



November 20, 2023

VIA E-FILING

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**RE: Solomon Gulch Hydroelectric Project (FERC Project No. 2742)
Draft Study Plan**

Dear Secretary Bose:

Copper Valley Electric Association (CVEA) is the Licensee, owner, and operator of the 12-megawatt Solomon Gulch Hydroelectric Project (Project), licensed under the Federal Energy Regulatory Commission (FERC) Project Number 2742. The Project is located on Solomon Gulch Lake in Valdez, Alaska.

CVEA is using the Traditional Licensing Process (TLP) for the relicensing, as approved by FERC on June 23, 2023. CVEA held a hybrid (virtual and in-person) Joint Agency Meeting (JAM) with agencies, followed by a site visit on August 15, 2023. Stakeholders were provided 60 days following the JAM to (1) provide comments on the Preliminary Application Document, (2) provide comments on the proposed studies, and (3) suggest additional studies that may be necessary to develop a complete environmental analysis for the relicensing of the Project.

Though not required by the TLP, CVEA hereby electronically files its Draft Study Plan (DSP), developed for the relicensing of the Project, as a best practice documentation measure. A copy of the DSP is being submitted to those on the attached distribution list for the Project. CVEA intends to provide stakeholders with 45 days to comment on the DSP (comments due January 5, 2024) and, if needed, will schedule a study plan meeting to resolve any questions in early 2024. The DSP will be finalized in March 2024, in time to initiate the 2024 field study season.

Sincerely,

A handwritten signature in blue ink that reads "Jaime Matthews".

Jaime Matthews
Chief Executive Officer, Copper Valley Electric Association

Ms. Kimberly D. Bose
November 20, 2023

2.

Cc: Distribution List
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Attachments: Distribution List
Draft Study Plan

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DRAFT STUDY PLAN

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC No. 2742

Submitted by:

**Copper Valley Electric Association
Valdez, Alaska**

Prepared by:

Kleinschmidt

November 2023

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ATTACHMENTS

Attachment 1 Preliminary Application Document Comment Letters and Responses

DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A

ABR	ABR, Inc.—Environmental Research & Services
ACCS	Alaska Center for Conservation Science
ADA	Americans with Disabilities Act
ADFG	Alaska Department of Fish and Game
AHRS	Alaska Heritage Resources Survey
AKEPIC	Alaska Exotic Plants Information Clearinghouse
ArcGIS	ArcGIS® is a desktop mapping and spatial data analysis application produced by Esri
ASG	Alaska Shorebird Group

B

BLM	U.S. Department of Interior, Bureau of Land Management
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C

°C	degrees Celsius
cfs	cubic feet per second
CVEA	Copper Valley Electric Association, Inc.

E

Esri	Environmental Systems Research Institute
EXIF	exchangeable image field format

F

FERC	Federal Energy Regulatory Commission
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G

GIS	Geographic Information System
GPS	Global Positioning System

M

MW	megawatt
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N

NOI	Notice of Intent to File an Application for a New License
NWI	National Wetland Inventory

P

PAD	Preliminary Application Document
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Project or P-2742 Solomon Gulch Hydroelectric Project

Q

QA/QC quality assurance/quality control

R

ROW Right(s)-of-way

S

Solomon Gulch Project Solomon Gulch Hydroelectric Project

T

TAPS Trans Alaska Pipeline System
TLP Traditional Licensing Process

U

UAF University of Alaska Fairbanks
USACE U.S. Army Corps of Engineers
USFS U.S. Forest Service
USFWS U.S. Fish and Wildlife Service

V

VFDA Valdez Fisheries Development Association Inc.

1.0 BACKGROUND

Copper Valley Electric Association, Inc. (CVEA) is relicensing the existing 12-megawatt (MW) Solomon Gulch Hydroelectric Project (Solomon Gulch Project or Project) with the Federal Energy Regulatory Commission (FERC). The current FERC license for the Solomon Gulch Project expires May 31, 2028. On April 28, 2023, CVEA filed with FERC its Notification of Intent to File an Application for a New License (NOI), Preliminary Application Document (PAD), and request to use the Traditional Licensing Process (TLP). FERC approved the use of the TLP on June 23, 2023, and in accordance with FERC regulations, CVEA held a Joint Agency Meeting and site visit on August 15, 2023. The PAD identified a preliminary list of potential studies. Following the meeting, state and federal resource agencies and other stakeholders were asked to comment on the PAD and to request any additional resource studies needed to evaluate Project impacts on natural, cultural, and recreational resources.

CVEA has prepared this Draft Study Plan to document and share with resource agencies and stakeholders its plans for conducting resource studies at the Solomon Gulch Hydroelectric Project.

The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska, as shown in Figure 1-1. The current Project Boundary includes: Solomon Gulch Reservoir (also known as Solomon Lake) and surrounding lands; the dam, saddle dike, spillway, penstocks, powerhouse and associated appurtenant facilities; 1.68 miles of 24.9-kV transmission line extending from the powerhouse switchyard to the Petro Star Switch Building at the Petro Star Valdez Refinery; and 108.16 miles of transmission line, extending from the Petro Star Switch Building to the Meals Substation (where it increases to 138 kV), to a substation adjacent to Pump Station 11 near Glennallen, Alaska. However, this longer segment of the transmission line is the subject of an ongoing license amendment for removal, since it no longer meets FERC's definition of a primary transmission line under the Federal Power Act (please see Docket Number P-2742-038) in the FERC eLibrary. CVEA expects this transmission line to be removed and the FERC boundary to be reduced prior to the filing of the license application; therefore, for purposes of describing study areas for relicensing, CVEA is limiting its analysis to the areas depicted in Figure 1-1. Land ownership within the current Project Boundary is a mix of federal, state, municipal, and privately owned lands.

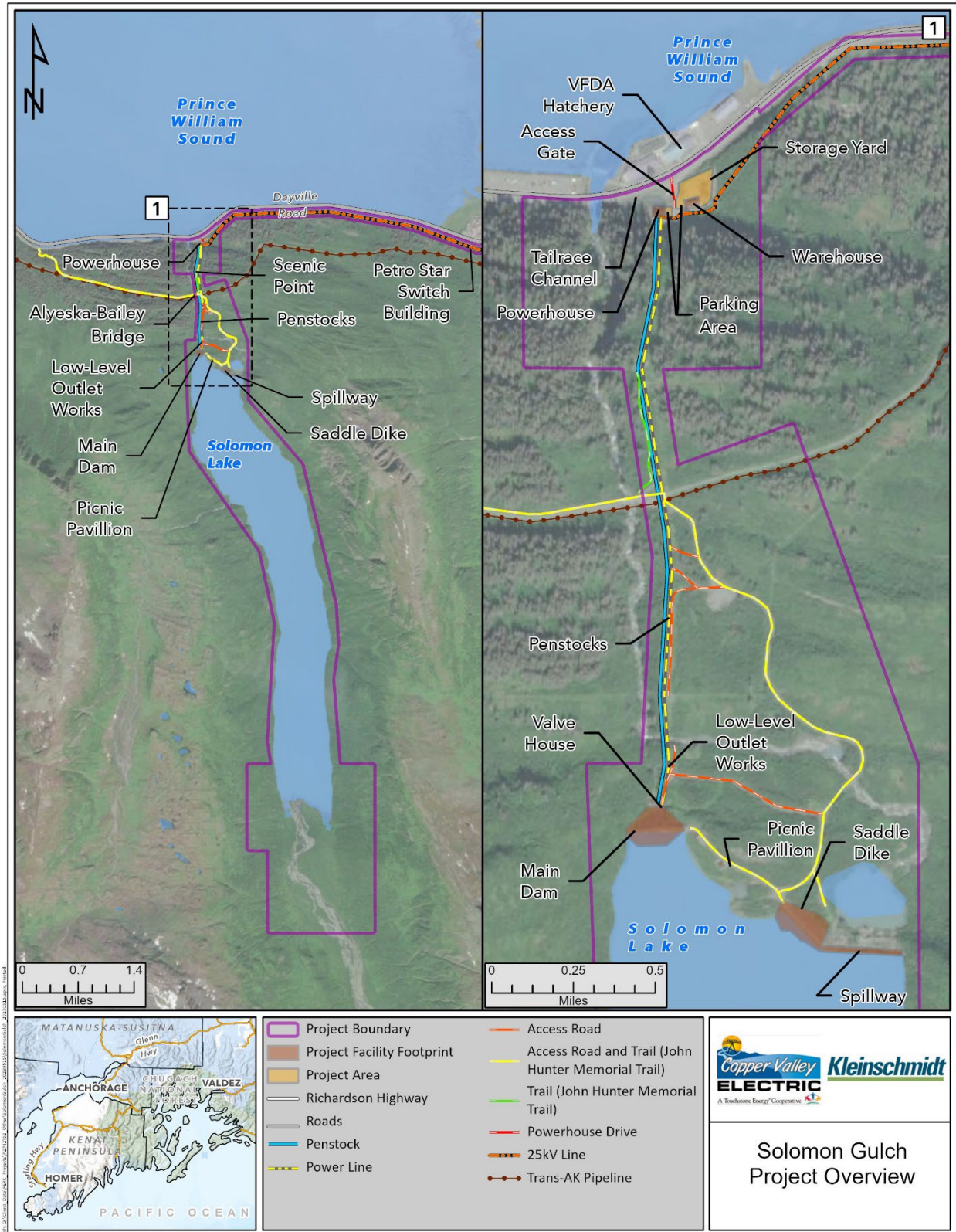


Figure 1-1. Solomon Gulch Hydroelectric Project

In response to the PAD filing and the hybrid Joint Agency Meeting and site visit (both held on August 15, 2023), the Licensee received comments from the Alaska Department of Fish and Game, Alyeska Pipeline, and U.S. Fish and Wildlife. Comment letters and responses are provided in Attachment 1.

Based on agency feedback received during the PAD writing, CVEA proposed a total of seven studies to be conducted at the Project for the relicensing, see Table 1-1. These studies are described in Section 2.0.

Table 1-1. Summary of Study Requests

Study Request
1. Water Temperature Monitoring Study
2. Vegetation Characterization Study
3. Rare and Sensitive Plant Study
4. Invasive Plant Study
5. Wildlife Habitat Evaluation Study
6. Recreation Evaluation Study
7. Cultural Resources Study

2.0 PROPOSED STUDIES

2.1 Water Temperature Monitoring Study

Solomon Gulch Project operations have the potential to alter water temperature in Solomon Lake and the affected stream reaches, which may affect fish or other aquatic species. The proposed Water Temperature Monitoring Study to be conducted in 2024 will characterize water temperatures in fish habitats with the potential to be affected by the operation of the Project.

The Project consists of two rockfill embankment dams, including the 115-foot-high Main Dam and the 55-foot-high Saddle Dike across the outlet of Solomon Lake, which captures a drainage area of approximately 19.7 square miles. Downstream of Solomon Lake, Solomon Gulch Creek flows approximately 0.7 miles from the Main Dam to tidewater in Port Valdez (Figure 2-1). Water is routed downstream from Solomon Lake to Prince William Sound via three routes seasonally. Low-level outlet works route water into the Project's penstocks as well as bypass discharge into Solomon Gulch Creek near the base of the Main Dam. Solomon Gulch Creek is very steep, dropping approximately 615 feet in elevation over 3,800 feet. The spillway routes surface water along the eastern bank of Solomon Lake into Spillway Creek (Figure 2-1). This 0.4-mile-long natural channel flows into Solomon Gulch Creek from the east, approximately 0.2 miles downstream of the Main Dam. The 3,785-foot-long Project penstocks run along the east bank of Solomon Gulch Creek to the powerhouse. The powerhouse discharges into an approximately 300-foot-long artificial tailrace channel, which enters Solomon Gulch Creek approximately 100 feet upstream of the Valdez Fisheries Development Association Inc. (VFDA) Hatchery weir at tidewater (Photo 2-1).



Figure 2-1. Water Temperature Monitoring Locations



Photo 2-1. Solomon Gulch Hydroelectric Powerhouse and Tailrace, VFDA Hatchery, and the Mouth of Solomon Gulch Creek

Fish habitat in the Project area includes the lower reaches of Solomon Gulch Creek and the artificial tailrace channel. Approximately 90 percent of the flows released from Solomon Lake are used by the Solomon Gulch Project and routed through the penstocks and powerhouse into the tailrace. Water diverted for power generation draws the lake level down during winter months. In spring, the lake is refilled from snow and glacial melt. The lake begins to overtop the spillway in most years by early July. A minimum of 2 cubic feet per second (cfs) is released from Solomon Lake into Solomon Gulch Creek at all times for the protection of fish resources. A minimum release of 2 cfs is also maintained at the powerhouse into the tailrace channel.

2.1.1 Study Area

The study area for the Water Temperature Monitoring Study consists of Solomon Gulch Creek downstream of the dam and Spillway Creek confluence and the tailrace below the powerhouse.

2.1.2 Study Goals and Objectives

The goal of the Water Temperature Monitoring Study is to characterize water temperatures in fish habitats with the potential to be affected by the operation of the Solomon Gulch Hydroelectric Project.

The specific objectives of the study are to:

1. Characterize water temperature in Solomon Gulch Creek and
2. Characterize water temperature in the Project tailrace.

2.1.3 Study Scope and Methods

Characterizing water temperatures in the Solomon Gulch Basin will support resource management goals related to water quality and fish and wildlife habitat protection. Project operations have the potential to increase water temperatures in downstream waters, which in turn could impact aquatic resources. Waters in Alaska designated for the growth and propagation of fish, shellfish, other aquatic life, and wildlife may not exceed 20°C at any time (ADEC 2022). Lower maximum temperature criteria are applicable for migration routes (15°C), spawning areas (13°C), rearing areas (15°C) and for egg and fry incubation (13°C).

2.1.3.1 Monitoring Locations

Water temperature monitoring will be conducted at the powerhouse tailrace and the new CVEA-installed gage on Solomon Gulch Creek (Figure 2-1). This configuration of monitoring locations will support evaluation of water temperatures in the stream reaches downstream of Solomon Lake with potential fish habitat.

2.1.3.2 Monitoring Equipment and Procedures

Continuous temperature monitoring will be conducted from June through October at 30-minute intervals following the data standards outlined in Mauger et al. (2015) using

calibrated, continuous temperature loggers. Temperature loggers will be capable of an accuracy of $\pm 0.25^{\circ}\text{C}$ and a range of -4°C to 37°C ; an Onset Hobo U22-001 or similar logger is proposed. Pre- and post-deployment accuracy checks will screen for defective equipment and qualify data reporting or adjust temperature estimates if measurement drift occurs. Accuracy checks will be conducted at a minimum of two temperatures (approximately 0°C and 20°C).

Field data will be recorded on datasheets or in pre-formatted waterproof survey field books. Records of accuracy checks will be maintained. Metadata for temperature logger deployment and retrieval will include a unique site identifier, date, and time. Data will be entered and managed in Microsoft Excel.

2.1.3.3 Analysis and Reporting

For continuous temperature sampling, data summaries will include:

- Daily summaries of minimum, maximum, and mean stream temperatures for days within the monitoring period that contain at least 90 percent of the 30-minute data for that day (i.e., 44 of the 48 30-minute measurements).
- Weekly average temperatures will be reported as the seven-day average of the daily maximum (7-DADMax) for consistency with proposed revisions to the Alaska Water Quality Standards.

Water temperature data will be evaluated with respect to state water quality criteria, and any exceedances will be summarized.

2.1.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-1.

Table 2-1. Water Temperature Monitoring Study Schedule

Task	Schedule
Water temperature monitoring	June–October 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.2 Vegetation Characterization Study

No vegetation map has been prepared for the Solomon Gulch Project (CVEA 2023). The Vegetation Characterization Study has been designed to address this data gap and will also provide mapping information for wetlands and wildlife habitats. Integrated vegetation, wetland, and wildlife habitat mapping within the Project area will provide a valuable planning tool to support and streamline studies of rare and sensitive plants and invasive plants (Sections 2.3 and 2.4). This will be done by identifying and mapping habitats for rare and sensitive plants and invasive plants where field survey efforts can be focused and more efficient. Existing wetland mapping for the Project area is outdated and at a broad scale (NWI 2023), will not provide current information or the fine spatial detail needed to identify rare and sensitive plant habitats, disturbed habitats for invasive plant species, or the landscape features needed to map wildlife habitats. The mapping of wildlife habitats in this study will be used in conjunction with the Wildlife Habitat Evaluation Study (Section 2.5) to provide information on the expected occurrence and habitat use of wildlife species of concern in the Project area.

2.2.1 Study Area

The study area for the Vegetation Characterization Study will encompass the Project Boundary for the Solomon Gulch Hydroelectric Project, as depicted in Figure 1-1, and all Project features within that boundary. Also included in the study area will be a 250-foot buffer zone surrounding the Project Boundary to place the resulting map data within a local landscape context.

2.2.2 Study Goals and Objectives

The goal of the study is to develop current data on the occurrence and extent of vegetation, wetlands, rare and sensitive plant habitats, disturbed habitats for invasive plants, and wildlife habitats in the Project area. This information will be used to assess possible impacts of Project operations on botanical, wetland, and wildlife resources in the Project area. The wetland map data may also be useful in discussions with FERC and the BLM regarding CVEA's proposal to reduce the Project Boundary around the reservoir to the area necessary for Project operations, and that also encompasses the probable maximum flood at an elevation of 694 feet msl. The information on wildlife habitat types will be used in conjunction with the Wildlife Habitat Evaluation Study (Section 2.5) to

provide the data needed to assess any possible impacts to wildlife habitats that could potentially occur from Project operations.

The specific objectives of the Vegetation Characterization Study are to:

- Map vegetation types to Level IV of the Alaska Vegetation Classification (Viereck et al. 1992), which includes information on both vegetation structure and plant communities.
- Map wetland types following the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) classification system (FGDC 2013), which is the system used by the U.S. Army Corps of Engineers (USACE) in the federal wetland permitting process.
- Map rare and sensitive plant habitat types using a combination of vegetation type and other landscape features (physiography, surface form, and microtopography) that can influence the establishment of rare and sensitive plant populations.
- Map gravel fill and disturbed habitats that may be colonized by non-native and invasive plants.
- Map wildlife habitat types using a combination of vegetation type and other landscape features important to wildlife, including physiography, surface form, microtopography, and disturbance type.

2.2.3 Study Scope and Methods

2.2.3.1 Field Methodology

A limited ground-truth survey for the Vegetation Characterization Study is planned for summer 2024 to gather the data necessary to update the office-based mapping of vegetation, wetlands, rare and sensitive plant and invasive plant habitats, and wildlife habitats (see Section 2.2.3.2, Classification and Mapping, below). The field survey will be focused in areas surrounding the existing Project infrastructure north of Solomon Lake, along the access road to the dam site and spillway, and in the undeveloped low-lying lake inlet area at the south end of Solomon Lake. To streamline the ground-truth survey, we will primarily sample predesignated plots placed in areas where the vegetation and other landscape features were difficult to determine accurately from photointerpretation alone; less effort will be expended in areas where the land cover types are more evident on the Project area imagery. Sample plots will consist of 30-meter (m) radius areas within which

we will record cover estimates for all vascular plant species and non-vascular plant taxa, and additional landscape features (physiography, surface form, microtopography, disturbance, and NWI type). These additional data on landscape features will be used to facilitate the classification of rare and sensitive plant habitats (see the Rare and Sensitive Plant Study plan, Section 2.3) and the classification of wildlife habitats. Soil pedon descriptions to update the classification of wetland types will be made within a shallow soil pit (approximately 20 inches deep) dug roughly in the middle of each sample plot. The sampling will not involve full wetland determination plots, which should not be required as no wetland permitting under Section 404 of the Clean Water Act is anticipated in the relicensing process. At each sample plot, geographic location coordinates and documentary site and soil photos will be recorded.

All data will be recorded electronically on ABR-prepared data-collection apps running on Android tablet computers. These apps allow for efficient field data collection and data QA/QC, with edits occurring directly in the Project database. ABR uses Esri ArcGIS Collector as a mobile map tool in the field, facilitating real-time, aerial image interpretation and the ability to take detailed notes on an electronic map through the placement of points, lines, and polygons. We will also use ABR-prepared field photo apps that automatically embed geospatial coordinates in each photo's EXIF (exchangeable image field format) tags. These procedures, along with ABR-prepared HTML-based plot review forms used in the office, increase the accuracy of the field data, and help streamline data analysis and report preparation.

2.2.3.2 Classification and Mapping

A preliminary, desktop-only vegetation map of the study area will be prepared prior to the field survey effort described above in Section 2.2.3.1, Field Methodology, by manually digitizing the Level IV vegetation types of Viereck et al. (1992) that occur in the study area. The vegetation mapping will be based on recently acquired, cloud-free, high-resolution, and leaf-on digital imagery that is either publicly available or provided by CVEA. Additional landscape features, including physiography, surface form, microtopography, disturbance type, and NWI wetland classes, will be attributed in the mapping to identify and develop map classes for rare and sensitive plant habitats and wildlife habitats. Comparisons of map classes with those identified in the mapping prepared for the nearby Allison Creek Hydroelectric Project (ABR 2011), which occurs in similar coastal forests,

subalpine, and alpine areas, will be made to verify the mapping for the Solomon Gulch Project.

Vegetation types and other landscape features will be identified by photointerpretation of image signatures in the digital imagery data source(s) noted above. The photointerpretation will be aided by using the finest-resolution digital terrain model data available for the study area to evaluate small and large changes in topographic relief. Wetland types will be identified by vegetation type, visible surface water connections, physiography, and macro- and microtopographic depressional features that can aid in the collection of surface water.

Map polygons for all landscape features will be digitized on-screen using Esri ArcMap at a scale of 1:2,000, which will be detailed enough to use in the development of additional map layers for rare and sensitive plant habitats, invasive plant habitats, wetland and riparian areas, and wildlife habitats. The final mapping and map layers for all landscape features will be prepared by revising map polygon boundaries in the preliminary desktop mapping, as needed, based on the ground-truth data collected during the field survey described above in Section 2.2.3.1, Field Methodology.

2.2.3.3 Analysis and Reporting

Data analysis will include a summary of the landscape feature data collected during the field survey and an analysis of climate data for 2024 from nearby weather stations. Data on temperature and precipitation in spring and summer 2024 relative to 30-year “normals” will be used to evaluate the field survey data within the context of current landscape conditions at the time of sampling.

Both rare and sensitive plant habitats and wildlife habitats will be developed using an Integrated Terrain Unit (ITU) mapping approach in which vegetation type and other individual landscape features (noted above) will first be combined to generate a large set of unique multivariate map classes. For rare and sensitive plant habitats, the set of multivariate map classes will then be aggregated to develop a smaller set of map classes that represent habitats where the focal rare and sensitive species possibly occurring in the study area are likely to be found (see Section 2.3). In this case, vegetation type, surface form, and physiographic position within the study area are likely to be most important in defining rare and sensitive plant habitats. For wildlife habitats, the vegetation structure component of the Level IV vegetation types will be emphasized when aggregating

multivariate map classes, along with physiographic position, surface form, and disturbance type, as these features provide food, cover/escape habitat, breeding and migration staging habitat, and denning/overwintering sites for wildlife.

The draft and final study reports will include the following:

- a description of the field and office-based methods used;
- a summary of the field survey data collected;
- a summary listing of each of the landscape features identified and mapped in the study area; and
- a tabular description and pdf-format maps of the vegetation types, wetland types, rare and sensitive plant habitats, invasive plant habitats, and wildlife habitats developed in the study.

2.2.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-2.

Table 2-2. Vegetation Characterization Study Schedule

Task	Schedule
Field ground-truth survey	July–August 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.3 Rare and Sensitive Plant Study

The PAD for the Solomon Gulch Project (CVEA 2023) identifies two rare plant taxa monitored by the Alaska Center for Conservation Science (ACCS) that may occur within the Project area. These are Hulten alkaligrass (*Puccinellia hultenii*) and Alaskan pretty shooting star (*Dodecatheon pulchellum* ssp. *Alaskanum*). To date, no comprehensive review of plant collection data, habitat-based mapping, or ground surveys for rare and sensitive plants have been completed for the Project area. To address this, the Rare and Sensitive Plant Study will provide a current list of the rare and sensitive plant taxa that could occur in the Project area and will document the locations and sizes of any populations of rare and sensitive taxa found during the field survey. These data will be used to assess how Project operations could affect rare and sensitive plant populations on site and can also be used in future monitoring of the status of any rare and sensitive plant populations found in the Project area.

2.3.1 Study Area

The study area for the Rare and Sensitive Plant Study will encompass the Project Boundary for the Solomon Gulch Hydroelectric Project, as depicted in Figure 1-1, as well as all Project features within that boundary.

2.3.2 Study Goals and Objectives

The goal of the study is to develop current data on the occurrence and size of rare and sensitive plant populations in the Project area, which will be used in the relicensing application to assess possible impacts of Project operations on those plant taxa.

The specific objectives of the Rare and Sensitive Plant Study are to:

- Establish a list of possible rare and sensitive plant taxa that could occur in the Project area based on the habitats available and existing plant collection data for the Prince William Sound area. This will be referred to as the focal rare and sensitive plant list.
- Develop a habitat-stratified field survey plan for the focal rare and sensitive plant taxa using the fine-scale mapping of rare and sensitive plant habitats prepared in the Vegetation Characterization Study (Section 2.2).

- Conduct a search for rare and sensitive plant taxa in the Project area following a random meander sampling method (USFS 2015).
- Document the locations of any rare and sensitive plant taxa populations in the Project area and estimate population sizes.

2.3.3 Study Scope and Methods

2.3.3.1 Field Methodology

Rare vascular plant collection locations within the Project Boundary and a 25-mile buffer zone surrounding it will be requested from the Alaska Rare Vascular Plant Database maintained by the ACCS (ACCS 2023a). In this case, a large buffer area is required to capture collection locations of rare and sensitive plant taxa, which are typically widely dispersed on the landscape. These data will be used to develop a list of focal rare plant taxa for the field survey, focusing on the rarer taxa known to occur in Alaska. Taxa with very few occurrences in the state and that have a very high risk of extirpation from the state are given an S1 ranking (critically imperiled), whereas species with few occurrences in the state and a high risk of extirpation are given an S2 ranking (imperiled; Nawrocki et al. 2013). Taxa listed as S3 (rare) have a moderate risk of extirpation. In this study, the focal rare plant list will include those taxa listed as S1, S2, S1S2, and S2S3. Any additional Bureau of Land Management (BLM) sensitive or watchlist plant taxa noted for the Alaska region, following BLM (2019), will also be added to the focal rare plant taxa list.

Habitats of plant taxa on the focal list will be assessed from collection data in the ACCS Alaska Rare Vascular Plant Database and information in the Flora of Alaska (Hultén 1968) and the Flora of North America (FNA 2023), as needed. That information will be used to inform the mapping of rare and sensitive plant habitats in the study area in the Vegetation Characterization Study (Section 2.2), and the resulting fine-scale rare and sensitive plant habitat map polygons will then be used as search areas for the field survey in this study. The rare and sensitive plant field survey will be conducted using a random meander sampling methodology developed by the U.S. Forest Service for rare plant surveys in the Tongass National Forest in southeast Alaska (USFS 2015). The method involves thorough searches of the likely habitats for plant taxa on the focal list. The search paths will be recorded as GPS tracks using the streaming function on a recreational-grade GPS receiver. Each occurrence of a plant(s) on the focal list will be documented with location coordinates, estimated population size, associated vascular and non-vascular plants, and site photographs. When possible (without risking detrimental population-level impacts),

voucher specimens will be collected and confirmed by ACCS or University of Alaska (UAF) Museum of the North botanical staff. If any rare plant taxa are identified, samples will be submitted to ACCS for curation.

2.3.3.2 Analysis & Reporting

Data analysis will include a summary listing of all rare and sensitive plant taxa found in the study area. The draft and final study reports will include:

- a description of the field survey methods used;
- a summary of the rare and sensitive plant taxa found in the study area, along with population size estimates;
- documentary photographs of rare and sensitive plant occurrences;
- geographic coordinates of rare and sensitive plant locations; and
- discussion of any potential natural or anthropogenic threats to the rare and sensitive plant populations located.

GIS (geographic information system) data for the locations of any rare and sensitive plant populations in the study area will be provided along with the study reports in an ArcGIS® (ArcGIS) geodatabase.

2.3.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-3.

Table 2-3. Rare and Sensitive Plant Study Schedule

Task	Schedule
Field survey	July–August 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.4 Invasive Plant Study

Numerous invasive plant populations have been documented in the Valdez region, and invasive plants may occur in the Project area, but to date, no occurrences are known in the Project area (ACCS 2023b). To address this data gap, the Invasive Plant Study will be conducted to develop a list of the invasive plant species that are likely to occur in the Project area and to document the locations and population sizes of any invasive plant occurrences found in the Project area. These data will be used to assess how the Project may potentially contribute to the spread of invasive plant species and can also be used in future monitoring and control efforts for invasive plants in the Project area.

2.4.1 Study Area

The study area for the Invasive Plant Study will encompass the Project Boundary for the Solomon Gulch Hydroelectric Project, as depicted in Figure 1-1, as well as all Project features within that boundary.

2.4.2 Study Goals and Objectives

The goal of the study is to develop current data on the existence and population sizes of any invasive plant occurrences in the Project area, which will be used in the relicensing application to assess how Project operations may potentially exacerbate the spread of invasive plant species in the vicinity of Valdez, Alaska.

The specific objectives of the Invasive Plant Study are to:

- Establish a list of non-native and invasive vascular plant species that are likely to occur in or near the Project area. This will be referred to as the focal invasive plant list.
- Conduct a search for non-native and invasive plant species in the Project area, focusing on disturbed habitats and adjacent areas that may harbor non-native invasive plants.
- Document the locations of any non-native and invasive plant populations in the Project area and estimate their population sizes.

2.4.3 Study Scope and Methods

2.4.3.1 Field Methodology

Non-native and invasive vascular plant collection locations within the Project Boundary and a 5-mile buffer zone surrounding it will be requested from the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database of non-native plant species maintained by the Alaska Center for Conservation Science (ACCS 2023b). A 5-mile buffer size will be used to capture the records of non-native plant collections in the Valdez area, which are clustered in the town of Valdez proper and along the Richardson Highway; currently there are no records along Dayville Road in the vicinity of the Project (ACCS 2023b). These data will be used to develop a preliminary list of focal invasive plant species for the field survey. Other invasive species likely to occur in and near Valdez but may not have yet been collected in the area will also be added to the focal invasive plant species list. The focal list will then be used to guide the field survey effort.

Roadsides, other areas of gravel fill, and disturbed habitats in and around existing facilities within the study area will be identified and mapped in the Vegetation Characterization Study (Section 2.2), and the field survey efforts will be focused in those disturbed areas where invasive plants can become established. Directly adjacent areas of partially disturbed and undisturbed habitats will also be surveyed to ensure the extent of invasive plant occurrences is completely documented. Occurrences will be documented with geographic location coordinates, estimated occurrence size, and site photographs. Population size will be documented directly for small occurrences and estimated for large occurrences where enumerating the number of plants present is not practicable. If needed for large occurrences, a map polygon (instead of a point location) will be delineated in the field using ArcGIS Collector and georeferenced aerial imagery for the study area on a tablet computer. As needed, voucher specimens will be collected for identification verification by ACCS or University of Alaska Fairbanks (UAF) Museum of the North botanical staff. All occurrence locations will be submitted to ACCS for incorporation into the AKEPIC database.

2.4.3.2 Analysis and Reporting

Data analysis will include summarizing all non-native and invasive plant occurrences found in the study area, their geographic locations, and population size estimates. The draft and final study reports will include the following:

- a description of the field survey methods used;
- a summary of the non-native and invasive plant species found in the study area, along with population size estimates and invasiveness risk rankings for each species following Carlson et al. (2008);
- documentary photographs of invasive plant occurrences;
- geographic coordinates of invasive plant locations; and
- a discussion of the likelihood of the spread of invasive species within the study area and in the broader Valdez region, as appropriate.

GIS (geographic information system) data for the locations of invasive plant occurrences in the study area will be provided along with the study reports in an ArcGIS geodatabase as points or polygons, depending on the occurrence's size.

2.4.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-4.

Table 2-4. Invasive Plant Study Schedule

Task	Schedule
Field survey	July–August 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.5 Wildlife Habitat Evaluation Study

Little is known about wildlife species' use of the Solomon Gulch Project area. To address these data gaps, a Wildlife Habitat Evaluation Study will be conducted in collaboration with the Vegetation Characterization Study (Section 2.2) to develop information on the expected occurrence and habitat use of wildlife species of concern in the Project area. Habitat values for those species will also be assigned to the habitats mapped in the area to identify the habitats of most importance for each species.

Bird, mammal, and amphibian species of concern expected to occur in the Project area will be identified in collaboration with management agencies and Project relicensing participants using a combination of factors as described in Section 2.5.2. Habitat values for these focal species will be assessed for each of the wildlife habitat types mapped in the Vegetation Characterization Study (Section 2.2). Two general types of information are available to assess habitat use and habitat values: distributional information and habitat-use information. Without Project-specific wildlife survey data, the habitat-value rankings for each species will be generated based on existing distribution and habitat-use information, relying especially on the survey data and habitat-use analyses conducted for the nearby Allison Creek Hydroelectric Project (ABR 2011).

2.5.1 Study Area

The study area for the Wildlife Habitat Evaluation Study will encompass the Project Boundary for the Solomon Gulch Hydroelectric Project as depicted in Figure 1-1 and all Project features within that boundary. Also included in the study area will be a 250-foot buffer zone surrounding the Project Boundary to place the resulting wildlife habitat-value data within a local landscape context.

2.5.2 Study Goals and Objectives

The goals of the study are to develop a list of wildlife species (birds, mammals, and amphibians) of cultural, ecological, or conservation concern that are known or expected to occur in the Project area, and to identify the habitats of most importance for those species. This information can then be used, if needed, to assess possible impacts of Project operations on the higher value wildlife habitats for those species in the Project area. **Error! Reference source not found.**

The specific objectives of the Wildlife Habitat Evaluation Study are to:

- Develop a list of the wildlife species of cultural, ecological, or conservation concern that are known or expected to occur in the study area. This list will be generated, in part, from the wildlife field survey data collected for CVEA's nearby Allison Creek Hydroelectric Project (ABR 2011).
- Assemble habitat-use information that applies to the habitats mapped in the study area from findings in the peer-reviewed scientific literature; unpublished research reports; wildlife management, inventory, and harvest reports; and wildlife survey data for nearby areas (e.g., ABR 2011).
- Categorically rank habitat values (negligible, low, moderate, and high value) for each of the wildlife species of concern for each of the wildlife habitat types mapped in the Project area in the Vegetation Characterization Study (Section 2.2).

2.5.3 Study Scope and Methods

The Wildlife Habitat Evaluation will be based on a similar habitat-value assessment conducted for CVEA's Allison Creek Hydroelectric project (ABR 2011), located approximately 1.5 miles away in the next valley to the west of the Solomon Gulch Project. The first step in the habitat evaluation will be the development of a wildlife habitat map for the study area. This will be accomplished as part of the Vegetation Characterization Study (Section 2.2) and will involve developing a set of wildlife habitat types using a combination of vegetation type and other landscape features that are important for wildlife. Based on wildlife habitat maps prepared by ABR in similar areas in southern Alaska, including the Allison Creek project (ABR 2011), the number of wildlife habitat types to be developed is expected to range from 20–30.

The second step in the habitat evaluation involves the selection of a set of focal bird, mammal, and amphibian species of concern to be assessed for habitat values. This will be done in collaboration with management agencies and Project relicensing participants. The focus in the selection of species of concern will be on those of cultural/subsistence, ecological, or conservation concerns that are known or expected to occur regularly in the habitat types mapped in the study area. This will include species that are expected to occur in substantial numbers, species of naturally low abundance that regularly breed or forage in the area (e.g., certain raptor species), and species of conservation concern that have undergone population declines. Species that only occur sporadically (not annually and often as lone individuals) will be omitted because any potential Project impacts on

such species will be negligible. An attempt will be made to include bird and mammal species representative of each of the most abundant habitats in the impact assessment area. The focal species can also be viewed as representative of other species with similar habitat-use patterns. In the absence of Project-specific wildlife survey data, information on the occurrence of wildlife species in the study area will be developed by reference to observational data on wildlife at the nearby Allison Creek project (ABR 2011), from interviews with local biologists, and observations recorded by local observers on the eBird platform (The Cornell Lab of Ornithology 2023).

Focal species of cultural/subsistence concern to be assessed for habitat values may include high-profile species such as moose, black bears, brown bears, and mountain goats. Species of conservation concern will focus on those species, primarily birds, for which population declines have been documented and which are listed as of high concern by various agencies and non-governmental working groups (e.g., ADFG 2015, ASG 2019, Handel et al. 2021, USFWS 2021). For species of ecological concern, an attempt will be made to include keystone bird and mammal species, as appropriate for the habitats in question, and species representative of each of the prominent habitats in the study area, including disturbed and developed habitats. Based on the focal wildlife species list prepared for the Allison Creek project in ABR (2011), the number of wildlife species of concern to be assessed in this study is expected to include approximately 25–30 birds, 10–15 mammals, and one amphibian (wood frog).

Once the focal wildlife species list is prepared, categorical habitat-value ranking scores (high, moderate, low, and negligible value) for each focal species and each mapped habitat type will be developed using the habitat-value class descriptions presented in Table 2-5. As noted above, without Project-specific wildlife survey data, the habitat rankings for each species will be generated based on existing habitat-use information. Data sources will include, but will not be limited to:

- wildlife habitat-use information in the peer-reviewed scientific literature and unpublished research reports for southcentral Alaska;
- wildlife survey data and habitat evaluation results for areas with similar habitats (e.g., ABR 2011, Welch et al. 2023); and

- Alaska Department of Fish and Game (ADFG) management and research reports, harvest statistics, and survey and inventory reports for Game Management Unit 6D.

Table 2-5. Habitat-Value Class Descriptions for the Wildlife Habitat Evaluation

Wildlife Group	Ranking Score	Habitat-Value Class	Description
Birds	3	High	Known to be frequently used for nesting and/or foraging/hunting during the breeding season, or by migrating birds, and in winter by resident species.
	2	Moderate	Moderate-value habitats may be regularly used during the breeding, migration, or wintering seasons for foraging/hunting, but less so than high-value habitats.
	1	Low	Low-value habitats would see little use by the species under consideration and in very low numbers.
	0	Negligible	The species is not expected to occur or will very rarely occur in negligible-value habitats.
Mammals	3	High	Known to be frequently used for breeding, shelter, denning, overwintering, and/or foraging/hunting during some portion of the year.
	2	Moderate	Moderate-value habitats may be regularly used for foraging/hunting and as travel corridors, but less so than high-value habitats.
	1	Low	Low-value habitats would see little use by the species under consideration and in very low numbers.
	0	Negligible	The species is not expected to occur or will very rarely occur in negligible-value habitats.
Amphibians	3	High	Aquatic habitats and adjacent habitat types known to be frequently used for breeding and foraging during spring and summer.
	2	Moderate	Moderate-value habitats may be regularly used for foraging, but less so than high-value habitats.

Wildlife Group	Ranking Score	Habitat-Value Class	Description
	1	Low	Low-value habitats would see little use by amphibians and in very low numbers.
	0	Negligible	Amphibians are not expected to occur, or will occur very rarely, in negligible-value habitats.

2.5.3.1 Analysis & Reporting

The draft and final study reports will include the following:

- a description of the office-based methods used;
- a summary of the literature and data used to support the habitat-value rankings (presented by species group);
- a tabular listing of the habitat-value rankings for each species and habitat type;
- pdf-format maps illustrating the distribution and extent of high- and moderate-value habitats for selected species in the study area; and
- a brief discussion of how Project operations could or could not potentially impact wildlife habitats.

2.5.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-6.

Table 2-6. Wildlife Habitat Evaluation Study Schedule

Task	Schedule
Habitat evaluation analysis, initiated after the habitat map is finalized	August–October 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.6 Recreation Evaluation Study

The FERC policy requires CVEA to provide reasonable public recreation opportunities consistent with the safe and effective operation of the Solomon Gulch Project. CVEA provides recreational opportunities according to the existing Solomon Gulch Project license conditions and has undertaken measures, including ongoing maintenance of recreation facilities, throughout the license term. The proposed Recreation Evaluation Study will provide information about available recreational facilities' current use and assess future recreational needs at the Solomon Gulch Project.

2.6.1 Study Area

The study area for the Recreation Evaluation Study includes the John Hunter Memorial Trail located within the Solomon Gulch Project Boundary (Figure 2-2).

2.6.2 Study Goals and Objectives

The goals and objectives of the Recreation Evaluation Study are to:

Goal 1 – Gather baseline information on the John Hunter Memorial Recreation Trail

Objective 1.1: Review existing information, inventory, and map (using GIS) the existing John Hunter Memorial Trail within the Solomon Gulch Project Boundary, including site location and facilities/amenities.

Objective 1.2: Evaluate the condition of the John Hunter Memorial Trail and facilities/amenities within the Solomon Gulch Project Boundary, including existing information on the suitability of facilities/amenities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current Americans with Disabilities Act [ADA] design standards), where feasible, and public safety features.

Goal 2 – Characterize the existing recreation use of the John Hunter Memorial Trail

Objective 2.1: Estimate the recreation use of the John Hunter Memorial Trail by day type (i.e., weekday, weekend, or peak weekend) and activity.

Objective 2.2: Evaluate visitor feedback regarding the perception and experience of the John Hunter Memorial Trail.

Goal 3 – Identify current and future recreation needs related to the John Hunter Memorial Trail.

Objective 3.1: Evaluate whether recreation capacity and the existing facilities/amenities on the John Hunter Memorial Trail meet current needs.

Objective 3.2: Estimate future recreation use of the John Hunter Memorial Trail.

Objective 3.3: Estimate potential future recreation needs and the ability of the John Hunter Memorial Trail to meet future needs over the term of a new license.

Table 2-7 summarizes the study objectives, information needed to meet those objectives, and sources of information. Section 2.6.3, **Error! Reference source not found.**, details the data collection methodology.

Table 2-7. Recreation Evaluation Study Plan Objectives and Efforts

Objectives	Information Needed	Source
Goal 1: Gather baseline information on the John Hunter Memorial Trail		
Objective 1.1: Review existing information, inventory, and map (using GIS) the existing John Hunter Memorial Trail within the Solomon Gulch Project Boundary, including site location and facilities/amenities.	<ul style="list-style-type: none"> • Recreation Site locations • Project Boundary 	<ul style="list-style-type: none"> • Existing data • On-site data collection
Objective 1.2: Evaluate the condition of the John Hunter Memorial Trail and facilities/amenities within the Solomon Gulch Project Boundary, including existing information on the suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current ADA design standards), where feasible, and public safety features.	<ul style="list-style-type: none"> • Site amenities available • Site conditions • ADA design standards • Public safety features 	<ul style="list-style-type: none"> • On-site data collection

Objectives	Information Needed	Source
Goal 2: Characterize the existing use of the John Hunter Memorial Trail		
Objective 2.1: Estimate the recreation use of the John Hunter Memorial Trail by day type (i.e., weekday, weekend, or peak weekend) and activity.	<ul style="list-style-type: none"> • Estimate the number of vehicles per day • Estimate the number of trail users per day • Estimate length of stay • Estimate number of people/vehicles • Proportion of visitors engaged in each available activity 	<ul style="list-style-type: none"> • Existing Data • Recreation Use Survey
Objective 2.2: Evaluate visitor feedback regarding the perception and experience of the John Hunter Memorial Trail visitors.	<ul style="list-style-type: none"> • Percent of visitors perceiving crowded facilities • Percent of visitors satisfied with recreational facilities • Average quality rating of facilities and amenities • Average value rating of overall recreation site 	<ul style="list-style-type: none"> • Recreation Use Survey
Goal 3: Identify current and future needs related to the John Hunter Memorial Trail		
Objective 3.1: Evaluate whether recreation capacity and the existing facilities and amenities on the John Hunter Memorial Trail meet current needs.	<ul style="list-style-type: none"> • User perceptions of crowding and needed facility/improvements compared to existing data • Parking capacity compared to utilization 	<ul style="list-style-type: none"> • Recreation Site Inventory • Results of Goal 2 analysis • Existing data

Objectives	Information Needed	Source
Objective 3.2: Estimate future recreation use of the John Hunter Memorial Trail.	<ul style="list-style-type: none"> • Current recreational use assessment • Population projects for the Project area • Recreational use trends 	<ul style="list-style-type: none"> • Results of Goal 2 analysis • U.S. Bureau of Census Data • SCORP or other readily available literature • Existing data
Objective 3.3: Estimate potential future recreation needs and the ability of the John Hunter Memorial Trail to meet future needs over the term of a new license.	<ul style="list-style-type: none"> • Recreation Inventory • Condition Assessment • Parking capacity at recreation site vs. projected needs density • Future needs identified by additional sources 	<ul style="list-style-type: none"> • Recreation Site Inventory and Condition Assessment • Results of Goal 2 analysis

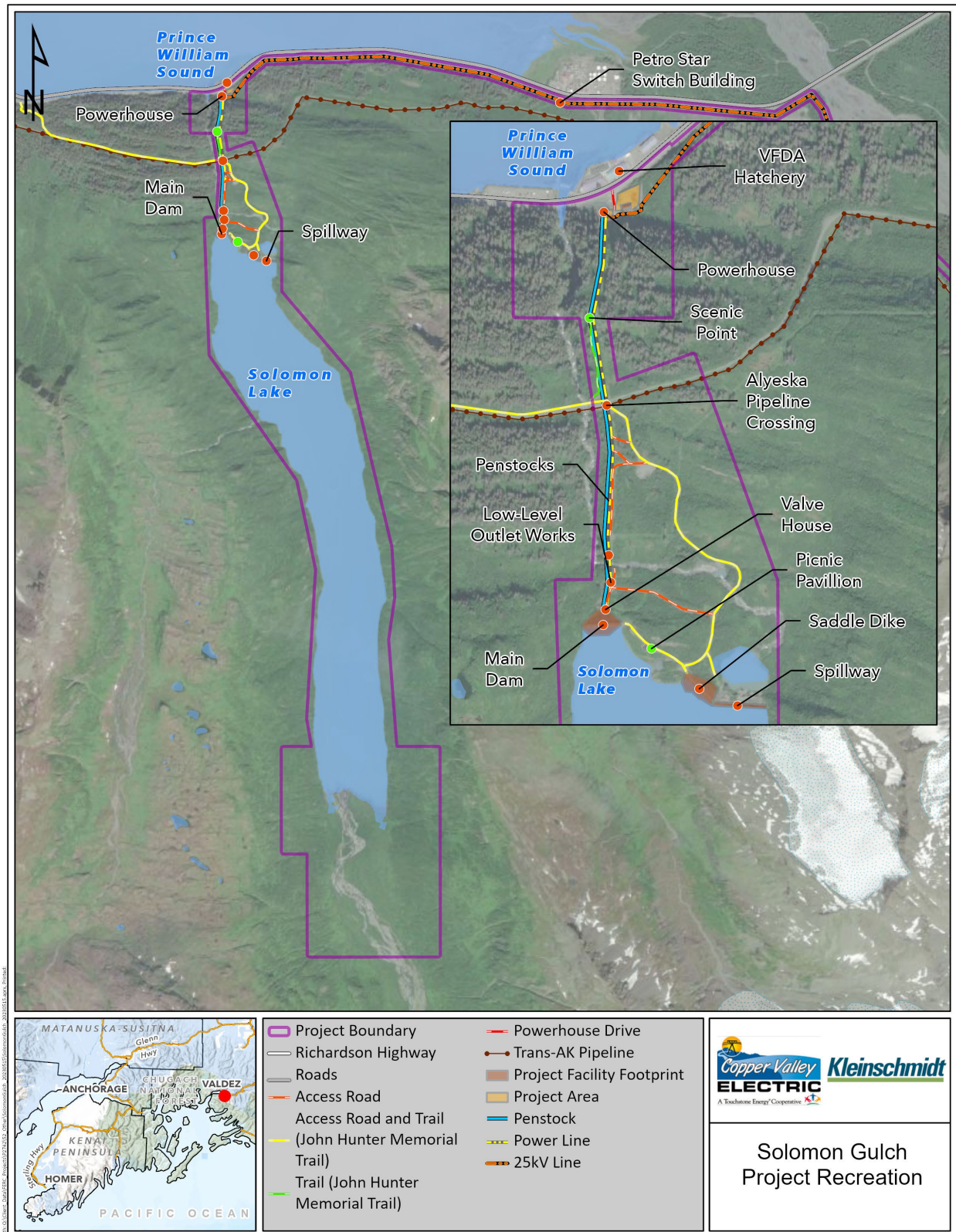


Figure 2-2. Project Recreation Area

2.6.3 Study Scope and Methods

2.6.3.1 Project Recreation Site Inventory and Condition Assessment

CVEA will compile a site inventory and condition assessment information for the John Hunter Memorial Trail. The recreation site inventory and condition assessment will:

- map the location of the recreation site in relation to the Project Boundary;
- describe the type, number, and condition of amenities at the site;
- estimate parking capacity;
- evaluate the condition of the recreation site and facilities, including the suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current ADA design standards) and public safety features; and
- document recreation facilities using photographs.

A Recreation Site Inventory Form (Attachment 1) will be completed for the John Hunter Memorial Trail. The inventory will document the type, number, and size of facilities and amenities (restrooms, parking areas, picnic shelters, tables, etc.) located at/along the John Hunter Memorial Trail. The general condition of all facilities will be noted during the inventory, and any facilities that qualify as ADA or barrier-free will be identified as such.

In addition, detailed maps of the John Hunter Memorial Trail will be developed that identify parcel boundaries, current property owner(s), access locations, spur trails, and facilities/amenities.

2.6.3.2 Project Recreation Use and Future Recreation Demand

Recreation user surveys will be collected for the John Hunter Memorial Trail. A Quick Response code will be posted at the sign-in station located where the trail connects to the Trans Alaska Pipeline System (TAPS) right-of-way (ROW). Surveys will include:

- questions regarding user demographics,
- group size,
- length of stay,
- type of recreational activities participated in, and
- perceptions of crowdedness and condition of recreation facilities.

A sample Recreation User Survey Form is included in Attachment 2. The data collected will be used to identify recreation use patterns and use estimates at/along the John Hunter Memorial Trail. The data on user perceptions of crowdedness will also be used to determine future expansion needs at/along the John Hunter Memorial Trail.

2.6.3.3 Analysis and Reporting

Future annual visitation to the John Hunter Memorial Trail will be estimated based on review of existing population forecasts in the Chugach Census Area in Alaska. The population forecasts will be applied to the annual use estimates for the Project to determine a future recreation use estimate. CVEA will also review the Alaska State Comprehensive Outdoor Recreation Plan during the future recreation use analysis. This information will be considered when determining future recreation needs at the Project.

The need for recreation and site development or modifications of the John Hunter Memorial Trail will be assessed based on the inventory, condition assessment results, user survey results, and future recreation use estimates.

The needs assessment will focus on the existing condition and user perceptions of the John Hunter Memorial Trail, the presence of barrier-free or ADA facilities at/along the John Hunter Memorial Trail, and the ability of the John Hunter Memorial Trail to meet current and anticipated future recreation demand.

The need for new recreation sites, facilities, and/or amenities, and improvements to the existing John Hunter Memorial Trail will be determined through assessment of the information collected and consultation with stakeholders.

2.6.4 Study Schedule

The preliminary schedule for this study is outlined in Table 2-8.

Table 2-8. Proposed Recreation Evaluation Study Schedule

Task	Schedule
Recreation fieldwork	Memorial Day 2024 – Labor Day 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

2.7 Cultural Resources Study

Cultural resources are the objects, sites, structures, districts, and landscapes that reflect history and prehistory at a local, state, or national level. The National Register of Historic Places (NRHP) is the nation's inventory of historic properties that meet specific criteria of local, state, or national importance. In order for a property to be eligible for listing on the NRHP, it must possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, the property must have significance under one or more criteria:

- be associated with events that have made a significant contribution to the broad patterns of our history;
- be associated with the lives of persons significant in our past;
- embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values;
- represent a significant and distinguishable entity whose components may lack individual distinction; or
- have yielded, or may be likely to yield, information important in prehistory or history.

There are some exceptions to these criteria for properties achieving significance in the last fifty years, certain cemeteries or religious properties, and other property types. Traditional Cultural Properties are properties or places that are eligible for listing on the NRHP because of its association with the cultural practices and beliefs that are:

1. rooted in the history of a community, and
2. are important for maintaining the continuity of that community's traditional beliefs and practices (Parker 1993).

The Alaska Department of Natural Resources (ADNR) Office of History and Archaeology (OHA) maintains the Alaska Heritage Resources Survey (AHRs) database. The AHRs is primarily a map-based system that consists of an inventory of reported cultural resources within the State of Alaska (also referred to as AHRs sites). AHRs sites include objects, structures, buildings, sites, districts, and travel ways, with a general provision that they are over 50 years old. Each individual site record contains information such as the site name, a description of the physical remains, data on the site's location, a list of bibliographic citations, site significance, affiliated cultures and dates, preservation status, site condition,

property owner, and other associated site numbers. The fundamental use of the AHRS is to protect cultural resource sites from adverse impacts. As a planning tool, the AHRS helps agencies avoid Project delays and prevent unnecessary destruction of non-renewable resources. Listing on the AHRS does not, in and of itself, provide protection for sites; however, it does allow agencies to make knowledgeable decisions regarding the future of these sites. Listing on the AHRS is not the same as listing on the NRHP.

2.7.1 Study Area

The study plan for the Cultural Resources Study is proposed to be conducted within the Solomon Gulch Proposed Project Boundary (Survey Area) (Figure 1-1 and Table 2-9 below) in 2024.

Table 2-9. Meridian, Township, Range, and Section for the Survey Area

USGS Quad Map	Meridian, Township, Range, and Section
Valdez A-7	C009S006W14
Valdez A-7	C009S006W15
Valdez A-7	C009S006W16
Valdez A-7	C009S006W21
Valdez A-7	C009S006W27
Valdez A-7	C009S006W28
Valdez A-7	C009S006W33
Valdez A-7	C009S006W34
Valdez A-7	C010S006W03
Valdez A-7	C010S006W04

Source: <https://gis.data.alaska.gov/> (accessed October 24, 2023)

2.7.2 Study Goals and Objectives

The goal of the study is to identify cultural resources located within the Survey Area. The specific objectives of the study are to:

- Complete an aerial (helicopter) survey of the entire Survey Area to identify areas within that have a moderate to high or low potential to contain intact cultural resources.
- Complete a Phase I (Identification) survey, as defined by the OHA guidelines (Historic Preservation Series No. 11) (Alaska Department of Natural Resources 2019 [2003]) of the areas within the Survey Area that have a medium or high potential to contain intact cultural resources, which:
 - can safely be accessed using the available methods of transportation (e.g., foot, boat, or helicopter) and
 - can safely be subjected to pedestrian survey.
- Document the existing components of the historic Solomon Gulch Hydroelectric Project.

2.7.3 Study Scope and Methods

2.7.3.1 Pre-field Methodology

Prior to the commencement of fieldwork, the contractor will review the AHRS and NRHP databases and previous cultural resources reports conducted in or near the Survey Area. This background information was already compiled as part of the Pre-Application Document (PAD). The information will be reexamined to confirm its validity at the time of field survey. The background information compiled as part of the PAD development and any new (or updated) information identified during reexamination or data sets will further inform the Phase I survey approach detailed below.

Prior to the commencement of fieldwork, the contractor will also apply for the following permits to conduct cultural resource investigations:

- State Cultural Resource Investigation Permit – applicable to State lands only
- Fieldwork Authorization and Archaeological Investigation Permit – applicable to BLM lands only
- Private land permissions will be obtained by Kleinschmidt Group/CVEA as needed.

2.7.3.2 Field Methodology

The fieldwork will consist of three phases: (1) aerial survey, (2) Phase I (Identification) survey, and (3) documentation of the existing components of the historic Solomon Gulch Hydroelectric Project.

2.7.3.3 Aerial Survey Methodology

The contractor will conduct an aerial survey of the Survey Area at the start of the Phase I survey to identify areas of moderate to high potential to contain intact cultural resources.

According to most recent information (Farvacque 2008; Tedor 2022), prehistoric and historic archaeological sites have a moderate to high potential of being located in places that possess the following features:

- Well-drained and stable terrain (e.g., dry terrain without a topographic prominence)
- Defined topographical rise on level terrain (e.g., terraces, moraines, ridges)
- Level terrain near breaks in slope
- Rock shelters and caves (i.e., natural shelter)
- Adjacent confluences of rivers and streams
- Adjacent lakes
- Adjacent travel routes (e.g., rivers, streams, wetland edges, and passes)
- Adjacent areas that congregate game (e.g., natural game corridors, grazing areas, perennial and relic ice patches, mineral licks, salmon-bearing streams)
- In or adjacent to old-growth or mature vegetation
- Adjacent resources (e.g., potable water, toolstone, concentrations of plants of known ethnographic use)
- A location that offers protection from prevailing wind and/or drifting snow
- There are known cultural resource sites elsewhere on a landform
- Any of the above characteristics that were present in the past but not today (e.g., relic lake shores and river channels)

During the aerial survey, the contractor will photograph and note the location (on paper maps or using a GPS) of areas considered to have a medium to high potential to contain intact cultural resources for subsequent surveys.

They will also photograph and note the location (on paper maps or using a GPS) of the existing components of the Historic Solomon Gulch Hydroelectric Project.

During the aerial survey, the helicopter will fly low elevation (typically 200 to 500 ft. above ground level) transects within the study area. The elevation flown will be determined in

consultation with the pilot based on local conditions, safety concerns, and the needs of the survey.

2.7.3.4 Phase I Survey Methodology

The contractor will conduct a Phase I (Identification) survey per OHA guidelines (Historic Preservation Series No. 11) ADNR 2019 [2003]) of areas identified during the aerial survey as having a moderate to high potential to contain intact cultural resources that can be safely accessed by the available methods of transportation (e.g., foot, helicopter, or boat) and can be safely subjected to pedestrian survey.

Identification surveys are designed to locate cultural resources. The Phase I survey will consist of systematic pedestrian survey at standard 10-m intervals. Deviations from the standard survey interval may occur as a result of increased surface visibility, restricted access to a portion of the Area of Potential Effect, standing water, hazards, slope angle, etc. If such deviations occur, detailed explanation and documentation (maps, photos, etc.) will be included in the interim and technical reports produced for this Project.

During the Phase I survey, subsurface testing will be implemented as follows:

- locations of moderate to high potential to contain intact cultural resources, as defined in Section 2.7.
- the location(s) of previously identified AHRS sites (as appropriate).
- a sample of areas not classified as having a medium to high potential as a control and to provide information on stratigraphy within these areas.

Areas with a moderate or high potential to contain prehistoric cultural resources will be subjected to subsurface testing. Testing of moderate to high potential areas for archaeological sites could include metal detecting, subsurface testing, and soil probes placed at the discretion of a professionally qualified field archaeologist.

The number and location of subsurface tests and the type of testing utilized will depend on the local condition and will be determined in the field. The professionally qualified field archaeologist will document the decision-making process used to determine what methods were used at each location.

Subsurface tests will consist of 50 x 50 cm shovel test pits excavated to bedrock, glacial till, permafrost, water, frozen ground, or other impasse, or a depth of 1 m. Excavated

material will be screened through 1/8-in. mesh unless the soil conditions require 1/4-in. screen. If an artifact or feature is found while using a 1/4-in. screen, the archaeologists will switch back to a 1/8-in. screen.

If intact sediment continues after reaching a depth of 1 m, a soil probe will be used to document the extent of intact deposits, and all potentially diagnostic stratigraphic layers (i.e., tephra, paleosols, charcoal concentrations, dateable materials) will be documented and sampled. Testing with a soil probe will extend to an impasse or a maximum depth of 4 m.

2.7.3.5 Test Probe Protocol

Archaeologists will insert a 2-cm (13/16-in.) probe into the rim and center of each suspected cultural surface depression unless evidence indicates that the feature is of modern origin. Additional test probes may be completed at the discretion of the archaeologists. If possible, probes will be inserted to a depth of 25 cm (10 in.).

The material collected in the probe will be examined for evidence of prehistoric and historic artifacts and evaluated using a method developed by Arndt (1977) for identifying prehistoric cache pits. In 88.9 percent of the depressions tested by Arndt, probes that had three or more of the attributes listed in Table 2-10 were of Dena'iana or Ahtna origin. However, historic depressions may also contain some or all of these attributes.

Table 2-10 Attributes of Dena'iana and Ahtna Cache Pits

Attribute Number	Attribute	Description
1	Stain/Fiber	Remnants of decayed wood or bark due to heavy deterioration
2	Spruce/Birch bark	Potential bark found in the walls or lining the base of a cache pit
3	Wood	Potential wood found in walls of the cache pit
4	Charcoal, ash	Result of cleansing, reusing, or keeping away insects through fire
5	Cache pit depth	Cache pit is normally within 10 cm (4 in.) of culturally sterile gravel sediments
6	Disturbed soils	These soils should be evident near the edge of the depression

7	Cultural resources	Lithics, metal, fauna, or flora associated with human activity
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Source: Arndt 1977 (Table IV-3, IV-4).

2.7.3.6 Metal Detector Survey Methodology

During the Phase I survey, a metal detector survey will be conducted at any historic sites encountered. The goal of the metal detector survey is to establish site boundaries, identify artifacts that can provide information on the site's age and function, and identify locations for subsurface testing. The primary function of a metal detector survey in a Phase I survey is to establish an approximate age for the site and define a preliminary site boundary.

Advanced Metal Detecting for Archaeologists sets forth best practices for working with metal detectors in an archaeological setting (Scott et al. 2012). Metal detectors are used as remote sensing devices to identify metal artifacts. They facilitate a time efficient testing of sites and reduce the need for extensive subsurface testing, which preserves site integrity for future inquiry (Reeves 2015).

Following an initial site examination, archaeologists will select the most appropriate of the four survey strategies listed below:

1. Systematic transects along four baselines: metal detecting is conducted in a 4-meter-wide transect along the four cardinal directions from a datum point established in the site. All targets identified during the metal detector survey within the transects will be flagged, point excavated, and mapped.
2. Survey Area systematic transects: metal detecting is conducted in transects across the entire site. A sample of the points identified is tested based on material and concentration. All targets identified during the metal detector survey will be flagged and mapped.
3. Topographic transect: metal detecting is conducted in systematic transects that take into consideration inconsistencies in topography. A sample of the points identified is tested based on material and concentration. All targets identified during the metal detector survey will be flagged and mapped.
4. Sampling blocks: the site is divided into survey units and testing is done in a representative block. All targets identified during the metal detector survey of the block will be flagged, point excavated, and mapped. This method is only recommended in cases of time constraints and does not provide data for site boundaries or artifact concentrations.

2.7.3.7 Data Collection

The contractor will collect paper and digital data during the survey, including completing standardized field forms and notebooks, GPS mapping, and photography.

2.7.3.8 Standardized Paper Forms and Notebooks

The contractor will complete standardized field forms and take rigorous notes to document all employed methods, survey coverage, and resources identified during the survey.

2.7.3.9 GPS Mapping

Each site will be recorded with a Samsung Galaxy Tab S6 tablet using the Collector program for ArcGIS, which will be connected to a Stonex Global Navigation Satellite System receiver (or equivalent) capable of sub-meter accuracy. GPS data collection will include:

- general outlines of site boundaries,
- all test units excavated at the site, and
- the location of recorded surface artifacts and features, including built structures and surface depressions.

Additional non-archaeological information will also be mapped as warranted, including the locations of photographs taken, old test units, ATV trails, modern debris, or other items. The cultural resource data generated will be entered into a geodatabase provided as a separate electronic deliverable.

2.7.3.10 Photography

Large and small features, such as structures or surface depressions, will be photographed with a scale. Photographs will be taken in the cardinal directions from each feature identified.

Each shovel test unit will have the stratigraphic profile of at least one wall photographed. If the unit is positive for cultural resources, all four walls will be photographed. In addition, photographs will be taken in the cardinal directions from each test unit to show the surrounding landscape and vegetation.

Artifacts will be photographed in the field setting. If any are collected, they will be photographed again in a laboratory setting. All photographs will be recorded in a

photolog created by the photographer, which will include the site name, date, direction, and description of the photographed object. GPS points will be recorded at all locations where a photograph is taken. Duplicate photographs at the same location do not require individual GPS points. All GPS and photo information will be recorded on the photo log.

2.7.3.11 Artifact Collection

The collection of artifacts will be kept to a minimum. In the case of historic cultural resources, only materials of an absolutely unique nature, or those in danger of being damaged or stolen, will be collected. Otherwise, all historical cultural materials will be recorded and left on-site.

For prehistoric cultural resources, surface finds will only be collected if they are diagnostic in nature, or consist of a traceable material, such as obsidian. The contractor will collect all prehistoric artifacts identified during subsurface testing.

Collected artifacts and samples will be documented, photographed, and their locations recorded with a GPS point. Once field documentation is completed, the artifacts will be bagged and labeled with the appropriate provenience information. Collected items will be recorded on the Excavation Unit Record and a Field Specimen Log for tracking purposes and removed from the site daily to ensure their safety. Artifacts will be transported to a laboratory where they will be securely stored for processing and analysis. Artifacts collected during the fieldwork for this Project will be curated in accordance with the applicable permit stipulations.

2.7.3.12 Bulk Sample and Charcoal Collection

Bulk or charcoal samples collected will be bagged, appropriately labeled, and documented on the Excavation Unit Record Form. The contractor will only collect bulk samples if they are required for the interpretation of the site. Bulk items such as brick, mortar, plaster, shell, and gravel will be counted or weighed in the field but not collected. A sample may be collected if needed for analysis.

Charcoal samples will be collected first in tin foil and subsequently placed in an appropriately labeled bag with as little handling as possible prior to the sample being bagged.

2.7.3.13 Documentation of Existing Components of the Historic Solomon Gulch Hydroelectric Project

During the survey, the contractor will document the existing components of the Solomon Gulch Hydroelectric Project that can be safely accessed using the available transportation methods (e.g., foot, helicopter, boat).

Photographs will be taken of the buildings and structures as well as their setting and any applicable character-defining features. Where possible, GPS points will be taken of the buildings and structures. Measurements of historic structures or features shall be in imperial units, consistent with the standards of historical archaeology.

2.7.3.14 Analysis and Reporting

The contractor will complete data analysis and reporting required to produce technical reports (draft and final versions) that meet state and federal standards and applicable state and federal permit requirements. The final version of the technical report will include new and updated AHRS cards and Historic Building Survey forms for all evaluated properties.

2.7.4 Study Schedule

The preliminary schedule for the Cultural Resources Study is outlined in Table 2-11.

Table 2-11. Cultural Resources Study Schedule

Task	Schedule
Field ground-truth survey	July–August 2024
Draft Study Report	early December 2024
Final Study Report	mid-February 2025

3.0 REFERENCES

Water Temperature Monitoring Study:

Alaska Department of Environmental Conservation (ADEC). 2022. Water Quality Standards. Amended November 13, 2022. Alaska Administrative Code Chapter 70 (18 AAC 70).

Mauger, S., R. Shaftel, E. J. Trammell, M. Geist, and D. Bogan. 2015. Stream Temperature Data Collection Standards for Alaska: Minimum Standards to Generate Data Useful for Regional-scale Analyses. *Journal of Hydrology: Regional Studies*, 4, pp.431-438.

Vegetation Characterization Study:

ABR, Inc.—Environmental Research & Services (ABR). 2011. Biological resources in the Allison Creek Hydroelectric Project area: 2008–2011 studies and impact analysis. Prepared for Hatch Acres, Seattle, WA, by ABR, Inc., Fairbanks, AK. May 2011. 113 pp. + appendices.

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Alaska Center for Conservation Science (ACCS). 2023a. Plant Species and Ecosystems of Conservation Concern. Accessible at: <https://accs.uaa.alaska.edu/vegetation/conservation-concern>. Accessed on 1 August 2023.

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Alaska Center for Conservation Science (ACCS). 2023b. Alaska Exotic Plants Information Clearinghouse (AKEPIC). Accessible at: <https://accs.uaa.alaska.edu/invasive-species/non-native-plants>. Accessed on 3 August 2023.

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Recreation Study:

Copper Valley Electric Association, Inc. (CVEA). 2023. Pre-Application Document, Solomon Gulch Hydroelectric Project, FERC No. 2742. Prepared by Kleinschmidt. 226 pp. + appendices.

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ATTACHMENTS

ATTACHMENT 1
PAD COMMENT LETTERS AND RESPONSES



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Fish and Game

Division of Sport Fish
Research & Technical Services

333 Raspberry Road
Anchorage, Alaska 99518-1565
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October 12, 2023

Coreen Palacios
Regulatory and Compliance Specialist
Copper Valley Electric Association, Inc.
Mile 187 Glenn Highway, P.O. Box 45
Glenallen, AK 99588

Subject: Comments on the Preliminary Application Document (PAD) for the Solomon Gulch Hydroelectric Project (P-2742)

Dear Ms. Palacios:

On April 28, 2023, Copper Valley Electric Association (CVEA) filed a Pre-Application Document (PAD) with the Federal Energy Regulatory Commission for the Solomon Gulch Hydroelectric Project (FERC No. 2742) and solicited stakeholder comments and/or study requests for the Project's relicensing. The Alaska Department of Fish and Game (ADF&G) has reviewed the PAD and supports the proposed studies.

We would like to make a comment regarding an inaccurate statement on page 5-51 of the PAD. In Section 5.4.3.1.4 on mountain goats, the PAD states that "Within GMU 06, mountain goats only inhabit the mainland along with Bainbridge, Culross, and Knight islands." However, ADF&G's Prince William Sound Area Wildlife Biologist states that mountain goats are common throughout the mainland of Prince William Sound and do not occur on Culross Island or Knight Island.

Thank you for the opportunity to comment on the PAD and to participate in the Joint Agency Meeting and site visit. If you have any questions, please contact me at (907) 267-2404 or via email at leah.ellis@alaska.gov. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink that reads "Leah M. Ellis".

Leah M. Ellis
FERC Hydropower Coordinator
Alaska Department of Fish and Game
(907) 267-2404

Cc: J. Klein, ADF&G; C. Westing, ADF&G; M. Marie, ADF&G; B. Blain-Roth, ADF&G

From: Mahara, Carol J <carol_mahara@fws.gov>

Sent: Monday, October 16, 2023 5:28 PM

To: Fatima Oswald <Fatima.Oswald@Kleinschmidtgroup.com>; Coreen Palacios <CPalacios@cvea.org>

Cc: Cooper, Douglass <douglass_cooper@fws.gov>

Subject: RE: [EXTERNAL] Solomon Gulch Hydroelectric Project PAD/Studies comment reminder

Hello Fatima and Coreen,

I wanted to give you a heads up that we will not be submitting official comments on the PAD or study requests. The Joint Agency Meeting was informative and very helpful for understanding the project, layout of the facilities, the existing environment, other information described in the PAD, and the questions I had were answered. Please let me know if you have any questions.

Thank you,

Carol

Carol Mahara

Fish and Wildlife Biologist

Ecological Services

US Fish and Wildlife Service

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Solomon Gulch Comment Summary Table

No.	Agency / Stakeholder	Comment	CVEA Response
1	ADF&G 10/12/2023 Letter	<p>The Alaska Department of Fish and Game (ADF&G) has reviewed the PAD and supports the proposed studies.</p> <p>We would like to make a comment regarding an inaccurate statement on pages 5-51 of the PAD. In Section 5.4.3.1.4 on mountain goats, the PAD states that "Within GMU 06, mountain goats only inhabit the mainland along with Bainbridge, Culross, and Knight islands." However, ADF&G's Prince William Sound Area Wildlife Biologist states that mountain goats are common throughout the mainland of Prince William Sound and do not occur on Culross Island or Knight Island.</p>	<p>Thank you for this comment. We will update this information in future relicensing documents (the Draft License and Final License Applications).</p>
2	Alyeska Pipeline 10/13/2023 Letter	<p>Several comments related to Dam Safety.</p>	<p>General Comment:</p> <p>CVEA appreciates the comments of Alyeska and its support for the Solomon Gulch Project license renewal. CVEA notes that Alyeska's comments and additional information requests are related to public safety and dam safety. While relicensing documents including the final license application are required to summarize a project's public safety and dam safety programs, dam safety of a FERC-regulated project is administered by the Division of Dam Safety and Inspections (D2SI). In addition, dam safety related correspondence and information are generally not public as it is considered Critical Energy Infrastructure Information (CEII). Accordingly, CVEA does not propose any additional studies related to Alyeska's requests as part of the Solomon Gulch Project relicensing. CVEA will address Alyeska's comments through the</p>

			FERC D2SI rather than within the context of the Solomon Gulch Project relicensing process. CVEA will provide a separate response to Alyeska and will submit a copy of this response to FERC D2SI Portland Regional Office (PRO).
3	USFWS 10/16/2023 Email	I wanted to give you a heads up that we will not be submitting official comments on the PAD or study requests. The Joint Agency Meeting was informative and very helpful for understanding the project, layout of the facilities, the existing environment, other information described in the PAD, and the questions I had were answered.	Comment received, thank you.