Executive Summary

On April 11, 2013 Juneau Hydropower, Inc. received a successive preliminary permit application to investigate the development to construct and operate the proposed Sweetheart Lake Hydroelectric Facility (Project) from the Federal Energy Regulatory Commission (FERC) in Washington, D.C. The Project is identified as FERC No. 13563-002. The 19.8 megawatt project will be located on Lower Sweetheart Lake and Sweetheart Creek with the transmission corridor running along and under Gilbert Bay approximately 30 miles south of Juneau, Alaska. The transmission line is proposed to tie into Alaska Industrial Development and Export Authority’s (AIDEA) existing Snettisham transmission line on the north side of Port Snettisham. The project will be located on federal lands managed by the United States Department of Agriculture Forest Service (USFS) as part of the Tongass National Forest. The project is listed as a Power Site Classification #221, Alaska No. 9, as a hydropower classification by a Secretarial Public Land Order 382b approved on May 14, 1929 by authority of the President of United States delegated to the Secretary of Interior. The project is located on Value Comparison Units (VCUs) 610, 570 and 550.

During Initial Consultation and Scoping, Project Stakeholders indicated a concern for the Project impacts on scenic and aesthetics resources on lands managed by the USFS. The USFS requested potential impacts on the scenery resource be inventoried, evaluated and analyzed based on the USFS Handbook for Scenery Management (USFS, 1995) and the Tongass National Forest Land and Resource Management Plan (USFS, 2008) (Forest Plan). The framework for scenery management included three phases of work: 1) inventory, 2) develop standards and 3) determine the effects of the Project on scenery. Based on this analysis, the effects of the project were evaluated to determine impacts to the existing landscape and whether these impacts to the scenery are acceptable.

The scenery inventory for the Project was carried out in the summer of 2013. Analysis of the impacts to VCU 610 will be less detailed than those found in VCUs 570 and 550 due to: 1) Project facilities (dam, increase in lake level, and tunnel penstock) being located in an unseen/seldom seen landscape, 2) there are no inventoried Visual Priority Travel Routes or Use Areas in VCU 610 that will facilitate viewing of impacts in this VCU, and 3) including data for this very large VCU will create an inaccurate perception of the landscape and proposed modifications within the Project area. Based on the inventory, the Project area is defined as having the following scenery attributes:

- 10% Distinctive and 90% Typical Inherent Scenic Attractiveness
- From Visual Priority Travel Routes and Use Areas, the Project area is comprised of 10% foreground, 70% middleground, 0% background, and 20% unseen.
- 97% Very High Existing Scenic Integrity with the remaining being 1% Moderate and 2% Low
- 73% Low Visual Absorption Capacity, 7% Intermediate and 20% High.

The Scenery Management System (SMS) establishes an overall framework for orderly inventory, analysis and management of scenery on lands administered by the USFS. Established scenery guidelines, goals and objectives are listed in the Forest Plan. Scenery guidelines, known as Scenic Integrity Objectives (SIOs), provide acceptable scenic modifications for human-based activities for all management activities on USFS lands.

The Forest Plan states “Manage the scenery of the Forest in order to achieve the adopted Scenic Integrity Objectives.” SIOs are established in the Forest Plan and are based on Distance Zones and Land Use Designations (LUDs). Value Comparison Unit (VCU) 610, 570, and 550 are defined by five LUDs: Semi-remote Recreation, Modified Landscape, Old-Growth Habitat, Scenic Viewshed, and Timber Production. The Project is located on three of these LUDs: Semi-Remote Recreation, Timber Production, and Old-Growth Habitat.

It is the intent of the Project, with consultation with the Forest Service to file and obtain a Transportation and Utility System (TUS) LUD for the project area in the future to have the Land Use Designation conform to and support the development of a public hydroelectric power project and its associated facilities including the Sweetheart Lake Hydroelectric Project. A TUS LUD is defined as an “Overlay LUD” where the underlying initial LUDs, remain in effect until a transportation and or utility system is initiated though construction, then this management prescription
will apply. Within the TUS corridor, the underlying LUDs continue to exist but are superseded by the TUS only for the allowable uses prescribed by the TUS. The TUS LUD applies only to the project limits/corridor necessary for the infrastructure and maintenance of facilities required as part of the TUS development. This Report analyzes the impacts on the three existing LUDs that are currently in place (Semi-Remote Recreation, Timber Production, and Old-Growth Habitat) as the basis of the reporting. In addition, this report also addresses a TUS LUD, should it be granted in the future. Portions of this Report that pertain to a possible TUS LUD are indicated in italics and are only relevant should the Project receive a TUS designation.

Scenic Integrity Objectives (SIOs) establish scenery standards for management and the degree to which the landscape must be retained intact or be visually perceived as modified by human activities. SIOs include; High (landscape visually intact), Moderate (landscape appears slightly altered), Low (landscape appears moderately altered with deviations dominating the landscape) and Very Low (modifications dominate the landscape).

Based on the Forest Plan, the adopted SIO for each LUD within the Project Area is as follows (same for each distance zone, unless noted):

- Old-Growth Habitat LUD: High SIO
- Semi-Remote Recreation LUD: Moderate SIO
- Timber Production LUD: Low SIO (foreground), Very Low SIO (middleground and background)

*Transportation and Utility System LUD: Low SIO (if TUS LUD is granted in future for project area)*

Activities within the High SIO must not be evident to the casual observer while modifications in the Moderate SIO must be subordinate to the landscape character. Low SIO may visually dominate the characteristic landscape, but must have visual characteristics similar to those of natural occurrences within the surrounding area or character type. Following Project completion, SIO should be met within 1 year in the foreground distance zone and within 5 years in the middle and background Distance Zones. Very Low SIO may visually dominate the landscape character. When planning activities, use naturally established form, line, color, and texture found in the landscape. Siting and design of facilities should borrow from naturally occurring patterns in the landscape, and should not be visually dominant when viewed in the background distance zone.

The adopted SIO for each LUD in the Forest Plan does make a provision for the Old-Growth Habitat and Semi-Remote Recreation LUDs where “exceptions for small areas of non-conforming developments …. may be considered in these LUDs on a case-by-case basis.”

To understand the Project effects on Scenic Integrity, three-dimension digital visual simulations were generated to document the expected effects of the Project on scenery on USFS lands. The simulations are based on site photos from established view points. One simulation was created for each view point to show the expected impacts based on the facilities and structures, clearing limits, terrain modifications, and impacts to the landscape as described in Juneau Hydropower, Inc, Exhibit G 4.4 (2013). The simulations were created using ESRI’s ArcMap (GIS) and three-dimensional visualization software for outdoor environments. The simulations were developed to show the expected visual impact of the Project at one year or five years after construction is complete as indicated by the LUD scenery requirements. Only effects within the seen landscape on USFS lands are evaluated.

Based on the expected visual impacts to the landscape on USFS lands shown in the simulations the following are the areas of concern based on the existing LUDs (Semi-Remote Recreation, Timber Production, and Old-Growth Habitat):

**VCU 610:**  
Lower Sweetheart Lake (Dam, elevated lake levels, and buried penstock). Expected Scenery Integrity effects will be within an unseen/seldom seen landscape.

- Semi-Remote Recreation LUD: Expected Scenery Integrity effects will be consistent with a Moderate Scenic Integrity Objective (SIO) and will not exceed the allowable visual impacts indicated in the Forest Plan.
**Executive Summary**

**VCU 570:**
East Side of Gilbert Bay (Penstock, powerhouse, switchyard, coastal road, utility corridor, dock facility, storage yard, and caretaker’s facility)

Semi-Remote Recreation LUD: Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will exceed the visual impacts for a Moderate SIO as allowable in the Forest Plan. This SIO will not be accomplished within one year after completion. This is not consistent with the Forest Plan.

West side of Gilbert Bay (Submarine and overhead transmission line and transition facility)

Timber Production LUD: Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will not exceed the visual impacts for a Very Low SIO as allowable in the Forest Plan. Expected impacts do not take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs. This is not consistent with the Forest Plan.

**VCU 550:**

South Side of Port Snettisham (Submarine and overhead transmission line and transition facility)

Timber Production LUD: Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will not exceed the visual impacts for a Very Low SIO as allowable in the Forest Plan.

Expected impacts do not take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs. This is not consistent with the Forest Plan.

North Side of Port Snettisham (Submarine and overhead transmission line and transition facility)

Old-Growth Habitat LUD: Expected Scenery Integrity effects will be consistent with a Moderate Scenic Integrity Objective (SIO) and will exceed the visual impacts for a High SIO as allowable in the Forest Plan. It is not expected that this objective will be accomplished within 6 months following project completion. This is not consistent with the Forest Plan.*

*Small area non-conforming developments may be considered in this LUD by USFS on a case-by-case basis.

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**Should the Project receive a TUS LUD for the entire corridor the following are the areas of concern:**

**VCU 610:**

*Expected Scenery Integrity effects will be within an unseen/seldom seen landscape. Expected Scenery Integrity effects will be consistent with a Moderate Scenic Integrity Objective (SIO) as allowable in the Forest Plan.*

**VCU 570:**

*Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) as allowable in the Forest Plan, however, it is not expected to meet the SIO in the first year for the foreground distance zone (east side of Gilbert Bay). This is not consistent with the Forest Plan. The Project is expected to meet the SIO in the middleground (and foreground) in the fifth year or beyond.*

*Expected impacts to scenery in the middleground distance zone will visually impact the visual landscape due to dissimilar visual characteristics to those of natural occurrences on both side of Gilbert Bay beyond five years. This is not consistent with the Forest Plan.*
VCU 550:

Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) as allowable in the Forest Plan and is expected to meet the SIO in the middleground within the fifth year.

Expected impacts to scenery in the middleground distance zone will visually impact the visual landscape due to dissimilar visual characteristics to those of natural occurrences on the south side of Port Snettisham beyond five years. This is not consistent with the Forest Plan.

Other Potential Areas of Concern:

One area of concern has been identified in the Sweetheart Lake Hydroelectric Recreation Resource Study Report (JHI, 2013). The area of concern is the lower portion of Sweetheart Creek that includes a personal use fishery for sockeye salmon and bear viewing area. This is a popular recreation area in July and August. Although not listed as a VPR, this use area is used in a limited capacity to gain physical and visual access to the Forest.

Several facilities associated with the Project are not on USFS managed lands and include the dock, a majority of the dock facility, and most of the coastal road. Although located on State managed lands, these facilities will result in cumulative visual impacts to the surrounding USFS lands and the landscape character.

Cumulative Effects:

Cumulative Effects takes into consideration not only this Project but also other anticipated projects within the area. There are no known other planned projects in the area or anticipated future modifications to the Project, however, development related to this Project on State managed land will result in cumulative effects.

Cumulative Effects analyzes the visual impacts to the whole project area within the reasonable foreseeable future and expected change in the Existing Scenic Integrity (ESI) as a result of the Project. ESI is a measure of the degree to which the landscape is perceived as whole, complete, or intact without any alterations or modification to the scenery by human activities. As indicated in the analysis, the ESI for the project area (VCU 610, 570 and 550) is comprised of a Very High (1) rating with all except 3% of the landscape character being intact or unaltered.

Based on analysis of this Project, it will be expected that the following changes will be made to the ESI.

It is expected that the Project will visually impact approximately 3% of the intact landscape or approximately 1,200 acres. 31% of the Project area will be modified from a ESI 1 to a proposed Scenic Integrity of Class 5, Very Low, where the landscape is heavily modified with deviations visually impacting the landscape character. This will be on the east side of Gilbert Bay in VCU 570 where the powerhouse, switchyard, road, dock facility, and other related facilities will be located. It is expected that with the proposed mitigation the visual impacts will be reduced to a Class 4, Low, once the revegetation matures in ten years or longer.

32% of the Project area will be modified from a ESI 1 to a proposed Scenic Integrity Class 4, Low, where the landscape appears moderately altered with deviations beginning to visually impact the landscape character. These areas include the overhead transmission corridors in VCUs 550 and 570.

37% of the Project area will be modified from a ESI 1 to a proposed Scenic Integrity Class 3, Moderate, where the landscape appears slightly altered when noticeable deviations are visually subordinate to the landscape character. This will be along portions of the overhead transmission corridor in VCU 570 and in VCU 550 near Mist Island.
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INTRODUCTION

Juneau Hydropower, Inc. (JHI) holds a Preliminary Permit from the Federal Energy Regulatory Commission (FERC) for the proposed Sweetheart Lake Hydroelectric Facility Project (Project), FERC No. 13563-002, the Project will proceed under steps required by FERC regulations.

During the January 2013 Study Plan Meeting in Juneau, project stakeholders (including state and federal resource agencies) indicated that more work and analysis was needed for the Project’s impact on scenic and aesthetic resources. These concerns were primarily related to Project construction activities and Project features, including the dam, reservoir inundation, powerhouse, transmission line, dock, road and other related facilities. These project related activities and features will occur on lands managed by the United States Department of Agriculture Forest Service (USFS). To address these concerns the impacts to scenery resources were to be inventoried, evaluated and analyzed based on current scenery management procedures mandated by the USFS and the Tongass National Forest Land and Resource Management Plan (USFS, 2008) (Forest Plan).

This study plan describes the analysis used to examine and quantify existing scenery resources and to evaluate potential project-related effects on those resources.

Scenery is defined as the general appearance of a place, general appearance of a landscape, or features of a landscape (USFS, 1995). Scenery is a resource found within the Tongass National Forest (TNF) much like recreation, timber, or wildlife. As a resource, it represents the attributes, characteristics, and features of landscapes that provide varying responses from and varying degrees of benefits to humans (USFS 1995). People who visit public lands are concerned about the quality of the scenery around them and have an impression of what they expect to see when they visit public lands (Newby, 1971). For many visitors and those that live within the TNF there is an expectation that the Forest provides visually appealing scenery, with emphasis on areas seen along the Alaska Marine Highway, tour ship and small boat routes, state highways, Forest roads, and from popular recreation places (USFS, 2008, pp. 2-6).

To understand the significance of the scenery resource for the project area, it needs to be inventoried, classified, and managed with an understanding that the scenery resource might be altered by human based activities. These activities may or may not visually alter the characteristic landscape. Scenery assessment includes the analysis of landscapes that allow informed management decisions based on the Forest Plan (USFS, 2008) and how people value the scenery of the TNF.

This scenery resources report is for the Sweetheart Lake Hydroelectric Facility. 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 water surface elevation of 636 feet with a surface area of 1,702 acres; (2) a new, roller compacted concrete dam 111 foot-high (from the downstream toe to the top of dam) 280 foot-long, 100 foot-thickness 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 15x15 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 re-entry 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); (12) a new 14,800 foot 12.47 kV service transmission line extending from the dam site to the dock facility providing operational electricity and communications for operations; and (13) a caretaker facility with shop and maintenance facilities; (14) a shelter facility at dam site; (15) appurtenant facilities. The Project lies within three Value Comparison Units (VCUs) which are under the management of the USFS: 610, 570 and 550. VCU's are comparable to large watersheds and generally follow major topographic divides. This scenery resource report only includes portions of the Project located on federal lands managed by the USFS where the agency has jurisdictional rights on this Project.

Scenery is evaluated from locations and routes that an observer of the TNF uses to gain physical and visual access to the TNF. These travel ways and use areas are identified as Visual Priority Travel Routes and Use Areas (VPRs). VPRs are inventoried and catalogued by the USFS based on public input, validated through public participation, and then listed in the Forest Plan. VPRs for the TNF can be water or land-based. All scenery work is based from these routes and use areas. The landscapes that can be visually accessed from these locations are classified as seen and are included in the analysis areas. The landscape that is not seen from VPRs is not included in the analysis, nor are lands that are not managed by the USFS.

This Report inventories, classifies, and analyzes the scenery resources and expected modifications by the Project to the scenery resources on the federal lands managed by the USFS. The Report is organized as follows:

**Analysis/Inventory Methodology:** Describes the methodology used for analysis and inventory of scenery resources.

**Inventory of Affected Environment (Existing Conditions):** Description of Project Area, Landscape Character Types, Inherent Scenic Attractive Classes, Visual Priority Travel Routes and Use Areas, Distance Zones, Key View Points, Existing Scenic Integrity, Site Productivity, and Visual Absorption Capacity for the Project area.

**Management Direction and Standards:** Description of desired Landscape Character, Scenic Integrity Objectives, and other scenery related goals and objectives.

**Scenery Effects Predictions:** Proposed Scenery Effects, cumulative effects to Landscape Character, cumulative effects to Scenic Integrity, and mitigation and scenery protection measures.
Figure 1. Scenery Resources Analysis Area for Sweetheart Lake Hydroelectric Project.
Sweetheart Lake Hydroelectric Infrastructure Site Plan

March, 2014

Figure 2. Sweetheart Lake Hydroelectric Infrastructure Site Plan

Sweetheart Lake Hydroelectric Project: Final Scenery Resources Report
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ANALYSIS/INVENTORY METHODOLOGY

The TNF uses the Scenery Management System (SMS) as the framework for integrating scenery management into all levels of USFS planning. The SMS evolved from and replaced the Visual Management System defined in Forest Service Agriculture Handbook #462 (USFS, 1974). The SMS is described in Agriculture Handbook #701 (USFS, 1995).

SMS is implemented as part of the forest planning process and includes three phases of work to inventory, develop standards, and determine the effects of the Project on scenery. The phases of SMS are as follows:

- Analysis/inventory of existing conditions
- Establishment of management standards and objectives
- Determine extent, magnitude and duration of effects of the Project.

This section looks at the first phase of work, analysis/inventory phase, and catalogues and verifies the existing forest visual characteristics as viewed from Visual Priority Routes (VPRs). The inventory process results in the development of Visual Absorption Capacity (VAC) and Scenic Integrity Objectives (SIOs) based on the analysis area and sets resource management guidelines related to impacts on scenery. The management guidelines are found in the following section of this Report. The inventory phase is recorded as mapping and as 35 mm photographs from Key Viewpoints along VPRs. Geographic Information System tools provided assistance in the development of the mapping. The inventory is developed as a sequence of analysis based on SMS and scenery guidelines within the Forest Plan. Work begins in data collection of existing scenery related documents and maps and all information is field verified from VPRs to reflect current existing conditions. The inventory phase consists of the following steps:

- Determine landscape character type of analysis area.
- Determine scenic attractiveness of landscape based on character type.
- Verify Distance Zones from VPRs and use areas identified in Appendix F in the Forest Plan.
- Analyze Existing Scenic Integrity (ESI) of existing landscape condition.
- Determine VAC of the landscape.
- Determine SIOs based on Forest Plan, Distance Zones, and Land Use Designation (LUD).

The scenery analysis/inventory was completed in June of 2013.

Scenery work was completed from the Juneau, Alaska office of Corvus Design-Landscape Architects. Corvus Design’s project scenery lead is Christopher Mertl, ASLA, Landscape Architect. Mr. Mertl is a former Forest Service landscape architect on the TNF and since joining private practice has completed several scenery resource reports for a variety of clients who have projects within the Tongass National Forest.
Issues

The key issue related to scenery resources is to identify human-based visual disturbances to the existing seen landscape resulting from management activities. The effects of these activities need to be documented and evaluated to determine the impacts to the existing landscape character and whether these impacts to the scenery are acceptable. Scenery guidelines, known as SIOs, set acceptable scenic parameters for human-based modifications for all management activities on National Forest System lands (USFS, 1995). These visual objectives also establish a timeline for the modifications to meet the scenery guidelines. All modifications will need to meet the SIOs through coordination between the various resources. In some instances mitigation measures may be required to meet the SIOs and allow the management activity.

Guidance

The TNF has two key adopted documents used in the assessment, analysis, and management of scenery. These consist of the Forest Plan (USFS, 2008) and Landscape Aesthetics: A Handbook for Scenery Management (USFS, 1995). These documents guide the process and management of scenery on the TNF and the level of acceptable degree of deviation from the existing landscape character of the TNF created by human activities or alteration. These documents establish Scenic Integrity Objectives (SIOs) for the lands under management of the USFS.
INVENTORY OF AFFECTED ENVIRONMENT

For the purpose of analyzing scenery resources, the area of analysis consists of all of the Sweetheart Lake Hydroelectric Facility (Figure 1) within USFS lands that are viewed from Visual Priority Routes. Areas that are unseen from these routes are not included. The analysis area includes the viewsheds surrounding the management activities for hydroelectric power generation and its distribution. The viewsheds encompass the existing resources in areas of direct disturbance and the adjacent seen areas surrounding the disturbance as viewed by an observer of the TNF using travel routes and use areas to gain physical and visual access to the area.

The area potentially affected by the Project is large, including three watersheds (VCUs) transected by the proposed transmission corridor. As shown in Figure 1, new construction in the Sweetheart Lake watershed will include a dam up to 111 feet high at the outlet of Lower Sweetheart Lake and tunnel penstock to the powerhouse. The dam will raise water levels sufficient to create significant additional inundation in Lower Sweetheart Lake. The dam, tunnel, and the visual impacts resulting from raising the lake levels are located in an unseen/seldom seen landscape. The penstock is within a tunnel environment and will not result in visual impacts. All other Project facilities are located in a seen landscape from VPRs.

To evaluate the Project, the affected environment area has been subdivided to correspond with the three VCUs.

VCU 610

This is an extremely large VCU (135,900 acres) that includes the Lower and Upper Sweetheart Lakes and the Whiting River drainages and extends to the Canadian border. Project facilities in this VCU include the dam and the tunnel penstock. Impacts will also include raising the lake levels for hydroelectric generation. All facilities in this VCU are located in an unseen/seldom seen landscape and as such analysis for this VCU will be general in nature. (See Special Consideration: VCU 610, pg 9).

VCU 570

This 28,129 acre VCU encompasses the Gilbert Bay drainage and hosts a majority of the Project facilities. Facilities include the tunnel penstock coming down from Lower Sweetheart Lake. Adjacent to Sweetheart Creek and near tidewater are a proposed powerhouse, switchyard, and tailrace. The proposed tailrace will consist of an open after-bay and tunnel extending to Sweetheart Creek. The powerhouse and switchyard will be located in a partially excavated area screened by a constructed vegetated barrier. The material excavated to construct the powerhouse will be recycled during the construction of an access road linking the powerhouse and switchyard with a new dock facility to the north. The proposed dock facility includes a dual-height marine ramp, floating docks for seaplane and boat access, and a staging area adjacent to the docks. A caretaker’s facility will be located behind the dock facility. Some excavation will occur within the Caretaker’s area (See Appendix A-4 and B-2).

At the northeast corner of the dock facility, the transmission line will enter the first transition facility and convert to a submarine cable that travels under Gilbert Bay to the west. Upon reaching land, a transition facility will allow the submarine cable to go to an overland configuration. The 15,400 foot long overhead transmission corridor will travel north perpendicular to the shoreline of Gilbert Bay to Sentinel Point. The corridor exits this VCU at the ridgeline above Sentinel Point.
VCU 550

This 22,403 acre VCU encompasses the Port Snettisham drainage and includes two transition facilities, one on the south shore at Sentinel Point and the other on the northern shore east of Mist Island. The overhead transmission corridor enters this VCU from the south above Sentinel Point and runs north to the water’s edge. At the north shore of Sentinel Point the line enters a third transition facility, converts to a submarine corridor, and travels under Port Snettisham to the north shore adjacent Mist Island. The transmission corridor continues underground until it reaches the fourth and final transition facility located within the existing clearing limits of AIDEA Snettisham overhead transmission corridor. Here the line converts to an overhead configuration and ties into the existing AIDEA line.

Special Consideration: VCU 610

Project facilities (dam, elevated lake levels, and tunnel penstock) within VCU 610 are located in an unseen/seldom seen landscape. There are no VPRs in this VCU or in the surrounding VCUs that will allow viewing of these facilities or impacts. Based on discussions with the USFS (Beard, 2014), Project impacts for VCU 610 will be general in nature with no visual simulations created and impacts will be based on best professional judgment to determine if the Scenery Integrity effects will be consistent with those allowable in the Forest Plan (see pg 59).

Additionally, due to the extremely large size of VCU 610 (135,900 acres), acreage data for this VCU will not be included in the inventory of existing conditions related to scenery. Including acreage data for this VCU will create an inaccurate perception of the proposed modifications within the Project area. This was confirmed by the USFS (Jensen, 2013).
Landscape Character Types

The Forest is divided into large ecological units that describe the geology, vegetation, soils, wildlife and other factors that have the same ecological context. Within these ecological units are smaller Landscape Character Types. These give a geographic area its visual and cultural image and consist of the combination of physical, biological and cultural attributes that make each landscape identifiable or unique. Scenery Management System uses Landscape Character Types to categorize the Forest.

The Landscape Character Types recognized for Tongass National Forest (TNF) lands are geographic units of land, each having distinguishing characteristics of landform patterns and features, vegetation patterns, surface water characteristics, and land use patterns or cultural features. Landscape character is usually based on total visual characteristics and not upon any one single characteristic, although landform and vegetation may be most influential at times. Descriptions for the TNF are based largely on the work by Nowacki, Shephard, Krosse, Pawuk, Fisher, Baichtal, Brew, Kissinger, and Brock (2001).

The Project is located within Region 3, the Boundary Ranges/Icefields landscape character type as defined by the USFS (USFS, 2005), which is the source for the following summary.

Landforms

The Boundary Ranges are a spectacular portion of the Coast Mountains running along the U.S.-Canadian border and consisting of high-elevation, angular, ice-capped mountains. High maritime precipitation, mostly as snow, feeds a discontinuous mix of icefields and glaciers separated by river valleys and pierced by nunataks and scree fields. The ranges include several sprawling icefields (e.g., Juneau and Stikine Icefields) – remnants of past ice ages. Among the largest and most well-known glaciers are the Taku, Mendenhall, Meade, Sawyer, Dawes, Baird, and LeConte glaciers. The southernmost tidewater glaciers in North America occur here. Most of these tidewater glaciers meet saltwater at the head or along the sides of deep fiords which penetrate the Boundary Ranges. In addition to the mountains of the Boundary Ranges, the unit includes the mountainous Chilkat Peninsula, which branches south from the St. Elias Mountains to form a picturesque peninsula separating Lynn Canal and Glacier Bay. Although these mountains are not as massive nor as ice-filled, they are similar to the Boundary Ranges in that they are rugged (angular and steep), contain small glaciers and icefields, and are generally snow-clad. Only a few large rivers manage to breach the Boundary Ranges from the Canadian Interior; these include the Stikine and Taku. These rivers carry sediment from the interior, but also pick up much sediment from streams draining the Boundary Ranges. As the rivers meander, sediments erode and redeposit. Because of strong down-valley winds during winter, sand and silt from exposed sediments on river bars and riverbanks are carried down valley. Other relatively large valleys that penetrate deeply into the Boundary Ranges include the valleys of the Katzehin River and its tributaries, and the valleys of the rivers that flow into Berners Bay (Berners, Lace, Antler, and Gilkey). This unit also includes a strip of lower elevation rounded mountains and lowlands between the western edge of the Boundary Ranges and saltwater, north of the Stikine River. The southern two-thirds of this strip is dominated by steep, but rounded mountains, while the northern third is dominated by lowland terraces and scoured hills.
Vegetation Patterns

The shallow and rocky soils support low-growing communities of sedges, grasses, forbs, and shrubs. Forests comprise a minor part of the vegetation along coasts and rivers. In the Chilkat Range, alpine snowfields, barrens, and meadows cover much of the area, with hemlock and hemlock-spruce forests covering the lower mountain slopes, valleys, and coastal areas. Timber harvest has occurred in the area near the tip of the Chilkat Peninsula, mostly within the past 20 years. In the Stikine, Taku, and other large river valleys, alder, willow, and cottonwood colonize newly deposited sediments; spruce and hemlock become established if given enough time. Riparian wetlands are abundant. In the rounded mountains portion of the unit between the western edge of the Boundary Ranges and saltwater, the vegetation is characterized by large areas of alpine meadows with forested sideslopes. Some of the lower rounded mountain areas support extensive productive Western Hemlock and Sitka Spruce forests. Timber harvest has occurred in the low elevations near Thomas and Hobart Bays within the past 50 years. Forests near Juneau and other accessible areas along beachfronts and lower slopes that were harvested around a century ago now support second-growth forest stands around 100 years old. Forested wetlands and emergent wetlands, the latter occurring adjacent to large estuaries and cirque lakes, are common in some areas. The lowland terraces and scoured hills in the northern shoreline portions of the character type are dominated by low productive forests and non-forested wetlands.

Water Features

Most mountain streams are clear, high gradient, and contained by the rough terrain. In contrast, glacial meltwater streams are loaded with silt, resulting in a very cloudy appearance. When entering the sea, these glacial streams turn from a brownish tan to a milky or aqua blue.

The Stikine and Taku Rivers are dominant water features where they cross the Boundary Ranges. They drain large portions of interior British Columbia and are fortified by sediment-laden meltwaters as they pass through the Boundary Ranges. River flow is highest in summer as a result of snow and ice melt. The Katzehin, Lace, Berners, Antler, Gilkey, Speel, Farragut, Bradfield, and Unuk represent other important rivers. Long, narrow bays and lakes follow bedrock weaknesses in some areas of this unit. Cirque basin lakes are often tucked in hanging valleys of the lower mountain summits.

Cultural Elements

This rugged, inhospitable landscape has limited the extent of human influence, which is evident only in small areas near saltwater on the edges of the unit, such as in the vicinity of Juneau and Skagway, and in areas with timber management. The only significant timber harvest in the character type took place at the tip of the Chilkat Peninsula, in the Hobart Bay area on private lands, and near Thomas Bay. Roads are frequently seen in the areas of timber management, and roads, buildings, and other structures are present in and near Juneau, Skagway, and smaller developments. There is very little private ownership in the unit, except in some low elevation areas near Juneau, Berners Bay, Hobart Bay, and Thomas Bay, and much of the unit is managed as wilderness. Many forests near Juneau and other accessible areas along beachfronts and lower slopes were harvested to support the mining industry around a century ago. These areas now support older second-growth stands. Kensington Mine (which has had recent exploration and permitting activities), near Berners Bay, is visible from Lynn Canal.
Comments

The Boundary Ranges and Icefields is another spectacular character type, which easily “stands on its own” in a visual frame of reference sense.

The visual character of VCU 570 and 550 is largely comprised of lower elevation rounded mountains rising to just over 3,000 feet with lowlands adjacent to saltwater as indicated in the landscape character type description for Region 3. Upper elevations consist of rounded exposed rock and alpine vegetation with some brushy landslide and avalanche chutes providing textural contrast. The middle and lower elevation slopes are blanketed by Western Hemlock and Sitka Spruce forests with forested wetlands and emergent wetlands populating the lowlands and gentler sloped areas. Shorelines are deficient of energy and transition from land to saltwater with no or little vertical exposed faces. Streams are steep gradient, clear water contained within the terrain and include Sweetheart and Prospect Creeks (Figure 1). At the head of Gilbert Bay is a large tidewater flat fed by Gilbert Creek. This landscape is comprised of a large flat muddy and gravel landscape dominated by grasses and sedges. VCU 550 shows obvious human influence upon the landscape; as is evident from the presence of the AIDEA transmission corridor connecting the Snettisham Hydroelectric Facility with the community of Juneau. The tall metal transmission towers and wide clearing limits dominate the landscape character type along the northern shore of Port Snettisham. A small cabin is found on the western shore near the mouth of the Whiting River which is located on private land.

VCU 610 has the more dramatic landscape that is punctuated by the steep bare walls containing the glacial fed Whiting River. Rounded exposed peaks rise from 3,000 to nearly 5,000 feet. Upper elevations are without vegetation and are comprised of bare exposed rock formations and dotted with small icefields. Middle elevations are comprised of alpine vegetation with brushy landslide and avalanche chutes while hemlock-spruce forests cover much of the lower elevations with limited wetlands due to the steep terrain.
Inherent Scenic Attractiveness Classes

Inherent Scenic Attractiveness (ISA) is the primary indicator of the intrinsic beauty of a landscape and of the positive responses it evokes in people. It helps determine landscapes that are important for scenic beauty, as well as those that are of lesser value, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water characteristics, and land use patterns and cultural features (USFS 1995).

Each landscape character type defined above is subdivided into three scenic attractiveness classes: distinctive (A), typical (B), and indistinctive (C). Each landscape character type has its own indicators of ISA. It is expected that a majority of the landscape will fall within the typical classification. A smaller portion of the landscape will be unique and fall within the distinctive classification or have lower than typical attractiveness rating of indistinctive. Although land use patterns and cultural features are landscape elements that can influence scenic attractiveness classes, the major portion of the Southeast Alaska and the Project landscape shows little to no human influence, with the exception of the existing AIDEA transmission line in VCU 550. Human influence such as a utility corridor is treated as a factor affecting the Existing Scenic Integrity (ESI) of an area, and does not typically affect its scenic attractiveness. Table 1 summarizes the total acreage of each class of ISA for the Project area (the analysis area for scenery resources).

Table 1 summarizes the ISA classes for Region 3, the Boundary Ranges and Icefields, where the Project is located.

As indicated in Table 1 and Figure 2, the Project area is dominated by a ‘Typical’ Inherent Scenic Attractiveness (ISA) for VCU’s 570 and 550. Ten percent of this landscape includes a ‘Distinctive’ ISA. None of the Project area is represented by an ‘Indistinctive’ ISA classification.

VCU 570, Gilbert Bay, contains three areas with a distinctive classification. These areas include the tidewater head of Gilbert Bay and the Gilbert Creek drainage with its expansive mud flats populated by grasses and sedges; the upper blocky mountain ridge to the north of Lower Sweetheart Lake and Sweetheart Creek with its deeply cut vertical walled drainage and series of waterfalls; and the northern exposed steep ridgeline above the mouth of the Whiting River with its massive rock outcrops and sheer glacially scoured escarpments. The landscape is dominated by a typical ISA that includes moderately complex terrain. This terrain tends toward codominance with other objects of the visual field. It includes minor snow fields, secondary peaks and is penetrated by inlets and bays. Vegetation includes moderately varied patterns with some variation in color and texture. Natural forest openings and patches of vegetation are subtly defined. Water features are secondary in nature and tend toward codominance with other objects of the visual field. Features are moderately significant with edge contrasts, spatial definition, and moderate spatial variety.

VCU 550, Port Snettisham, is largely characterized as a typical ISA with moderately complex terrain dominated by angular profiles penetrated by prominent inlets and bays. Geologic features are moderately significant (secondary peaks, escarpments, small snow fields, rock outcrops) which tend toward codominance with other objects of the visual field. Features...
have strong edge contrasts and spatial definition with moderate spatial variety. Vegetative patterns have some variety providing moderate variation of color and texture especially at natural forest openings. Water features are secondary in nature with somewhat diverse shorelines that tend toward codominance with other objects of the visual field. A portion of this VCU contains a distinctive ISA and is found in the northern portion where the ridgeline from the Speel Arm enters the VCU. This landscape is described as highly complex terrain dominated by angular profiles and defined crests that dominate other objects of the visual field and provide strong edge contrasts and spatial definition. Vegetation includes many variations of color and texture with natural forest openings sharply defined and sharing dominance with other objects of the visual field.

Table 2. Inherent Scenic Attractiveness Classes for Region 3, the Boundary Ranges and Icefields

<table>
<thead>
<tr>
<th>Landform patterns and features</th>
<th>Distinctive (A)</th>
<th>Typical (B)</th>
<th>Indistinctive (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit characterized by highly complex terrain dominated by massive angular profiles and sharply defined crests frequently penetrated by deep glacial troughs and fiords. Geologic features are numerous and/or highly significant (matterhorn peaks, massive rock outcrops and sheer glacially scoured escarpments, expansive floodplains, large deltas, major examples of mass wasting, and large moraines are typical examples). These features tend to dominate other objects of the visual field. Strong edge contrasts and spatial definition. Moderate spatial variety.</td>
<td>Unit characterized by moderately complex to complex terrain dominated by angular profiles and sharply defined crests often penetrated by prominent inlets and bays. Geologic features are moderately significant (secondary peaks, escarpments, cirques, rock outcrops, and floodplains are typical examples). These features tend toward codominance with other objects of the visual field. Strong edge contrasts and spatial definition. Moderate spatial variety.</td>
<td>Unit characterized by moderately diverse terrain dominated by blocky occasionally angular profiles and well defined crests indented by minor bays and coves. Geologic features are somewhat insignificant (minor peaks, escarpments, rock outcrops, minor examples of mass wasting, and small isolated sand beaches are typical examples). These features are usually subordinate to or are occasionally codominant with other objects of the visual field. Moderate edge contrasts and spatial definition. Little spatial variety.</td>
<td></td>
</tr>
<tr>
<td>Vegetation patterns and composition</td>
<td>Unit characterized by a highly varied vegetative pattern (many major plant cover types are apparent). Many variations of the color and texture. Natural forest openings and/or patches of vegetation are sharply defined tending to dominate or share dominance with other objects of the visual field.</td>
<td>Unit characterized by a moderately varied vegetative pattern (a few major plant cover types are apparent). Some variation of color and texture. Natural forest openings and patches of vegetation are subtly defined tending toward codominance with or are subordinate to other objects of the visual field.</td>
<td>Unit characterized by a more or less uniform vegetative pattern (only one major plant cover types are apparent). Little (if any) variation in color and texture. Few (or no) natural forest openings and/or patches of vegetation. Vegetative cover edge contrast tends to be minimal in relation to the visual field.</td>
</tr>
<tr>
<td>Surface water characteristics</td>
<td>Unit characterized by numerous and/or highly significant water features (prominent glaciers, snow fields and ice floes, diverse shorelines and associated saltwater features, moderately large lakes, major rivers, waterfalls, and clusters of colorful tarns are typical examples); features that tend to dominate or are codominant with other objects of the visual field.</td>
<td>Unit characterized by moderately significant water features (secondary glaciers, minor snow fields, moderately large streams, small distinctive lakes or clusters of tarns, secondary waterfalls, somewhat diverse shorelines, and associated saltwater features are typical examples); features that tend toward codominance with other objects of the visual field.</td>
<td>Unit characterized by somewhat insignificant water features (shorelines and associated saltwater features of little diversity, minor unfigured lakes, ponds, or bogs, and minor streams are typical examples); these features tend to be subordinate to other objects of the visual field.</td>
</tr>
</tbody>
</table>

Source: USFS, 2005
Figure 3. Inherent Scenic Attractiveness classifications for Sweetheart Lake Hydroelectric Project.
Visual Priority Travel Routes and Use Areas

An observer of the TNF uses travel routes and use areas to gain physical and visual access to the TNF. These travel ways and use areas are identified as Visual Priority Routes (VPRs) and are inventoried and catalogued by the USFS. VPRs for the TNF can be water or land-based and include water boating routes, roads, anchorages, recreation areas, communities, trails, and other listed areas used by the public. VPRs are identified in Appendix F of the Forest Plan. VPRs determine typical observer positions and locations where the public views the landscape and identify what areas of the landscape can or cannot be observed by users. Land- and water-based travel ways tend to be linear in nature and allow for movement through large areas of the landscape typically at speed, while use areas are concentrated locations with high viewing use due to the stationary or near stationary viewing. Travel routes for water based activities (Alaska Marine Highway, cruise ships, and small and mid-size boats) are to be catalogued from middle channel (Ouderkirk, 2012). VPRs are used for performing visibility analysis and calculating the Distance Zones of the landscape scenery. The VPRs for the Project are found in Table 3 and Figure 3.

Key Viewpoints

Viewpoints are established to record and inventory the existing scenic conditions of the landscape at key locations along Visual Priority Routes (VPRs). Each time scenery analysis/inventories are developed for an area, these same viewpoints are to be used and will provide a record of the landscape, its characteristics, and how it has regenerated or been modified over the years. The area around the Sweetheart Lake Hydroelectric Project does not have any predetermined viewpoints or photo points established from previous scenery analysis in the region (Jensen, 2013). As such, new points were established (Fig. 4) along Priority Travel Routes and from Use Areas listed above. In total, 7 water-based photo points were established and confirmed by the USFS (Jensen, 2013). Water-based points were from middle channel locations of marine routes, at anchorages, saltwater use areas, or where marine routes intersected another route or adjacent to neighboring use areas. The latitude and longitude of each photopoint were recorded, and a 360-degree panorama image was created for each photopoint using a 35 mm digital single-lens reflex (SLR) camera. A 50 mm lens on a 35 mm SLR film camera replicates the human cone of vision. The field of view on a digital camera is 1.6 greater than a film camera due to the formatting size of the digital image. To obtain the same field of vision using a digital format SLR a 32 mm lens was used to obtain the same field of vision that would have been obtained by a 50 mm lens on a 35 mm film camera.

Table 3.
Visual Priority Travel Routes and Use Areas for Sweetheart Lake Hydroelectric Project

<table>
<thead>
<tr>
<th>Travel Routes</th>
<th>Use Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska Marine Highway and cruise ship routes</td>
<td>Gilbert Creek/Sweetheart Flats, Whiting River</td>
</tr>
<tr>
<td>Stephens Passage, Juneau To Tracy Arm via Stephens Passage</td>
<td>Gilbert Bay, Port Snettisham</td>
</tr>
<tr>
<td>Small boat and mid-size tour boat routes</td>
<td>Port Snettisham, Gilbert Bay, Whiting Inlet, Whiting River</td>
</tr>
</tbody>
</table>

Source: USFS 2008: Appendix F, Forest Plan
Inventory of Affected Environment

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Figure 4. Visual Priority Travel Routes and Use Areas Map with Key Viewpoints for Sweetheart Lake Hydroelectric Project

Sweetheart Lake Hydroelectric Facilities: Scenery Resource Project Analysis Area

General Base Data *
- Analysis Area
- Non-National Forest
- Sweetheart Creek
- Sweetheart Falls

Visual Priority Routes *
- Alaska Marine Highway and Ferries
- Tour Boat Route
- Small Boat and Motorized Boats Route
- Trails
- Anchorage
- Dispersed Recreation

Proposed Project Features
- Power Station
- Dock
- Dams
- Access Road
- Transmission Line (Electric)
- Transmission Line (Cable)
- Tunnel

Land Use Designations *
- Modified Landscape
- Old-Growth Habitat
- Semi-Remote Recreation
- Saws Visited
- Tender Production

Other Data
- Photo Points: Arrow points direction of initial photo, then clockwise rotation. Estimated June 2012 by Corynes.

* Data obtained directly from Tongass National Forest
** Data modified from Tongass National Forest raw data based on fieldwork by Corynes Design – June 2013.
Distance Zones

Visual Priority Travel Routes and Use Areas (VPRs) establish how a user gains physical and visual access to the Forest and establishes landscape visibility. From these VPRs, landscape visibility is subdivided into Distance Zones, based on the distance of the landscape from the viewer. The Scenery Management System uses Distance Zones in the classification, analysis, and inventory of scenery. These Distance Zones consist of foreground, middleground, and background as identified in the Forest Plan (Fig. 5).

- Foreground: visible landscape ½ mile and closer to the observer on a VPR. The limit of this zone is based upon the distance at which details can be perceived. Typically, objects in the foreground can clearly be identified including details and texture. Individual boughs of trees and larger leaves form texture.

- Middleground: ½ mile to 5 miles of visible landscape from the observer on a VPR. Individual elements can still be perceived if unique to surroundings. Texture is typically characterized by the mass of trees rather than individual elements of the trees. Individual trees are usually only discernible in open landscapes.

- Background: 5 miles to the horizon of visible landscape from the observer on a VPR. Texture of uniform tree cover is generally very weak or non-existent. Texture is seen as large groups or patterns of trees.

The landscape that is not seen from any VPR is classified as unseen or seldom seen (USFS, 1995). These landscapes are not viewed by the typical Forest visitor. Landscapes that are viewed from more than one VPR may have more than one distance zone and will have the closest distance associated with the landscape. Landscape visibility in the foreground is typically more visually sensitive that those in the middleground or background.

Twenty percent of the Project area (VCUs 570 and 550) is classified as unseen and are found in pockets and slopes facing away from VPRs and steeper terrain landscapes at the back of the VCUs (Table 4; Figure 5). A majority of the landscape is within the middleground distance zone. This is attributed to the Gilbert Bay and Port Snettisham VPRs penetrating the middle of the two VCUs. Most all slopes that are visible from the shoreline to surrounding ridge lines of the VCUs are classified as middleground. The foreground is limited to the immediate shoreline where anchorages are located (Port Snettisham and Gilbert Bay) and the Gilbert Creek/Sweetheart Creek Flats and Whiting River which are dispersed use areas and provides inland access to the Forest. The water based travel routes (Alaska’s Marine Highway, Tour Ship Routes, and Small Boat and Mid-Size Tour Boat Routes) are located in bodies of water that are wide enough that from the middle of the channel that they do not contribute to the foreground distance zone, except adjacent to Speel Arm in VCU 550.

As an aside, over 64% of VCU 610 is classified as unseen, but not included in calculation.

<table>
<thead>
<tr>
<th>Distance Zone Classification</th>
<th>Forest Service Lands Acres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreground</td>
<td>4,822 (10%)</td>
</tr>
<tr>
<td>Middleground</td>
<td>35,721 (70%)</td>
</tr>
<tr>
<td>Background</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Unseen</td>
<td>9,989 (20%)</td>
</tr>
</tbody>
</table>
Figure 5. Distance Zone classifications for Sweetheart Lake Hydroelectric Project.
Existing Scenic Integrity

Existing Scenic Integrity (ESI) is a measure of the degree to which the landscape is perceived as whole, complete, or intact without any alterations or modification to the scenery by human activities (USFS, 1995). These could include but are not limited to roadways, communities, timber harvest, quarries or mines, and the development of recreation areas. ESI is an important tool in planning and understanding the regenerative rate of the forest and restoring landscape character back to its intact state. Understanding the ability and time required for the landscape to return back to its complete visual condition becomes an important factor in evaluating potential modifications and the longevity of the visual impacts on the landscape. The Scenic Management System outlines the five classifications of ESI:

- **Very High (1).** The characteristic landscape is intact or unaltered.
- **High (2).** The characteristic landscape appears intact. Deviations may be present, but repeat form, line, color, texture, and pattern common to the landscape character and at such a scale that they are not evident.
- **Moderate (3).** The landscape appears slightly altered. Noticeable deviations are visually subordinate to the character.
- **Low (4).** The landscape appears moderately altered. Deviations begin to dominate the landscape character.
- **Very Low (5).** The landscape appears heavily altered. Deviations are dominant to the characteristic landscape.

Ninety-seven percent of the Project area has a Very High (1) ESI (Table 5; Figure 6). Overall the Project landscape is largely perceived as whole and intact and this is especially true for VCU 570, Gilbert Bay, where the landscape has a Very High (1) rating except for a very small area (less than 1%) of moderate ESI (3) is found surrounding the private cabin near the Whiting River. VCU 550, Port Snettisham, is less intact and visual modifications upon the landscape are evident from the AIDEA transmission corridor running parallel with the north shore of Port Snettisham. Depending on the topography and when the corridor was last cleared of vegetation thereby creating visual deviations from the surrounding unaltered landscape, the ESI ranges from Low (4) to Moderate (3) where the modifications begin to dominate the landscape. The total area of modified landscape represents 3% of the overall Project area.

### Table 5. Existing Scenic Integrity: Sweetheart Lake Hydroelectric Project

<table>
<thead>
<tr>
<th>Existing Scenic Integrity Classification</th>
<th>Forest Service Lands Total Acres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (1)</td>
<td>48,727 (97%)</td>
</tr>
<tr>
<td>High (2)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Moderate (3)</td>
<td>652 (1%)</td>
</tr>
<tr>
<td>Low (4)</td>
<td>1,153 (2%)</td>
</tr>
<tr>
<td>Very Low (5)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>
Figure 6. Existing Scenic Integrity classifications for Sweetheart Lake Hydroelectric Project
Existing Scenic Integrity and Forest Regeneration

Existing Scenic Integrity (ESI), the degree to which the landscape is perceived as whole, complete, or intact, is an important tool in understanding the regenerative rate of the Forest. By looking at past modifications that have occurred on the landscape at a variety of time periods provides an understanding of the visual regenerative rate of the Forest within the Project. It also assists in determining the time necessary to restore the landscape character back to its visually intact state. Understanding the ability and time required for the landscape to return back to its complete visual condition becomes an important factor in evaluating potential modifications and the longevity of the expected visual impacts on the landscape.

The existing AIDEA transmission corridor on the north side of Port Snettisham provides indicators to the regeneration rate of the Forest in the immediate area. The transmission corridor is routinely maintained where larger woody debris is removed from the clearing limits. Comparing ESI and the duration of time since the last clearing operation within the corridor provides a baseline to understand regeneration. From a scenery perspective this becomes a valuable tool to understand the rate of regeneration of the Forest and the duration to meet the required Scenery Integrity Objective.

Based on the AIDEA transmission corridor maintenance schedule and ESI, it is expected that visual effects will be the greatest in the first 5 years. One year after the removal of all plant material, the landscape would maintain its ESI 5 (Very Low) rating where soils are exposed, slash is visually obvious and there is significant visual contrast between the cleared landscape and surrounding undisturbed landscape. Low lying vegetation and alder begin to dominate the landscape. After five years, it is expected that residual shrubs and herbaceous plant will begin to fill in and cover much of the exposed soils, however areas of bare soil may still exist on steep slopes and areas with thin soils. Slash would also still be visible. There would still be significant visual contrast between the cleared landscape and surrounding undisturbed landscape and would result in an ESI 5/4. After 20 years hemlock and spruce up to 15 feet tall begin to fill in and create an overstory shrubs are present but are becoming visually subordinate. Contrast between disturbed project areas and adjacent mature stands is still very obvious. Areas that were will be expected to move from an ESI 5 (Very Low) to an ESI 4 (Low). After 50 years the new forest would reach an average height of 50 feet or approximately half the height of adjacent mature stands. After 80 years the stand would reach 75 percent of its mature height and Forest would regenerate to a condition where there would no longer be a discerning visual impact to the casual observer, ESI 2 (High), provided the Forest is undisturbed during that period. After 100 years the stand would blend with adjacent mature stands.
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Visual Absorption Capability

Visual Absorption Capacity (VAC) is the ability of a landscape to absorb human alterations without changing the natural character or scenic condition of the landscape. VAC is an indicator to the ease or difficulty of maintaining the scenic quality of the seen landscape while applying modifications upon the landscape (USFS, 1995). There are three classifications of VAC: High, intermediate, and low (Table 6. Figure 7).

High VAC landscapes are those with gentle slopes and/or high terrain, and vegetative diversity. Modifications in a high VAC landscape tend to not be evident to the casual observer even without mitigation or special design considerations. Landscapes that are unseen from Visual Priority Routes (VPRs) are assumed to have a high VAC.

Intermediate VAC landscapes have some variety in terrain and vegetation and intermediate slopes. Depending on the modifications, mitigation and design considerations may or may not be necessary.

Low VAC landscapes are generally those with steep slopes, minimal terrain variety, and minimal vegetative diversity. Without mitigation measures or design considerations, modifications to low VAC landscapes tend to dominate the landscape character.

VAC is a planning tool that provides direction for understanding management activities and their impacts on scenery due to human alteration. VAC is an indicator of potential costs, mitigation, and efficiency when proposing management activities in the landscape. Those landscapes with a low VAC tend to have higher costs and effort associated with the alteration with higher impacts to the scenic character of the landscape. Modifications in a high VAC area tend to be accomplished easily, at lower costs, and with minimal visual impacts to the scenery.

Value Comparison Unit (VCU) 570, Gilbert Bay, predominately has a Low VAC due to its high visibility high gradation slopes from numerous VPRs, lack of vegetative diversity, and moderate variety in terrain. This VCU has a small percentage of mosaic Intermediate VAC scattered along its lower and middle elevation slopes. This is attested to natural openings in the forest and intermediate slopes on which modifications will be less apparent than the Low VAC areas. All unseen areas have a High VAC and are found in the higher elevations of the Snettisham Peninsula, upper reaches of Gilbert Creek, Sweetheart Creek, and upper elevations to the north of Lower Sweetheart Lake. All foreground distance zones have a Low VAC in this VCU.

VCU 550, Port Snettisham, has similar qualities to VCU 570. The VCU is dominated by a Low VAC landscape due to its high visibility steep slopes from numerous VPRs, lack of vegetative diversity, and moderate variety in terrain. This VCU has a small percentage of mosaic Intermediate VAC scattered along its lower and middle elevation slopes. High VAC is found in unseen landscapes in the upper elevations above Prospect Creek and pockets above Point Sharp along Port Snettisham. All foreground distance zones also have a Low VAC in this VCU.

<table>
<thead>
<tr>
<th>Visual Absorption Capability Classification</th>
<th>Forest Service Lands Total Acres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>9,998 (20%)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>3,721 (7%)</td>
</tr>
<tr>
<td>Low</td>
<td>36,814 (73%)</td>
</tr>
</tbody>
</table>
Figure 7: Visual Absorption Capability classifications for Sweetheart Lake Hydroelectric Project
Other Inventory Information

This section identifies non-scenery attributes that are not specifically required as part of the analysis and inventory as set forth by Scenery Management. These attributes tend to be social attributes of the ecosystem and landscape that if identified as an important priority for the community and users are included in this section. If appropriate, these social attributes may be carried forward and developed with the interdisciplinary development of desired conditions, goals and alternatives for the Project, although outside of the Scenery Management System. These attributes may include auditory, olfactory, physical contacts, recreation setting, emotional, political, spiritual, economic and other values or considerations that are identified by the public.

Other Visual Priority Travel Routes and Use Areas

This is a popular recreation area for bear viewing and a personal use fisheries area during the months of July and August. Sweetheart Creek is an informal use area that is not a Visual Priority Route (VPRs) as identified in Appendix F of the Forest Plan and is not a facility maintained by the USFS. Sweetheart Lake is stocked annually by a private non-profit hatchery located in Juneau; Douglas Island Pink and Chum, Inc. (DIPAC) for sockeye. The returning sockeye cannot pass the Sweetheart Creek barrier falls which exist a very short distance from tidewater. The returning sockeye salmon do not successfully spawn and the fishery is therefore completely dependent on the annual lake stocking of sockeye fry by DIPAC. Sweetheart Creek is located in an unseen landscape from listed VPRs, however the lower creek to the upper pool/falls is a popular use area by residents of Juneau and allows people the capacity to gain physical and visual access to the TNF. This informal use area was not used in the preparation of this report, but is addressed in the Juneau Hydropower Recreation Report.
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MANAGEMENT

The second phase of Scenic Management Systems is establishing the management requirements including the development of scenery goals and objectives. This phase references the established guidelines, goals and objectives in the Forest Plan to set standards and thresholds for acceptable levels of modifications to scenery.

The establishment of Forest-wide goals and objectives for the Tongass National Forest is outlined in Chapter Two ‘Goals and Objectives’ in the Forest Plan. The chapter presents the Desired Conditions for the Forest and the Forest-wide goals and objectives. The Forest-wide Desired Conditions for scenery is as follows:

The outstanding scenery of the Forest is a major attraction for resident and nonresident recreation users; a full range of recreation opportunities is present. In some cases, scenic values from certain travel routes, trails, high vista points, or aerial observations are affected by timber harvest or mining activities. Users have the opportunity to experience independence, closeness to nature, solitude, and remoteness. (USFS, 2008, p. 2-2).

The goals of the Forest Plan respond to public issues and the ecosystems of the Forest to obtain desired conditions. These goals and objectives are broad general statements without a specific timeline. The Forest-wide goal and objective related to scenery are found below.

Forest-wide goals and objectives are achieved through the development of Management Prescriptions as found in Chapter 3 of the Forest Plan. These more specific goals represent management from an “ecosystem” perspective, where ecosystems are considered from the “site” to the “Forest” level. Goals are achieved through the development of management requirements for each of the eighteen Land Use Designations (LUDs) found within the Forest and the implementation of the standards and guidelines specified for each LUD. Each LUD has goals, standards and guidelines established for scenery resources. Additional objectives to help accomplish the goals are also found in Chapter 3 of the Forest Plan, and in the Resource Schedules contained in Appendix J (USFS, 2008).

Table 7. Forest Scenery Goal and Objectives:
Sweetheart Lake Hydroelectric Project

<table>
<thead>
<tr>
<th>Scenery Goal</th>
<th>Scenery Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide Forest visitors with visually appealing scenery, with emphasis on areas seen along the Alaska Marine Highway, tour ship and small boat routes, state highways, major Forest roads, and from popular recreation places; recognize that in other areas where landscapes are altered by management activities, the activity may visually dominate the characteristic landscape.</td>
<td>Manage the scenery of the Forest in order to achieve the adopted Scenic Integrity Objectives.</td>
</tr>
</tbody>
</table>

(USFS 2008, p. 2-6)
Landscape Character Goals

Landscape character is a description for an identifiable area of a national forest or region. Landscape character gives a geographic area its visual and cultural image and consists of the combination of physical, biological and cultural attributes that make each landscape identifiable or unique. Landscape character defines the characteristics of landform patterns and features, vegetation patterns, surface water, and land use patterns or cultural features. The Landscape Character for the Project Area is the Boundary Ranges and Icefields and is summarized previously under Landscape Character. Effects to scenery are referenced back to the Landscape Character of the Project Area and the impacts to its identifiable landscape characteristics (vegetation, landforms, surface water, etc.).

Land Use Designations (LUDs) are management zones within the Forest that define a range of allowable uses and affects upon the landscape and the specific Landscape Character as defined in the Forest Plan. LUDs are only for the management of USFS lands. Value Comparison Unit (VCU) 610, 570, and 550 are defined by five LUDs: Semi-remote Recreation, Modified Landscape, Old-Growth Habitat, Scenic Viewshed, and Timber Production. The Project traverses three LUDs: Semi-remote Recreation, Old-Growth Habitat, and Timber Production. The goals, objectives, desired condition, and LUD Standards and Guidelines for scenery for the Project LUDs are as follows (USFS 2008, pp. 3-57, 3-63, 3-116).

Semi-remote Recreation

Goals

• To provide predominantly natural or natural-appearing settings for semi-primitive types of recreation and tourism, and occasional enclaves of concentrated recreation and tourism facilities.
• To provide opportunities for a moderate degree of independence, closeness to nature, and self-reliance in environments requiring challenging motorized or non-motorized forms of transportation.

Objectives

• Manage recreation and tourism use and activities to meet the levels of social encounters, on-site developments, methods of access, and visitor impacts indicated for the Semi-Primitive ROS classes. Enclaves of concentrated recreation and tourism developments within the Land Use Designation (LUD) or management activities in adjacent LUDs may cause the ROS setting to become Rural.
• Determine on a case-by-case basis whether roads, trails, and other areas should be closed to motorized recreation activities. If so, incorporate into off-highway vehicle (OHV) plans. If not, the use of boats, aircraft, and snowmachines for traditional activities is allowed.
• Permit small-scale, rustic recreation and tourism facilities, and occasional enclaves of concentrated recreation and tourism facilities.
• Apply the Moderate SIO to any developments, facilities, or structures.
• Fish enhancement and wildlife habitat improvement may occur.

Desired Condition

Areas in the Semi-remote Recreation LUD are characterized by generally unmodified natural environments. Ecological processes and natural conditions are only minimally affected by past or current human uses or activities. Users have the opportunity to experience a moderate degree of independence, closeness to nature, solitude, and remoteness, with some areas offering motorized opportunities and others non-motorized opportunities (except for the traditional uses of boats, aircraft, and snowmachines). Interaction between
users is infrequent. Facilities and structures may be minimal or occasionally may be larger in scale, but will be rustic in appearance, or in harmony with the natural setting.

Scenery
1. Design resource activities to remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the landscape. New form, line, color, or texture will be subordinate to the characteristic landscape.

2. Apply Forest-wide Standards and Guidelines for the Moderate Scenic Integrity Objective (SIO).

3. There may be cases where facilities associated with a concentrated recreation or tourism development may not feasibly meet the Moderate objective. After analysis of the proposal and public involvement, the NEPA decision document for this project should determine the specific SIO for the development. The environmental analysis shall also prescribe design guidelines necessary to meet this scenery objective. During the Project’s design phase, the USFS shall be closely involved in the review of design work as it evolves.

4. Design visitor facilities to blend, to the extent feasible, with the natural setting.

5. Rehabilitation techniques may be used to restore disturbed landscapes to be compatible with the Semi-Primitive setting.

Old-Growth Habitat Land Use Designation

Goals
- Maintain areas of old-growth forests and their associated natural ecological processes to provide habitat for old-growth associated resources.
- Manage early seral conifer stands to achieve old-growth forest characteristic structure and composition based upon site capability. Use old-growth definitions as outlined in Ecological Definitions for Old-growth Forest Types in Southeast Alaska (R10-TP-28).

Objectives
- Provide old-growth forest habitats, in combination with other LUDs, to maintain viable populations of
- Native and desired non-native fish and wildlife species and subspecies that may be closely associated with old-growth forests.
- Contribute to the habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses.
- Maintain components of flora and fauna biodiversity and ecological processes associated with old-growth forests.
- Allow existing natural or previously harvested early seral conifer stands to evolve naturally to old-growth forest habitats, or apply silvicultural treatments to accelerate Forest succession to achieve old-growth forest structural features. Consider practices such as thinning, release and weeding, pruning, and fertilization to promote accelerated development of old-growth characteristics.
- To the extent feasible, limit roads, facilities, and permitted uses to those compatible with old-growth forest habitat management objectives.

Desired Condition
- All forested areas within this LUD have attained old-growth forest characteristics. A diversity of old-growth habitat types and associated species and subspecies and ecological processes are represented.

Scenery
1. Apply Forest-wide Standards and Guidelines for High Scenic Integrity Objective. Design activities to not be visually evident to the casual observer.
2. Exceptions for small areas of non-conforming developments, such as recreational developments, transportation developments, log transfer facilities, and mining development, may be considered on a case-by-case basis. Use designs and materials that are compatible with forms, colors, and textures found in the characteristic landscape.

**Timber Production Land Use Designation**

**Goals**

- To maintain and promote wood production from suitable forest lands, providing a continuous supply of wood to meet society’s needs.
- To manage these lands for sustained long-term timber yields.
- To seek to provide a supply of timber from the Tongass National Forest that meets the annual and planning-cycle market demand, consistent with the standards and guidelines for this LUD.

**Objectives**

Within this LUD, apply the Scenic Integrity Objectives of Low in the foreground distance zone, as seen from Visual Priority Travel Routes and Use Areas (see Appendix F, Forest Plan). Apply the Very Low Scenic Integrity Objective to all other areas.

Locate and design timber harvest activities primarily to meet timber objectives. Suitable forest lands are available for timber harvest; appropriate silvicultural systems may be used. Other timber management objectives include:

- Seek to reduce clearcutting when other cutting methods will meet land management objectives.
- Identify opportunities for diversifying the wood products industry (e.g., special forest products, and value-added local production).
- Use forest health management to protect resource values.
- Improve timber growth and productivity on commercial forest lands.
- Plan, inventory, prepare, offer, sell and administer timber sales and permits to ensure the orderly development of timber production.
- Emphasize the overall reduction of costs, increase of revenues, and improvement of public service within the timber program.
- Provide a spectrum of recreation and tourism opportunities consistent with the capabilities of this LUD.
- Manage recreation and tourism use to be compatible with timber production objectives. Manage changed recreation settings in accordance with the appropriate Recreation Opportunity Spectrum (ROS) class.
- Plan a transportation network of roads and helicopter access that will eventually access most of the suitable forest lands for standard logging or helicopter yarding systems and transition to young-growth management.

**Desired Condition**

- Suitable forest lands are managed for the production of sawtimber and other wood products on an even-flow, long-term sustained yield basis; the timber yield produced contributes to Allowable Sale Quantity. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses; some roads may be closed, either seasonally or year-long, to address resource concerns. Management activities will generally dominate most seen areas. Tree stands are healthy and with a mix of age classes from young stands to trees of harvestable age, often in 40- to 100-acre stands. Recreation opportunities, associated with roaded settings from Semi-Primitive to Roaded Modified, are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.
Scenery

1. Timber management activities may dominate the scenic character of the landscape.

2. Apply Forest-wide Standards and Guidelines for the Low Scenic Integrity Objective in the foreground distance zone of Visual Priority Travel Routes and Use Areas (see Appendix F, Forest Plan) and the Very Low Scenic Integrity Objective for all other areas. This objective defines the maximum limit of allowable change to the scenic character of the area; less visible evidence of activities is acceptable.

3. Consider roadside cleanup of construction debris and logging slash as a mitigation measure when recreational use is included as a road management objective for the proposed road.

4. In areas visible from Visual Priority Travel Routes and Use Areas, incorporate landscape design techniques in the planning process to the extent that they are compatible with LUD objectives.

Special LUD Consideration

It is the intent of the JHI to obtain a new LUD for the Project area in the near future (Mitchell, 2013). The desired designation will be a Transportation and Utility System (TUS) LUD to support the development of state and federal highways, railroads, public hydroelectric power projects and associated facilities, powerlines 66 kV or greater, and pipelines 10 inches or greater in diameter and will include the Sweetheart Lake Hydroelectric Project. A TUS LUD is defined as an “Overlay LUD” where the underlying initial LUDs, Timber Production, Old Growth Habitat, and Semi-remote Recreation, remain in effect until that time where the initiation of construction, and during system operation of the TUS facility, this management prescription will apply. Within the TUS corridor, the underlying LUDs continue to exist but are superseded by the TUS only for the allowable uses prescribed by the TUS. The TUS LUD applies only to the project limits/corridor necessary for the infrastructure and maintenance of facilities required as part of the TUS. Outside the TUS corridor, the underlying LUDs remain as the management prescription.

The intent of this Report is to be dynamic in nature and analyze and document the visual impacts related to the current LUDs (Timber Production, Old Growth Habitat, and Semi-remote Recreation) and to also analyze and document the scenery effects should the Project obtain a TUS LUD. All discussion related to the proposed future TUS designation will be indicated by use of italicized text and is only valid should the Project receive the TUS designation in the future. Until that time, the Project will be analyzed, managed, and scenery effects documented as they relate to the current existing three LUDs (Timber Production, Old Growth Habitat, and Semi-remote Recreation) found in the Forest Plan.

The goals, objectives, desired condition, and LUD Standards and Guidelines for the Transportation and Utility System LUD (if obtained in the future) are as follows (USFS, 2008, 3-128 to 3-133).

Transportation and Utility System

Goals

- To provide for, and/or facilitate the development of, existing and future major public Transportation and Utility Systems, including those identified by the State of Alaska and the Alaska Energy Authority.

Objectives

- Apply this management prescription to existing major systems corridors. Use the prescription as criteria in the planning and design of future system corridors. The corridors shown on the Land Use Designation (LUD) Map (2007) do not include viable routes that may be considered during project analysis. Consideration of alternate routes that meet corridor objectives while reducing costs and/or minimizing resource impacts is encouraged. During the period before
actual construction of new systems occurs, the management prescription(s) of the (initial) LUD(s) underlying the corridors will remain applicable. Upon initiation of construction, and during system operation, this management prescription will apply. The Transportation Utility System (TUS) LUD takes precedence over any underlying LUD (subject to applicable laws) regardless of whether the underlying LUD is a TUS Avoidance LUD or not. As such, it represents a “window” through the underlying LUD through which roads and/or utilities can be built.

- For application of this LUD, “major systems” are defined as state and federal highways, railroads, public hydroelectric power projects and associated facilities, powerlines 66 kV or greater, and pipelines 10 inches or greater in diameter.
- Allow special uses and facilities not related to transportation or utility systems, if compatible with present or future systems.
- If the development of systems changes the Recreation Opportunity System (ROS) setting, manage recreation and tourism opportunities in accordance with the new setting. Consider the development of recreation and tourism facilities in conjunction with the planning of state or federal highways or reservoirs.
- Following construction of systems, lands in the right-of-way, if permanently cleared, will be considered unsuitable for timber production.
- Transportation and utility corridors, to the extent feasible, should follow the same route.
- Transportation Utility Systems may dominate the seen foreground area, yet are designed with consideration for the existing form, line, color, and texture of the characteristic landscape.
- Minimize and/or mitigate adverse effects to wildlife habitat and populations to the extent feasible.
- Maintain the present and continued productivity of anadromous fish and other fish habitat to the extent feasible.

**Desired Condition**

Transportation Utility Systems have been constructed in an efficient and economic manner, and have been designed to be compatible with the adjacent Land Use Designation to the maximum extent feasible. The minimum land area consistent with an efficient, safe facility is used for their development. Effects on other resources have been recognized and resource protection has been provided. Other resources uses and activities in the area do not conflict with utility operations. State and federal highways and reservoirs offer new developed recreation opportunities, as appropriate.

**Scenery**

1. The landscape may be dominated by activities associated with Transportation Utility Systems. Although Transportation and Utility System developments may dominate the seen area, they are designed with consideration for existing form, line, color, and texture found in the characteristic landscape.
2. Apply Forest-wide Standards and Guidelines for the Low Scenic Integrity Objective. Perform viewshed analysis in conjunction with project development to provide direction for retaining or creating a visually attractive landscape over time.
3. Work with topographic and vegetative features to screen the development when seen from Visual Priority Travel Routes and Use Areas (see Appendix F, Forest Plan).
4. Consider the following during the design phase of routes, which are, or are seen from, Visual Priority Travel Routes and Use Areas:
   a. Vegetation of slopes seen from the road.
   b. Providing “planting pockets” or terraces or slopes, where needed.
   c. Maintaining landforms through road location and design.
Table 8. Adopted Scenery Integrity Objectives for Each Distance Zone Based on Land Use Designation

<table>
<thead>
<tr>
<th>Land Use Designation</th>
<th>Foreground SIO</th>
<th>Middleground SIO</th>
<th>Background SIO</th>
<th>Unseen/Seldom Seen SIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-Remote Recreation*</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Timber Harvest*</td>
<td>Low</td>
<td>Very Low</td>
<td>Very Low</td>
<td>Very Low</td>
</tr>
<tr>
<td>Old-Growth Habitat*</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Scenic Viewshed</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Very Low</td>
</tr>
<tr>
<td>Modified Landscape</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Very Low</td>
</tr>
<tr>
<td>Transportation and Utility System**</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

*LUD within Project Area.

** If obtained.

Source: USFS 2008

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*d. Breaking up the straight line effect of linear corridors by considering special treatment of vegetation on clearing slopes or application of other design techniques and principles.*

5. *Requiring roadside cleanup of construction debris and logging slash on all roads receiving general public use or expected to have such future use.*
Scenic Integrity Objectives

A major component of the Scenery Management System (SMS) is the Scenic Integrity Objectives (SIOs). SIOs are used to establish scenery standards for management and the degree to which the landscape must be retained intact or can be perceived as modified by alterations by human activities (USFS 1995). In the Forest Plan, SIOs were adopted that provide direction and objectives for landscape scenery and Distance Zones within each Land Use Designation (LUD) (USFS, 2008, p. 4-57). The long-term future scenic condition for each area is set as a scenic integrity level that defines maximum levels of visual impact desirable from human alterations to the natural landscape character. Associated with each objective is a set of recommended scenery standards and guidelines for each allowable use. These recommendations are guidelines that generally define how much modification can occur and still meet the SIO. Each objective makes recommendations for each distance zone and the timeline to meet the SIO (USFS, 2008, pp. 4-57 to 4-59).

SMS and the Forest Plan outline four classifications of SIOs (Figure 8).

- **High:** The characteristic landscape appears intact. Deviations may be present but must repeat form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.
- **Moderate:** The landscape appears slightly altered. Noticeable deviations are visually subordinate to the character.
- **Low:** The landscape appears moderately altered. Deviations may be dominant, but are shaped to borrow from the natural landform and other visual dominance elements (line, form, texture, color) and are subordinate to the characteristic landscape when viewed as background.
- **Very Low:** Deviations are dominant, but borrow from the natural terrain and other elements common to the characteristic landscape.

LUD plays a key role in establishing management prescriptions and determining the SIO for the landscape. The Project currently has three LUDs: Timber Production, Old Growth Habitat, and Semi-Remote Recreation. As previously discussed, there is a desire by JHI to obtain a Transportation and Utility Systems (TUS) LUD for the Project. The TUS is an "overlay" LUD where the initial three underlying LUDs remain in effect until initiation of construction and during system operation of the Transportation and Utility System facility, at which point the TUS LUD supersedes the underlying three LUDs. Until a TUS LUD is obtained, the three existing LUDs listed in the Forest Plan determine the SIO for the landscape.

The Forest Plan adopts SIOs that provide direction and objectives for landscapes within each LUD. The long-term desired future scenic condition for a specific area is the maintenance of a scenic integrity level that is at least as high as the adopted SIO for that area. Adopted SIOs for each Distance Zone is listed for each LUD and found in Table 8 (USFS, 2008, p. 4-57).

Footnote 4 on the Forest Plan’s Adopted Scenery Integrity Objectives for the Semi-Remote Recreation and Old-Growth Habitat LUDs indicate the following: “Exceptions for small areas of non-conforming developments, such as recreation developments, transportation developments, log transfer facilities, and mining development, may be considered in these LUDs on a case-by-case basis.” (USFS, 2008, p. 4-57).

Value Comparison Unit (VCU) 570, Gilbert Bay, is comprised of a large tract of Semi-Remote Recreation LUD (both in the foreground and middleground distance zones) on the east side of Gilbert Bay stretching from the southern limit to the north and therefore receives a Moderate Scenic Integrity Objective (SIO). The lower and middle elevations along the western side of Gilbert Bay have a Very Low SIO as a result of its Timber Management LUD in the middleground distance zone. Two other LUDS are found in this VCU but outside the Project Area. These
include a sliver of Old-Growth Habitat at the southern portion with a High SIO and a Modified Landscape on the upper elevations above the west side of Gilbert Bay. This area receives a Low SIO in the middleground.

VCU 550, Port Snettisham, is made up of an Old-Growth Habitat LUD and middleground distance zone on the north side of Port Snettisham adjacent Stephens Passage and is designated as a High SIO. A small portion of Timber Management is located at Sentinel Point and results in a Very Low SIO in the middleground. Another three LUDs exist in this VCU and are outside the Project Area. The first being the area surrounding Prospect Creek, which has a Modified Landscape LUD and a Low SIO in the middleground and Moderate SIO in the foreground. The second is the south portion of Port Snettisham designated as Scenic Viewshed and has a Moderate SIO due to being in the middleground. The last is a Semi-Remote Recreation LUD (middleground distance zone) and receives a Moderate SIO.

VCU 610 is comprised of a Semi-Remote Recreation LUD and therefore receives a Moderate Scenic Integrity Objective (SIO). The upper reaches of Sweetheart Creek and all of Lower Sweetheart Lake where Project facilities and impacts are proposed are within an unseen/seldom seen landscape, however still receives a Moderate SIO.

As discussed previously, it is the intent of the JHI to obtain a Transportation and Utility Systems (TUS) Land Use Designation (LUD) that would overlay the Semi-Remote Recreation, Timber Production, and Old-Growth Habitat LUDs. These initial underlying LUDs remain in effect until that time where the initiation of construction and during system operation of the Transportation and Utility System (TUS) facility, at which point the TUS LUD supersedes the underlying LUDs. The TUS is a linear LUD with an undetermined size over the underlying Scenic Integrity Objective (SIO). Until the TUS LUD is obtained, the three existing LUDs will determine the management and SIO of the Project.

Table 9.
Existing Scenic Integrity Objectives (VCU 550 and 570):
Sweetheart Lake Hydroelectric Project

<table>
<thead>
<tr>
<th>Scenic Integrity Objective Classification</th>
<th>Forest Service Lands Acres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>6,424 (13%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>17,940 (36%)</td>
</tr>
<tr>
<td>Low</td>
<td>15,434 (30%)</td>
</tr>
<tr>
<td>Very Low</td>
<td>10,673 (21%)</td>
</tr>
</tbody>
</table>

Table 10.
Land Use Designation Related to VCU and Distance Zones:
Sweetheart Lake Hydroelectric Project

<table>
<thead>
<tr>
<th>VCU</th>
<th>LUD</th>
<th>Foreground Acres (%)</th>
<th>Middleground Acres (%)</th>
<th>Not Seen Acres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>570</td>
<td>Semi-Remote Recreation*</td>
<td>2,175 (4%)</td>
<td>11,009 (22%)</td>
<td>1,889 (4%)</td>
</tr>
<tr>
<td></td>
<td>Timber Production*</td>
<td>2,246 (4%)</td>
<td>3,823 (7%)</td>
<td>535 (1%)</td>
</tr>
<tr>
<td></td>
<td>Modified Landscape</td>
<td>-</td>
<td>2,075 (4%)</td>
<td>2,664 (5%)</td>
</tr>
<tr>
<td></td>
<td>Old-Growth Habitat</td>
<td>-</td>
<td>494 (1%)</td>
<td>1,191 (2%)</td>
</tr>
<tr>
<td>550</td>
<td>Old-Growth Habitat*</td>
<td>-</td>
<td>4,596 (9%)</td>
<td>144 (&lt;1%)</td>
</tr>
<tr>
<td></td>
<td>Timber Production*</td>
<td>-</td>
<td>105 (&lt;1%)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Semi-Remote Recreation</td>
<td>-</td>
<td>1,365 (3%)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Scenic Viewshed</td>
<td>-</td>
<td>1,159 (2%)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Modified Landscape</td>
<td>321 (&lt;1%)</td>
<td>11,113 (22%)</td>
<td>3,711 (7%)</td>
</tr>
</tbody>
</table>
Figure 8. Scenic Integrity Objective classifications for Sweetheart Lake Hydroelectric Project.
Scenic Integrity Objectives: Specific Guidelines

High SIO: Old- Growth Habitat LUD (all Distance Zones)
Design activities to not be visually evident to the casual observer. This objective should be accomplished within 6 months following Project completion.

Facilities
- Keep vegetation clearing to a minimum and within close proximity of the site.
- Select materials and colors that blend with those found in the natural surroundings.
- Screening should be used from viewpoints and travel routes if feasible.

Transportation
- Rock Sources. When a forest development road is a Visual Priority Route (VPR), locate rock sources off the road, when possible. Spur road access may be necessary to minimize the visual impact. Rock source development should not be apparent from the road, use area, or marine travel route to meet this scenic objective.
- Corridor Treatment. Provide roadside cleanup of ground-disturbing activities.
- Depending on site conditions, cut stumps as low as possible and angled away from the viewer. Incorporate this treatment in the timber sale contract.

Moderate SIO: Semi-Remote Recreation LUD (all Distance Zones)
Design activities to be subordinate to the landscape character of the area. This SIO should be accomplished within 1 year of Project completion.

Facilities
- Keep vegetation clearing to a minimum and within close proximity of the site.
- Emphasize enhancement of views from recreational facilities.
- Select materials and colors that blend with those found in the natural surroundings.

Transportation
- Design rock sources to be minimally apparent as seen from VPRs. Rehabilitation is usually necessary following closure of rock source developments. It may be necessary to modify some ground-disturbing activities seen from the foreground of VPRs.
- Corridor Treatment. Roadside cleanup of ground disturbance activities may be necessary.

Low SIO: Timber Harvest LUD (Foreground Distance Zone)
Activities may visually dominate the characteristic landscape, but must have visual characteristics similar to those of natural occurrences within the surrounding area or character type. This SIO should be met within 1 year in the foreground distance zone and within 5 years in the middle and background Distance Zones following Project completion.

When planning activities, use naturally established form, line, color, and texture found in the landscape.

Facilities
- Siting and design should borrow from naturally occurring patterns in the landscape, and should not be visually dominant when viewed in the background distance zone.
Transportation

- Rock source operations and resulting landform modifications may be evident to the casual observer as seen from VPRs. However, the rock excavation location and design should mitigate, to the extent feasible, the apparent visual size and dominance of the activity (e.g., shaping of backwalls, visual landform barriers, roadside screening, and general orientation of the opening).

Low SIO: Transportation and Utilities System LUD (all Distance Zone)*

Activities may visually dominate the characteristic landscape, but must have visual characteristics similar to those of natural occurrences within the surrounding area or character type. This SIO should be met within 1 year in the foreground distance zone and within 5 years in the middle and background Distance Zones following Project completion.

When planning activities, use naturally established form, line, color, and texture found in the landscape.

Facilities

- Siting and design should borrow from naturally occurring patterns in the landscape, and should not be visually dominant when viewed in the background distance zone.

Transportation

- Rock source operations and resulting landform modifications may be evident to the casual observer as seen from VPRs. However, the rock excavation location and design should mitigate, to the extent feasible, the apparent visual size and dominance of the activity (e.g., shaping of backwalls, visual landform barriers, roadside screening, and general orientation of the opening).

*This LUD is currently not listed with the Project Area in the Forest Plan, however JHI is proposing to obtain this LUD for the Project.

Very Low SIO: Timber Harvest LUD (Middleground and Background Distance Zones)

- Activities may dominate the characteristic landscape, yet when viewed as background, should appear to be a natural occurrence.

- Locate and design management activities to take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs.

- Design activities to resemble natural occurrences as viewed in the background distance zone.
Other Scenery Related Goals and Objectives

Design Activities

The Forest Plan also indicates that in designing activities to meet specific Scenic Integrity Objectives (SIOs), a number of factors must be considered. These factors include the following:

The landscape’s Existing Scenic Integrity (ESI) rating is an inventoried condition that rates the degree of change that has already occurred on the ground. It is important to compare the ESI of the Project area to the SIOs assigned by the Forest Plan. Should there be conflicting conditions presently existing and the intent of the Land Use Designation (LUD) is not presently met, it will be appropriate to consider either 1) some specific rehabilitation measures or 2) Project deferral that will allow the landscapes in the Project area time to regenerate sufficiently.

Visual Absorption Capability (VAC), which is an estimate of the relative ability of a landscape to absorb management activities. High, Intermediate, and Low VAC ratings are used. These ratings reflect the degree of landscape variety in an area, viewing distance, and topographic characteristics. For example, a Low VAC setting generally has steep slopes, with little landscape variety, while a High VAC setting may be relatively flat and/or has a high degree of variety in the landscape.

Size, shape, orientation to viewer, color, texture, etc. are critical elements in determining whether or not an activity meets the adopted SIO. Consideration for the scenery is essential early on in the planning process, particularly in areas seen from a Visual Priority Route. However, each landscape setting is different, and should be evaluated on a case-by-case basis. There may be instances where the SIO can be met even though the proposed activity is greater than the guideline, or there also may be cases where the activity must be smaller to meet the intent of the SIO.
SCENERY EFFECTS

The proposed Sweetheart Lake Hydroelectric Facility (Figs. 1 & 2) will include a dam and penstock on Lower Sweetheart Lake with a powerhouse and switchyard adjacent to Sweetheart Creek. A transmission corridor will run along (as overhead cables) and under (as submarine cables) Gilbert Bay and Port Snettisham. The transmission line is proposed to tie into Alaska Industrial Development and Export Authority’s (AIDEA) existing transmission line on the north side of Port Snettisham. Additional Project facilities will include an access road, dock facility, and a caretaker’s facility on the east side of Gilbert Bay north of the powerhouse. The project will be located on federal lands managed by the USDA Forest Service (USFS) as part of the Tongass National Forest and on lands owned by the State of Alaska. Proposed facilities for each VCU are summarized below.

VCU 610
Project facilities in this VCU include the dam and the tunnel penstock. Impacts would also include raising Lower Sweetheart Lake’s level for hydroelectric generation. All facilities are located in an unseen/seldom seen landscape.

The dam is located at the mouth of Lower Sweetheart Lake in a narrow ravine. The height of the concrete and dam on the downstream side will be 111 feet tall. On the lake side, the height of the dam will vary between twenty-six and eighty-five feet depending on lake levels. The dam is proposed to raise the surface elevation of Lower Sweetheart Lake by a minimum of 25 feet and a maximum of 85 feet and would impact existing vegetation on the side slopes of the lake. The penstock will be located in a tunnel and would have no scenery impacts.

VCU 570
Facilities include the tunnel penstock coming down from Lower Sweetheart Lake. Adjacent to Sweetheart Creek and near tidewater is proposed a powerhouse, switchyard, smolt re-entry pool, and tailrace consisting of an open afterbay and tunnel extending to Sweetheart Creek. The powerhouse and switchyard will have earthen berms predominately placed on the western and southern portions of the site. The powerhouse and switchyard will be in a partially excavated area linked by a 4,400 foot-long access/service road to the north to a new dock facility including a dual-height marine ramp, floating docks for seaplane and boat access, and a staging area adjacent to the docks. The dock facility and most of the coastal road will be primarily located on State of Alaska lands. Located to the south of the dock facility will be a caretaker’s facility. All facilities, except the penstock, will be located in the foreground distance zone.

In additional to physical facilities and associated disturbances, the project will also affect scenery in the reduction of water flowing over the Sweetheart Creek Falls and in the upper pools of the creek. Current flow rates over the falls average 346 cubic feet per second (cfs) and once power production starts will be reduced to 3 cfs plus 3 percent accretion. Flow rates in the lower creek will be similar to current from the tailrace and below. The falls and creek are located in an unseen/seldom seen landscape but is identified as an Area of Concern.

Adjacent to the dock facility, the transmission line will be a 9700-foot submarine cable that travels under Gilbert Bay to the west shoreline. Upon reaching land a transition facility will allow the submarine cable to go to an overhead configuration. The 15,400-foot long transmission corridor will travel north perpendicular to the shoreline of Gilbert
Bay to Sentinel Point. The corridor exits this VCU just to the south of Sentinel Point. These facilities will be located in a middleground distance zone.

VCU 550

The overhead transmission corridor (approximately 0.1 mile) enters this VCU from the south and converts to a submarine corridor at Sentinel Point and travels approximately 16,000 feet under Port Snettisham to the other transition facility on the northern shore of Port Snettisham east of Mist Island. The transmission corridor continues on land underground for 400 feet before entering a transition facility where it converts to an overhead configuration and ties into the existing AIDEA overhead transmission corridor. These facilities are located in a middleground distance zone.

Project wide, overhead transmission structures will be steel T and straight-shaped towers with a typical height of 80 feet. These structures, largely due to the use of guys, can be designed to be relatively light weight allowing setting of the structures with the use of a heavy lift helicopter. The structures are to be supported on micro-pile foundations (JHI Exhibit G 4.4, 2013). The clearing width within the transmission corridor will be 100 feet on either side of the center line resulting in a total of 200 feet cleared for all overhead transmission corridors. All trees will be cleared from the transmission corridor at the initiation of construction and during the existence of the Project to eliminate potential hazards and allow access to the transmission line. Vegetation management will be required as part of the scheduled maintenance of the corridor. The width of the cleared corridor may vary depending on tower placement, existing vegetation, terrain, and slopes, and is determined by the utility engineer.

It is expected that the Project will have the greatest visual impacts immediately after completion of construction. As the Forest naturally regenerates within the transmission corridor, the visual impacts will be reduced. In the middleground and background Distance Zones, visual impacts will be attributed to the deviation in color and texture from the surrounding undisturbed vegetated landscape. In the foreground, the transmission structures, utility lines, and the deviation in vegetation (color and texture) within the corridor will result in visual impacts.
Prominence and Sensitivity of Proposed Scenery Effects

To fully understand the expected scenery effects from the Project the following details the structures, sizes, spacing and corridor clearing limits for each of the Project segments within each of the Value Comparison Units (VCUs). The summary also identifies where scenery impacts are expected, the distance zone effected, and those areas that are sensitive including those with a Low Visual Absorption Capacity, Existing Scenic Integrity (ESI) of 1-3, and High Inherent Scenic Attractiveness (ISA). The landscape areas that are identified as being sensitive are highlighted in bold text under the prominence and sensitivity summary for each segment.

VCU 610
Dam, Penstock and Elevated Lake Levels

This VCU includes the Lower Sweetheart Lake dam, spillway and penstock. The height of the dam on the downstream side will be 111 feet tall and the height on the lake side will vary from twenty-six to eighty-five feet depending on lake levels. The penstock will not be visible as it will be set within a tunnel drilled through existing rock. Lower Sweetheart Lake levels will be elevated between twenty-five and eighty-five feet above existing to allow for power generation. This increase in lake levels will effect existing vegetation on the side slopes of the lake to the upper range of the proposed lake elevation. Temporary facilities associated with construction activities on Sweetheart Lake including construction staging, camp and laydown areas will be submerged when lake levels are elevated as part of power generation and no longer visible.

Prominence and Sensitivity of this segment:

- Dam, penstock and elevated lake levels: Unseen/seldom seen landscape, High ESI (Class 1), Distinctive ISA, High VAC.
- Due to facilities being in an unseen/seldom seen landscape and having a High VAC, the sensitivity of these facilities in a High ESI and Distinctive ISA are negligible.

VCU 570

Facilities in this VCU include the powerhouse, switchyard, tailrace, access road, caretaker’s facility, dock facility, and transition facilities. Transmission lines in this VCU include buried, submarine, and overhead configurations.

East Side of Gilbert Bay: Power Generating and Related Support Facilities

Facilities on this portion of the VCU include the powerhouse, switchyard, tailrace, access road, dock facility, caretaker’s facility, and transition facility. Total disturbed area will be approximately 12.4 acres, of which 8.3 will be on State land. The powerhouse and switchyard will be located in an excavated area just north of Sweetheart Creek and within the tree line above the tidal area. The two-story, approximately 9,600 sq. ft. powerhouse will be set into the landscape with soil berms and vegetation around the perimeter of the structure to assist in screening the facility. One face of the building will be partially visible towards Gilbert Bay. Adjacent to the powerhouse will be an approximately 22,000 sq. ft. switchyard, and 125 sq. ft. smolt re-entry pool flowing into Sweetheart Creek. The tailrace channel will have a partially covered arch culvert and and be backfilled to provide a wildlife crossing over the channel. The backfill will allow revegetation and assist in screening the powerhouse and associated
Scenery Effects Predictions

facilities. Earth berms and landscaping will surround the powerhouse and switchyard on the south and west sides to create a visual buffer from Gilbert Bay. From the powerhouse, a 4,400 foot-long gravel access road will travel north just above the high tide line. The road will largely be built on fill material on State lands to get grade above the high tide line. The 25-foot-wide gravel road will have five pull-outs on the water side of the road that will add 16 feet to the width of the roadbed at those locations. Each pull out is approximately 200 feet long. After the power facility is operational the two lane gravel access road will be decommissioned to a one lane gravel service road and the pullouts also decommissioned and revegetated. The road clearing limits including road fill limits to cut slopes on the uphill side of the road varies but has a typical width of approximately 75 feet. No vegetation would remain between the road and Gilbert Bay except where revegetation planting is installed adjacent to the pull outs. Larger boulders will be placed at high tide on fill slopes to provide visual variety for the road bed fill slopes. The transmission line will be buried below the road bed and run for approximately 4700’ from the powerhouse to the marine transition facility.

The access road links the powerhouse to the dock facility. The dock facility includes a dual-height marine ramp, a floating dock will provide boat access (141’ length and 24’ width) with a seaplane dock at its terminus (1,500 sq. ft.). These facilities are not on USFS lands rather are on fill placed on State managed lands. Adjacent to the dock facility is a sloped area of fill (31,500 sq. ft.) that will be used for a staging/storage area and is also located on State Land except for a small portion of USFS land totaling 0.1 acres. These facilities will be located in the foreground of the caretaker’s facility. This two-story structure will have a 4,225 sq. ft. footprint and be accessible from the road. A partially buried concrete vault will be located near the dock facility that allows the underground transmission line to transition to submarine before entering Gilbert Bay.

Prominence and Sensitivity of this segment:

All facilities are located in:

- Foreground Distance Zone
- Typical ISA (Class B)
- High ESI (Class 1)
- Low VAC

West Side of Gilbert Bay: Transmission Lines

This segment of transmission lines includes going from a submarine cable exiting Gilbert Bay, entering a transition facility just above high tide and then going to an overhead transmission line. The submarine cable corridor would result in cleared vegetation on land above the buried cables to a width of 30 feet and running approximately 50 feet from the high tide line to the transition facility. The station will be a small secured structure sitting on a cleared pad of approximately 625 square feet. Exiting the station will be a single transmission line with three conductors supported on steel T and straight-shaped towers with an average height of 80 feet. The transmission line will run to the north towards Sentinel Point. The clearing limits for the corridor are estimated at 100 feet on the downhill side and 100 feet on the uphill side, for a total clearing width of 200 feet. The total length of the overhead corridor in this VCU is approximately 15,400 feet.

Prominence and Sensitivity of this segment:

- Middleground
- Typical ISA (Class B)
- High ESI (Class 1)
- Low VAC (dotted with Intermediate)
VCU 550

The Project in this Value Comparison Unit (VCU) only includes the hydroelectric transmission lines.

Transmission Lines

This segment of transmission lines includes going from overhead line at Sentinel Point to submarine cable under Port Snettisham and back to overhead line to connect to the existing Snettisham Transmission Line. The overhead transmission line exits VCU 570 on the ridge above Sentinel Point and enters VCU 550 from the south as an overhead line. The transmission line travels approx. 1,000 feet from the edge of the VCU to the south shore of Port Snettisham. The transmission line conductors in this portion of the VCU will be supported by steel T and straight-shaped towers with an average height of 80 feet. The clearing limits for the corridor are estimated at 100 feet on the downhill side and 100 feet on the uphill side, for a total clearing width of 200 feet. At Sentinel Point the transmission line enter a transition facility just above high tide and converts to a submarine cable configuration. The submerged cable travels west 16,000 feet and meets up with the northern shore of Port Snettisham just east of Mist Island. It continues north underground as it heads 400 feet up the shore to the transition facility located within the existing AIDEA Snettisham transmission corridor. Both transition facilities would result in cleared vegetation above the buried cables to a width of 30 feet. Both stations will be a small secured structure sitting on a cleared pad of approximately 625 sq. ft. Upon exiting substation adjacent to the AIDEA transmission line the transmission line will convert to an overhead configuration supported on one steel T and straight-shaped tower with a height of 80 feet. The overhead transmission line runs approx. 150 feet from the transition facility to the tie-in with the existing AIDEA overhead transmission lines. The clearing limits for the corridor before connecting to AIDEA’s Snettisham line are estimated at a total clearing width of 30 feet. The total length of the overhead corridor within VCU 550 is 1,150 feet.

Prominence and Sensitivity of this segment:

- Middleground
- Typical ISA (Class B)
- **High ESI** on the southern portion of the VCU adjacent Sentinel Point. Very Low ESI on northern side of Port Snettisham adjacent Mist Island and AIDEA corridor.
- Low VAC
Construction and Maintenance

In addition to the physical features associated with the Project, construction techniques and scheduled maintenance during the operation of the facility will also determine the extent of scenery effects at various time periods during the life time of the Project.

Construction operations within USFS lands includes clearing and grading a portion of the access road, clearing all trees from within the clearing limits of the transmission line corridor, construction of the gravel roadway, and placement of the hydroelectric towers and structures to support the transmission line. The access road will be constructed with typical expected road building techniques and equipment with a specific emphasis to retain the characteristic of the rock and landscape. An example of the emphasis is the technique to build the coastal road/trail with a reverse slope away from the shore. This technique and others to be employed help naturally mask the visual impacts of the roadway. The equipment, personnel and the transmission line towers and structures will be placed with the use of helicopters to minimize disturbance to the ground plane and existing vegetation (Mitchell, 2013). A roadway is not required within the transmission corridor beyond the gravel access road described in VCU 570. This will allow all remaining shrubby and herbaceous vegetation to remain and minimize exposure of bare earth except at the base of structures and where materials may be stockpiled. The greatest impact to scenery is expected just after construction is complete. Select facilities will be routinely cleared of all vegetation and include the switchyard, the area immediately surrounding the powerhouse, the road, service yards adjacent the dock facility, adjacent the warehouse, and the transmission facilities where the cables go from submarine to overhead. Visual berms are designed to mask most of the switchyard the powerhouse from the VPR. Additionally, vegetation and trees will be transplanted to assist in providing a visual barrier. Other areas will be allowed to revegetate and include the excavated area, disturbed cut slopes adjacent facilities, and along the slopes along the roadway.

A component of the Project throughout its life will be maintenance and the removal of hazardous trees within the utility corridor clearing limits that impact the reliability and safety of transmission of power. The width of the clearing limits is described above for each VCU. Vegetation management within transmission corridors is regulated by the National Electrical Safety Code, Section 218: Tree Trimming. The code states:

Trees that may interfere with ungrounded supply conductors should be trimmed or removed. Note: Normal tree growth, the combined movement of trees and conductors under adverse weather conditions, voltage and sagging of conductors at elevated temperatures are among the factors to be considered in determining the extent of trimming/removal required.

Based on the federal requirement, Juneau Hydropower, Inc. has a five year maintenance cycle where hazardous trees are removed from the within the clearing limits of the transmission corridor but smaller height trees and shrubby vegetation are left in place. Removal of trees greater than thirty feet tall within the clearing limits will be part of the expected maintenance (Mitchell, 2013). After completion of construction, the period with the next greatest visual impact will occur after maintenance within the clearing limits.
Landscape Character Effects

The Landscape Character for the Project Area is the Boundary Ranges and Icefields and represents the landscape at a macro level or large scale. Landscape Character defines the broad characteristics of landform patterns and features, vegetation patterns, surface water, and land use patterns or cultural features of the region. The Project effects to these identifiable landscape characteristics (vegetation, landforms, surface water, etc.) determine the extent and magnitude of the deviation from the Landscape Character; and if these impacts meet the Scenic Integrity Objectives (SIO) listed in the Forest Plan. Additionally, these effects must be analyzed during the life time of the Project from initial construction, to operation and maintenance, and final decommissioning. These cumulative effects of the Project over its entire life/duration must look at reasonable expected actions and effects on scenery and identify impacts that deviate from the Landscape Character and determine if they meet the required SIO.

As identified previously, the Project is located within three Land Use Designations (Semi-remote Recreation, Timber Management and Old-Growth Habitat), however there is a desire by JHI to obtain a TUS LUD for the Project area. Until the TUS LUD is obtained the three existing LUDs shall establish the Desired Conditions and Scenery Requirements for the Project. The TUS LUD is shown and is only valid should this LUD be obtained in the future.

VCU 610
Lower Sweetheart Lake
Desired Condition:
This area is in a Semi-remote Recreation LUD with Project facilities and impacts located in an unseen/seldom seen landscape. The proposed facilities must be rustic in appearance and have a minimal footprint so natural conditions are only minimally affected by current activities. Facilities and structures may be minimal or occasionally may be larger in scale, but will be rustic in appearance, or in harmony with the natural setting.

Scenery:
Design resource activities to remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the landscape. New form, line, color, or texture will be subordinate to the characteristic landscape.
Apply Forest-wide Standards and Guidelines for the Moderate Scenic Integrity Objective (SIO).
Rehabilitation techniques may be used to restore disturbed landscapes to be compatible with the Semi-Primitive setting.

VCU 570
East Side of Gilbert Bay
Desired Condition:
This area is in the Semi-remote Recreation LUD. The proposed facilities must be rustic in appearance and have a minimal footprint so natural conditions are only minimally affected by current activities. Facilities and structures may be minimal or occasionally may be larger in scale, but will be rustic in appearance, or in harmony with the natural setting.
Scenery:

Design resource activities to remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the landscape. New form, line, color, or texture will be subordinate to the characteristic landscape.

Apply Forest-wide Standards and Guidelines for the Moderate Scenic Integrity Objective (SIO).

Rehabilitation techniques may be used to restore disturbed landscapes to be compatible with the Semi-Primitive setting.

**West Side of Gilbert Bay**

**Desired Condition:**

Suitable Forest lands are managed for the production of sawtimber and other wood products on an even-flow, long-term sustained yield basis; the timber yield produced contributes to Allowable Sale Quantity. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses; some roads may be closed, either seasonally or year-long, to address resource concerns. Management activities will generally dominate most seen areas. Tree stands are healthy and with a mix of age classes from young stands to trees of harvestable age, often in 40- to 100-acre stands. Recreation opportunities, associated with roaded settings from Semi-Primitive to Roaded Modified, are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.

**Scenery:**

Timber management activities may dominate the scenic character of the landscape.

Apply Forest-wide Standards and Guidelines for the Low Scenic Integrity Objective in the foreground distance zone of Visual Priority Travel Routes and Use Areas (see Appendix F, Forest Plan) and the Very Low Scenic Integrity Objective for all other areas. This objective defines the maximum limit of allowable change to the scenic character of the area; less visible evidence of activities is acceptable.

Consider roadside cleanup of construction debris and logging slash as a mitigation measure when recreational use is included as a road management objective for the proposed road.

In areas visible from Visual Priority Travel Routes and Use Areas, incorporate landscape design techniques in the planning process to the extent that they are compatible with LUD objectives.

**VCU 550**

**South of Port Snettisham (Sentinel Point)**

**Desired Condition:**

Suitable Forest lands are managed for the production of saw timber and other wood products on an even-flow, long-term sustained yield basis; the timber yield produced contributes to Allowable Sale Quantity. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses; some roads may be closed, either seasonally or year-long, to address resource concerns. Management activities will generally dominate most seen areas. Tree stands are healthy and with a mix of age classes from young stands to trees of harvestable age, often in 40- to 100-acre stands. Recreation opportunities, associated
with roaded settings from Semi-Primitive to Roaded Modified, are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.

**Scenery:**

Timber management activities may dominate the scenic character of the landscape.

Apply Forest-wide Standards and Guidelines for the Low Scenic Integrity Objective in the foreground distance zone of Visual Priority Travel Routes and Use Areas (see Appendix F, Forest Plan) and the Very Low Scenic Integrity Objective for all other areas. This objective defines the maximum limit of allowable change to the scenic character of the area; less visible evidence of activities is acceptable.

Consider roadside cleanup of construction debris and logging slash as a mitigation measure when recreational use is included as a road management objective for the proposed road.

In areas visible from Visual Priority Travel Routes and Use Areas, incorporate landscape design techniques in the planning process to the extent that they are compatible with LUD objectives.

**North of Port Snettisham**

**Desired Condition:**

All forested areas within this LUD have attained old-growth forest characteristics. A diversity of old-growth habitat types and associated species and subspecies and ecological processes are represented.

**Scenery:**

Apply Forest-wide Standards and Guidelines for High Scenic Integrity Objective. Design activities to not be visually evident to the casual observer.

Exceptions for small areas of non-conforming developments, such as recreational developments, transportation developments, log transfer facilities, and mining development, may be considered on a case-by-case basis. Use designs and materials that

*Should the Project receive a TUS LUD in the future the following would apply. Until that time the management listed above is in effect. (All text related to the TUS LUD is in italics.)*

**Project Wide**

**Desired Condition:**

*Transportation Utility Systems have been constructed in an efficient and economic manner, and have been designed to be compatible with the adjacent LUD to the maximum extent feasible. The minimum land area consistent with an efficient, safe facility is used for their development. Effects on other resources have been recognized and resource protection has been provided. Other resources uses and activities in the area do not conflict with utility operations. State and federal highways and reservoirs offer new developed recreation opportunities, as appropriate.*

**Scenery:**

*The landscape character may be dominated by activities associated with Transportation Utility Systems. Although TUS developments may dominate the seen area, they are designed with consideration for existing form, line, color, and texture found in the characteristic landscape.*
In summary, the design and engineering of hydroelectric facilities and their linear transmission corridors typically dominate the Landscape Character by creating strong horizontal visual contrast in line, form and texture across the landscape especially within the clearing limits of the corridor and around the associated facilities. The corresponding LUD and related Desired Conditions and Scenery Requirements establishes acceptable aesthetic conditions allowable and an acceptable range (if any) in which the Project effects may deviate from the Landscape Character. The Project will meet the scenery requirements in VCU 570 along the west portion of Gilbert Bay (Timber Management LUD) but likely will not on the remaining eastern portion of the VCU (Semi-Remote Recreation LUD) without visual mitigation. However, the dock and adjacent marine ramp and portions of the coastal road/trail are on State of Alaska lands and not subject to the Forest Plan. It is not expected that the Project will meet the scenery requirements for VCU 550 north of Port Snettisham, however there is existing precedence with the existing AIDEA transmission line and the Forest Plan does allow small areas of non-conforming development within an Old-Growth Habitat LUD. The Project will meet the scenery requirements for VCU 550 in the area adjacent Sentinel Point where it may dominate the landscape character (Timber management LUD). To best meet, and where possible exceed the scenery requirements, the Project should be designed in consideration of the existing form, line, color and texture found in the Boundary Ranges and Icefields Landscape Character.

Should the Project receive a TUS LUD, it is expected that the Project will meet the Scenery Requirements in all three VCUs. Some visual mitigation will be required on the eastern portion of VCU 570 (Gilbert Bay) where a majority of the non-State of Alaska tideland facilities and visual impacts will be located.

The Desired Conditions and Scenery Requirements and impacts to the Landscape Character for the three LUDs will be used to evaluate all portions of the project located on lands managed by the USFS. Specifically this includes: the Project facilities, any expected disturbance to the landscape (vegetation, terrain, etc.) associated with the installation of the facilities, and the federal and local clearing limits requirements for the utility corridor. In addition to the physical facilities and modifications upon the landscape, another aspect that must be considered is the expected maintenance of the Project over its lifetime and the natural regeneration of the Forest. The maintenance of the clearing limits and the natural regeneration of the Forest within the clearing limits will result in a dynamic and evolving landscape over time. The extent, magnitude and duration of these effects, both man-made and natural processes, needs to be predicted and evaluated as best possible during the entire life of the Project. The evaluation of reasonable future effects includes expected maintenance and frequency of maintenance, replacement of facilities, and the natural regeneration of the landscape.

It is expected that the Project will have the greatest visual impacts on the Landscape Character related to vegetation patterns and cultural elements. In regard to vegetation patterns, the linear nature of the utility corridor with its managed vegetation within the clearing limits of the corridor will visually contrast with the vegetation characterized by areas of alpine meadows with forested side slopes that support extensive productive Western Hemlock and Sitka Spruce forests. The visual impacts to the existing vegetation will include form, line, color and texture. These will be attributed to the vegetation management within the clearing limits of the corridor which will contrast in color and texture due to the variation in plant species, maturity and height to the surrounding undisturbed landscape. Additionally the development of a road, and several structures will require the clearing of native vegetation and create further impacts to color, line and texture. It is expected that the greatest visual impacts to the Landscape Character will be during construction where bare earth and rock will be present as trees and overburden are removed from road corridors, building pads, storage yards, and cut slopes around these facilities are underway and new fill placed. Within the utility corridors, all large trees will be removed with some small patches of bare earth and the Forest understory
being exposed within the transmission corridor. Once construction is completed visual impacts to Landscape Character will be lessened as time passes due to the natural regeneration of the Forest. Visual impacts will be the least just prior to management of vegetation within the transmission corridor, along road corridors and around structures when taller trees are removed but other vegetation remains. It is expected that the physical components (towers, transition facilities, and transmission line) within a seen landscape will have minimal impacts to form, line, texture, and color except when viewed in the foreground from a Visual Priority Route.

A visual impact to the Landscape Character is also expected in regard to the cultural elements. The cultural impacts of the Boundary Ranges and Icefields is described as, “the majority of the landscape shows very little human influence.” Notable human influence within the Project is the existing AIDEA transmission corridor; beyond this impact the landscape is largely intact with 97% of the project area having a Very High Existing Scenic Integrity. The greatest human influence will be located on the east side of Gilbert Bay in VCU 570 where a majority of the facilities will be concentrated and include the powerhouse, switchyard, access road, dock facility, and other related structures. It is expected that a range of vehicles (boats, float planes, trucks) and personnel will be working at various times in this area to operate and maintain the facility. Additionally, the linear layout of the Project’s corridors and visual color and texture contrast, as discussed previously, will result in an increase in human influence within the seen landscape transecting all three Value Comparison Unit (VCUs).

It is expected that the Project will meet the LUD requirements and allowable impacts to the Landscape Character as set forth by the Timber Management LUD. While it will not meet the minimums for the Old-Growth Habitat, it may be allowable due to the adjacent AIDEA line and the Forest Plan indicating that small non-conforming development may be considered on a case-by-case basis. The greater challenge will be meeting the minimum LUD scenery requirements for the Semi-Remote Recreation LUD (found on the eastern portion of Gilbert Bay VCU 570) especially during and immediately after initial construction of the Project when scenery impacts to the Landscape Character will be the greatest. The large area associated with the dock facility, storage yard, road, and various structures along the water’s edge as well as the linear nature of the hydroelectric facility and its operation makes it difficult to reduce visual impacts and obtain a higher level goal for Landscape Character through incorporating existing form, line, color, and texture during the initial construction period of time. After initial construction and throughout the operation and maintenance, it is expected that the impacts to the Landscape Character will move towards being more compatible with the higher LUD scenery requirements. During operation of the Project, revegetation within the transmission and access road corridors will reduce visual contrast (form, line, color, and texture) to the surrounding landscape. Due to scheduled maintenance and removal of large trees within the clearing limits of the corridor it is not expected that the Project will ever obtain these higher goals, but with good maintenance practices it can move away from the lower visual conditions experienced immediately after construction.
Scenic Integrity Effects

Scenic Integrity is a major component of Scenery Management and is used to establish scenery standards for management. Scenic Integrity also establishes the degree to which the landscape must be retained intact or can be perceived as modified from the Landscape Character (Boundary Ranges and Icefields) by human activities. Scenic Integrity Objectives (SIOs) provides direction and objectives for landscape scenery and is determined by the Distance Zones within each Land Use Designation (LUD). SIOs establish the long-term future scenic condition of the landscape by defining maximum levels of visual impact allowable from human alterations to the natural landscape character for each allowable use. The objectives also set schedules or periods of time after project completion or conclusion of construction in which the SIOs must be met. The effects by the Project related to the Scenic Integrity on USFS managed lands must determine the extent, magnitude and duration as viewed from areas of concern. Again these effects must be analyzed during the life time of the Project from initial construction to operation and maintenance. These cumulative effects of the Project over its entire life/duration must look at reasonable expected actions and effects on scenery and identify impacts that do not meet the Scenery Integrity Objectives. Scenic integrity represents the landscape at a micro level from areas of concern.

As discussed in Landscape Character, the Project is located within three LUDs (Old-Growth Habitat, Timber production and Semi-remote Recreation) and results in a High, Moderate, Low and Very Low SIO. The Scenery Objectives for each are as follows:

High SIO (Old-Growth Habitat LUD, VCU 550: North side of Port Snettisham)
Design activities to not be visually evident to the casual observer. This objective should be accomplished within 6 months following project completion.

Facilities

- Keep vegetation clearing to a minimum and within close proximity of the site.
- Select materials and colors that blend with those found in the natural surroundings.
- Screening should be used from viewpoints and travel routes if feasible.

Transportation

- Rock source development should not be apparent from the road, use area, or marine travel route to meet this scenic objective.
- Corridor Treatment: Provide roadside cleanup of ground-disturbing activities.
- Depending on site conditions, cut stumps as low as possible and angled away from the viewer. Incorporate this treatment in the timber sale contract.

Moderate SIO (Semi-Remote Recreation LUD, VCU 610: Lower Sweetheart Lake and VCU 570: East Side of Gilbert Bay)
Design activities to be subordinate to the landscape character of the area. This SIO should be accomplished within 1 year of project completion.

Facilities

- Keep vegetation clearing to a minimum and within close proximity of the site.
- Emphasize enhancement of views from recreational facilities.
- Select materials and colors that blend with those found in the natural surroundings.
Transportation

- Design rock sources to be minimally apparent as seen from VPRs. Rehabilitation is usually necessary following closure of rock source developments. It may be necessary to modify some ground-disturbing activities seen from the foreground of VPRs.
- Corridor Treatment: Roadside cleanup of ground disturbance activities may be necessary.

Very Low SIO (Timber Production LUD, VCU 550: West Side of Gilbert Bay and VCU 550: Sentinel Point)

Activities may dominate the characteristic landscape, yet when viewed as background, should appear to be a natural occurrence.

Locate and design management activities to take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs.

Design activities to resemble natural occurrences as viewed in the background distance zone.

Should JHI successfully obtain a TUS LUD for the Project area the following Scenery Objective would apply. Until that time, the previously listed SIOs (above) are in effect for this Project.

Low SIO (Transportation and Utility System LUD, Project Wide)

Once construction is initiated and throughout the operation and maintenance of the Sweetheart Lake Hydroelectric Project, the TUS LUD takes precedence and supersedes the underlying Timber Production, Old-Growth Habitat and Semi-Remote Recreation LUDs. The Scenery Objectives for a TUS LUD and Low SIO are as follows:

Apply Forest-wide Standards and Guidelines for the Low Scenic Integrity Objective. Perform viewshed analysis in conjunction with Project development to provide direction for retaining or creating a visually attractive landscape over time.

Work with topographic and vegetative features to screen the development when seen from Visual Priority Travel Routes and Use Areas.

Consider the following during the design phase of routes, which are, or are seen from, Visual Priority Travel Routes and Use Areas:

- Vegetation of slopes seen from the road
- Providing “planting pockets” or terraces or slopes, where needed
- Maintaining landforms through road location and design
- Breaking up the straight line effect of linear corridors by considering special treatment of vegetation on clearing slopes or application of other design techniques and principles

Require roadside cleanup of construction debris and logging slash on all roads receiving general public use or expected to have such future use.

Activities may visually dominate the characteristic landscape, but must have visual characteristics similar to those of natural occurrences within the surrounding area or character type. This SIO should be met within 1 year in the foreground distance zone and within 5 years in the middle and background Distance Zones following Project completion.

- When planning activities, use naturally established form, line, color, and texture found in the landscape.
- Facilities. Siting and design should borrow from naturally occurring patterns in the landscape, and should not be visually dominant when viewed in the background distance zone.
Scenery Effects Predictions

Should a TUS LUD be granted for the Project, the allowable visual impact upon scenery falls under the Low Scenic Integrity Objective (SIO) where activities may dominate the landscape character in the foreground and middleground. Once construction is complete the Low SIO must be met within 1 year in the foreground and within five years in the middle and background. The project shall be developed to create a visually attractive landscape overtime through the planning and design that uses naturally established form, line, color, and texture found in the landscape. Use topography and vegetation to screen the development from Visual Priority Routes (VPRs). For linear corridors, break up the straight line edge of the corridor by using non-linear clearing limits and the use of planting pockets on visible slopes.

Each SIO provides guidelines on the acceptable amount of visual impact that is allowable upon the Landscape Character and duration (time period) after project completion when the objective must be met. Additionally each SIO provides specific recommendations to minimize visual impacts for a variety of facilities (road, timber harvest, etc.). For all SIO’s, to varying degrees, the project shall be developed through the planning and design that uses naturally established form, line, color, pattern, and texture found in the Character Landscape to appear to be a natural occurrence in various prescribed distance zones.

As discussed in Landscape Character, the greatest Project effects on the scenic integrity will be the period between the initiation and completion of construction and a short period of time following (approximately one year) until the Forest can begin to regenerate. These impacts will be the greatest within the seen landscape with a Low Visual Absorption Capacity. As the Forest regenerates within the clearing limits around buildings and facilities, and within transmission and road corridors, these visual impacts will be reduced.

To fully understand the effects on Scenic Integrity, three dimension digital visual simulations were generated to document the expected effects of the Project on scenery from key VPRs. Viewpoints for the simulations corresponded with the photo points used in the inventory phase of the scenery work to verify existing conditions and establish a baseline for the model. All simulations are from established VPRs. Mapping of the visual simulations viewpoints and the simulations are found in Appendix A of this Report. Each simulation shows the existing conditions and the expected impacts based on the facilities and structures, clearing limits, terrain modifications, and impacts to the landscape as described in the work by Juneau Hydropower, Inc., Exhibit G 4.4 (2013).

The simulations were created with raw geospatial data provided by the USFS that was compiled and verified in ESRI’s ArcMap (GIS). The data included shapefiles for hydrology and infrastructure, color maps, and a digital elevation model. The files were then imported into three-dimensional visualization software for outdoor environments. The resulting graphics were verified against the GIS data and imagery of the existing landscape taken from recorded photo points to verify accuracy. LiDAR data (Light Detection And Ranging data) was provided by Aero-Metric. It was used to create a detailed ground plane in the model. The ecotypes within the project are based on vegetation and canopy cover color maps and height is based on field observation and USFS records for the area. The utility infrastructure (towers, transition facilities, roads, etc.) in the model is based on data provided by Juneau Hydropower, Inc. Three-dimension models of the infrastructure elements and the clearing limits were inserted into the model. One set of renderings were generated from viewpoints that will best record the expected impacts to scenery. They model the proposed Project effects of the Project with expected regeneration after 1 year or 5 years as dictated by each LUD. Regeneration was modeled on expected growth rates for the Gilbert Bay/Port Snettisham area. Growth rates are based on USFS documentation and photographs of adjacent clearing operations within the AIDEA Transmission Corridor. Color, texture, line and form of the regeneration were derived from images of existing conditions taken in the field and previous discussion under Existing Scenic Integrity (ESI). The image locations in the model align with geo-referenced images captured during Corvus Design’s field work in 2013.
The visual simulations were developed using a one or five year duration after completion of construction as indicated for each LUD in the Forest Plan. This is a point in which modifications to the landscape are to obtain the required SIO in the middleground and foreground as mandated by scenery requirements in the Forest Plan. Each simulation documents the expected effects upon scenery and forms the basis of the discussion below. No visual simulations were developed for VCU 610 as the proposed facilities are located in an unseen/seldom seen landscape. Additionally, there are no VPRs that provide visual access to the Project facilities in VCU 610 from which to base the visual simulation.

VCU 570

Visual Simulation Photo Points: 1 through 5

This Value Comparison Unit (VCU) includes the hydroelectric generation facility including the penstock, powerhouse, switch yard, transition facility, and a combination of underground, submarine and overland transmission lines. Other facilities associated with the Project include the access road, dock facility, storage yard, and the caretaker’s facility. These facilities are located on the east side of Gilbert Bay (Semi-Remote Recreation LUD). The dock and a majority of the dock facility and most of the road are located on fill placed on submerged lands and are under management of the State of Alaska and are not included in the effects analysis, however, will result in cumulative effects. The west side of Gilbert Bay (Timber Production LUD) has a transition facility and both submarine and overhead transmission lines.

East Side of Gilbert Bay (Semi-Remote Recreation LUD)

Facilities include a 9,600 sq. ft. two story powerhouse and 22,000 sq. ft. switchyard located in an excavated area adjacent to tidewater on Gilbert Bay near Sweetheart Creek. Earth berms and revegetation would surround these facilities making them visible only from Gilbert Bay. From the powerhouse, a 4,400 foot long and 25 foot wide, back-sloped gravel coastal road/trail heads north along the east shore of Gilbert Bay to a new dock facility that includes a dual-height marine ramp, floating docks for seaplane and boat access, and a staging area adjacent to the docks on the east shore of Gilbert Bay north of the powerhouse. A two story 4,225 sq. ft. caretaker’s facility is to be located southeast of the dock and dock facility. This facility is located on the road’s edge and will be fully visible from VPRs. The excavated area and segments of the access road will be revegetated using native plant material and soil on the waterside to reduce visual impacts. This revegetation is reflected in simulations 1 and 2.

The transmission lines in this portion of the VCU include underground lines beneath the roadbed from the powerhouse to the transition vault near the dock facility where the line converts to submarine and heads west into Gilbert Bay. The underground lines, vault and first 50’ feet of submarine cable are located on USFS managed lands while the remaining submarine cable segment is located on state-owned lands.

Impacts to Scenic Integrity of VCU 570 East Side of Gilbert Bay:

- Structures, facilities and related clearing limits will be visible from VPRs and will dominate the landscape character.
- Transmission Lines: Foreground (largely unseen due to buried and submarine configuration), located within Low VAC. Only vault structure will be visible in the foreground.
• Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will exceed the visual impacts for a Moderate SIO as allowable in the Forest Plan. This SIO will not be accomplished within one year after completion. This is not consistent with the Forest Plan.

West Side of Gilbert Bay (Timber Production LUD)
Transmission lines include submarine and overhead configuration and a transition facility. The transition facility and the last 50’ feet of submarine cable are located on USFS managed lands while the lower extent of submarine cable is located on state-owned lands. From the transition facility the lines go to an overhead configuration. This segment of overhead transmission line includes poles 1 through 36 and runs along the west shore of Gilbert Bay to the ridge above Sentinel Point. The poles are 80’ in height with spans ranging from 265’ to 946’. The wire support structures will be steel T and straight-shaped towers. The clearing width is anticipated to be 100’ on either side of the center line, for a total width of 200’.

Impacts to Scenery Integrity of VCU 570 West Side of Gilbert Bay:
• Middleground, within a Low VAC and patches of Intermediate VAC along corridor.
• A large portion of the corridor clearing limits and some of the upper portions of the transmission structures may be visible from VPRs as it cuts across the landscape in a horizontal orientation.
• Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will not exceed the visual impacts for a Very Low SIO as allowable in the Forest Plan.
• Expected impacts do not take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs. This is not consistent with the Forest Plan.

Area of Concern for VCU 570:
Gilbert Bay and Sweetheart Flats VPRs: On the east side of Gilbert Bay within the Semi-Remote Recreation LUD, the facilities and structures will exceed the allowable scenic effects of a Moderate SIO. Impacts are expected to be consistent with a Very Low SIO within one year where modifications will dominate the landscape character. This SIO is not expected to meet the one year duration requirement and may be challenged to meet a Moderate SIO during the operation of the Project without additional mitigation. After five years revegetation/mitigation efforts should elevate the SIO to Low. Expected impacts include both landscape character and cultural. Landscape effects include clearing limits around facilities, a coastal road along the shoreline, and a variety of large structures visible from VPRs that creates contrast to the surrounding undisturbed landscape. This results in contrast in color, line and texture found in the landscape character. Cultural effects include a waterfront development with a variety of structures and periodic human and vehicular activity for operation of the facility. The clearing adjacent the caretaker’s facility is not expected to meet the requirement to be “minimally apparent as seen from VPRs” within the one year period. Proposed project mitigation includes visual landform barrier berming and revegetation around the powerhouse, switchyard, and at locations along the coastal road, as well as revegetating excavated areas to cover a majority of the backwall. These mitigation measures elevate the Project in this area from an expected Very Low SIO to the expected Low SIO identified once revegetation becomes established (five or more years).

Gilbert Bay VPR: On the west side of Gilbert Bay within the Timber Production LUD, the facilities include overland transmission lines and associated clearing limits. The linear nature of the facilities and horizontal orientation of the clearing limits contrast with the undisturbed landscape and do not take advantage of pattern and texture found in the landscape when viewed as middleground.

Lower Sweetheart Creek: Although not listed as a Visual Priority Route (VPR), this is a recreational use area during the months of July and August for fishing and bear viewing. If
included in the future as a VPR, portions of the Project adjacent the creek will become part of the seen landscape as foreground in this VCU.

Sweetheart Creek Falls: The reduction of typical flow rates over the Sweetheart Falls and within the upper pools of the creek from approximately 336 cubic feet per second (cfs) to 3 cfs plus 3 percent of the annual average will transition the falls and pools from a high energy creek to a very low energy stream. Flow rates from the tailrace entry into the creek and below will be similar to existing. Although the falls are located in an unseen/seldom seen landscape as it is not visible from an adjacent VPR, the lower Sweetheart Creek has been identified as an area of concern due to summer seasonal use by fishermen and recreationalists. The diminished energy (flow rate) of the falls will reduce the existing scenic integrity of the immediate falls area. Visual impacts will be greatest by those who have previously experienced the higher flow rates.

*Should the Project receive a Transportation and Utilities System LUD for the entire corridor the following summarizes the Impacts to Scenic Integrity and Areas of Concern for VCU 570.*

**Impacts to Scenic Integrity of VCU 570 (TUS LUD):**

- **Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) as allowable in the Forest Plan however it is not expected to meet the SIO in the first year for the foreground distance zone (east side of Gilbert Bay). This is not consistent with the Forest Plan. The Project is expected to meet the SIO in the middleground (and foreground) in the fifth year or beyond.**

- **Expected impacts to scenery in the middleground distance zone will dominate the visual landscape due to dissimilar visual characteristics to those of natural occurrences on both side of Gilbert Bay beyond five years. This is not consistent with the Forest Plan.**

**Area of Concern for VCU 570 (TUS LUD):**

Gilbert Bay and Sweetheart Flats VPRs: Impacts are allowed to dominate the visual landscape however it is not expected that the Project on the east side of Gilbert Bay will meet the Low SIO in the foreground in the first year. This is not consistent with requirements in the Forest Plan. Proposed mitigation measures are expected to take five or more years to become effective and once established the Project will be consistent with a Low SIO in the foreground and middleground. Expected impacts to scenery in the middleground distance zone will dominate the visual landscape on both side of Gilbert Bay beyond five years and will continue to dominate due to dissimilar visual characteristics to those of natural occurrences throughout the Project’s life. This is due to the size of facilities and maintenance cycle within clearing limits of facilities and transmission corridors. This is not consistent with the Forest Plan.

**VCU 550**

**Visual Simulation Photo Points: 6 & 7**

The Project in this VCU only includes the hydroelectric transmission lines, support structures, and transition facilities. The Sweetheart Lake transmission corridor ties into the existing AIDEA transmission corridor in this VCU. All facilities in this VCU are located on USFS managed lands, with the exception of the submarine cable which are on lands managed by the State of Alaska.

**Sentinel Point-South Port Snettisham (Timber Production LUD)**

The overhead transmission line within this VCU starts at pole 37 on the ridgeline above Sentinel Point and runs down the slope to the north side of Sentinel Point to pole 40 at the
south shore of Port Snettisham. Poles in this VCU will be 80’ in height with spans ranging from 150 to 307. Poles will be steel T and straight-shaped towers. This area is heavily wooded. The clearing width for the overhead section on the south side of Port Snettisham is anticipated to be 100’ on either side of the line for a total clearing width of 200’. The line enters a transition station and converts to submarine cable. It moves west under Port Snettisham on State of Alaska Lands with only the first 50 foot length of the submarine cable being on USFS lands.

Impacts to Scenic Integrity of VCU 550 Sentinel Point:
- Middleground, within a Low VAC.
- All of the corridor clearing limits, transmission structures, and transition facility will be visible from VPRs as it comes down the ridgeline to the water.
- Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) and will not exceed the visual impacts for a Very Low SIO as allowable in the Forest Plan.
- Expected impacts do not take advantage of existing (both natural and imposed) pattern and texture found in the landscape when viewed in the middleground from VPRs. This is not consistent with the Forest Plan.

North Port Snettisham (Old-Growth Habitat LUD)
The submarine cable under Port Snettisham reemerges east of Mist Island on USFS-managed lands and will have a clearing width of 30’ for the underground segment. The cable continues underground up the shore for 400’ to connect with the final transition station. The transition station is located within the existing clearing limits of the existing AIDEA Snbettisham Transmission Corridor. The line will convert to overhead at pole 41 and then tie in to the existing AIDEA corridor. The pole will be steel T and straight-shaped towers with a height of 80’. There is no additional clearing anticipated for the final overhead segment as it is sited within the existing clearing limits for the Snettisham Corridor.

Impacts to Scenic Integrity of VCU 550 North Port Snettisham:
- Middleground distance zone within a Low VAC.
- Transition facility and overhead transmission line will be visible from VPRs.
- Expected Scenery Integrity effects will be consistent with a Moderate Scenic Integrity Objective (SIO) and will exceed the visual impacts for a High SIO as allowable in the Forest Plan. It is not expected that this objective will be accomplished within 6 months following project completion. This is not consistent with the Forest Plan.*

*Small area non-conforming developments may be considered in this LUD on a case-by-case basis.

Areas of Concern for VCU 550:
Port Snettisham VPR: The north side of Port Snettisham adjacent Mist Island, including the transition facility, is not expected to meet the High SIO as required in the Forest Plan. Visual impacts are expected to be a Moderate SIO and this is not consistent with the Forest Plan. Development will be visually evident to the casual observer beyond the 6 month period following project completion. (Note: the existing AIDEA Snettisham Transmission Corridor has a greater visual impact to the landscape character than this significantly smaller segment of the Sweetheart Lake Corridor. This smaller segment of the Project could be considered by the USFS as a small area of non-conforming development as allowable by the Forest Plan, if desired by USFS.) Expected impacts include the linear clearing limits moving down from the ridgeline to the shoreline that does not take advantage of existing pattern and texture found in the landscape in the middle ground distance zone on the south side of Port Snettisham. This is not consistent with the Forest Plan.
Impacts to Scenic Integrity of VCU 550 (TUS LUD):

- Expected Scenery Integrity effects will be consistent with a Low Scenic Integrity Objective (SIO) as allowable in the Forest Plan and is expected to meet the SIO in the middleground within the fifth year.

- Expected impacts to scenery in the middleground distance zone will dominate the visual landscape due to dissimilar visual characteristics to those of natural occurrences on the south side of Port Snettisham beyond five years. This is not consistent with the Forest Plan.

VCU 610

Visual Simulation Photo Points: N/A

Lower Sweetheart Lake and the upper reaches of Sweetheart Creek are located in this VCU within an unseen/seldom seen landscape. There are no VPRs that provide a typical Forest user to view the facilities associated with the Project in this VCU. As such no visual simulations were created for this portion of the Project. Facilities include the dam, spillway and penstock and impacts include raising the lake levels between twenty-five and eighty-five feet. These facilities are located within a Semi-Remote Recreation LUD.

Facilities in this VCU include a 111-foot-high concrete and dam, and a 125-foot-wide overflow spillway, constructed at the natural outlet of Lower Sweetheart Lake. The height of the dam on the downstream side will be 111 feet tall and the height on the lake side will vary from twenty-six to eighty-five feet depending on lake levels. The penstock will not be visible as it will be set within a tunnel drilled through existing rock. Lower Sweetheart Lake levels will be elevated between twenty-five and eighty-five feet above existing to allow for power generation. This increase in lake levels will impact the existing vegetation on the side slopes of the lake to the upper range of the proposed lake elevation. An increase of 25 feet in lake depth will increase the existing lake surface area from 1,260 acres to 1,449 acres.

Impacts to scenery are based on best professional judgment rather than interpretation of visual simulations due to the lack of VPRs that would indicate where a Forest user would view these facilities. Professional judgment will be based on typical expected impacts rather than best-case or worst-case scenarios. It is expected that very few Forest users will experience these facilities as they are located in an unseen/seldom seen landscape.

The greatest impacts to scenery will be the downstream face of the 111 foot high dam. Gaining access to this side of the dam will be extremely difficult due to the steep ravine walls on either side of the upper creek and dam. Impacts to scenery on the lake side will be variable depending on lake levels. Impacts will be greater when lake levels are lower and more face of the dam is exposed. The face of the dam visible on the lake side will range between twenty-six and eighty-five feet high. Impacts will also be reduced the further a user is from the dam. The penstock will not be visible.
Raising of lake levels up to 85 feet will result in the death of some vegetation on the side slopes of the lake between existing lake levels and the new higher levels. During high lake levels, the visual impacts will be similar to those that could occur naturally on the Forest when beaver dam a lake or a landslide impacts the outflow of the lake. Impacts surrounding the lake will be greatest when lake levels are low and dead vegetation and bare slopes are visible between the lower lake level and upper fill limits.

**Impacts to Scenic Integrity of VCU 610 Lower Sweetheart Lake:**

- Dam, penstock and elevated lake levels: Unseen/seldom seen landscape located within High Visual Absorption Capacity (VAC).
- Dam, penstock and elevated lake levels will be not visible from VPRs.
- **Expected typical Scenery Integrity effects will be consistent with a Moderate Scenic Integrity Objective (SIO) and will not exceed the visual impacts for a Moderate SIO as allowable in the Forest Plan.**

**Areas of Concern for VCU 610:**

Lower Sweetheart Lake: Impacts will be greatest when lake levels are low, exposing the most of the dam wall face from the lake side. Other impacts during low lake periods will be the visibility of dead vegetation and exposed soils on the side slopes of the lake to the upper reaches of the lake’s high water mark. This condition is not typical where mid to high lake levels will be the norm. These areas of concerns are further reduced due to the scenery impacts being located in an unseen/seldom seen landscape.
Cumulative Effects

Cumulative Effects take into consideration not only this Project but also other anticipated projects within the area. At the time of this report, there are no known other planned projects in the area. Additionally, there are no expansion plans or other anticipated future modifications to the Project (Mitchell, 2013). The components of this Project on State managed lands will contribute to the cumulative effects and include the dock facility, storage yard, and most of the coastal road.

Cumulative Effects analyzes the visual impacts to the whole project area within the reasonable foreseeable future. Cumulative Effects related to scenery look at the expected change in the Existing Scenic Integrity (ESI) as a result of the Project. ESI is a measure of the degree to which the landscape is perceived as whole, complete, or intact without any alterations or modification to the scenery by human activities. As indicated in the analysis, the ESI for the project area (VCUs 550 and 570) is comprised of a Very High (1) rating with 97% of the landscape character being intact or unaltered. This modified landscape (ESI 3 and 4- Moderate and Low) is concentrated to the slopes north of Port Snettisham in VCU 550.

To understand the cumulative effects, the proposed project and its expected visual impacts to the landscape are overlaid onto the ESI mapping to document the expected cumulative effects. These effects would extend beyond the physical limits of the Project and would impact the larger viewshed in which the modifications are located. These impacts would only occur within the seen landscape. The linear nature of the corridor and its clearing limits within the forested landscape will have a greater visual impact than alpine areas where there would not be clearing limits and only structures might be seen in the distant landscape. Regularly scheduled clearing of large trees within the clearing limits every five years would prevent the landscape from returning to an intact undisturbed landscape.

Based on analysis of this Project, existing hydroelectric projects in the Tongass, the three-dimensional digital simulations, and the landscape, it will be expected that a majority of the Project would result in three proposed Scenic Integrity ratings for the Project.

The proposed Project changes to Scenic Integrity would add approximately 3% (approximately 1,200 acres) of landscape that would transition from a Class 1 (Very High) where the landscape is perceived whole or intact to one where man-made modifications begin to dominate or dominate the landscape character. These impacts are fairly closely divided among the Classes of 3 (Moderate), 4 (Low), and 5 (Very Low). VCU 570 (east side of Gilbert Bay) (31% of overall project area) would receive a Class 5, Very Low, where the landscape appears heavily altered and deviations dominate the landscape character. This is a result of the numerous man-made structures and larger clearing limits which are all located within the foreground. It is expected that this area may receive a Class 4, Low, due to the proposed visual mitigation and screening however this is likely 10 years or greater post construction. The remaining portion of VCU 570 (west side of Gilbert Bay) with its overhead transmission lines contains Class 4, Low, and Class 3, Moderate where the clearing limits will be the main visual modification. On
sloped landscapes facing VPRs and landscapes with a Low VAC, the proposed Scenic Integrity will be Class 4 Low where deviations begin to dominate the landscape character. The remaining portion of the corridor that is partially screened from VPRs and with an Intermediate VAC will result in a Class 3, Moderate, where deviations begin to dominate the landscape. These two Classes for the overhead transmission corridor in this VCU make up 58% of the Project impacts.

VCU 550 has a limited length of clearing within a forested landscape to support the overhead transmission lines and transition facility running from the ridgeline to shoreline at Sentinel Point. This clearing limit will dominate the landscape character and receives a proposed Class 4, Low for a total of approximately 6% of the Project. The final segment is adjacent Mist Island and includes a transition facility and overhead corridor with limited clearing limits. It is expected this portion of the Project (5%) will meet the requirements for Class 3, Moderate, where the modifications begin to dominate the landscape. This area is currently surrounded by both ESI 3 and 4 due to the existing AIDEA Snettisham transmission lines and will reduce the overall impacts for the proposed Project due to the size and scale of the existing corridor.

As stated previously, the proposed Scenic Integrity will fluctuate within the clearing limits for the overhead transmission lines. The proposed Scenic Integrity will move towards a landscape with less dominance as trees mature within the clearing limits, and will move back towards more visual dominance immediately after regularly scheduled maintenance and removal of larger woody material within the clearing limits.

As indicated, the current ESI for the Project area, prior to construction, is 97% of the landscape character being intact or unaltered. Project impacts would add another 3% for a total of approximately 6% where the landscape has been visually altered.

It is possible to reduce the visual impacts of the project through the use of additional scenery protection measures/mitigation identified in the following section. These were not used in the calculation of the cumulative effects of the project.
Scenery Protection Measures /Mitigation

Scenery protection measures will ensure the Project achieves the scenery guidelines as outlined in the Forest Plan. These measures are established for the whole Project and identify specific actions for the Areas of Concern previously listed. Measures may include scenery enhancement, conservation, and restoration to protect the scenic condition of the landscape affected by the Project. These protection measures provide scenery management options for Project to meet or exceed the required Scenic Integrity. Where protection is not possible and the Scenic Integrity cannot be maintained, mitigation, either on-site or off-site, may be a method to offset the scenery impacts that results for the Project.

Project-Wide

The following protection measures are prescribed for the entire project and should be applied where appropriate or feasible. These measures were not used to determine the Project impacts upon scenery or in the creation of the visual simulations but are additional recommendations to assist the Project in maintaining or reducing the expected visual impacts, if required.

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.

The linear nature of utility corridors and the clearing limits create modifications which do not typically match the line, color, and texture found in the surrounding landscape and can dominate the landscape character. 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 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. The metal structures will visually contrast both in form and color. The metal structures can also have a reflective component from sunlight in certain conditions and from various VPRs that can further dominate the seen landscape. Metal towers should be painted with a non-reflective paint or coating. Additionally, each structure should be painted a color that matches the surrounding landscape. Several different color schemes may be needed for the corridor to match the colors found along the route (i.e. forested). Consider color selection also for the transition facilities to allow them to blend into the surrounding landscape character.

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.

Any facilities that require security fencing (powerhouse, switchyard, and transition facilities) should utilize black colored fencing material to reduce visual impacts and allow these features to blend into the surrounding landscape. Where security allows, let native plant material grow on the side of fencing when viewed from VPRs.

Allow vegetation to reestablish itself over submarine lines that are buried on land and transition from water to the transition facilities.
These mitigation practices would assist in speeding up the regeneration of vegetation, reduce visual impacts and expected changes to ESI, and provide further assurance that the Project meets the scenery guidelines in the Forest Plan. These mitigation/protection measures will assist in speeding up and to reduce the likely visual impacts of the Project. Many of these practices are consistent with mitigation found in the Forest Plan to ensure compliance with scenery guidelines.

**VCU Specific Protection Measures**

**VCU 570**

To ensure full compliance with scenery guidelines the previously listed project-wide protection measures will further reduce visual impacts and reduce project close-out costs. 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.

The area of greatest concern is the area immediately surrounding the dock facility, storage yard, reverse-sloped access road, and caretaker’s facility. While a majority of the dock facility is developed from placing fill into submerged waters of the State of Alaska it opens up the view into and removes opportunities for significant screening and buffering of the lands behind which are under the management of the USFS. Consider reconfiguring layout of the upland facilities to maximize opportunities for vegetative screening between the water’s edge and the storage yard, caretaker’s facility, and associated facilities. Although outside of the jurisdiction of the USFS lands, incorporate vegetative screening along the water’s edge on facilities that are installed on State submerged lands to reduce the overall Project impacts in this area through vegetating rock fill slopes for the dock facility where possible. Explore options for coloring marine access facilities to better blend into the surrounding landscape and avoid the use of metallic colored materials that would reflect sunlight. Minimize the storage of materials and vehicles in the immediate vicinity of the dock facility. Store materials and other items where they will be screened from the Gilbert Bay VPR. Utilize building colors and materials that blend into the landscape character. Avoid the use of metallic colored materials that tend to reflect sunlight and draw attention.

Utilize natural rock and stone along the coastal road where fill will be exposed to the Gilbert Bay for both USFS and State managed lands. 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 revegetated, utilize appropriately deep quality organic native soils that support and will allow native plant material to thrive 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.

**VCU 550**

To ensure full compliance with scenery guidelines the previously listed project-wide protection measures will further reduce visual impacts and reduce project close-out costs. The Area of Concern for this VCU includes the Port Snettisham VPR where clearing limits and transmission structures may be seen in the middleground distance zone and will dominate the visual landscape beyond five years. Selecting 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. Consider realigning corridor prior to reaching shoreline and running parallel to the shoreline a short distance while maintaining existing Forest edge to break up the linear straight line clearing limits from the water’s edge to the ridgeline above.


Appendix A - Viewpoint Renderings
Simulation View Points Map

Sweetheart Lake: Simulation View Points

Value Comparison Unit (VCU)*
- VCU Analysis Area

Visual Priority Routes *
- Alaska Marine Highways and Ferries Routes
- Small Boat and Midsize Cruise Routes
- Tour Ship Routes

Project Features
- Overland Utility Route
- Marine Cable Route
- Facility Road
- Penstock
- Dam
- powerhouse
- Dock

View Points
- Simulation View Point

* Data obtained directly from Tongass National Forest
After 1 Year

View Point #1
Gilbert Bay looking Southeast toward Sweetheart Creek
View Point #2
Gilbert Bay looking East toward Sweetheart Lake

After 1 Year
Appendix A

Corvus Design      Landscape Architecture - Planning - Industrial Design
Sweetheart Lake Hydroelectric Project: Scenery Resources

After 5 Years

•A-5•

View Point #3
Gilbert Bay looking west toward Snettisham Peninsula

Support Structure
Corridor Clearing Limits
Transition Station
View Point #05
Gilbert Bay Looking West toward Snettisham Point

After 5 Years

Support Structure

Corridor Clearing Limits

Support Structure
After 5 Years

View Point #06
Port Snettisham Looking South toward Snettisham Point
After 5 Years

View Point #07
Port Snettisham Looking North toward Mist Island