Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Aesthetic Resources Study
Study Plan Section 12.6

Final Study Plan

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

July 2013

12.6. Aesthetic Resources Study

On December 14, 2012, Alaska Energy Authority (AEA) filed with the Federal Energy Regulatory Commission (FERC or Commission) its Revised Study Plan (RSP), which included 58 individual study plans (AEA 2012). Included within the RSP was the Aesthetic Resources Study, Section 12.6. RSP Section 12.6 focuses on inventorying and documenting baseline aesthetic conditions within the Aesthetic Resources Study Area and evaluating the potential effects to aesthetic resources that may result from construction and operation of the proposed Project. RSP 12.6 provided goals, objectives, and proposed methods for aesthetic resources data collection and analysis.

On February 1, 2013, FERC staff issued its study determination (February 1 SPD) for 44 of the 58 studies, approving 31 studies as filed and 13 with modifications. RSP Section 12.6 was one of the 13 approved with modifications. In its February 1 SPD, FERC recommended the following:

We recommend that AEA modify the Aesthetic Resources Study Plan as follows:

- *Conduct surveys of ambient sound levels in all four seasons.*
- *Include in the initial study report any proposed modifications to the study plan based on the first year's data on the lower river uses, hydrology, and ice processes.*

In accordance with the February 1 SPD, AEA addressed the recommended modifications in the Final Study Plan for Section 12.6. These modifications are also included in the methods below.

12.6.1. General Description of the Proposed Study

The goals and objectives for the Aesthetic Resources Study are to inventory and document baseline aesthetic (e.g., visual, auditory) conditions within the Aesthetic Resources Study Area and evaluate the potential effects to aesthetic resources that may result from construction and operation of the proposed Project. The analysis will focus on assessing these potential impacts and will help identify potential design and other mitigation options.

12.6.2. Existing Information and Need for Additional Information

Existing information on aesthetic resources is provided in BLM Anchorage District planning documents, and in AEA's PAD (AEA 2011b). The Aesthetic Resources Study Area is located within the planning area boundary of the BLM Anchorage District. Although the Study Area is located within the lands managed under the East Alaska Resource Management Plan (RMP), the southwestern portion of the Study Area includes lands administered by the Ring of Fire RMP. As part of the RMP development process, the Bureau of Land Management completed a visual resource inventory (VRI) of BLM-administered lands within the Study Area. The VRI data consist of 3 components: scenic quality, visual sensitivity, and visual distance zone data. This information can be used to understand existing visual (aesthetic) resources at a planning level, and refine where necessary to better convey project-level information.

The PAD includes aesthetics resource data collected during the 1985 Susitna Hydroelectric Project Application for License for Major Project (APA 1985). These data included a description of landscape character within portions of the Study Area, a ranking of aesthetic value and visual absorption capability, and identification of notable landscape features. As part of the 2012 work,

each component, described below, was assessed to determine its completeness and applicability to the proposed Project. An aesthetic resources study was initiated in 2012 to gather data to inform the 2013-2014 study plan. As part of this effort, data collected during the 1985 Susitna Hydroelectric Project Application for License for Major Project (APA 1985) was field verified. The nexus between each landscape character type and the proposed project was re-assessed to help inform the selection of Key Observation Points (KOPs) and indicators to be used in the impact analysis.

Additional elements of the 2012 aesthetic resources study included the following:

- Review of relevant federal, state, and local land use planning documents
- Viewshed modeling of the existing Susitna River, from approximately 5 miles downriver of the proposed dam site to approximately 5 miles upriver of the inundation zone
- Viewshed modeling of the proposed reservoir
- Field reconnaissance, including an assessment of existing cultural modification, lighting, and soundscapes
- Collection of photography
- Planning for the soundscape analysis
- Initiation of interdisciplinary coordination

In order to analyze potential impacts from the proposed Project (beneficial or adverse), additional baseline data is required. Collection of these data will focus on establishing the type and distribution of scenic quality attributes present within the Study Area, visual sensitivity to change within the Aesthetic Resources Study Area (assessed throughout a larger geographic area), and existing visual distance zones within the Study Area. These data will be used to support the impact analysis, including direct, indirect, and cumulative impacts to aesthetic resources.

Using information obtained from existing data, the 2012 aesthetic resources study, the FERC scoping process and incorporation of Agency and licensing participant recommendations, indicators proposed for the impact analysis were identified and study methods for 2013-2014 were developed.

12.6.3. Study Area

The Aesthetic Resources Study Area is shown in Figure 12.6-1. It is designed to be sufficient in size to address likely established indicators of change, including potential direct and indirect effects to recreation, cultural resources, subsistence, socioeconomics, geomorphology/ice processes, and riparian vegetation.

The Aesthetic Resources Study Area will be divided into primary and secondary study areas. The primary study area will be defined by a 30-mile radius surrounding all Project components, including: the proposed dam and camp facilities including construction sites, the reservoir, transmission corridors, access road corridors, borrow sites, and rail sidings. The Project viewshed will be defined in Q1 2013 using the most current Project design information. The analysis will focus on the following broadly defined viewer areas:

- The Susitna River corridor, downstream of Devils Canyon to Talkeetna
- The Susitna River corridor, from Devils Canyon to the proposed dam site
- The Susitna River, upstream of the proposed dam site to the upriver extent of the inundation zone
- Upland areas adjacent to the Susitna River, with emphasis on those areas within the viewshed of the inundation zone, proposed access roads, and proposed transmission corridors
- Common air transportation routes used for transportation and recreational air tours

The secondary study area for this study will include all lands located between the Denali Highway, south to the Glenn Highway and from the Richardson Highway, east to the mouth of the Susitna River (Figure 12.6.2). This area will be evaluated using existing information and used to understand the distribution of on aesthetic resources within a larger geographic context.

The aesthetics resource study area could be adjusted in 2014 to include areas within the river corridor located downriver of Talkeetna if 2013 studies in the lower reach indicate a possible Project-related effect on aesthetic resources in this area. Any recommended changes to any study areas will be included in AEA's Initial Study Report, which will be prepared and distributed in early February 2014. Such recommendation will be based on an assessment of modeling completed as part of the hydrology and ice processes analyses, including potential changes in the hydrologic regime, such as water timing, quantity, and quality (Section 7.0), and the expected change in the type, distribution, and seasonality of ice cover on the Susitna River, downriver of the proposed dam (4Q 2013). The Initial Study Report in early 2014 will include any proposed modifications to the study plan based on the first year of data collected on the lower river uses, hydrology, and ice processes.

12.6.4. Study Methods

The visual resource impact analysis will generally follow methods developed by the BLM (BLM 1986). This methodology will be used to gather baseline data, complete the impact analysis, and inform design and mitigation options. Baseline data collection will occur across the primary and secondary study area. The primary study area will be evaluated using a combination of desktop and field-based observations. The secondary study area will be evaluated using desktop analyses and existing information. Data collection and analysis will be completed across all four seasons. Components of the study include:

- Viewshed Modeling
- Interdisciplinary Coordination
- Identification of Analysis Locations
- Baseline Data Collection
- Impact Analysis (Photosimulations, Contrast Rating, Visual Resource Inventory Analysis)
- Identification of Design and Other Mitigation Options

Viewshed Modeling

Viewshed models will be generated for all Project features, including the proposed reservoir, roads and transmission lines. Viewshed models will be developed for pre-and post-Project conditions of the inundation zone of the Susitna River to depict expected changes in viewshed

areas (i.e., creation of new views, loss of others). Additional viewsheds will be created from identified analysis locations, described below. Maps displaying the viewsheds will be created, and used to direct the identification of important views and vistas considered in the analysis.

Identification of Analysis Locations

Standard analysis locations will be established that represent: (1) common and/or sensitive views within the Aesthetic Resources Study Area, and (2) areas used to measure anticipated change in scenic quality, and/or new opportunities for views, based on potential configuration of access roads/transmission corridors. These locations, referred to as Key Observation Pints (KOPs), will be used to evaluate baseline aesthetic values (including visual resources and soundscape), and will be carried forward through the impact analysis. Analysis locations will differ by landscape analysis factors (i.e., distance from the Project, predominant angle of observation, dominant use), and may be applicable to one or more seasons.

KOPs will be categorized as follows:

- *Observation Points (OPs)*: Observation Points represent specific locations or viewpoints. The viewer experience at these locations is typically stationary and from a single vantage point. Views experienced from OPs may be directional (i.e., a focal view) or not (i.e., a 360 degree panoramic).
- *Observation Areas (OAs):* Observation Areas represent large geographic areas where views could be experienced from a variety of locations. Views are typically transient, and experienced by viewers moving through the area (i.e., dispersed recreation; subsistence). The likelihood of viewers standing in the same spot during repeated visits is low. The degree of variability of views experienced from OAs will depend on a variety of landscape characteristics.
- *Observation Corridors (OCs)*: Observation Corridors, also called "linear KOPs", represent linear viewing experiences, in which scenic attributes are experienced as a continuum. They may be focal (i.e., leading toward a noteworthy natural feature; entrance way), and/or transient (i.e., passing through a landscape).
- *Landscape Character Points (LCPs)*: Landscape Character Points will be established to provide standardized locations in which to evaluate changes in scenic quality. These locations are not tied to a particular viewer experience; however, they will provide information regarding the change in the visual resource of the area (beneficial or adverse) that may result from the proposed Project.

Preliminary recommendations for analysis locations are described in Table 12.6-1. Each location is targeted to address potential impacts (beneficial or adverse) to aesthetic resources, and is based largely on the anticipated nexus between the proposed Project and aesthetic resources identified in 2012. Locations used to assess new access to views / viewer experience that may result from access roads and/or transmission corridors will be selected through review of topographic maps and viewshed modeling. Final draft target analysis locations will be selected and mapped. Input from agencies on analysis locations will be sought through a TWG meeting in 2013, and will be considered when establishing final analysis locations.

Baseline Data Collection

Baseline data collection will include a combination of desktop (primary and secondary study area) and field data collection (primary study area).

Desktop data collection will include existing spatial and geospatial data describing aesthetic attributes, including scenic quality, visual distance zones, and visual sensitivity of the primary and secondary study areas.

Field data collection will be implemented using methodology developed by the BLM (BLM 1986). Data collection will target analysis locations sited within the primary study area. Data collection and analysis will focus on identifying existing aesthetic resource values including scenic quality, visual sensitivity, and distance zones.

Data on scenic quality will include the basic landscape components of form, line, color and texture, carried forward through the contrast rating procedure (BLM 1986) used in the impact analysis.

Visual sensitivity will be assessed through: (1) review of existing data collected during the Visual Sensitivity Level Analysis (SLA) completed during the RMP planning process for the BLM Ring of Fire and East Alaska RMP, and (2) Project-specific analysis. BLM planning-level data will include spatial data defining Sensitivity Level Rating Units (SLRUs), and the associated sensitivity-level analysis completed for that unit.

The Project-specific visual sensitivity analysis will be completed through intercept surveys, mail surveys, and executive interviews completed in coordination with recreation resources, socioeconomics, and subsistence resources. Survey instruments will be finalized during Q12013 study year. Focus groups will be held in 2014 to address visual preference of each alternative. Simulations created from KOPs under each alternative will be used to collect input on aesthetic attributes of each. A total of three focus groups will be held, targeting: (1) public agencies, (2) local tour operators/outfitters and guides/lodge owners, and (3) Alaska Native populations.

Visual distance zones represent the distance from which the landscape is most commonly viewed. These zones are established by buffering common travel routes and viewer locations at distances of three miles, five miles, and 15 miles using GIS (BLM 1986). Existing visual distance zones completed during the RMP planning process for the BLM Ring of Fire and East Alaska RMP will be used to describe baseline characteristics. Project-level visual distance zones will be developed based on an understanding of local travel routes, including those used for recreation and tourism (i.e., the Susitna River corridor below Devils Canyon; flightseeing tours).

One goal of the Aesthetic Resources Study will be help identify potential design and mitigation options to address potential impacts to aesthetic resources. A preliminary assessment of expected visual contrast of all Project components will be completed. This information will allow AEA to identify the mechanism of change in visual resources that may result from construction and operation of the Project and assist in identifying design features or other potential mitigation measures that could be implemented to reduce impacts.

Photo simulations

To support the visual resource effects analysis and to illustrate expected visibility of Project components from various locations, photo simulations will be prepared for a subset of analysis locations. Simulations will be produced by rendering Project components (dam structure, reservoir, access roads, transmission corridors) with 3-dimensional (3-D) computer models and superimposing these images onto photographs taken from analysis locations. Simulations will be

produced to illustrate (1) the dam structure, (2) reservoir landscape characteristics, (3) access roads and transmission lines, (4) views of reservoir from upland areas, and (5) views of potential construction-related impacts. Simulations will be completed for all seasons and under daylight and nighttime/darkness conditions. An estimated total of 30 visual simulations will be produced. All images will be available for other Project uses.

Analysis

The aesthetics analysis will focus on identifying potential changes to aesthetic resources that may result from the proposed Project. The analysis will include a disclosure of anticipated effects, and a description of new aesthetic attributes (i.e., access; viewer experience). The analysis will address the following indicators of change:

- the mechanism of change in to aesthetic resources, measured by the degree of visual contrast in form, line, color, and texture created by construction and operation of the proposed Project;

- change in existing scenic quality, visual sensitivity, and distance zones within the Aesthetic Resources Study Area due to construction and operation of the proposed Project – change may result from inundation of the river channel, operation of the reservoir, introduction of new access roads and transmission lines (informed by siting and design), and/or alteration of downstream flow regime (including potential effects to geomorphology, ice processes, water quality, riparian vegetation, river flow regime, and access/recreation);

- change in viewshed *of* and *from* the Susitna River due to inundation of the river channel and creation of the reservoir;

- change in access to views, due to the presence of the reservoir, access roads, and transmission corridor(s), and potentially improved navigability through Devils Canyon;

- change in mechanism of view (i.e., transition from mobile view traveling downriver, to static view when situated on the reservoir);

- change in visibility that may result from Project-related dust; and

- effect on dark sky due to light and glare.

Methodology used to address each indicator is described below:

- *Contrast Rating Analysis* - The BLM Contrast Rating procedure will be used to determine visual contrast that may result from the construction and operation of the Project using photo simulations depicting Project features. This method assumes that the extent to which the proposed Project affects visual resources is a function of the visual contrast between the proposed Project and the existing landscape character. Impact determinations will be based on the identified level of contrast and are not a measure of the overall attractiveness of the Project (BLM 1986). At each analysis location, Project features will be evaluated using photo simulations and described using the same basic

elements of form, line, color, and texture used during the baseline evaluation. The level of perceived contrast between the proposed Project and the existing landscape will be classified using the following definitions:

- None: The element contrast is not visible or perceived.
- Weak: The element contrast can be seen but does not attract attention.
- Moderate: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Strong: The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

The level of contrast will be assessed for all Project components used during construction, operations and maintenance, and decommissioning of the proposed Project.

- *Visual Resource Inventory Analysis*: The VRI analysis will be used to identify expected change to scenic quality, visual sensitivity, and/or distance zones that may result from operation of the proposed Project. Impacts will be evaluated by ranking each factor used to classify scenic quality, visual sensitivity, and distance zones under operational conditions, and comparing those values to baseline conditions.
- *Light and Glare:* The impact analysis for light and glare will focus on potential change that may result from nighttime artificial lighting and/or daytime glare. The analysis of artificial lighting will identify sources, intensity and spatial extent of anticipated impacts. Photo simulations will be produced to demonstrate views of the proposed Project under dark conditions from select analysis locations.
- *Change in Viewshed Area and Mechanism of View:* Viewshed analysis performed for both pre- and post-Project conditions will be compared to identify the changes in viewshed and mechanism of view. These data will quantify the extent of changes in views, and the degree to which access to views changes with the development of roads and the elevation of the viewer within the inundated portions of the reservoir.
- *Change in Visibility:* Data generated by the Air Quality Resource discipline will be used to determine the potential for changes in visibility that may result from construction and/or operation of the proposed Project and related recreation resource values. Should it be determined that changes in air quality would be detectable, additional visibility analyses will be performed.

Soundscape Analysis

A systematic sound study will be conducted to characterize the existing ambient sound environment in the vicinity of the proposed Project and estimate the potential effect of Project construction and operational activities on that environment. The analysis will focus on:

- Quantifying existing soundscape data
- Determining consistency of existing soundscape with management objectives pertaining to sound (i.e., ROS data)
- Identifying anticipated changes in soundscape based on construction and operation phases of the Project (predictive sound emission modeling)
- Determining expected post-Project conformance with existing ROS designations

The analysis will include an assessment of Project-induced effects based on the assessment of future recreation use and demand and Project-related opportunities (Section 12.5.4).

The steps in the sound analysis are described below.

Review Documentation and Develop Data Needs

Relevant Project data will be reviewed, including the most current Project description, operating and construction equipment inventories, and construction schedules. Existing ambient sound data recorded within the secondary study area will be obtained. Based upon this review, itemized data requirements will be developed that will be needed to perform predictive sound emission modeling. A seasonal set of outdoor ambient sound level surveys in the vicinity of the Project Area will be obtained (one survey for each of the four seasons will be collected). The data requirements will include anticipated categories of stationary and mobile construction equipment and their frequency of operation, locations of nearest representative noise-sensitive receivers (NSR), recreation sites (RS), and sound data or specifications associated with intended operating dam systems and processes. Laws, ordinances, regulations, and standards that may influence the sound impact assessment for this study will also be inventoried.

Seasonal Surveys of Ambient Sound Levels

Ambient sound level measurements will be collected in the Aesthetic Resources Study Area, with the goal of establishing baseline soundscape data. Analysis locations will coincide with KOPs identified for the visual resource assessment, including both viewer [receptor]-based (OPs, OAs, and OCs), and landscape-based (LCPs). Landscape-based sound measurements will be used to understand current and future conformance with ROS designations. Based on input from the wildlife resource study, additional sound monitoring locations may be added to areas with documented wildlife concentration. Sound measurements will include unattended long-term ([LT]", a minimum of 24 continuous hours, up to a single week) sound level monitoring at up to a total of four representative NSR or RS locations, and up to a total of 16 attended short-term ([ST], e.g., 15-20 minutes duration each) daytime and nighttime sound measurements to help characterize the affected environment. Observations of perceived and identifiable sources of sound contributing to the ambient sound environment and the conditions during which they occur will be documented as part of the field survey. This survey will be conducted four times, associated with each of the four distinct seasons (e.g., summer, fall, winter, spring). To the extent practicable, the survey locations will be the same for each surveyed season.

Modeling of Project Sound Levels.

Up to three scenarios or alternatives of future Project operational sound levels will be estimated with System for the Prediction of Acoustic Detectability (SPreAD) (Reed 2010). Computer Aided Noise Abatement (CADNA/A), an industry-accepted outdoor sound propagation modeling program, could also be used (Sound Advice Acoustics Ltd, 2012). Predicted sound level isopleths or "sound contours" will be superimposed on suitable aerial photographs or maps of the Project vicinity and will include specific sound level prediction at selected measurement and/or assessment locations from the ambient sound field surveys of Task 2. Predicted sound emissions associated with both Project construction and operation using different transportation route options will also be assessed.

GIS Maps and Figures

Viewsheds, analysis locations, and soundscapes will be mapped using GIS following Project geospatial standards. Mapping will also identify relevant management standards within the study area. Significant visual features will be photographed for inclusion in the Aesthetic Resources Report. Visual simulations depicting the appearance of the proposed Project will be produced for a subset of KOPs, and used to inform the impact analysis.

12.6.5. Consistency with Generally Accepted Scientific Practice

The methods and work efforts outlined in this Study Plan are the same or consistent with analyses used by applicants and licensees and relied upon by FERC in other hydroelectric licensing proceedings. The visual resource studies are based on the BLM's visual resources methodology. The sound analysis is consistent with NPS Guidelines.

12.6.6. Schedule

Upon implementation, the term of the Aesthetic Resources Study will be two years. In 2014 and 2015, licensing participants will have opportunities to review and comment on the study reports (Initial Study Report in early 2014 and Updated Study Report in early 2015). Updates on the study progress will be provided during Technical Workgroup meetings which will be held quarterly in 2013 and 2014 (See Table 12.6-1).

12.6.7. Relationship with Other Studies

Interdisciplinary coordination will be an essential component of the Aesthetic Resources Study and will result in efficient collection and analyses of data common between studies for the Project. Coordination will occur with other Project studies focused on recreation, cultural resources, subsistence, socioeconomics and transportation, geomorphology, ice processes, water quality, and riparian vegetation. Data collected by other studies will inform the approach to and eventual development of an Aesthetics Resources Report by identifying locations of common, sensitive, or valued aesthetic resources and/or areas where potential changes to biophysical processes could impact scenery attributes within the primary study area. The Initial Study Report in early 2014 will include any proposed modifications to the study plan based on the first year of data collected on the lower river uses, hydrology, and ice processes.

Coordination with Recreation Resources (Section 12.5) (including Recreation River Flow and Access [Section 12.7]) will include identification of recreational use areas, including areas of targeted use (i.e., trails, river/stream corridors, access points, State Parks) and areas of dispersed use. Analysis locations will be established in these areas to quantify aesthetic experience, including both scenery attributes and soundscape. Data pertaining to recreation use and demand, experiential preferences, and place-base value obtained from household and intercept surveys will inform the visual sensitivity analysis. Because of the integration between Aesthetics Resources and Recreation, it is expected that data will be shared in an ongoing manner (i.e., Q1 2013- Q4 2013).

Coordination with Cultural Resources (Section 13.0) will include identification of eligible or identified TCPs within the primary study area and establish analysis locations through collaboration with cultural resource study leads. It is expected that data will be shared in an ongoing manner throughout 2013-2014, recognizing restrictions applied to protect sensitive data.

Coordination with Subsistence Resources (Section 14.0) will focus on identifying areas within the primary study area that are used for subsistence purposes, or to access other areas used for subsistence to establish analysis location for both scenery attributes and soundscape. Additional coordination with subsistence resource study leads will identify questions pertaining to visual sensitivity and place-based value to be added to both household surveys and traditional and local knowledge interviews (Q3 2013- Q1 2014).

Input from the Socioeconomics and Transportation (Section 15.6 and 15.7) studies will include data on recreation and subsistence use values, quality of life, community use patterns, non-use environmental values, and social conditions of the area to inform the visual sensitivity level analysis. Socioeconomics data is expected to be available in Q1 2014. Data obtained from the Transportation Resources Study (Section 15.7) will be evaluated to understand anticipated changes related to transportation demands that could affect aesthetic resources (Q3 2013– Q1 2014).

Coordination with Riparian Instream Flow Study (Section 8.6) will be used to understand potential changes in riparian vegetation that would result in detectable changes in scenic attributes of the river corridor. Riparian instream flow data is expected Q4 2014, and will be used to refine the aesthetics resources impact analysis.

Coordination with Water Quality (Section 5.0) will focus on identifying expected changes in water quality parameters that would be detectable to viewers situated on or near the river (3Q 2014).

Coordination with Water Quality (Section 5.0) will focus on identifying expected changes in water quality parameters that would be detectable to viewers situated on or near the river. Water quality data is expected to be available Q3 2014.

Input from the Geomorphology Study (Section 6.5) will include determination of whether the geomorphic response to Project operations will result in detectable changes in downstream scenery attributes (Q1 2013 – Q4 2014).

Coordination with Hydrology-Related Resources (Section 7.0) will be used to understand hydrologic conditions that may affect scenic attributes and soundscape. A major focus will be on reviewing results of the Ice Processes in the Susitna River Study (Section 7.6) to better understand expected changes in the type, distribution, and seasonality of ice cover on the Susitna River, downriver of the proposed dam (Q4 2013).

Anticipated coordination actions and outcomes are graphically depicted in Figure 12.6-2.

12.6.8. Level of Effort and Cost

The estimated cost of the Aesthetics Resources Study is $835,000.

12.6.9. Literature Cited

Alaska Energy Authority (AEA). 2011b. Pre-application Document: Susitna-Watana Hydroelectric Project FERC Project No. 14241. Prepared for the Federal Energy Regulatory Commission, Washington, DC.

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12.6.10. Tables

Table 12.6-1. Preliminary Recommendations for Analysis Locations.

	Analysis Goal	Locations Being Considered	Outcome
Mid Susitna River Valley	Evaluate potential impacts of transmission and access routes to aesthetic resources of the Mid Susitna River Valley.	Include upland and river-based Analysis Locations, including: • Susitna River, view downriver from perspective of a boater • Susitna River, view upriver from perspective of a boater (jetboat) • View from rail line • Upland, from perspective of existing trails • Upland, from dispersed recreation and/or subsistence use areas • Aerial views, from common flight path used for flightseeing	• Understand landscape absorption • Identify changes in scenic quality due to introduction of cultural modification • Where possible, inform engineering team to consider potential design options
	Evaluate new access to views of both the Susitna River Basin, and the surrounding areas that may be created from access routes and transmission corridors Evaluate each proposed route to determine where new views to focal or large-scale panoramic views would be accessible. Use viewshed modeling to support the selection of analysis locations	• Select locations on and adjacent to proposed access routes and transmission line corridors	• Identify areas where increased access to focal or panoramic views may increase exposure to certain viewsheds • Identify areas where access to noteworthy natural features may change • Use information to inform understanding of post-Project visual sensitivity
	Evaluate the change in appearance of downstream river attributes as a result of the proposed Project.	• View downriver, from perspective of a boater. Identify islands and/or riparian areas influenced by hydrologic regimes (i.e. multi-aged stands / varied vegetation communities) • View from existing winter trail toward ice bridge (note that this analysis will be coordinated to the outcome of the ice processes study) • View from upland trail, and/or dispersed recreation / subsistence use area • At transect locations for ice	• Define anticipated changes to riparian vegetation and related perceivable potential indirect impacts to aesthetic resources (i.e., increased enclosure, potentially decreased heterogeneity/contrast across vegetation communities) • Characterize existing scenic quality attributes of ice bridges, with a focus on

	Analysis Goal	Locations Being Considered	Outcome
		processes/geomorphology/riparian vegetation studies	those areas where ice bridge formation has been recorded across multiple years; evaluate anticipated change in these attributes (spatially and/or temporally) based on input from ice processes work • Define anticipated change in landscape character of the Valley
		• View of river valley from upland area, i.e., locations with existing view of the Mid Susitna River Basin (i.e., Denali State Park; rail line; trails)	• If determined to be detectable by the study, define anticipated changes to character of the river that may result from operation of the Project • Demonstrate differences in ability to detect change as a function of distance from the Project
Devils Canyon	Evaluate the change in the appearance, if any, of riverflow within Devils Canyon as a result of the proposed Project	• View downriver from perspective of a low flying aircraft	• Define anticipated change to aesthetic attributes based on possible change in flow regime
		• View upriver from perspective of a jet boat operator (base of DC)	• Define anticipated change to aesthetic attributes based on change in flow regime
	Evaluate potential impacts of transmission and access routes to aesthetic resources of Devils Canyon	• View from river canyon, south toward corridor (visibility questionable)	• Define impacts to scenic quality attributes of Devils Canyon that may result from access roads and transmission lines
	Evaluate new access to views of Devils Canyon due to access roads and transmission corridors	• If determined that views would be accessible, select locations on and adjacent to proposed access routes	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors
Susitna River / Vee (River) Canyon	Evaluate change in mechanism of view(s) within the inundation zone	• View upriver / downriver from within Susitna River corridor (existing)	• Disclose anticipated changes in viewer experience due to formation of the reservoir
	Evaluate change in landscape features (landform, vegetation, waterform, cultural modification)	• View upriver / downriver from within Susitna River corridor (existing), with analysis location established at height of reservoir	• Identify change in scenic quality attributes of landform, vegetation, waterform, cultural modification

	Analysis Goal	Locations Being Considered	Outcome
	Evaluate change in *views of* the existing river corridor (waterform) following inundation and formation of the reservoir	• Views of the river from existing access trails, and upland areas used for dispersed recreation and/or subsistence	• Identify changes in scenic quality attributes and associated scores based on introduction of prominent water feature in viewshed
Susitna Upland Wet Tundra Basin	Evaluate change in *views of* the existing river corridor (waterform) following inundation and formation of the reservoir	• Views of the river from existing access trails, and upland areas used for dispersed recreation and/or subsistence	• Identify changes in scenic quality attributes and associated scores based on introduction of prominent water feature in viewshed
Portage Lowlands	Evaluate change in seasonal attributes of river downstream of the proposed dam site as a result of varied flow regimes	• Views from existing trail; views from mouth of creek	• Identify change in scenic quality attributes of landform, vegetation, waterform, cultural modification. Consider focus on flow-based aesthetic qualities
	Evaluate potential impacts to landscape character that may result from access roads and/or transmission lines	• Views from proposed access roads and transmission lines	• Identify changes in scenic quality attributes that may result from introduction of roads and transmission corridors. • Use information gleaned from analysis to inform engineering design and design options
	Evaluate new access to views of Portage Lowlands and Portage Creek due to access roads and transmission corridors.	• Select locations on and adjacent to proposed access routes and transmission line corridors.	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors
	Evaluate potential impacts to landscape character that may result from access roads and/or transmission lines	• Views from existing trails; dispersed recreation and/or subsistence use areas	• Identify changes in scenic quality attributes that may result from introduction of roads and transmission corridors. • Use information gleaned from analysis to inform engineering design options

	Analysis Goal	Locations Being Considered	Outcome
Chulitna Moist Tundra Uplands	Evaluate new access to views of Portage Lowlands and Portage Creek, Devils Canyon (noteworthy natural feature), Devils Creek Falls (noteworthy natural feature), the dam structure and reservoir due to access roads and transmission corridors.	• Views from proposed access roads and transmission corridors.	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors
	Evaluate potential impacts to landscape character that may result from access roads and/or transmission lines	• Views from existing trails; dispersed recreation and/or subsistence use areas • Views from Tsusena Butte / Lake • Views from Denali Highway, with emphasis on existing pull-outs/established vistas	• Identify changes in scenic quality attributes that may result from introduction of roads and transmission corridors. • Use information gleaned from analysis to inform engineering design options
Wet Upland Tundra	Evaluate new access to views of Deadman Creek, the dam structure and reservoir due to access roads and transmission corridors	• Views from proposed access roads and transmission corridors	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors
	Evaluate potential impacts to landscape character that may result from access roads and/or transmission lines	• Views from the Susitna River • Views from rail line • Views from Sherman interpretive signs • Views from existing trails; dispersed recreation and/or subsistence use areas	• Identify changes in scenic quality attributes that may result from introduction of roads and transmission corridors • Use information gleaned from analysis to inform engineering design options
Talkeetna Uplands	Evaluate new access to views of Devils Canyon, the Mid-Susitna River valley due to access roads and transmission corridors, including cumulative effects due to existing transmission corridor	• Views from proposed access roads and transmission corridors	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors
	Evaluate change in *views of* the existing river corridor (waterform) following inundation and formation of the reservoir	• Views of the river from existing access trails, and upland areas used for dispersed recreation and/or subsistence	• Identify changes in scenic quality attributes and associated scores based on introduction of prominent water feature in viewshed

	Analysis Goal	Locations Being Considered	Outcome
Talkeetna Mountains	Evaluate potential impacts to landscape character that may result from the dam structure, access roads and/or transmission lines	• Views from Fog Lakes • Views from Stephan Lake • Views from dispersed recreation and/or subsistence use areas	• Identify changes in scenic quality attributes that may result from introduction of roads and transmission corridors • Use information gleaned from analysis to inform design options to enhance aesthetic attributes of the project
Susitna Upland Terrace	Evaluate change in *views of* the existing river corridor (waterform) following inundation and formation of the reservoir	• Views of the river from existing access trails, and upland areas used for dispersed recreation and/or subsistence	• Identify changes in scenic quality attributes and associated scores based on introduction of prominent water feature in viewshed
	Evaluate new access to views of Devils Canyon, the dam structure, and the reservoir (including Watana Creek) due to access roads and transmission corridors, including any cumulative effects due to existing transmission corridor	• Views from proposed access roads and transmission corridors • Consider views of portions of the river located directly downriver of the dam where ice formation may change as a result of Project Operations	• Describe scenic quality attributes of views accessed by roads and/or transmission corridors • Demonstrate open water area below dam during winter
	Evaluate change in *views of* the existing river corridor (waterform) following inundation and formation of the reservoir	• Views of the river from existing access trails, and upland areas used for dispersed recreation and/or subsistence	Identify changes in scenic quality attributes and associated scores based on introduction of prominent water feature in viewshed (i.e., does this feature enhance or distract)
Susitna Upland	Evaluate impacts to landscape character when viewed from the air	• Views from common flightseeing routes.	• Identify changes in scenic quality attributes that may result from introduction of the reservoir, dam facility, roads and transmission corridors.
Air Tour Routes[1]	Evaluate change in scenic attributes of the river as a result of changes in flow volume	• Montana Creek Recreation Site	• Understanding of how specific metrics of scenic quality related to river flow could change as a result of operation of the Project

	Analysis Goal	Locations Being Considered	Outcome
Susitna River, downstream of Talkeetna	Evaluate potential changes to aesthetic attributes related to changes in ice processes and/or river flows; note that the extent to which these areas are evaluated will depend on the outcome of analysis of modeling completed relating to ice processes and river flows	• Montana Creek Recreation Site • Winter Trail(s) at Delta Islands • Iditarod NHT Winter Trail	• Identify potential changes to aesthetic attributes related to changes in ice processes and/or river flows, if any

Table 12.6-2. Aesthetic Resources Study Schedule.

Activity	2012				2013				2014				2015
	1 Q	2 Q	3 Q	4 Q	1 Q	2 Q	3 Q	4 Q	1 Q	2 Q	3 Q	4 Q	1 Q
Viewshed Modeling					—								
Baseline Data Collection (Aesthetics and Soundscape)						—	—	—		--------	-------		
Simulation Development / Sound Modeling						—	—	—		--------	-------		
Effects Analysis							—	—		--------	-------		
Initial Study Report							—	—	Δ				
Updated Study Report										—	—	—	▲

Legend:

— Planned Activity
Δ Initial Study Report (February 2014)
▲ Updated Study Report (February 2015)

12.6.11. Figures

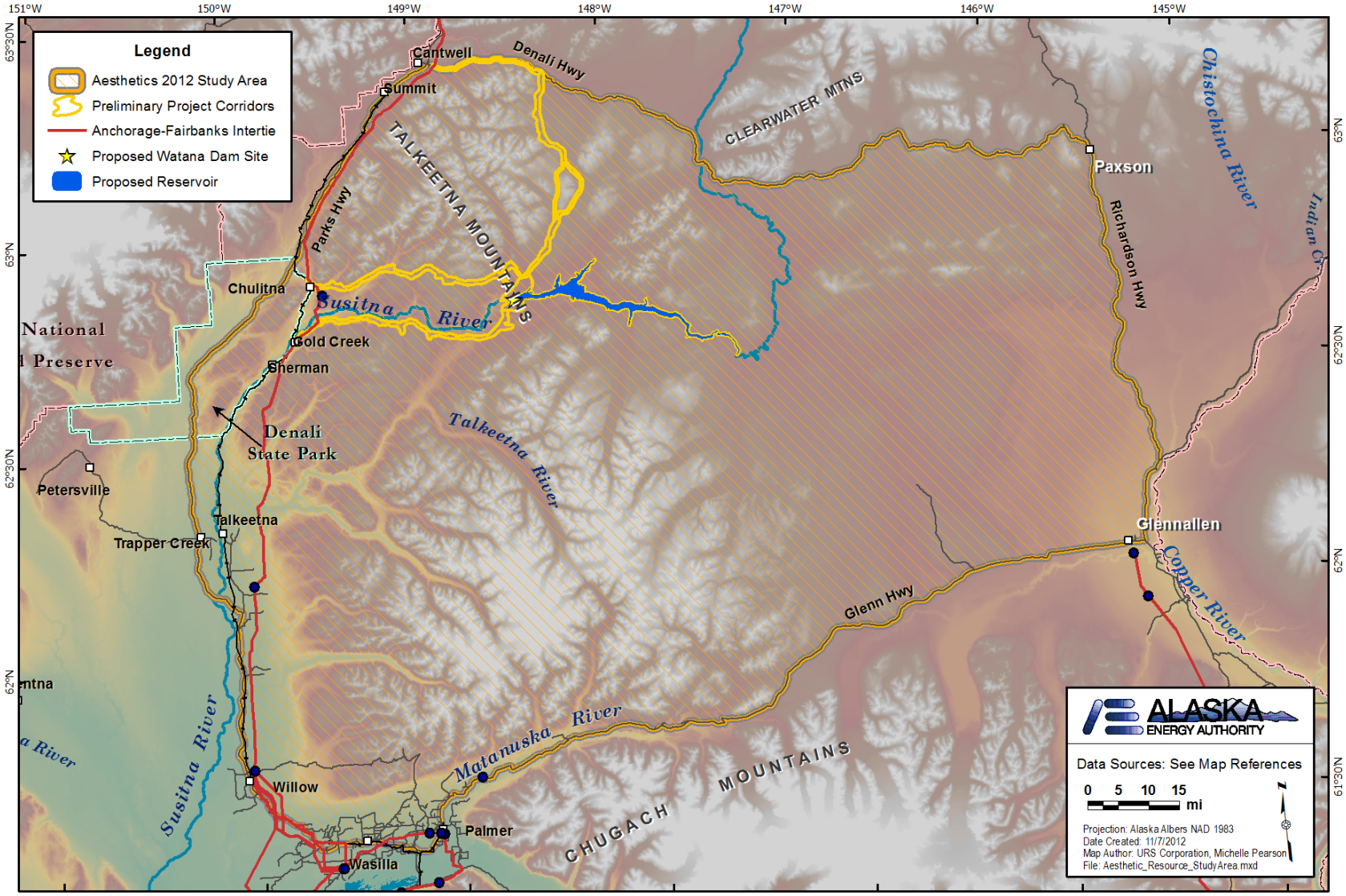

Figure 12.6-1 Aesthetic resources study area.

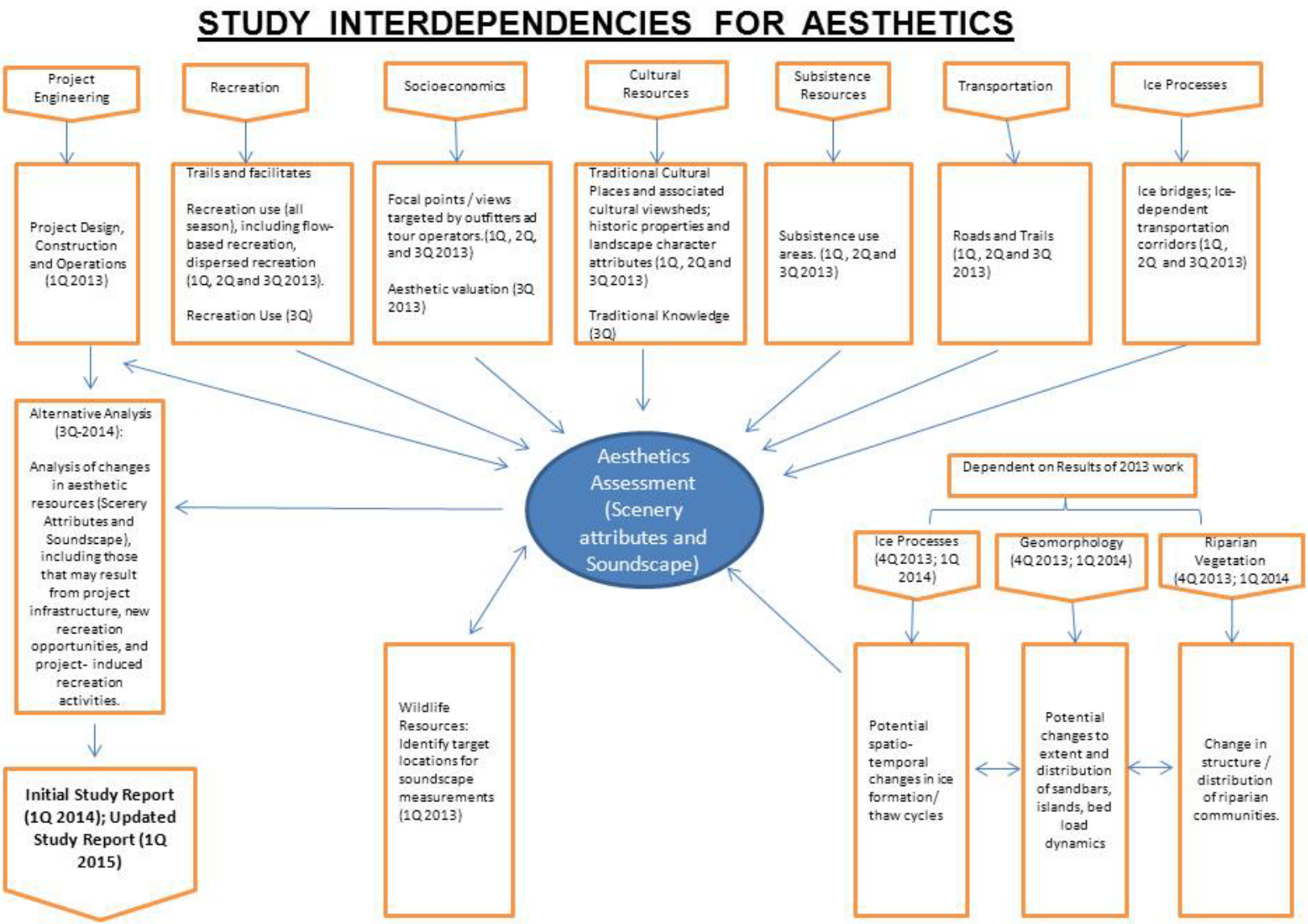

Figure 12.6-2 Study interdependencies for aesthetics.