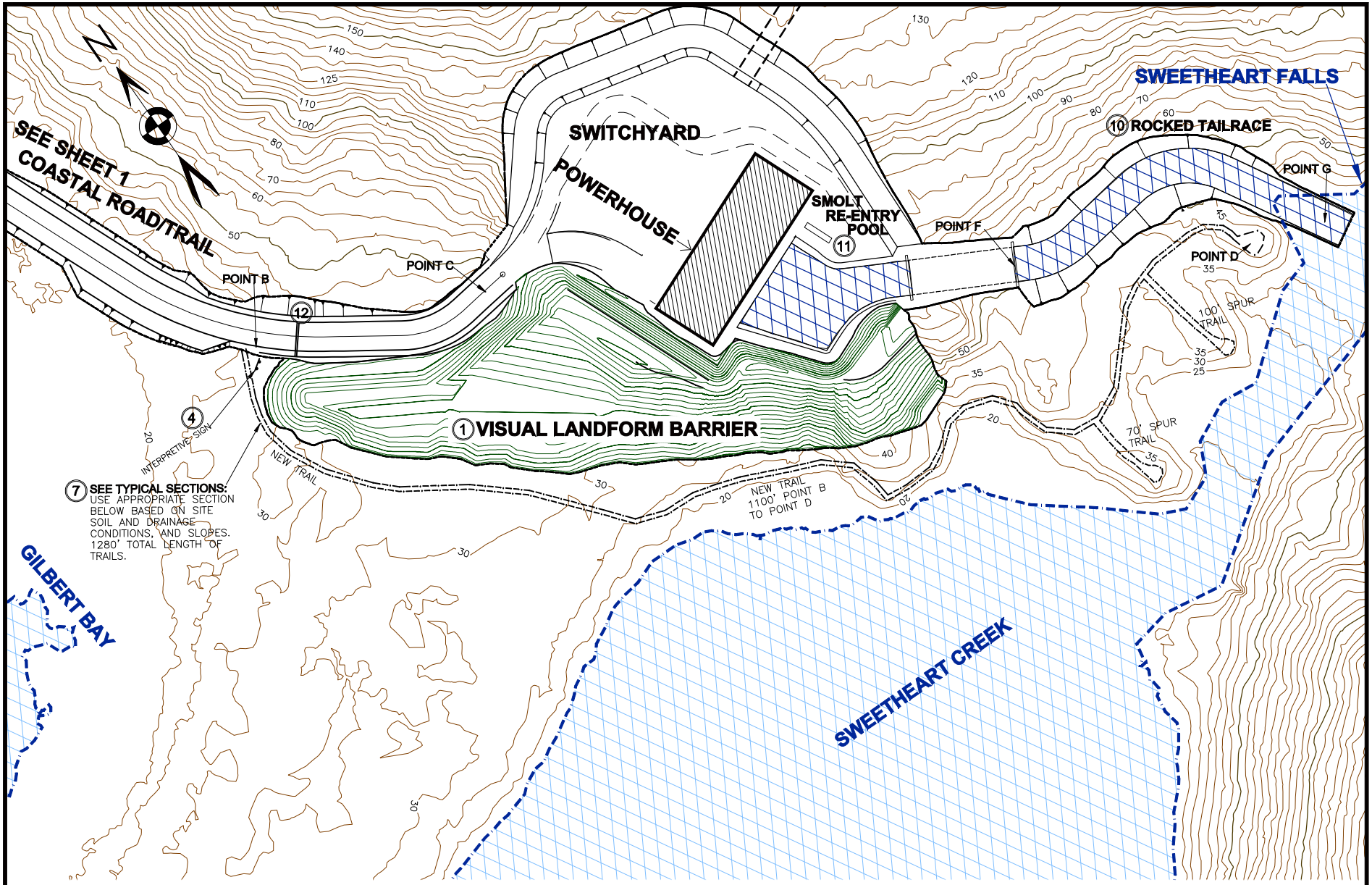
0′ 200′ 400′ 600′

LEGEND

(#) SEE DETAILED DESCRIPTION ON SHEET 3

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563
RECREATIONAL FACILITIES AND MEASURES MAP

SHEET 1 OF 5



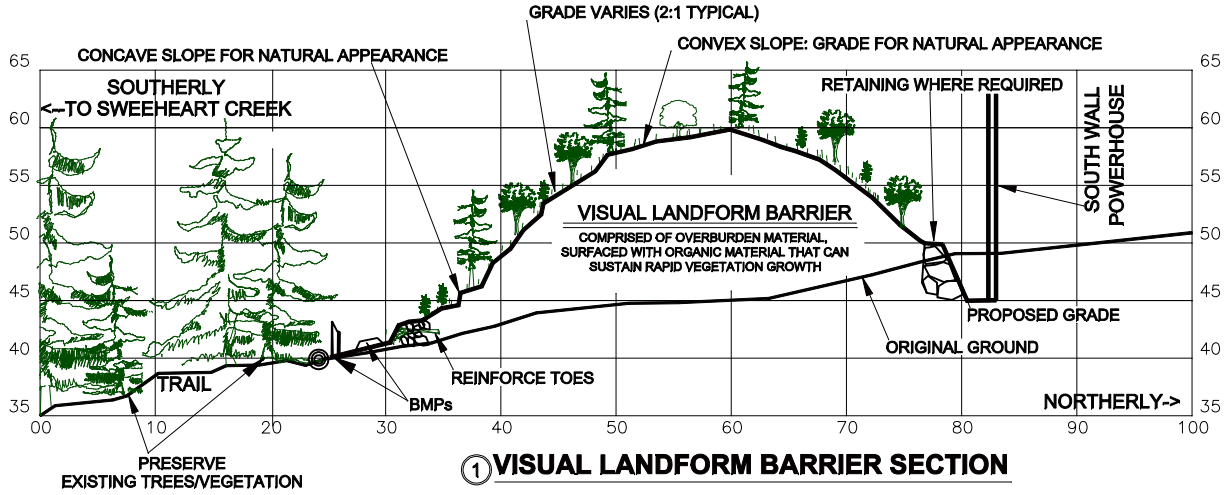
LEGEND

(#) SEE DETAILED DESCRIPTION ON SHEET 3

TRAIL PLAN

0′ 60′ 120′ 180′

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563
RECREATIONAL FACILITIES
AND MEASURES MAP
SHEET 2 OF 5



(1) VISUAL LANDFORM BARRIER SECTION

RECREATIONAL FACILITIES NOTES

(1) VISUAL LANDFORM BARRIER: will be constructed and vegetated, which will recreational users from sound and visual impacts of the powerhouse and switchyard. See typical section on sheet 2.

(2) RAMP: will be installed at the dock area for limited non-commercial boat landings. See sheet 1.

(3) DOCK: will be installled for limited non-commercial boat and floatplane landings. See sheet 1.

(4) INTERPRETIVE SIGNS: will be installed at the beginning of the footpath trail, to include bear saftey, trail information, ADF&G information, and USFS information. See sheet 2.

(5) TRASH AND LITTER COLLECTION: will be collected along access road and trail at a limited seasonal basis. Public trash recepticles will not be provided. This is a "pack it in, pack it out" recreational area.

(6) ACCESS ROAD/TRAIL: will be maintained in sufficient condition to allow both caretaker truck access and non-motorized recreational user access. See typical section on sheet 4.

(7) TRAILS: will be maintained in good condition and trees and weeds will be controlled as necessary. See sheet 2.

(8) NON-COMMERCIAL MOORING BUOYS: will be maintained is good condition to allow temporary non-commercial small boat mooring. See sheet 1.

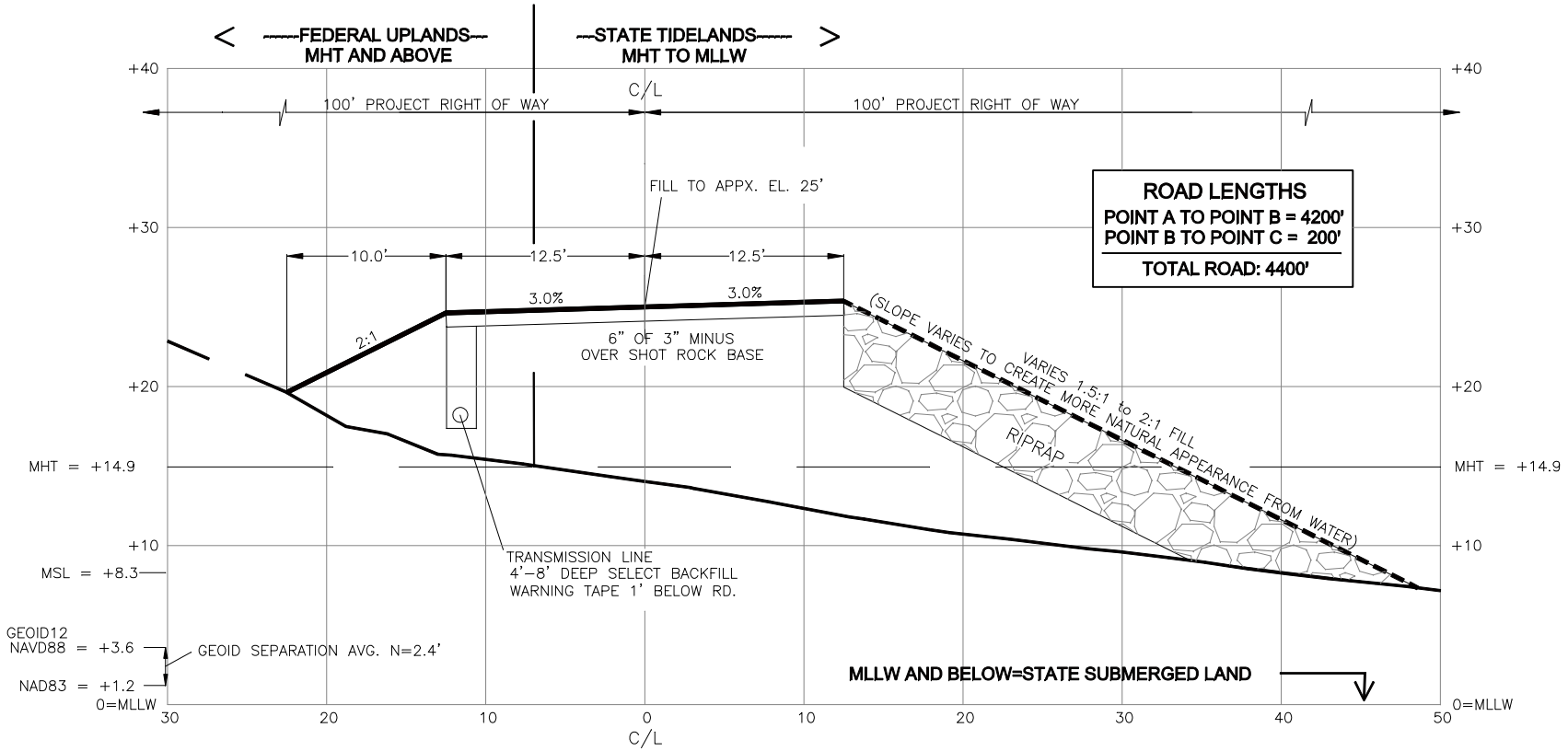
(9) SNOW REMOVAL: will occur on the Access Road/Trail to ensure safe operational access to the powerhouse and switchyard. Snow removal will not be provided on the side trails.

(10) ROCKED TAILRACE: the tailrace surfaces will be rock instead of concrete, which will enhance natural appearance and allow additional fishing area. Length from Point F to Point G is 300 feet. See sheet 2.

(11) SOCKEYE COLLECTION AND TRANSPORTATION SYSTEM: a smolt re-entry pool will be located at the powerhouse site, which will allow fish acclimation before release into the tailrace. This fish collection and transportation systems have been designed in collaboration with Douglas Island Pink and Chum (DIPAC). See sheet 2.

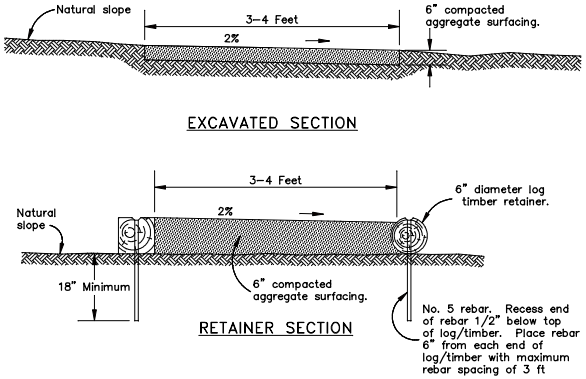
(12) GATED ACCESS: gates will be installed at the locations shown such that motorized use of the coastal road/trail will be limited to the caretaker. Recreational motorized use of the coastal road/trail will not be permitted. See sheet 2.

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563
RECREATIONAL FACILITIES
AND MEASURES MAP
SHEET 3 OF 5



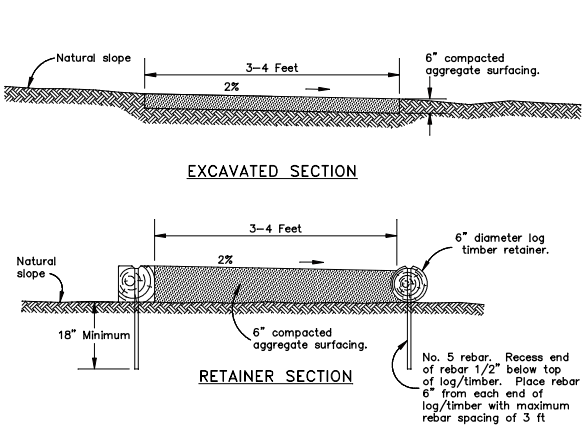
COASTAL ROAD/TRAIL TYPICAL SECTION

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563
RECREATIONAL FACILITIES
AND MEASURES MAP
SHEET 4 OF 5



TYPICAL TRAIL SECTIONS NOT TO SCALE

Source: USFS Trail Detail 941–1 (per EM–7720–103 rev 3/97)



TYPICAL TRAIL SECTIONS NOT TO SCALE

Source: USFS Trail Detail 941–1 (per EM–7720–103 rev 3/97)

SWEETHEART LAKE HYDROELECTRIC PROJECT
FERC PROJECT NOS. P-13563
RECREATIONAL FACILITIES
AND MEASURES MAP
SHEET 5 OF 5

SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

SCENERY MANAGEMENT & MONITORING PLAN (SMMP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

SCENERY MANAGEMENT & MONITORING PLAN (SMMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: j) Scenery Management Plan. The U.S. Department of the Interior National Park Service (NPS) in its January 12, 2014, comments on the aesthetics section of the PDEA expressed the need for protecting the visual resource for visitors and those fishing. JHI is submitting this preliminary Scenery Management Plan (SMP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service

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transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

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C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 SCENERY MANAGEMENT & MONITORING PLAN (SMMP)

This Scenery Management and Monitoring Plan (SMMP) includes measures to keep the visual character of the Project area consistent with the standards and guidelines of the Tongass National Forest Land and Resource Management Plan (2008).

Expected scenery impacts by the Project and proposed mitigation measures for the various Project features are described in the following sections:

4.0 VISIBLE PROJECT FEATURES

4.1. Marine Access Facilities

The marine access facilities are as described below and shown on Exhibit F drawings and SWPPP drawings.

- A dual-height marine ramp for loading and unloading freight barges and landing craft constructed of clean shot rock. The ramps will have a minimum width of 50 feet, a slope of 15-20 %, and a compacted rock surface. The toe of the fill will be near -15 (MLLW) allowing low tide access without grounding of the vessels. The ramps will slope up from +12 to +25 (MLLW) for access at all tidal conditions. The sides and front slopes will be protected with rock riprap.

- Floating docks will provide seaplane and boat access for both passengers and freight during construction and maintenance. The floats will be secured by 8 galvanized steel piles. A drive down ramp will connect the float to the staging area concrete abutment.

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4.2. Coastal Road/Trail

There will be one short road along the coast 4400 feet from the dock to the powerhouse. The road and dock will be constructed with clean shot rock and protected with riprap produced from the excavation of the powerhouse site and power tunnel. The subgrade width would be up to 25 feet to provide for large construction machinery such as cranes and powerhouse turbines. The surface width will be reduced following construction for aesthetics to 16 feet by shaping and planting.

4.3. Powerhouse

The powerhouse will be located in a deep excavation approximately 600 feet northwest of the anadromous barrier on Sweetheart Creek, and approximately 2,000 feet east of the confluence of Sweetheart Creek and Gilbert Bay. The powerhouse will be approximately 50 feet wide and 120 feet long. Floor level of the powerhouse will be at Elevation 50 (MLLW), with an eave height of about 35 feet and concrete substructure up to 32 feet deep. The powerhouse will be constructed with concrete walls and a metal or concrete roof.

4.4. Switchyard

The switchyards will be located adjacent to the powerhouse on fill over the penstocks and next to the Existing Snettisham Transmission lines. These locations have been selected to allow screening by existing vegetation to the maximum extent possible.

4.5. Transmission Lines

Power generated by the Project would be transmitted by new transmission lines that would connect into an existing 138 kV Snettisham Transmission Line owned by the State of Alaska, Alaska Industrial Development and Export Authority (AIDEA).

5.0 SCENERY IMPACTS

Scenery impacts are primarily expected to be from the overhead transmission line corridor, marine access facilities, and the coastal road/trail, which will be along the shoreline. These features would be visible from the Visual Priority Route (VPR) in the middle of Gilbert Bay. A visual simulation was prepared to determine what impacts the Project will have on the VPR (Final Scenery Resources Report – Appendix T).

The following Project features will not have a visual impact to the VPR in the middle of Gilbert Bay because they will be hidden from view by the existing terrain and vegetation:

- Dam

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- Tunnel Portals / Penstock
- Intake Structure
- Reservoir
- Switchyard / Diesel generator

Project features that could have an impact on the VPR are discussed below.

5.1. Marine Facilities

The expected scenery impacts from the Marine Access Facilities are expected to be as follows:

- The permanent features of the Marine Access Facilities (staging area, barge ramp, boat, and floatplane float) will present features that will initially stand out because of their new surfaces.
- Eventually, wood products will weather and rock or concrete that are exposed to marine water will gain a "marine patina" of browns and greens; consisting of staining, seaweed, and/or barnacles and mussels.
- Metal surfaces may rust, get a "marine patina," or if painted, have a reduced visual impact.
- Riprap armoring will initially be fairly visible until they weather or they acquire the "marine patina."
- The submarine cable landings will have buried structures above the tidal zone to convert from terrestrial to submarine and vice-versa; excavation through the beach and intertidal zone for the cables will be recovered with native material from the beach and within a few months should be invisible due to tidal action.

5.2. Coastal Road / Trail

The expected scenery impacts from the Coastal Road / Trail are expected to be as follows:

- Riprap armoring of road will initially be fairly visible until it weathers or they acquire the "marine patina."
- The grass/sedges naturally found along the shoreline in Gilbert Bay will also find footholds on and around the riprap of the coastal road.

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5.3. Powerhouse

The expected scenery impacts from the Powerhouse are expected to be as follows:

- Removal of vegetation to clear the powerhouse area.
- Powerhouse structure may be visible from the VPR in Gilbert Bay; roof reflectivity would be the largest concern because of the height, increasing its potential to be seen from the VPR.
- Rock spoil from powerhouse and tunnel excavation used to create a visual screen berm may create a visual that can be seen from the VPR because of it being newly exposed rock that does not have a weathered patina (see the simulations in the Final Scenery Resources Report – appendix T of the PDEA).

5.4. Transmission Line Poles and Corridor Clearing

The expected scenery impacts from the transmission line poles and corridor clearing are expected to be as follows:

- Poles may be visible if left with a highly reflective surface.
- Clearing of vegetation along the transmission route will be necessary to not just install the transmission line but also to keep in place a single-lane access road for maintenance.
- Conductors may be visible if bird deflectors (reflective devices) and airplane visual aids (orange balls) are used to mark them.

6.0 PROJECT WIDE PROPOSED MITIGATION MEASURES

The following protection measures are prescribed for the entire Project and should be applied where appropriate and feasible.

- Prior to beginning construction, once survey and layout of the corridor, clearing limits and location of facilities has been field located, verify Project conditions and note any deviations from the original Licensing Document. Modifications, including minor ones, to the routing of corridor, clearing limits, and the location and size of facilities may have a positive or negative expected scenery impact.
- Where possible, feather edges of clearing limits rather than hardline clearing on the uphill slope of the corridor to reduce visual impacts. Match existing lines

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found in the immediate surrounding landscape to mimic meadow openings, rock outcrops, and avalanche and rock slide formations where present.

- Transmission structures that support the overhead lines will be constructed of metal. To minimize their visual impact the towers should be grey in color.

- The removal of vegetation within the clearing limits of the corridor should be limited to only trees that can obtain a mature height of thirty feet or greater or will require removal later as part of the transmission corridor maintenance. Maintain shrubby vegetation, perennials, and smaller trees within the clearing limits to minimize visual contrast after construction and after maintenance of clearing limits. Avoid exposure of soil.

- Facilities that require security fencing (powerhouse, switchyard) should be colored grey to reduce visual impacts and allow these features to blend into the surrounding landscape.

- Allow vegetation to reestablish itself over disturbed areas where possible

7.0 SPECIFIC PROTECTION MEASURES

The main Area of Concern is identified as the east side of Gilbert Bay where the Project is viewed as foreground in a Semi-Remote Recreation LUD. This is the area immediately surrounding the marine access facility, storage yard, access road, and caretaker's site.

Plant vegetative screening between the water's edge and the caretaker's facilities. Color the marine access facilities to blend into the surrounding landscape and avoid the use of materials that would reflect sunlight. Minimize the storage of materials and vehicles in the immediate vicinity of the marine access facility. Store materials and other items where they would be screened from the Gilbert Bay VPR. Utilize building colors and materials that blend into the character landscape.

Utilize rock along the coastal road where fill would be exposed to Gilbert Bay. Although most portions of the road are on submerged lands, incorporate native vegetation along the water's edge on all fill slopes for the road to the greatest extent possible. For all areas to be vegetated, utilize organic native soils that support and will allow native plant material to grow and create quick and effective visual screening. Use the correct native plants for the soil available.

Avoid the use of exterior lighting; if needed, use "cut-off" style lighting that minimizes light pollution and prevents light from spilling beyond the intended areas.

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Where clearing limits and transmission structures may be seen in the middle-ground distance zone and will dominate the visual landscape beyond five years, select appropriate colors to paint the structures (towers and transition facilities) to match the surrounding landscape would likely reduce impacts. Soften edges of the clearing limits where possible by feathering edges rather than straight hardline clearing of the corridor to reduce visual impacts.

8.0 DOCUMENTATION

Photos will be submitted with a report by December 31st of each year to the Forest Service to document current conditions for use in the annual review.

From the Tongass National Forest Land and Resource Management Plan (2008) guidance - Upon completion of construction, Licensee will photograph the approved facilities from the middle of Gilbert Bay to document scenery management mitigation measures approved in the Plan. Each summer for the first ten years of the license, from approximately the same location along the Visual Priority Route (VPR), the Licensee will photograph the approved facilities to document vegetation, and continued success of scenery management mitigation. Photos taken will be submitted to the Forest Service at the end of each year as part of the annual consultation.

9.0 COMPLIANCE

Compliance with the plans objectives will be documented and enforced by the Environmental Compliance Monitor through commercial operations and then JHI management will be responsible for reporting to the Forest Service as directed.

10.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

SOLID WASTE & WASTEWATER PLAN (SWWP)

PREPARED BY:

Juneau Hydropower, Inc.
PO Box 22775
Juneau, AK 99802

MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

SOLID WASTE & WASTEWATER PLAN (SWWP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: f) Solid Waste and Wastewater Plan (SWWP). JHI concurs that this is a necessary plan and is submitting this preliminary Waste Plan with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility

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To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

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3.0 SOLID WASTE & WASTEWATER PLAN (SWWP)

This Solid Waste and Wastewater Plan (SWWP) addresses the following waste and its disposal at the Project construction site:

- Disposal of solid waste (e.g., construction debris and garbage/trash)
- Disposal of wastewater (including human waste [sewage])
- Disposal of organic waste

The following two items are addressed in other plans as listed below:

- Disposal of excavated materials (soil and rock) is described in the Spoil Disposal Plan (SDP) (in Appendix Z of the PDEA)
- Disposal of hazardous substances is discussed in the Hazardous Substance Plan (HSP) (in Appendix Z of the PDEA)

4.0 SOLID WASTE DISPOSAL

Garbage will be collected daily and stored in bear-proof containers until it can be removed to the Juneau disposal facility or another approved uplands disposal facility. It will be transported by barge or boat.

Construction debris will be collected, contained, and removed from site via barge from the dock staging area.

All solid waste will be sorted and delivered to an approved uplands disposal site (either Juneau, Alaska, or Seattle, Washington).

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5.0 WASTEWATER DISPOSAL

An approved wastewater treatment plant will be permitted for the Gilbert Bay construction camp and caretaker's facility and for the Sweetheart Lake camp prior to construction. The Gilbert Bay camp is expected to serve 20 people the first year and up to 60 the second year. The Sweetheart Lake camp is expected to serve 20 people from April to October for 2 years of construction.

With lower water use designs, it is expected the Gilbert Bay camp would use 50 gallons per person and the Sweetheart Lake camp would use 40 gallons per person.

Preliminary design for the Gibert Bay wastewater treatment plant uses 2 Whitewater D150FF with a capacity of 3,000 gallons per day. The Sweetheart Lake camp treatment system will use a single Whitewater D150FF (or approved similar plant) for a capacity of 1,500 gallons per day.

At other construction sites portable toilets will be used on site for human waste and will be maintained on an as-needed basis. They will be transported, serviced, and maintained in a safe and hygienic manor with waste transported for disposal at the City and Borough of Juneau treatment plant or at another approved site. An appropriate effort will be made to prevent raw sewage from reaching streams or other water bodies.

6.0 ORGANIC WASTE

Organic waste consisting of stumps, limbs, moss, and other vegetation will be used to construct the powerhouse visual landform barrier and reclaim the site where the caretaker's facility will be built. The organics will be shaped and stabilized with rock and planted as soon as possible with native plantings. The powerhouse site and other sites with disturbed ground will have the surface covered with chipped limbs and brush to reduce erosion and promote natural vegetation. Limbs, trees, and the roots of trees removed at the dam and lake will be burned.

Rock and soil will be stored and disposed as stated in the SDP and handled in accordance with the Erosion and Sedimentation Control Plan (ESCP) and SWPPP.

7.0 COMPLIANCE

Prior to on-site construction activities, this SWWP will be reviewed by the Environmental Compliance Monitor (ECM) and JHI to ensure all plan features match the current operations plans and that all systems and permits are ready and approved. This will be documented by the ECM. At least monthly, The ECM will document inspection of all components of this plan and direct changes if required through start of commercial operations.

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8.0 AGENCY COMMENTS

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

SPOIL DISPOSAL PLAN (SDP) & ACID ROCK DISPOSAL CONTINGENCY PLAN (ARDCP)

PREPARED BY:

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Juneau, AK 99802

MAY 2014

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3.0 SPOIL DISPOSAL PLAN (SDP)

This document provides a description of the means and methods that will be used at the Sweetheart Lake Hydroelectric Project (Project) to dispose of excavated materials This plan is compiled from information provided by Juneau Hydropower, Inc.'s (JHI's) selected contractors and consultants. This plan will be worked in compliance with the above-listed environmental and safety plans developed for the Project (Appendix Z). JHI and its contractors will comply with all permits and federal, state, and local laws.

This SPOIL Disposal Plan (SDP) focuses on the handling and disposal of excavated materials. This SDP will work in conjunction with the Project Erosion and Sedimentation Control Plan (ESCP), which includes the Storm Water and Pollution Prevention Plan (SWPPP).

3.1. SPOIL DISPOSAL SITES

Temporary and permanent spoil disposal sites are at the lower tunnel portal/powerhouse site (major site), coastal road, barge dock, caretaker's facility, and dam construction staging areas.

3.2. MATERIAL COMPOSITION

The vast majority of the material excavated will be rock, by the drill and blast method. No geotechnical drilling has been done to date do to Forest Service special use requirements, so all material type and quantities will necessarily be evaluated when permitted. Total excavation is estimated at 245,000 cubic yards (cy) of that 15,000 is estimated to be organic material and soil with the remaining 230,000 being rock. The road and barge dock site require 201,000 cy of rock, the dam and cofferdams use 22,000 cy of rock, the tailrace and powerhouse use 8,000 cy of rock, and the submarine cable uses 7,000 cy of rock. The visual landform barrier as designed is 28,000 cy of

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unclassified material. The Project is very closely balanced for cut and fill; further adjustments are possible if geotechnical information dictates.

3.2.1. SDP Measures

The following details the SDP measures required for the Project:

- Silt containment will be placed down slope of all spoil sites, whether temporary or final.
- Rock sources will be tested before excavation for possible acid rock drainage (ARD) potential.
- Soil spoil that remains unused after construction will be contoured to the existing terrain slope and planted in either the caretaker's facility or the powerhouse visual landform barrier and in small amounts adjacent to the coastal road.
- Rock spoil that remains after construction will be contoured to the existing terrain in the dam construction staging areas or the visual landform barrier adjacent to the powerhouse.

4.0 ACID ROCK DISPOSAL CONTINGENCY PLAN (ARDCP)

4.1. Background

Acid rock drainage (ARD) can occur when sulfide minerals, particularly pyrite (FeS2), pyrrhotite (FeS), and marcasite (FeS2), but also chalcopyrite (CuFeS2) and arsenopyrite (FeAsS), oxidize in the presence of oxygen and water. Most often, the principle cause of ARD is the oxidation of pyrite found in gold, base metal, and coal.

Any exposed rock material that has high-enough concentrations of pyrite and/or other sulfides has the potential to generate and release acid and dissolved metals. The amount of acid released from stored rock material is dependent on the concentration and rate of oxidation of the sulfides, the nature and quantity of acid-consuming minerals in the rock, and the amount of water passing through or over the rock material. Acid generation can occur almost immediately when the rocks are exposed to air and water, or can take decades to fully develop.

Initially, the principal factor controlling the rate of oxidation of pyrite is oxygen in the presence of water. However, as the pH of the water decreases with increasing acidity, ferric ions (Fe3+), produced from the oxidation of iron sulfides, become more dominant in the oxidation process. Commonly, the amount of atmospheric oxygen needed to

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generate acid is low, less than a few percent of the oxygen content in air. Generated acid may not migrate if there is a sufficient volume of acid-neutralizing minerals such as calcite and dolomite in the rock material.

4.2. Acid Rock Drainage (ARD) Potential

Additional work is planned to evaluate the ARD potential of the disturbed materials using visual observations, petrographic analysis, and testing using static methods. Additional testing of suspected ARD areas would occur with detailed invasive drilling techniques not available under the conditions of the current amendments of the Forest Service Special Use Permit. This testing would occur prior to construction. The Environmental Compliance monitor (ECM) will ensure that areas to be disturbed are adequately tested, and if an ARD situation is found to be evident, will take measures to institute ARDCP measures.

Total projected excavation is estimated at 245,000 cy for the Project. Specific areas and ARD potential are described below:

- The powerhouse excavation accounts for 155,000 cy or 63% of the total Project excavation. Of the eight sample sites in this area mapped by Schnabel Engineering, only one site adjacent to Lower Sweetheart Creek (Stop B-4) showed small crystals of possible pyrite. There does not appear to be much potential for ARD from rock removed from this site.

- The dam site accounts for 15,000 cy or 6% of the total Project excavation. Of the 10 nearby Schnabel sample sites, none notes pyrite or other acid prone minerals. There does not appear there is much potential for ARD from rock produced at this site.

- The power tunnel excavation accounts for approximately 72,000 cy or 29% of total Project excavation. Neither the upper or lower portal samples noted show ARD probability from rock produced. There is a possibility that in the 9,621 feet of tunneling area, that ARD will be of concern. If on-site geotechnical drilling and sampling indicate a potential for creating ARD from the excavated materials, then an Acid Rock Drainage Plan will be developed in consultation with JHI geotechnical engineers, the Forest Service, and the Alaska DFG, and submitted to FERC within 90 days.

If site work encounters rock that may have a potential to develop ARD in stockpiles the following measures will be taken:

- Separate spoils containing acid-forming materials for immediate disposal.

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- Dispose of the acid-forming material in a designated area with a liner and cap sufficient to keep the weathering reaction from occurring.

- Determine if the acid-forming material would need to be treated with a buffering agent such as lime to neutralize it on site

4.3. Rock Predictive Methods and Characterization

The most important aspect for any investigation into the potential of ARD is to document the various rock types, as well as the content and distribution of sulfide minerals in the rock units, in the Project area. After determining the number of rock unit categories (separate geological units with different concentrations of pyrite), an appropriate number of samples that will be representative of each category should be determined. A sufficient number of samples should be collected to effectively characterize the various elements of the Project such as exposed rock in road cuts, overburden material pushed to the downward side of the road being built, and any other surface disturbance associated with road building which would expose potential sulfide mineral-bearing material.

If ARD potential is found to exist, static sample characterization methods will be used to assess potential acidity.

- **Static tests** that determine both the total acid-generating and total acid-consuming potential of a sample and are used to predict the potential of the rock to produce acid. These may include but are not limited to:
  - Paste or slurry pH tests to measure the surface acidity of rocks;
  - Acid-Base accounting tests which determine the Maximum Potential Acidity (MPA) and Acid Neutralizing Capacity (ANC) of samples;
  - Net Acid Producing Potential (NAPP), which is the theoretical balance between a sample's capacity to generate acid and its capacity to neutralize the acid that is generated (NAPP = MPA - ANC); and
  - Net Acid Generation (NAG) test using hydrogen peroxide to stimulate oxidation to assess how much acid production may occur.

Results of these tests will place a waste material type into one of five categories, which are:

- Acid Consuming Material, non-sulfidic (ACM);

- Non-Acid Forming - Low Sulfur (NAF-LS);

- Non-Acid Forming - High Sulfur (NAF-HS);

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- Potentially Acid Forming - Low Capacity (PAF-LC); and
- Potentially Acid Forming - High Capacity (PAF-HC).

If a site contains PAF-HC, PAF-LC or NAF-HS material, then management of the oxidation and water drainage from this material must be given serious attention.

4.4. Disposal of ARD

Per measures listed above and in consultation with the Forest Service.

4.5. Reporting

To be developed, if needed, in consultation with the Forest Service.

5.0 AGENCY COMMENTS

Comments will be shown by date.

January 10, 2014, Forest Service comments, 3.3.1 Geology and Soils. Requested further testing for Acid Rock Drainage Potential, and if potential is found to exist, a plan to address Acid Rock Drainage must be approved by the Forest Service.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

VEGETATION MANAGEMENT PLAN (VMP)

INCLUDING INVASIVE SPECIES MANAGEMENT PLAN (ISMP)

&

THREATENED, ENDANGERED, PROPOSED FOR LISTING AND SENSITIVE PLANT SPECIES PLAN (TEPLSPSP)

PREPARED BY:

Juneau Hydropower, Inc.
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MAY 2014

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1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower, Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan: k) Vegetation Management Plan, and l) Invasive Species Management Plan. The Alaska Department of Fish and Game (Alaska DFG) in its January 20, 2014, Preliminary Conditions, Article 17, number 5 "Revegetation methods and species," also requested additional information. JHI concurs that these are necessary plans and is submitting this combined preliminary Vegetation Management Plan (VMP) & Invasive Species Management Plan (ISMP) and Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The Project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service

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transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental impacts of the Project. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide Project management through all phases of construction and into operation:

2.1. Appendix Z - JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

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Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

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Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

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A. Invasive Species Management Plan (ISMP)

B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 VEGETATION MANAGEMENT PLAN, INCLUDING INVASIVE SPECIES MANAGEMENT PLAN & THREATENED, ENDANGERED, PROPOSED FOR LISTING & SENSITIVE PLANT SPECIES

The purpose of this Vegetation Management Plan (VMP) is to provide JHI's approach and commitment to protecting the native vegetation in the Project area. The approach has three areas of focus: limiting damage, mitigating damage, and documentation. This approach is applied to design, implementation, and maintenance processes.

The compliance with this plan will be enforced by the Environment Compliance Monitor (ECM) as detailed in the Environmental Compliance Monitoring Plan (EMCP), also in Appendix Z of the PDEA.

The plan objectives are to limit the chance of introduction of invasive plant species, minimize soil erosion, and minimize the visual impact of the constructed features.

This VMP has been prepared to conform to recommended best management practices (BMPs) for preventing the introduction and spread of invasive plant species. This plan was prepared to summarize the provisions for noxious weed prevention and control, vegetation of disturbed areas, and vegetation monitoring and contingency measures.

4.0 LIMITING VEGETATION IMPACT THROUGH DESIGN

JHI and its design contractors have limited the impact on the Project lands to the minimum necessary while maintaining the functionality of the Project. The design

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chosen has eliminated the construction of a road from the dock to the dam site that had originally been proposed but that would have had many vegetation issues as well as sedimentation and visual impacts. Instead, the chosen design will provide access to the dam for construction materials and machinery through the power tunnel and will avoid the impact on the undeveloped forest lands. This will also eliminate a transport route for invasive species that may have been carried up the road by people or animals. The choice of the coastal road/trail constructed of rock from the excavation of the powerhouse site and power tunnel in place of a forest route will reduce the chance of erosion and will limit disturbed area for the spread of invasive species. These combined features have reduced the areas of exposed soil by more than 50% from the prior design.

5.0 MITIGATING DAMAGE TO AREAS OF DISTURBANCE

There are four distinct areas of disturbance: the first is the dam site and upper portal of the power tunnel on Lower Sweetheart Lake, the next is the inundation area of sweetheart lake after construction of the dam, the third is the powerhouse area and the lower portal of the power tunnel with access facilities and switchyard, and the fourth is the power transmission corridor and connection switchyard at the existing Snettisham Transmission Line connection point. Following is a description of each listing the area of disturbed ground and the mitigation measures (all mitigation will be performed on site).

5.1. Dam Site and Upper Portal of the Power Tunnel

The dam site will have 8.7 acres of clearing and excavation to construct the diversion tunnel, diversion dams, power tunnel upper portal, gatehouse, intake structure, and dam. This site will be accessed by helicopter, floatplane, and – during dam construction – through the excavated rock power tunnel. Most of the work at this site other than dam construction will be drilling, blasting, and excavating rock with small equipment brought to the site by helicopter. Since the excavated materials will be primarily shot rock and this construction area (with the exception of the upper structures of the dam and the gatehouse facilities) will be inundated by the lake after completion of the dam, there will be no revegetation of this area.

5.2. Inundation Area of Sweetheart Lake

The permanent inundation area of the lake will be from the existing lake level of 551 feet MLLW to the normal minimum water level of 576 feet. The normal maximum lake level will be 636 feet, allowing a fluctuation of 60 feet. The existing vegetation will not be disturbed during construction and will be left to decay over time. This will both (1) limit both the chance of introducing invasive species and (2) control the release of soil erosion. No revegetation is expected in this area.

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5.3. Powerhouse Area and the Lower Portal of the Power Tunnel

The area of most concern for introduction of invasive species and release of sediments is the powerhouse site and the attached coastal road/trail to the marine dock. This site will have the most traffic from off site, and all materials will be delivered here. The design has limited the disturbed area to the minimum required at 7.62 acres (above mean high tide).

Adjacent to the powerhouse site and directly below is a construction feature (a visual barrier) that will be built of rock, logs, stumps, excess fill, and topped with organics and plants removed from the powerhouse site.

Additionally, there will be the areas above the powerhouse site, adjacent to the tailrace, and around the caretaker's facility. These areas will be planted and covered in wood chips made from cleared limbs and plants not salvaged for replanting. Moss removed from the cleared area will be placed throughout the replanted area.

All areas will be monitored during construction and for the first 5 years after commercial operation begins. Additionally, after construction, the coastal road/trail will have the maintained surface reduced to a single lane by sculpting and planting to reduce the visual impact of the site. This will be accomplished by using native species planted in salvaged organics.

5.4. Power Transmission Corridor

The uplands segments of the transmission lines not included in the powerhouse site consist of a 15,400-foot section of an elevated 138-kilovolt (kV) line on the west side of Gilbert Bay and a 400-foot section of buried 138-kV line on the north side of Port Snettisham to the connecting switchyard at the junction with the existing Snettisham Transmission Line. This area will be constructed without roads or extensive ground cover clearing. Trees that could impact the power lines or poles will be cut in whole or in part to protect the power line with the minimum clearing necessary. This is to avoid exposing soils to erosion, reduce the chance for invasive plants to take root, and to reduce the visual impact of the corridor. Instead of falling all of the trees in the corridor, JHI personnel will "top" some of them to improve scenic goals and reduce wind blowdown of adjacent trees.

Similar to the powerhouse site, the disturbed areas around the power poles and over the buried line, 2.47 acres, will be replanted with native plants and moss and ground cover of chipped limbs and trees. This area will be inspected annually for 5 years after construction to ensure that replanting has worked and to check for and reduce any invasive plants.

6.0 CONSTRUCTION PHASES IMPLEMENTATION

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Implementation of the construction phases of this plan will be overseen by the ECM in accordance with the ECMP. To minimize the transportation of invasive species into the construction areas, all JHI employees and contractors will receive training and be instructed to follow Project procedures. These procedures are as follows:

- Clean all equipment and footwear prior to transporting them onsite.
- Remove all mud, soil, and plant debris.
- Do not bring any plants on site that have not been approved.
- Be vigilant by inspecting all arrivals.
- Immediately notify the Environmental Compliance Monitor (ECM) of suspect species.

Planting procedures will be developed for specific areas based on location, soils types, planting season, and Project goals (i.e., scenery, erosion control, or invasive species control).

7.0 DOCUMENTATION

Prior to on-site construction, all areas will be inspected and photographed to document existing vegetation. Through construction, all exposed soil and all replanted areas will be inspected and photographed monthly during the growing season (April through September), and all conditions and any invasive plants shall be recorded by the ECM. Annually, for the first 5 years of commercial operation, a condition survey will be performed by JHI of all planted areas and areas disturbed. These areas will be photographed, and the ECM will report the condition of plantings, any invasive species found, and any maintenance or eradication performed to JHI. Both the precondition report and annual reports shall be submitted by ECM in the annual Project review.

8.0 REFERENCES

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Alaska Department of Fish and Game. 2014. Invasive Species. <http://www.adfg.alaska.gov/index.cfm?adfg=invasive.main>)

9.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

WATER MANAGEMENT PLAN (WMP)

PREPARED BY:

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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

WATER MANAGEMENT PLAN (WMP)

1.0 AGENCY PLAN REQUESTS

In October 2013, JHI submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) reviewed these documents, and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plans: d) Reservoir Management and Inundation Plan, p) Stream Flow Management Plan, and q) Stream Flow Measurement Plan. In its January 16, 2014, General Comments (B-5), FERC stated that the Water Management Plan (WMP) was mentioned but not included in the prior draft, and the agency requested incorporation. The Alaska Department of Fish and Game (Alaska DFG) in its January 20, 2014, Preliminary Terms and Conditions Article 1) Instream Flows in the Bypass Reach, Article 2) Instream Flows in the Anadromous Reach, 3) Ramping Rates, 4) Stream Gaging and Instream Flow Compliance, 5 Instream Flow Fail-Safe Provisions – all relating to Water Management – also requested a plan. JHI concurs that a WMP is a necessary plan and is submitting this preliminary WMP with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 862-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long, road from the powerhouse to the dock/landing site; (9) a new

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dock/landing site for boat, seaplane, barge/landing craft ramp, and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility, providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, JHI has developed designs and specifications to meet federal, state, and local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental project impacts. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide project management through all phases of construction and into operation:

2.1. Appendix Z - JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

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- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

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Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

Solid Waste and Wastewater Plan (SWWP)

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Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)

B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 WATER MANAGEMENT PLAN

This Water Management Plan (WMP) incorporates the following plans:

1. Reservoir Management and Inundation Plan (RMIP)

2. Stream Flow Management Plan (SFMP)

3. Stream Flow Measurement Plan (SMP)

These plans meet specific project requirements and are all related; therefore, they are combined into this one plan.

4.0 BACKGROUND

Sweetheart Lake is listed as a federal power site under Public Land Order (PLO) No. 382b as Power Site Classification 221 March 6, 1929. The Lower Sweetheart Lake drainage encompasses 35 square miles.

Sweetheart Creek is defined by the barrier falls at the upper in of the anadromous reach. Lower Sweetheart Creek is the anadromous reach ending at the barrier falls. Upper Sweetheart Creek is from the outlet of Sweetheart Lake downstream to the base of the barrier falls. Sweetheart Creek below the outlet of Sweetheart Lake has a drainage

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area of approximately 4% and an accretion of approximately 3% of Sweetheart Lake above the outlet (Appendix C of the PDEA).

Sweetheart Creek has been studied for nearly a century (Canfield, 1919) as a potential energy source and the U.S. Geologic Survey (USGS) gaged the stream (USGS Station No. 1503000) from August 1915 to September 1927. JHI has commissioned Civil Science Inc. (CSI) to develop a Hydrology Report and Errata (Appendix C of the PDEA). CSI reestablished the USGS gaging station and installed a second gaging station at the outlet of Sweetheart Lake. CSI reports the average annual flow at the Lower Sweetheart Creek barrier falls to be 344 cubic feet per second (cfs) (Appendix C, Errata, Table 1).

5.0 RESERVOIR MANAGEMENT AND INUNDATION PLAN (RMIP)

This Reservoir Management and Inundation Plan contains the following requirements:

- Water Level Measurement. JHI will measure the lake level and integrate this information into the powerhouse operations and controls systems.

- Water Quality Maintenance. JHI will maintain water quality in Sweetheart Lake during construction, initial inundation, and during commercial operations.

- Water Level Management. JHI will maintain power generation storage capacity and flows while meeting permitted flow release requirements and operating within permitted reservoir levels.

- Lake Vegetation Management. JHI will maintain the safety of the project operations form Floating Debris, from decomposing vegetation in the inundation zone and vegetation deposited by the numerous avalanche slide paths into the lake.

6.0 STREAM FLOW MANAGEMENT PLAN

- JHI will maintain minimum flows to the Anadromous Reach. This requires releasing minimum flows as set by Alaska Department of Fish and Game (Alaska DFG) in negotiation with JHI at the base of the Sweetheart Creek barrier falls. The Alaska DFG has a Reservation of Water on file with Alaska Department of Natural Resources (Alaska DNR). The purpose of the reservation is to protect fish habitat, migration, and propagation in the anadromous reach. JHI will include methods to control the flow and alternatives to assure continuous compliance.

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- JHI will develop procedures to limit the Ramping Rate affecting the lower anadromous reach below the Extreme High Tide (EHT) elevation.

- JHI will maintain Bypass Reach Flow. JHI will maintain adequate flow to the bypass reach of Sweetheart Creek from the dam site to the lower barrier falls. This will include the methods to control the release flow and alternative to assure compliance.

7.0 STREAM FLOW MEASUREMENT PLAN

- JHI will measure the Sweetheart Creek flow at the barrier falls. This will require a calibrated stream gauge installed near the existing Lower Sweetheart Creek gauge station. This gauge will require that the data be integrated into the powerhouse operations and control systems.

- JHI will measure the release at the dam into Upper Sweetheart Creek. This will require a calibrated flow measuring system is installed into the release system. This system will require that the data be integrated into the powerhouse operations and control systems.

7.1. Proposed Measures From PDEA

- Proposed 3 cfs instream flow to be supplemented with naturally occurring accretion estimated at 3% of the previous flow would not affect rainbow trout or Dolly Varden species; no measures proposed.

- JHI has a proposed measure that is crafted from Alaska DFG 10 (j) recommendations and Forest Service 4 (e) Preliminary conditions, to develop and implement a Water Management Plan (WMP) that includes a Stream Flow Management Plan (SFMP) and Stream Flow Measurement Plan (SMP). These preliminary plans are found in Appendix Z. These plans include a consistent instream flow release between 300 and 486 cfs to Sweetheart Creek at the base of the barrier falls once the Project reaches reservoir fill. The late July-early August, pulsing flows are intended to stimulate salmon to migrate upstream: these pulsing flows are not intended as "stream channel maintenance" flows.

- Alaska DFG 4. Stream Gaging and Instream Flow Compliance

  JHI would emplace permanent gaging instrumentation on the inner face of the dam to obtain and measure reservoir water levels. JHI would also maintain a permanent gage in Sweetheart Creek just below the exit of the tailrace to monitor flow entering the anadromous reach. The lower Sweetheart Creek gage would be synchronized with powerhouse controls that would also monitor

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the water release made into the tailrace. Additionally, JHI would measure flow released at the base of the toe of the dam to monitor instream flow releases via a gage or metering device. The powerhouse would be synchronized with lower gage in order to adjust instream flow release as required. The water data from these gages would be updated and periodically issued (every 3 years) as the Sweetheart flow record continues. These data would be developed in conjunction with additional weather data collected from instrumentation used at the Project to better describe the hydrology of the system over time.

- Stream gage data collection and analysis would continue as needed throughout Project development. The gages shall be operated and maintained according to USGS standards. All data shall be recorded at a frequency of not greater than 15-minute intervals and filed with the Commission by April 1st of each year, documenting the previous water year. Copies of the data shall be provided upon request to interested parties. These gages and/or other integrated gages would also accommodate and record other weather related data as requested by NOAA.

7.1.1. Documentation

A report will be filed annually with the Forest Service by December 31 to document the condition and effectiveness of all measures.

7.2. Compliance

For the construction period, this WMP will be documented and enforced by the Environmental Compliance Manager and upon commercial operations, this will be the responsibility of JHI management.

8.0 AGENCY COMMENTS

Comments will be shown by date.

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SWEETHEART LAKE HYDROELECTRIC PROJECT

FERC PROJECT NO. P-13563

WILDLIFE MITIGATION AND MONITORING PLAN (WMMP) & THREATENED, ENDANGERED, PROPOSED FOR LISTING, AND SENSITIVE SPECIES PLAN (TEPLSSP)

PREPARED BY:

Juneau Hydropower, Inc.
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MAY 2014

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SWEETHEART LAKE HYDROELECTRIC PROJECT

WILDLIFE MITIGATION AND MONITORING PLAN (WMMP) & THREATENED, ENDANGERED, PROPOSED FOR LISTING, AND SENSITIVE SPECIES PLAN (TEPLSSP)

1.0 AGENCY PLAN REQUESTS

In October 2013, Juneau Hydropower Inc. (JHI) submitted a subsequent draft license application and draft Preliminary Draft Environmental Assessment (PDEA) for the Sweetheart Lake Hydroelectric Project to the Federal Energy Regulatory Commission (FERC). On October 22, 2013, FERC published notice and issued a request for comments and preliminary terms and conditions. The U.S. Forest Service (Forest Service) reviewed these documents and in its January 10, 2014, Preliminary 4(e) Terms and Conditions, number 22, requested the following plan be included: m) Wildlife Mitigation and Monitoring Plan. The Alaska Department of Fish and Game (Alaska DFG) in its January 20, 2014, Preliminary Terms and Conditions, Article 12, Requests guidelines for Avian protection; Article 14, Requests controls to minimize impacts on mountain goats; Article 15, Requests the maintenance of wildlife corridors; and Article 16, Requests restricting access and land use to minimize fish and wildlife impacts; and also requested a plan. JHI concurs that a plan is necessary and is submitting this preliminary Wildlife Mitigation and Monitoring Plan (WMMP) with the Final License Application and PDEA for comment.

2.0 PROJECT DESCRIPTION

The project consists of: (1) the existing Lower Sweetheart Lake, raised from a surface water elevation of 551 feet (MLLW) and a surface area of 1,414 acres to a new minimum surface water elevation of 576 feet and a new surface area of 1,449 acres and a maximum surface water elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller-compacted concrete dam 111 feet high (from the downstream toe to the top of the dam), 280 feet long, 100 feet thick at the base, constructed at the outlet of Lower Sweetheart Lake; (3) an independent intake structure with fish screen adjacent to the dam right abutment, which conveys water to a 15 X 15-foot horseshoe-shaped, 9,621-foot-long unlined tunnel; (4) a 9-foot-diameter, approximately 896-foot-long penstock installed within the lower portion of the tunnel, with approximately another 160 feet of buried 7-foot-diameter penstock and manifold connecting to the powerhouse; (5) a powerhouse containing three new Francis generating units (6.6 MW each) with a total installed capacity of 19.8 MW; (6) a 541-foot tailrace discharging flows to Sweetheart Creek, including a salmon smolt reentry pool located adjacent to the powerhouse and tailrace; (7) a fenced switchyard adjacent to the powerhouse; (8) a new, approximately 4,400-foot-long road from the powerhouse to the dock/landing site; (9) a new

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dock/landing site for boat, seaplane, barge/landing craft ramp and/or helicopter access, located on the east shore of Gilbert Bay; (10) a new, 138-kilovolt transmission line that would be a total of 45,900 feet long (25,700 feet of submarine cable in two segments; 15,400 feet of overhead transmission line on Snettisham Peninsula; and 4,800 feet of buried transmission line in two segments); (11) a new, 14,800-foot, 12.47-kV service transmission line extending from the dam site to the marine facility providing operational electricity and communications for operations; (12) a caretaker facility with shop and maintenance facilities; (13) a shelter facility at the dam site; (14) appurtenant facilities.

To construct and operate the Sweetheart Lake Hydroelectric Project systems, Juneau Hydropower, Inc. (JHI) has developed designs and specifications to meet Federal, State, and Local regulations. In addition, JHI has developed the following plans to implement procedures to construct, monitor, and mitigate the safety, health, and environmental project impacts. These plans are prepared to meet regulatory requirements of various involved agencies and some plans address similar issues. Together these plans form a comprehensive resource to guide project management through all phases of construction and into operation:

2.1. Appendix Z - JHI Preliminary Plans

The plans included in Appendix Z of the PDEA are as follows:

Access Management Plan (AMP)

Aquatic Habitat Restoration and Monitoring Plan (AHRMP)

- Fish Mitigation and Monitoring Plan (FMMP)

Bear Safety Plan (BSAFE)

Construction Plan (CP)

Environmental Compliance Monitoring Plan (ECMP)

Erosion and Sedimentation Control Plan (ESCP)

- Storm Water and Pollution Prevention Plan (SWPPP)

Fire Prevention Plan (FPP)

Hazardous Substances Plan (HSP)

Heritage Resource Plan (HRP)

Recreational Management Plan (RMP)

Scenery Management and Monitoring Plan (SMMP)

Solid Waste and Wastewater Plan (SWWP)

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Spoil Disposal Plan (SDP)

- Acid Rock Disposal Contingency Plan (ARDCP)

Vegetation Management Plan (VMP)

A. Invasive Species Management Plan (ISMP)

B. Threatened, Endangered, Proposed for Listing, and Sensitive Plant Species Plan (TEPLSPSP)

Water Management Plan (WMP)

A. Reservoir Management and Inundation Plan (RMIP)

B. Stream Flow Management Plan (SFMP)

C. Stream Flow Measurement Plan (SMP)

Wildlife Mitigation and Monitoring Plan (WMMP)

- Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP)

3.0 WILDLIFE MITIGATION & MONITORING PLAN (WMMP)

The Wildlife Mitigation and Monitoring Plan (WMMP) is provided to identify requirements for construction and mitigation measures to meet Forest Service wildlife habitat objectives and standards in the Tongass National Forest Land and Resource Management Plan (2008). The Threatened, Endangered, Proposed for Listing, and Sensitive Species Plan (TEPLSSP) is incorporated into this document.

The licensee, JHI, has prepared this plan in consultation with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS), Forest Service, and Alaska DFG.

3.1. Construction Mitigation Measures

Construction compliance with the requirements discussed in this section will be enforced by the Environmental Compliance Monitor (ECM) as detailed in the Environmental Compliance Monitoring Plan (ECMP). Operations compliance with measures in the ECMP will be the responsibility of the licensee. Agreement with the conditions of the ECMP will be a provision of employment for all personnel.

3.1.1. Wildlife Proposed Measures

The following Table 3-1 lists the proposed measures to address Project-related wildlife effects:

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Table 3-1 Wildlife Effects and Measures

Environment	Effect	Proposed Measures
Marine Mammals	Construction and operations potential for collision with marine mammals	Establish a marine mammal safety zone of 100 yards around in-water construction activities for the protection of marine mammals from effects caused by in-water construction of laying submarine transmission line.
Marine Mammals	Construction and operations potential for collision with marine mammals	Prepare and implement an in-house awareness program to prevent collisions between service boats and marine mammals and to minimize harassment of marine mammals.
Marine Mammals	Construction and operations potential for collision with marine mammals	Boat captains on JHI business are responsible to spot marine mammals within the safety zone. Boat captains on JHI business are responsible to notify construction management of marine mammals within the safety zone.
Marine Mammals	Construction and operations potential for collision with marine mammals	If marine mammals are in the direct path of a boat and unavoidable, the boat shall either go to "slow-safe speed" or stop until the marine mammal is clear or can be avoided by a minimum of 100 yards. A "slow-safe speed" is defined in the Inland Navigational Rules and the International Regulations for Preventing Collisions at Sea 1972 (COLREGS) (33 U.S.C. 1602, respectively. The COLREGS Rule 6 defines operations such that "every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions."
Marine Mammals	Construction and operations potential for collision with marine mammals	In the unlikely event of a vessel colliding with a marine mammal, the National Marine Fisheries Service would be notified within 48 hours of the event.
Marine Mammals	Construction and operations potential for collision with marine mammals	In-water pile driving for the marine dock and landing facilities would stop if marine mammals enter the 100-yard safety zone. Construction would resume only after the animal leaves the zone.
Marine Mammals	Construction and operations potential for collision with marine mammals	Vessels laying cable are exempt from the approach distance regulations for humpback whales. However, trained boat captains and observers would still be present on cable-laying vessels and notify the vessel captain of marine mammal presence within the 100-yard safety zone and advise a "safe-slow speed".

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Environment	Effect	Proposed Measures
Steller Sea Lions	Construction and operations potential for disturbance of Steller Sea Lions	Marine transportation routes and flight pathways crossing Port Snettisham would be located at least 3,000 feet from the Steller sea lion haulout located east of Mist Island. Weather and sea conditions may dictate the necessity to vary from these routes in the interest of safety of the vessel or aircraft and passengers.
Wildlife Movements	Construction and operations potential for blocking wildlife movements	To minimize blocking natural wildlife movements and to aid in wildlife movements around the Project area, the following measures will be adopted. 1. Open areas at Sweetheart Creek mouth and Gilbert Creek marsh would remain free of any obstruction to wildlife movement. Wildlife movements near the powerhouse would be accommodated by constructing a broad overpass over the tailrace and a connecting trail on the shore side of the visual barrier to the coastal trail. A bypass wildlife trail would be developed upland of the caretaker's cabin site to minimize human-animal interaction. 2. The penstock and tunnel would be buried avoiding impediments for animals traversing the Project area. 3. Construction work on the tailrace near Sweetheart Creek would be scheduled to minimize disturbance at the time bears are fishing. 4. Project design has eliminated overhead power lines on or near Gilbert Bay flats to protect migratory birds. 5. The switchyard and powerhouse would be constructed in an excavated area to minimize the effects of Project operations on wildlife; 6. The Project footprint has been designed to use minimal area, and the coastal road/trail minimizes disturbance to the forested area. 7. The dam and intake structures are designed to operate without frequent visits, and no road to the site is intended allowing minimal animal disturbance. 8. The caretaker's quarters on Gilbert Bay are designed as far away from Sweetheart Creek and the heavy animal use areas as possible within the Project boundary.

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Environment	Effect	Proposed Measures
Project footprint	The Project construction and operation will affect the overall habitat footprint to some extent.	The following measures will seek to minimize the Project area to the extent possible. 1. Only remove vegetation that is either directly in the way of a Project structure, or may be a hazard to Project structures; 2. Vegetation would be removed only within the necessary boundaries of the Project; 3. Construction equipment would be appropriately sized for the Project; 4. Care would be exercised to preserve the natural landscape; conduct all operations to prevent unnecessary destruction, scarring, or defacing of the natural surroundings; 5. All operations would be conducted in a manner causing the least disturbance to the vegetation outside of the construction area. Material from construction work shall be deposited where it would be protected from erosion; 6. Soil mass movement would be prevented by laying back permanent cuts and other excavations to stabilize slopes. Stabilize steep rock slopes with rockbolts, wire mesh, gabion walls, and shotcrete, if necessary. 7. To mitigate the impacts of Project construction to the natural landscape, a revegetation plan is included with the Erosion and Sediment Control Plan (ESCP).
Goats	The Project may affect goat habitat areas.	JHI will conduct surveys for evidence of goat activity near the outlet of Sweetheart Lake prior to construction and smolt capture and transport activities. If evidence of goat presence in the area is found, flight paths would be designed to maintain 1,500 feet vertical and horizontal distance to the extent possible.

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Environment	Effect	Proposed Measures
Wildlife Exploitation	Increased human presence during construction may increase the possibility of wildlife exploitation in the Project area.	1. Employees, contractors and subcontractors would be restricted from hunting, fishing, and trapping within ½ mile of Project features during construction of the Project; 2. Hunting and Fishing Regulations would be posted on site; 3. No personal firearms on site except as specifically approved by the ECM with any additional restrictions; 4. The ECM would be responsible for reporting any violations; disciplinary measures to include termination of employment for violators; 5. JHI personnel are not to interfere with citizens who are legally hunting, trapping, or fishing other than when necessary for safety issues (blasting, snow removal, maintenance, etc.).
Bear Human Interaction	Increased human activity may increase the chances for human bear interaction.	The JHI would Bear Safety Plan (BSAFE) is in the form of a Bear Safety Instruction Manual, which would be required reading for all personnel during construction and operation. The Bear Safety Instruction Manual is enclosed with the BSAFE. The BSAFE plan is listed in Appendix Z. Some elements are listed below: a. Instructions for operating practices when in bear country that minimize possible conflict; b. Instructions to minimize encounters and avoid areas often used by bears, if possible; c. Instructions for keeping construction sites and refuse areas clean; d. Installation of bear-proof garbage receptacles and other measures to prevent bears from obtaining food or garbage; e. Removal of garbage to an approved disposal site as soon as practicable; f. Procedures to deal with problem bears; g. Informing workers about bear safety procedures at safety “tailboard” meetings; and h. Posting signs notifying the public that bears are frequent in the area, suggesting the use of designated pathways, and be alert. i. Notification to Alaska DFG point of contact designee of any bear-human conflicts.

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Environment	Effect	Proposed Measures
Avian Protection	The Project may impact Avian habitat.	The overhead segment of the 138-kV transmission line would be designed according to the Avian Power Line Interaction Committee's Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 **Bald Eagles -** JHI would consult with the FWS if active nesting occurs in the vicinity of the Project to develop measures to avoid or minimize Project effects
Monitoring	Project Activities may have compliance implications for wildlife.	During construction, JHI would retain an Environmental Compliance Monitor to ensure compliance with license requirements, to ensure that resource mitigation and protection measures are implemented as planned, and act as a liaison between construction management and resource agencies. The ECM shall maintain a log of daily activities including observations of construction activities, any environmental problems reported to construction management, any measures taken to avoid environmental problems, or to mitigate damages to resources. The ECM shall also report to JHI management and contractor management any incidents such as bear-human interactions and illegal activities by employees of JHI or the construction contractor. The need for disciplinary action shall be the responsibility of JHI and contractor management.

4.0 THREATENED, ENDANGERED, PROPOSED FOR LISTING, AND SENSITIVE SPECIES PLAN (TEPLSSP)

This TEPLSSP establishes the standards and guidelines for the minimization of impacts to animals within the project area. Sensitive or endangered plants are covered in the Vegetation Management Plan (VMP) which includes a Threatened, Endangered, Proposed for Listing Sensitive Plant Species Plan (TEPLSPSP) included in Appendix Z.

This TEPLSSP has been prepared for the Sweetheart Lake Hydroelectric Project, FERC No. **P-13563.** This plan describes the steps JHI will take to meet the requirements of the Forest Service license conditions. It establishes the goals and objectives for threatened, endangered, and sensitive species management and the guidelines for the consultation that will occur over the term of the license. This plan was prepared collaboratively by JHI, the Forest Service, the NMFS, and the FWS.

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This plan includes:

- Review of the license article to ensure the plan meets the requirements of the article.
- Statements of the purpose, goals, and objectives of the plan.
- Regulatory references and definitions to maintain consistency between the plan and other pertinent laws, regulations, and policies.
- Plan implementation requirements describing the site-specific and species-specific criteria and actions that will be taken under this plan.
- Reporting mechanisms for this plan, including implementation of the Terms and Conditions of the Forest Service, FWS, and NMFS.

The Endangered Species Act (ESA) section 7 implementing regulations (50 Code of Federal Regulations [CFR] 402.02) define "effects of the action" as:

The direct and indirect effects of an action on the species or critical habitat together with the effects of other activities which are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal project in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

There are possible determinations of effects under the ESA:

- *No effect means that the proposed action or interrelated or interdependent actions will not affect (positively or negatively) listed species or their habitat.*
- *May affect, not likely to adversely affect means that the proposed action or interrelated or interdependent actions may affect listed species or their habitat, but the effects are expected to be insignificant, discountable, or entirely beneficial.*
    - Insignificant effects relate to the size of the impact and should never reach the scale where a take will occur.
    - Discountable effects are those that are extremely unlikely to occur. Based on best judgment, one would not 1) be able to meaningfully measure, detect, or evaluate insignificant effect; or 2) expect discountable effects to occur.

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  - Beneficial effects are contemporaneous positive effects with no adverse effects to listed species.

- *May affect, likely to adversely affect means that the proposed action or interrelated or interdependent actions may have measurable or significant adverse effects on listed species or their habitat. Such a determination requires formal ESA Section 7 consultation.*

Determinations are also required of the effect of a federal action on any designated critical habitat for listed species.

The humpback whale is the only species listed as endangered under the ESA that is known to occur in the vicinity of the Project. The eastern Steller sea lion was recently delisted. There are no species currently Proposed for Listing,

4.1. Humpback Whale

The reservoir, tunnel, and powerhouse are not considered as part of the action area affecting humpback whales since these features are located far enough from the shoreline of Gilbert Bay to avoid any potential Project effects. The action area includes Project onshore facilities that are located adjacent to Gilbert Bay along the coast road route, quarry area, and dock/land facilities and includes a protection zone of 100 yards into Gilbert Bay. The marine transmission line-laying route also has a 100-yard-wide marine mammal protection zone on either side of the line crossing Gilbert Bay and Port Snettisham (the preferred route). The overhead transmission line segment located on the Snettisham Peninsula is included in the action area since the construction would include use of a barge serving as a staging area and use of a helicopter for placing transmission towers and transporting workers to and from the powerhouse staging area located on the east side of Gilbert Bay.

Materials would be delivered along marine shipping routes between Seattle, Washington, and the Gilbert Bay dock/landing facilities and are included in the action area.

Table 3-2 lists Projects effects and measures that will be implemented to avoid contact with humpback whales.

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Table 3-2 Humpback Whales (Endangered) Effects and Measures

Environment	Effect	Proposed Measures
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	Establish a marine mammal safety zone of 100 yards around in-water construction activities for the protection of humpback whales from effects caused by in-water construction of laying submarine transmission line.
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	Prepare and implement an in-house awareness program to prevent collisions between service boats and marine mammals and to minimize harassment of humpback whales.
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	Boat captains on JHI business are responsible for spotting marine mammals, including humpback whales, within the safety zone. Boat captains on JHI business are responsible for notifying construction management of humpback whales within the safety zone.
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	If humpback whales are in the direct path of a boat and unavoidable, the boat shall either go to "slow-safe speed" or stop until the whale is clear or can be avoided by a minimum of 100 yards. A "slow-safe speed" is defined in the Inland Navigational Rules and the International Regulations for Preventing Collisions at Sea 1972 (COLREGS). Rule 6 of the COLREGS defines operations such that "every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions."
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	In the unlikely event of a vessel colliding with a humpback whale, the NMFS would be notified within 48 hours of the event.
Humpback Whale Disturbance	Construction and operations potential for disturbance of natural whale behavior	In-water pile driving for the marine dock and landing facilities would stop if marine mammals enter the 100-yard safety zone. Construction would resume only after the animal leaves the zone.

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Environment	Effect	Proposed Measures
Humpback Whale Collision Avoidance	Construction and operations potential for collision with humpback whales.	Vessels laying cable are exempt from the approach distance regulations for humpback whales. However, trained boat captains and observers would still be present on cable-laying vessels and notify the vessel captain of marine mammal presence within the 100-yard safety zone and advise a "safe-slow speed."

4.2. Other Federally Listed Species

Over the term of the license, additional fish and wildlife species under the jurisdiction of the FWS or the NMFS may become listed by either FWS or NMFS under the ESA as threatened or endangered. If a species becomes listed or is proposed for listing in accordance with Section 4 of the ESA, JHI will consult with the agency having ESA jurisdiction (FWS or NMFS) to:

- Determine whether the species is present or potentially present on project lands or lands influenced by project operation.
- Determine whether operation and maintenance of the project or compliance with one or more articles of the license or settlement agreement could result in take of the species.
- Identify steps that will be necessary to avoid, minimize, or mitigate take of the species associated with the project.

4.2.1. Notification of Actions Affecting Listed Species

Terms and Conditions associated with NMFS and FWS Biological Opinions, as well as other articles (e.g., SA 104, 505, etc.) identify actions necessary to address listed species. JHI will notify the NMFS and the FWS of any actions taken under this plan related to listed species. In addition, JHI will provide an annual report to the FERC of consultations and conservation measures undertaken related to listed species under this plan.

4.3. Sensitive Species

There are four sensitive species identified by the Forest Service for the Tongass National Forest (TNF) in Region 10 (Forest Service, 2008). Sensitive species for the TNF are provided in Table 2. Determinations of Project effects on sensitive species considers four levels of effects as defined below:

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1. The (proposed action/alternative) would have no impact;

2. The (proposed action/alternative) would have beneficial impacts;

3. The (proposed action/alternative) may adversely impact individuals but not likely to result in a loss of viability in the Project-affected area, nor cause a trend toward federal listing for the species; and

4. The (proposed action/alternative) is likely to result in a loss of viability in the Project-affected area, or in a trend toward federal listing for the species.

Table 2 lists sensitive species in or near the TNF; as noted, none of them will be affected by the Project.

Table 2 Sensitive Species for the Tongass National Forest

Species	Project Presence	Project Effects
Aleutian Tern	The breeding range of this species does not extend south of Glacier Bay, Alaska. Not likely to occur in the area of the Project.	The proposed Project would have no impact.
Black Oystercatcher	Potential presence and nesting.	The proposed Project may adversely impact individuals but is not likely to result in a loss of viability in the Project-affected area, nor cause a trend toward federal listing for black oystercatchers.
Dusky Canada Goose	Potential fall or spring migrant.	The proposed Project may adversely impact individuals but is not likely to result in a loss of viability in the Project-affected area, nor cause a trend toward federal listing for dusky Canada geese.
Queen Charlotte Goshawk	Potential presence and nesting.	The proposed Project may adversely impact individuals but is not likely to result in a loss of viability in the Project-affected area, nor cause a trend toward federal listing for goshawks.

There are no proposed measures that are related to sensitive species for the Project.

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5.0 REPORTING

JHI will prepare an annual report that summarizes activities taken under this plan, including FWS and NMFS consultation, conservation measures, and implementation of the terms and conditions carried out the previous January through December. The annual report on the implementation of the TEPLSSP will provide a comprehensive framework for FWS and NMFS consultation and will serve as a tracking system regarding the implementation of the measures in this plan.

5.1.1. Reporting Schedule

JHI will provide a draft Threatened, Endangered, and Sensitive Species report to the FWS for a 30-day review by March 31 of the year following the reporting period as part of our overall WMMP. Revised annual reports, incorporating FWS comments, will be submitted to FERC by May 1 of that year.

5.1.2. Reporting Format

The annual report will include:

- A summary of FWS and NMFS consultation.
- A summary of activities conducted in response to FWS and NMFS consultation.
- A summary of activities associated with the conservation measures in this plan and the implementation of the FWS and NMFS terms and conditions.
- A summary of any issues and concerns raised by JHI, FWS, or NMFS and how they were addressed.
- Any proposed modifications to the plan.

6.0 AGENCY COMMENTS

Agency comments will be listed by date received and by which agency.

January 20, 2014 – Alaska DFG requested stream buffers to protect transportation corridors for wildlife; designs to avoid electrocution of raptors and other birds; methods to minimize the potential for bear/human interactions, reduce aircraft disturbance of mountain goats, ensure that wildlife movement is minimally affected, and minimize the impacts to area harvest levels during construction.

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