

***Response to
Stage 1 Comments and Study Requests for
Relicensing of the
Cooper Lake Project (FERC No. 2170)***

Chugach Electric Association, Inc.

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Response to Stage I Comments and Study Requests for Relicensing of the Cooper Lake Project (FERC No. 2170)

1 INTRODUCTION

1.1 Background

Chugach Electric Association (Chugach) is in the process of relicensing its Cooper Lake Hydroelectric Project (Project) with the Federal Energy Regulatory Commission (FERC). The current license for the Project expires at the end of April 2007, and Chugach must file an application for a new license on or before April 30, 2005.

Chugach is using a traditional three-stage consultation process for the relicensing. As the first formal step in Stage 1 of the consultation process, Chugach issued the Initial Consultation Package (ICP) in early June 2002. A joint agency and public meeting was held in early July, within the timeframe specified by FERC following issuance of the ICP, to provide agencies and other relicensing participants with the opportunity to provide verbal comment on the ICP and to tour Project facilities. At this meeting, agencies indicated that further details regarding Chugach's anticipated relicensing studies would provide them with information to help in development of their Stage 1 comments and formal study requests in response to the ICP. Based on this input, Chugach issued its document titled "Preliminary Study Concepts and 2002 Data Collection Methods for Relicensing of the Cooper Lake Project (FERC No. 2170)" on August 13, 2002. The "Study Concepts" document provided conceptual information regarding planned relicensing studies, for comment by the agencies ahead of preparation of detailed study plans.

Written comments and study requests in response to the ICP (ICP comment letters) were submitted by relicensing participants in early September, following the 90-day comment period after issuance of the ICP. Chugach received written comments and study requests from the following agencies and organizations: USDA Forest Service, Chugach National Forest (USFS); U.S. Department of the Interior, Fish and Wildlife Service (USFWS); U.S. Department of Commerce, National Marine Fisheries Service (NMFS); U.S. Department of the Interior, National Park Service; State of Alaska, Department of Fish and Game, Habitat Restoration Division (ADFG); State of Alaska, Department of Natural Resources, Water Resources Section (ADNR); State of Alaska, Cooper Landing Fish and Game Advisory Committee; Kenai Peninsula Borough; Alaska State Council of Trout Unlimited and Alaska Fly Fishers; The Fish for Cooper Creek Coalition; and American Whitewater.

Following receipt of the ICP comment letters in early September, Chugach identified a planned suite of relicensing studies for 2003 to address the study requests in the ICP comment letters. Resource experts from HDR Alaska, Inc. (Chugach's lead contractor for the environmental studies for relicensing) have been preparing draft study plans for each of the studies that will be conducted in 2003. In conjunction with this effort, HDR study leads have been meeting with agency resource experts as needed to obtain further guidance on recommended study methodologies and incorporating this guidance into the draft study plans. Most of the draft study

plans for the environmental studies have been completed and are being issued along with this document for review by the relicensing participants.

In addition to the environmental study planning effort, Chugach and its engineering consultants from Montgomery Watson Harza (MWH) have developed a program of engineering studies and analyses to address the study requests in the ICP comment letters and to provide critical background information that will also be used in the studies to evaluate potential effects of the Project on environmental resources. Some of the planned engineering work will be described in a draft study plan to be issued by early January 2003. Other engineering analyses and data compilation efforts have already been completed and are being provided in a Supplemental Information Packet in conjunction with issuance of this document.

1.2 Purpose and Structure of This Document

This “Stage 1 Response Document” is intended to outline Chugach’s responses to comments and study requests in the ICP comment letters. The document summarizes actions Chugach is taking or plans to take primarily in near term (late 2002 through 2003). As discussed in this document, studies planned for 2003 are focused on characterizing existing Project-area resources and evaluating potential impacts associated with ongoing and/or future Project operations, and it is these study efforts that are described in the draft study plans and summarized in this document. Chugach recognizes that additional studies may be needed in some cases to refine the impacts assessments based on the results of the 2003 studies, and that post-2003 analyses will be required to evaluate potential mitigation measures based on the impacts studies.

The document is structured by resource area. Response categories (as applicable) within each resource section are organized as follows (Note that not all of the response categories appear within the discussion of every resource area because for some resource areas, only one or two of the response categories apply):

1. Supplemental Information

This section describes responses to requests for information that Chugach has addressed by development of information to supplement the ICP. The Supplemental Information Packet includes further details regarding Project facilities, enhanced descriptions of Project operations, and information on Chugach’s practices to manage environmental risk at the Project.

2. Planned Studies

Relicensing studies that Chugach is planning to conduct to address the study requests in the ICP comment letters are identified in this section. Taken together, the list of these planned studies includes:

- Hydrology Study
- Reevaluation of the Probable Maximum Flood
- Cooper Creek Fish Resources Study
- Cooper Creek Fish Habitat Survey
- Cooper Creek Instream Flow Study
- Stream Flow and Water Quality Study

- Cooper Lake Fish Resources Study
- Preliminary Evaluation of Entrainment in Cooper Lake
- Cooper Lake Macroinvertebrates Study
- Porcupine Creek Fish Resources Study
- Evaluation of Effects of Project Discharge on Kenai River Fish Habitat
- Terrestrial Vegetation Study
- Sensitive and Exotic Plant Survey
- Cooper Lake and Cooper Creek Water Birds Study
- Terrestrial Wildlife Study
- Recreation and Visual Resources Study
- Cooper Creek Recreational Whitewater Potential, Preliminary Evaluation
- Cultural Resources Study
- Road and Access Route Condition Survey

3. *Issues Addressed by Preliminary Analysis*

Some of the study requests in the ICP comment letters have been addressed in this document through preliminary analysis sufficient to support a conclusion that there is no need to conduct a more intensive study as requested.

4. *Requests Not Addressed at This Time*

Study requests from the ICP comment letters that Chugach does not intend to address at this juncture fall into two categories:

- *Studies Not Timely*

This category of study or information requests generally includes requests for studies that Chugach believes would be premature before the results of 2003 impacts assessment studies are available; examples include requests for a more intensive level of impacts assessment than appears warranted for initial evaluation of an issue, or requests for detailed evaluation of mitigation alternatives yet to be identified.

- *Areas of Disagreement*

In a few cases, Chugach has a disagreement on principle regarding the need for a particular study that has been requested. These study requests and Chugach's rationale for declining to conduct the study are summarized in this section of the applicable resource area discussions.

1.3 Next Steps

With issuance of this Stage 1 Response Document, the Supplemental Information Packet, and many of the draft study plans, Chugach hopes that relicensing participants will have a solid basis for evaluating Chugach's planned relicensing study program that will facilitate discussions to finalize the study plans for the 2003 field season. A workshop with all relicensing participants to discuss the draft study plans and relicensing studies is scheduled for December 3, 2002; however, comments on draft study plans may be provided at any time within a 30-day review period following issuance of each draft study plan. Chugach will continue to complete remaining draft study plans, engage resource agency experts in further discussion as needed to

resolve study details, and incorporate changes as appropriate into final study plans for the 2003 field season. A second workshop will be held in spring 2003 to review final study plans and discuss schedule and other study details for the 2003 field season.

2 FACILITIES / OPERATIONS / ENGINEERING

2.1 Supplemental Information

Information that has been developed to supplement the ICP in response to requests in the ICP comment letters includes expanded descriptions of Project facilities, operations, and hydrology, as described below. The information is presented in the Supplemental Information Packet.

2.1.1 Description of the Project

Project Boundary Map. Chugach has recently developed a set of 12 Geographic Information System (GIS) based map sheets that show the location of the existing Project boundary described in the current FERC license for the Project. The boundary encompasses Cooper Lake Dam, Cooper Lake to an elevation of 1,220 feet above mean sea level (msl), the tunnel/penstock system, the Project powerhouse on Kenai Lake, the 6.3-mile-long transmission line from the powerhouse to the Quartz Creek Substation, the Quartz Creek Substation, and the 90-mile long transmission line from the Quartz Creek Substation to the Anchorage Substation.

Expanded Descriptions of Project Facilities. The Supplemental Information Packet provides requested information regarding hydraulic capacities of the facilities.

Clarification of Project Water Right. Among the requests in the ICP comment letters was a request to clarify information regarding the State of Alaska water right for the Project. Specifically, it was noted that the water appropriation of 90,600 acre-feet/year plus total outflow from Cooper Creek (which equals inflow to Cooper Lake) is less than the usable storage capacity of the reservoir. Chugach was asked to address whether it planned to apply for a change in the water right in conjunction with relicensing of the Project and the proposal to operate at a higher reservoir level than it has for the past several years. Chugach has no plans to change its water right and sees no need to do so. As explained in the Supplemental Information Packet, since the early 1960s (following initial testing of the spillway), the Project has used all annual inflow into Cooper Lake for power generation, in accordance with the water appropriation. In some years, Project water use has exceeded 90,600-acre feet/year. However, the average water use per year since Project construction is approximately 73,000 acre-feet per year, as determined by inflow to the reservoir. Regardless of what the reservoir storage capacity is, water use at the Project is limited by annual inflow to Cooper Lake, and historical operational data does not warrant that Project operations be curtailed to stay within the current water right.

Explanation for Difference Between Originally Licensed and Actual Dam Height. As noted in the ICP, Cooper Lake Dam was constructed 10 feet higher than specified in the original Project license (the discrepancy was corrected in the license amendment issued July 21, 1966). Based on a request in the ICP comment letters, the Supplemental Information Packet includes further history regarding construction of the dam to a height that was different than specified in the

original license. As explained in the Supplemental Information Packet, Chugach filed with the Federal Power Commission (FPC; predecessor to FERC) on June 18, 1962, revised exhibit drawings showing Project works as constructed, and on August 10, 1962, an application for amendment of the license to reflect the revised Project works. This information was supplemented by letter dated April 15, 1963, and by the required Initial Statement of actual legitimate original costs (FPC Form No. 6), filed February 29, 1964. As noted in the FPC's July 11, 1966, Order Further Amending License (Major) and Approving Project Exhibits, the licensee had advised, based on feasibility study results, that the additional head provided by the extra 10 feet of reservoir storage below the spillway would increase annual power output by 600,000 kilowatt-hours (kWh). Based on these records, it is presumed that Chugach constructed the dam 10 feet higher than the originally licensed 1,210 feet msl based on the results of its feasibility study. No further records have been found to further document the construction history and decision-making process related to dam construction.

Clarified Description of Potential Future Dam Modifications. The ICP comment letters included questions concerning the currently proposed dam modifications described in the ICP. As noted in the ICP, the Cooper Lake Dam spillway is currently not large enough to pass the PMF (which was estimated through a study conducted in 1984) if the starting reservoir level is at the licensed normal maximum elevation of 1,210 feet msl. Therefore, since the mid-1980s, to prevent a situation in which the dam could potentially be overtopped by flood flow (which would pose a significant risk of dam failure), Chugach has maintained the reservoir at a level of 1,194 feet msl or lower, even though the licensed normal maximum operating level of the reservoir is 1,210 feet msl. This reduced normal maximum operating level ensures that there is sufficient unused storage capacity in the reservoir to be able to capture routine floods as well as pass the theoretical PMF-size flood event without overtopping the dam. (It should be noted that a PMF is the estimated extreme rare flood event. Studies indicate that if a flood of this magnitude were to ever occur, the reservoir level if starting at the current maximum normal elevation of 1,194 feet msl would rise to 1,220 [top of dam], and would remain at that level for just under 24 hours before receding. Discharges through the dam spillway would be on the order of 14,000 to 15,000 cfs.)

While operating the reservoir at a lower level provides a safety factor in the event of a PMF, it also reduces hydraulic head and thus generation at the Project. Therefore, as explained in the Supplemental Information Packet, Chugach is currently proposing (pending further analysis) to lower the elevation of the spillway of the dam from its current level at 1,210 feet msl to 1,206 feet msl. This modification will enlarge the spillway enough to allow it to safely pass the probable maximum flood (PMF) from a starting reservoir elevation of 1,206 feet msl (which would be the new spillway level) without overtopping the dam. As a further precaution, a 4-foot-high parapet wall will be added to the top of the dam to prevent overtopping of the dam by wave run-up during a PMF event. With these modifications, the reservoir would be able to be safely operated up to a normal maximum operating elevation of 1,206 feet msl as provided for in the license, rather than the currently reduced normal maximum operating level of 1,194 feet msl.

Chugach currently envisions that these structural modifications of the dam and spillway (if they prove feasible) will be proposed in the application for a new license for the Project, and if approved by FERC, the modifications would be made soon after issuance of the new license. It

should be noted, however, that as part of its relicensing study program, Chugach intends to reevaluate (using up-to-date methods and assumptions) the PMF study and engineering evaluation on which these proposed modifications were designed, to make sure that any proposal included in the license application is fully supported by current engineering information. As part of this study effort, detailed reservoir operations modeling, and cost and economic studies will be conducted to analyze the merits of the dam/spillway modifications. Chugach anticipates that the new PMF analysis and engineering/economic evaluation will be completed by late 2003. Based on these results, the proposal for modifications to the dam/spillway will be confirmed or revised at that time as appropriate.

2.1.2 Description of Reservoir Fluctuation Levels

Information requests in the ICP comment letters included requests to clarify the description of the current licensed maximum normal reservoir elevation and the maximum normal elevation that would exist with the currently proposed dam/spillway modifications. Information was also requested to better describe existing and proposed reservoir operations. In addition to the general explanation provided in the preceding paragraphs, an expanded description of existing and proposed reservoir operations — including summaries of historical operations representative of different water year types (i.e., “normal,” “wet,” and “dry”) — are included in the Supplemental Information Packet.

2.1.3 Hydrology / Inflows / Discharge

The ICP comment letters included a number of requests for information regarding hydrology of Project-related water bodies and operations. Much of the requested information will be developed through a comprehensive hydrology study, as described in the Planned Studies section, below. More readily available information is provided in the Supplemental Information Packet. This information includes:

- Description of inflow to Cooper Lake by water-year type.
- Summary of historical and current powerhouse discharge data for the past 18 years, in terms of mean annual flows, monthly flows, and monthly duration analyses.

2.1.4 Dispatch and Historical Project Generation

To address questions in the ICP comment letters regarding strategy for operating the Project — in terms of the determining factors for when the Project generates and how generation is dispatched — a general description of how Project generation is dispatched (including a summary of relevant historical data) has been developed and included in the Supplemental Information Packet. Also provided is a description of the operations model Chugach proposes to use to evaluate alternative Project operations.

2.1.5 Penstock Releases to Porcupine Creek

The potential effect on fish resources in Porcupine Creek from the periodic release of water during the draining of the Project penstock has been identified as a relicensing issue, as discussed in the ICP. As background information to address this issue, the following

operations/engineering-related information is included in the Supplemental Information Packet, expanding on the explanation provided in the ICP:

- Frequency of releases into Porcupine Creek
- Timing of releases
- Release rate (cfs)

A study of fish presence and habitat is proposed to evaluate potential future Project impacts on Porcupine Creek resources (see section 3.2.8, below).

2.1.6 Permitting and Mitigation Records

The ICP comment letters included requests for Chugach to provide a complete record of all permitting and mitigation activity for the Project since its inception. Such a compilation is not a relicensing requirement; however, Chugach maintains records for the Project dating back to original construction, and these records are available for public review in Chugach's public information library.

2.2 Planned Studies

2.2.1 Hydrology Study

As noted above, a comprehensive study of Project-related hydrology will be conducted as part of the relicensing studies program. To address the information requests in the ICP comment letters, the study will include the following proposed components:

- Comparative hydrologic analyses of Cooper Creek, Kenai Lake, and Cooper Lake under historic, current, and proposed Project operation flow regimes.
- Description of Cooper Creek streamflow hydrology (including characterization of the hydrology for different water-year types; description of the timing, magnitude, and duration of peak flows, high flows, and low flows; simulations of actual and natural flows for different operating scenarios).
- Evaluation of the effect of Cooper Lake current and proposed reservoir operations on lake freezing.

A draft study plan will be developed and issued to relicensing participants for review. Chugach anticipates that the draft study plan will be issued by early January 2003. The results of this study will be used in conjunction with information developed through the proposed field studies (as described in sections 3 through 6, below) to evaluate possible impacts of existing Project operations and potential alternative operations.

2.2.2 Reevaluation of the Probable Maximum Flood

As noted above in section 2.1.1, Chugach agrees that there is a need to reevaluate the ability of the Cooper Lake Dam spillway to pass the PMF. This evaluation will entail a new analysis to confirm the estimated PMF into Cooper Lake. In turn, the new PMF estimate will be used in the new engineering analysis of the currently proposed dam/spillway modifications. The results of the PMF analysis to be conducted for relicensing will also inform the safety inspection of the existing structure. Performance of the dam under flood conditions is evaluated regularly through 5-year safety inspections required by FERC. The next 5-year inspection is scheduled for 2003.

In addition to the engineering implications for dam safety and the potential structural modifications to Cooper Lake Dam, the results of the PMF reevaluation will also be used to assess the flood risk associated with flows into Cooper Creek. The study will calculate the outflow to Cooper Creek under specific conditions and assumptions as requested (i.e., at different flood magnitudes, at different starting elevations for the reservoir [including at the currently proposed maximum normal reservoir operating level of 1,206 feet msl], etc.). If the potential for uncontrolled spill under proposed Project operations appears significant, then a study to predict the effects on Cooper Creek related to potential uncontrolled spills would be completed.

2.3 Requests Not Addressed at This Time

Two general areas of the study/information requests in the ICP comment letters, facility designs and economics, will not be addressed through study efforts at this time because such efforts would be premature. However, Chugach fully anticipates that the requested information for analysis of potential mitigation alternatives — with the appropriate focus to be determined based on the results of impacts assessment — will be developed in time to be included in the final license application. The requests, and Chugach’s corresponding rationale for deferring the analyses until further information is developed on Project impacts, are summarized below.

2.3.1 Engineering Designs

Specific requests were made for Chugach to develop conceptual and functional engineering designs and plans for potential dam modifications or facilities at the Project, such as facilities to provide instream flows to Cooper Creek and to provide fish passage around Project structures. Engineering designs for any dam modifications or facilities to accomplish mitigation measures (if determined needed based on impacts studies) will be developed later in the pre-filing phase of relicensing and will be included in the final license application. In addition, description of potential engineering-related measures will be included on at least a conceptual level in the draft application, to the extent that the information has been developed. As requested, Chugach will provide all engineering designs for consideration by relicensing participants as early in the consultation process as practicable.

2.3.2 Natural Resource Economics

Study requests related to natural resource economics included requests to quantify the potential economic and social benefit of restoring/enhancing Cooper Creek flows, and to compare such benefits to the economic benefit to consumers of the power produced by the Project. Chugach will determine, in consultation with the relicensing participants and based on the results of the 2003 resource/engineering studies, how best to address these study requests.

2.3.3 Value of Project

A study was requested to evaluate the need for the power from the Project and options to replace some or all of the power from the Project. Chugach agrees to conduct an analysis of the engineering/economic factors and tradeoffs associated with various potential mitigation

measures, as those measures become defined based on the results of the 2003 resource impacts studies. Economic analysis of specific scenarios, including Project decommissioning, is not appropriate at this time.

3 FISH / AQUATIC RESOURCES

The ICP comment letters included numerous requests for information and studies on fish and aquatic resources in Project-related waters. Chugach plans to address most of the requests through either supplemental information provided in the near-term or studies to be conducted beginning in 2003. Other requested studies are considered by Chugach to be unnecessary based on preliminary analysis, as described in section 3.3, below. A few of the study requests will not be addressed at this time, either because the analysis would be premature, or because Chugach fundamentally disagrees with the need for the study or the requested approach; Chugach's rationale for its position regarding each of these study requests is summarized in section 3.4.

3.1 Supplemental Information

Among the requests in the ICP comment letters was a request to evaluate the adequacy of current facilities and operations to prevent the release of contaminants from Project facilities into the environment; a specific area of concern noted was with regard to water quality. Chugach believes it already has in place measures that minimize the risk of release of contaminants to the environment. For example, as explained in further detail in the Supplemental Information Packet, Chugach has completed a significant effort to ensure that future potential risk specifically from polychlorinated biphenyls (PCB) contamination has been minimized (also see description of documented study results in section 3.4.2). Chugach also maintains a Spill Prevention, Control, and Countermeasures Plan (SPCCP) for the Cooper Lake Project. The SPCCP pertains to all facilities and activities associated with the Project. State regulations require the SPCCP to be updated every five years. The next update to the SPCCP for the Project is currently underway and is expected to be completed by the end of December 2002. A summary of Chugach's procedures and practices for managing environmental risk is included in the Supplemental Information Packet.

3.2 Planned Studies

Fish and aquatic resource issues that will be addressed through studies to begin in 2003 are summarized below.

3.2.1 Cooper Creek Fish Resource Study

Chugach will conduct a study to develop additional information regarding the fish populations (i.e., species and use) of Cooper Creek for the purpose of characterizing existing conditions, possible effects of ongoing Project operations, and potential future effects associated with alternative flow regimes in the creek that may be considered during the course of the relicensing process. Specifically, the emphasis of this study is on the distribution of fish within various habitat types and stream segments. The fish resource study will be integrated with the Cooper Creek habitat description study, which is described in the following section. The draft study plan

for the Cooper Creek fish resource study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

3.2.2 Cooper Creek Fish Habitat Survey

In conjunction with the evaluation of existing Cooper Creek fish populations described above, Chugach will conduct a study to characterize existing fish habitat in Cooper Creek. A habitat mapping approach was developed and a survey of fish habitat using USFS protocol was conducted in September and October 2002 in consultation with the USFS and other interested resource agencies. Expert training on application of the USFS methodology was provided by the USFS in the field during the survey. In the ICP comment letters, agencies requested use of a more detailed survey level (Tier 4 of the USFS protocol) than was completed in the field at the recommendation of the USFS expert (Tier 2 and 3). However, development of the study approach is in progress through continuing discussions with agency biologists. If it seems warranted based on these continuing discussions, additional surveying on some stream segments may be conducted in 2003 to meet Tier 4 criteria. Additional habitat mapping, if conducted, would be done in conjunction with improved base-mapping of the stream channel, to be completed in 2003. The fish habitat characterization study will also include an analysis of fish passage barriers (based on the habitat survey). The draft study plan for this study will be issued for review by early December.

3.2.3 Cooper Creek Instream Flow Study

To address the need for information regarding Cooper Creek fish resources under existing and potential alternative flow regimes in the creek, Chugach plans to conduct an instream flow study in Cooper Creek. The study will include both hydraulic and temperature modeling components to allow prediction of fish habitat under alternative streamflow and temperature scenarios. In addition to modeling physical habitat with different flows, the hydraulic modeling conducted for this study will also be used to evaluate geomorphic aspects of Cooper Creek flows, such as flushing flows, channel maintenance flows, and bedload transport. The hydraulic modeling will be linked to water temperature modeling, to allow evaluation of possible Project effects on Cooper Creek and Kenai River temperatures and prediction of temperature regimes under alternative flow scenarios in Cooper Creek.

Chugach agrees with comments expressed in the ICP comment letters that further discussion with agencies is needed to clarify details of the Cooper Creek instream flow study plan, and is working with agencies to arrange a workshop in December to discuss instream flow study methodologies. After these discussions, a draft study plan will be completed and issued to relicensing participants for review. Chugach anticipates that the draft study plan for the Cooper Creek instream flow study will be issued by early January 2003.

3.2.4 Stream Flow and Water Quality Study

Chugach will conduct a study to collect streamflow and water quality data in areas affected by the Project. The purpose of the data collection for this study will be to describe current conditions in Cooper Creek and the upper Kenai River relative to stream flows and water quality, including temperature. The data collected at the monitoring stations used in this study will also

serve as input to models and calculations to predict conditions under various mitigation options that might alter the existing streamflow and temperature conditions (see description of the Cooper Creek instream flow study, above; also see description of the study to evaluate effects of Project discharge on Kenai River fish habitat, below).

In September and October 2002, as part of the preliminary work for this study (summarized in the draft study plan for this study), new instrumentation at the following monitoring sites was installed:

- Cooper Creek (below dam) – flow and temperature
- Stetson Creek (at mouth) – flow and temperature
- Cooper Creek canyon (near Stetson Creek) – air temperature
- Cooper Lake near dam – temperature in upper 15 meters of the lake

The following instrumentation will be installed as soon as possible, when high seasonal flows have receded:

- Kenai River at the outlet to Kenai Lake – temperature
- Kenai River above the confluence with Cooper Creek – temperature
- Kenai River below the confluence with Cooper Creek – temperature

Water samples also will be collected from the Cooper Creek monitoring stations for analysis of physical water quality parameters. In addition, water samples will be collected from the vicinity of the powerhouse outfall in Kenai Lake to address concerns regarding the potential for low dissolved oxygen or gas supersaturation due to the powerhouse discharge (see preliminary analysis of this issue in section 3.3.1, below).

Aside from temperature and streamflow monitoring throughout the study area, this study focuses efforts for collection of samples for analysis of chemical water quality constituents on Cooper Creek. Sampling proposed for Cooper Lake focuses on biological components — i.e., the benthic fauna in the reservoir fluctuation zone. Given that quantitative water quality data for Cooper Lake have been obtained (primarily by ADFG) on previous occasions (as summarized in section IV.C.2.b of the ICP) and the fact that no water quality issues or impacts have been identified in Cooper Lake aside from the possible Project effect on benthic fauna, Chugach does not anticipate the need to obtain further general limnological data from Cooper Lake as part of the relicensing studies. Similarly, while Chugach has collected local water samples in Kenai Lake to address concerns regarding the potential for low dissolved oxygen or gas supersaturation due to the powerhouse discharge, Chugach does not anticipate the need to collect general water quality information from Kenai Lake, because no other Project-related water quality issues or concerns have been identified to date.

The draft study plan for the stream flow and water quality study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

3.2.5 Cooper Lake Fish Resource Study

The Cooper Lake fish resource study will evaluate fish presence, abundance, and distribution in Cooper Lake and evaluate possible effects of reservoir operations on spawning. The focus of the

study is on rainbow trout and Arctic char, the principal fish species in the reservoir. The purpose of the study is to obtain additional baseline information, such as basic life history and population size of the rainbow trout and Arctic char populations; identify possible existing Project effects, such as possible impact due to fluctuating water levels; and gain insight into potential Project effects on those fish populations under potential alternative reservoir operation scenarios. The study will emphasize description of fish use of the shallow water areas within the reservoir fluctuation zone, while at the same time addressing the questions of population size and general life history. Reconnaissance observations and field efforts in 2002 conducted to inform development of the study plan for this study are summarized in the draft study plan, which is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

3.2.6 Preliminary Evaluation of Entrainment in Cooper Lake

The ICP comment letters included requests that Chugach conduct a study to determine the annual numbers and size distribution of Cooper Lake rainbow trout and Arctic char entrained into the Project tunnel/penstock. Requested study approaches included seasonal fish sampling and hydroacoustic/photographic monitoring at the intake. Chugach recognizes that the potential for fish to be entrained through the Project intake structure needs to be evaluated. However, as discussed in the August 13 Study Concepts document, Chugach continues to believe that a phased approach to this impact assessment is appropriate and prudent. Therefore, Chugach plans to conduct a preliminary analysis (involving review of existing information) to assess the risk of entrainment. The draft study plan for the preliminary evaluation of entrainment in Cooper Creek is in preparation and will be issued for review by early December.

Based on the conclusions of this preliminary analysis along with information gained regarding the current fish populations in Cooper Lake, Chugach, in consultation with appropriate agencies, will determine whether site-specific field studies and/or mitigation measures are warranted.

3.2.7 Cooper Lake Macroinvertebrates Study

Chugach will conduct a study to evaluate the possible current effects and potential future effects of Project operations on benthic macroinvertebrates that live in the littoral zone of Cooper Lake. Macroinvertebrates are a food source for both fish and water birds that use Cooper Lake and an indicator of overall ecological health of the aquatic environment. The goal of the macroinvertebrate study is to evaluate the effects of existing lake level fluctuations on macroinvertebrate populations and assess the potential effects of alternative reservoir operations.

The draft study plan for the Cooper Lake macroinvertebrates study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document. As described in the draft study plan for this study, the specific objectives of the study are to:

- identify taxa present in representative habitats in the littoral zone.
- describe relative population density of macroinvertebrates in representative habitats.
- describe changes in taxa and relative population density within each representative habitat as lake level fluctuates.

3.2.8 Porcupine Creek Fish Resources Study

As noted in section 2.1.5, above, Chugach will conduct a study to evaluate possible Project impacts to fish and aquatic habitat in Porcupine Creek. The study will include both hydrologic and fisheries aspects. Information on existing and proposed use of Porcupine Creek for penstock releases will be incorporated into the analysis. The hydrologic information that will be considered in the study consists of Project operations-related practices affecting flows into Porcupine Creek, as described in the Supplemental Information Packet. The fisheries study will comprise a reconnaissance-level evaluation followed by more detailed studies if warranted. Specifically, the study to be conducted in 2003 consists of a general reconnaissance-level investigation of fish presence within the various segments of the creek and a more detailed look at fish habitat and fish abundance/distribution in the half-mile below the first set of impassable falls. The draft study plan for the 2003 Porcupine Creek fish resources study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

An initial visual reconnaissance of portions of Porcupine Creek was conducted in September 2002, which provided study planning information regarding the existing stream channel, habitat, fish passage barriers, and fish presence. The results of the initial reconnaissance observations are summarized in the draft study plan.

3.2.9 Evaluation of Effects of Project Discharge on Kenai River Fish Habitat

Evaluation of possible effects of the Project discharge on salmon spawning success in the Kenai River will be undertaken through a study comprising extensive literature review of fish use of the river, stream temperature monitoring, and simplified hydraulic modeling (involving surveying transects to determine wetted perimeter of the channel at different flows). The study will also incorporate results from the hydrology study described in section 2.2.1, which will include modeling to describe Kenai River stage changes under historic, current, and proposed Project operations. Project-related temperature effects on the Kenai River also will be evaluated through the hydrology and water quality studies proposed for relicensing (see study descriptions in sections 2.2.1 and 3.2.4). The draft study plan for the evaluation of Project effects on Kenai River fish habitat is in preparation and will be issued for review by early December.

3.3 Issues Addressed by Preliminary Analysis

Chugach believes that some of the fish- and aquatics-related issues and study requests included in the ICP comment letters have been adequately addressed through preliminary analysis, without the need for a full technical study. These issues and the preliminary analysis to address them are summarized below.

3.3.1 Water Quality at Powerhouse Outfall

Among the requests for study of Project-related water quality were requests to evaluate water quality parameters (dissolved gases) at the powerhouse outfall. Chugach was requested to monitor dissolved oxygen at the powerhouse outfall and to determine whether nitrogen supersaturation occurs at the outfall, due to the powerhouse discharge. Nitrogen supersaturation is sometimes a problem in pressurized water systems or where a plunge pool is present and in

these situations can cause gas bubble disease in fish residing in the tailrace discharge water. Dissolved oxygen concentration of discharge water can be low relative to the receiving water if the water at the intake is low in dissolved oxygen or if processes occurring within the penstock reduce the oxygen concentration. Because of the design of the Project facilities and the quality of the Cooper Lake water, neither of these problems is likely to occur. Chugach feels that information described below on the physical characteristics of the Project facilities and conditions that lead to the water quality problems of concern — which will be supported by water sampling at the Project outfall this fall — demonstrate that the requested water quality monitoring program at the outfall is not needed.

With regard to nitrogen supersaturation, the generation water intake is always well below the surface of Cooper Lake, and there is no opportunity for air to enter the water within the power conduit until it reaches Kenai Lake. Continuous high water pressure to the turbines suggests that air leakage into the pipe somewhere in the system is unlikely; water would leak out rather than air entering. In addition, the powerhouse discharge does not plunge from a great height into a pool below, a situation that can cause air to be entrained, leading to gas supersaturation. Without a source of air entrainment it is not possible for nitrogen concentrations to increase beyond the ambient levels at the intake. Nevertheless, water samples will be collected from the outfall area this fall and examined for gas supersaturation downstream from the turbines to confirm the above conclusion.

Regarding the concern for potentially low dissolved oxygen conditions at the outfall, results from previous limnological studies in Cooper Lake suggest that oxygen concentrations are relatively high at all depths in the reservoir year round (see the ICP, section IV.C.2.b, for a summary of ADFG limnological data). Oxygen depletion within the penstock is unlikely because of the low oxygen demand and short residence time. Therefore, there is no reason to believe that oxygen in the tailrace discharge water will be significantly lower than the receiving water. Water samples will be obtained from the outfall area this fall and analyzed to determine dissolved oxygen concentrations.

3.3.2. False Attraction

The ICP comment letters also included a study request to quantify seasonal adult holding and juvenile rearing fish abundance and distribution in the vicinity of the Project outfall to determine whether fish populations have been or are being affected by “false attraction” to the tailrace resulting in migration delay or aborted spawning. It is possible that some anadromous fish seeking Cooper Creek were initially confused by the altered water chemistry of the Creek in the early years of Project operation. Some of these fish may have entered Kenai Lake and become attracted to Cooper Lake water exiting the tailrace. Studies of tailrace attraction may have been appropriate during the first five years of Project operation. However, more than 40 years have elapsed since then, encompassing 7–20 generations of salmon (depending on species). No conclusions would be possible regarding impacts of tailrace attraction after 40 years of operation. Additionally, Chugach is not aware of any evidence suggesting that current use of the outfall area by fish is unusual. Gillnet studies completed for the PCB contamination analysis in Kenai Lake indicated that the numbers of lake trout in the outfall vicinity were similar to other areas of the lake (see Chugach’s “Final Report for the Sediment, Fish, and Food Web Sampling Project at the Cooper Lake Hydroelectric Project,” dated April 1, 2002).

3.3.3 Potential for Fish Injury at the Turbines

Another expressed concern relating to potential impacts from tailrace attraction is the potential for fish to swim upstream into the discharge piping and become injured by the turbines. This prospect is extremely unlikely for two reasons. The first is that the water velocities within the conduit leading to the turbine are greater than the swimming velocities of the fish present in Kenai Lake, which would make it impossible for fish to swim into the turbines after they begin to spin. The draft tube immediately below the turbine is less than 3 ft in diameter, yielding a calculated velocity of about 30 ft/sec. The strongest swimming salmon are capable of burst speeds of just over 20 ft/sec. The second reason fish would be extremely unlikely to contact the turbine blades is the configuration of the draft tubes. As shown in the facility drawing of the powerhouse included in section V of the ICP, the draft tubes form a 90-degree angle and become narrower as they extend vertically upward to the turbines. Therefore, even at times when the turbines are not operating, a fish would need to make a concerted effort to navigate upward in these tubes to reach the turbines.

3.4 Requests Not Addressed at This Time

Some of the study requests in the ICP comment letters will not be addressed by a study at this time, either because the study would not be timely or because Chugach fundamentally disagrees that there is a need to conduct the requested study in order to adequately determine Project impacts or to evaluate potential mitigation alternatives.

3.4.1 Studies Not Timely

The requested studies / information development that Chugach believes would be premature at this time, and Chugach's corresponding rationale for deferring the analyses until further information is developed on Project impacts, are summarized below.

Identification and Evaluation of Mitigation Measures. Several requests in the ICP comment letters related to identification and/or evaluation of mitigation measures. However, identification of appropriate and feasible mitigation measures will occur based on the results of environmental and engineering studies that will be conducted during 2003, and thus would be premature at this time. Mitigation proposals will be developed and evaluated for inclusion in the draft and final license applications.

Detailed Cooper Creek Stream Substrate Inventory. A study was requested that would inventory stream substrate size and substrate embeddedness in Cooper Creek to determine if fine-sediment deposition has occurred to a level that adversely affects spawning habitat. Substrate in Cooper Creek will be described as part of the stream transect data collection for the instream flow study. More detailed inventory (to determine embeddedness) might be conducted as a second level of analysis in identified spawning reaches if such inventories are determined to be warranted based on the initial substrate descriptions or other study results. However, Chugach does not believe there would be sufficient value in conducting these more detailed evaluations at this time; the suggested methodologies are very labor intensive, and in any event, it would be difficult to distinguish Project-related impacts from mining-related impacts.

Engineering Designs. As noted in section 2.3.1, above, engineering designs for any facilities to accomplish mitigation measures (e.g., an outlet structure at the dam to provide flows into Cooper Creek; or screening at the power intake) will be developed later, if warranted, in the pre-filing phase of relicensing and will be included in the final license application. Because identification of potential mitigation alternatives for detailed engineering analysis will be based largely on the results of Project impacts studies, it would be premature to begin the engineering designs for facilities at this stage. Designs of potential measures will be included on at least a conceptual level in the draft application, to the extent that information developed through studies allows, and Chugach will provide all engineering designs for consideration by relicensing participants as early in the consultation process as practicable.

Transmission Line, Road, and Access Route Impacts. Studies were requested to evaluate the possible effects of the Project transmission lines and Project-related roads and access routes on fish and wildlife habitat. Among the study components requested were sampling of the streams above and below the vehicle crossings to verify the presence or absence of fish; evaluations of the need for bridges or culverts at stream crossings to mitigate for fish passage, habitat, or water quality impacts; evaluation of the adequacy of existing culverts; and evaluation of the need for restrictions on use of the transmission line rights-of-way. As described for the road and access route condition survey (see section 7.1, below), Chugach agrees to conduct an assessment of possible impacts on stream systems due to vehicle use of Project-related roads and access routes. As requested, culverts along the Snug Harbor Road and the Cooper Lake Dam access roads will be inventoried and assessed for fish passage using standard approaches. In addition, preliminary assessment of the possible impacts on streams of vehicle use of the powerline access routes will be made in conjunction with the road and access route condition survey by inventorying and determining the status of access routes and stream crossings. However, the requested site-specific stream sampling to evaluate fish presence will be deferred until results from the stream crossing inventories are available and can be used to appropriately focus any further analysis that may be needed. The requested evaluation of the potential need for crossing structures, culvert improvement, and access restriction measures will also be deferred until the results from the road and access route condition survey are available and indicate the need for consideration of mitigation measures.

3.4.2 Areas of Disagreement

Paired or Surrogate Stream Analysis. In previous discussions as well as in the ICP comment letters, agencies have requested that stream systems similar to Cooper Creek be studied to allow a comparison of Cooper Creek habitats and fish resources with those of streams that have not been disturbed by hydroelectric development or other historical activity. Chugach continues to believe that conducting parallel studies (which would also involve intensive field efforts) in other area streams would not be appropriate or useful at this time. Chugach explained its rationale for this position in the August 13 Study Concepts Document. As noted in that document, from a FERC policy standpoint, the pre-project (much less, as in the case of the requested comparative analysis, pre-mining) condition is not the proper baseline for project impact studies. The 9th Circuit Court of Appeals has recently confirmed that licensees are not required to examine pre-project conditions when applying for a new license and that the existing environment is the appropriate baseline to use in a relicensing procedure (*American Rivers v. FERC* [9th Cir.

1999]). Moreover, characterizing habitat in “comparison” streams would not accomplish the objective of the relicensing study, which is to determine what types of habitat could be available under alternative conditions in Cooper Creek — given the existing features of this stream (including the fact that it has suffered significant mining impacts). Chugach also has significant reservations about the technical merits of the requested paired stream analysis approach, compared to a more rigorous hydraulic modeling of alternative conditions such as Chugach is planning to conduct for Cooper Creek. Specific technical concerns with the requested comparative stream analysis are as follows:

1. All streams are different. Productivity of fish resources is affected by a host of variables; consequently there would always be a question whether the selected surrogate stream(s) was actually comparable to Cooper Creek.
2. Cooper Creek consists of at least six logical stream segments, each of which is very different from the other in terms of channel type, gradient, flow, and potential fish habitats. A surrogate stream would, at best, only be comparable to a single segment. Approximately 70 percent of the length of Cooper Creek is within a canyon, which creates unique stream conditions.
3. Resources to conduct relicensing studies are not unlimited, and the requested studies would add significantly to the time and cost of the Cooper Creek assessment. Chugach feels that limited resources are best spent on detailed studies of Cooper Creek proper. Currently proposed studies involving habitat description and modeling of physical and biological conditions will provide adequate description of existing conditions and will provide the basis for predicting the effects of various potential operational changes.
4. One stated objective of the paired stream analysis is to provide an indication of what the fish habitat potential of Cooper Creek might be under various mitigation scenarios. This objective may be reasonable for some specific kinds of mitigation options. However, evaluation of the need for various kinds of mitigation measures will be based on the Project impacts analyses to be conducted in 2003; therefore, no specific mitigation measures have yet been proposed. If mitigation measures are proposed the success of which could be enhanced by observations of other streams, then studies focused specifically on the needs of the planned mitigation could be conducted.

In summary, Chugach is focusing its relicensing efforts on developing information that it believes would be most helpful in developing a vision of reasonably foreseeable future Project conditions. Chugach believes that its proposed rigorous field studies and modeling analysis of Cooper Creek physical habitat and fish use are the best approach to evaluating the potential effects of the Project on attaining future management objectives, rather than trying to determine what pre-Project (and certainly pre-mining) conditions would have been on Cooper Creek.

Comparative Studies of Littoral Habitat in Cooper Lake and Other Lakes. For reasons analogous to its arguments against conducting paired stream analysis, Chugach declines to conduct requested studies to compare littoral and riparian habitat in Cooper Creek and Cooper Lake with habitat around other rivers and lakes in the Kenai River basin. Among the specific requested studies of this nature were comparative study of littoral habitat in Cooper Lake and other (non-dammed) lakes. As with the requests for paired stream analysis, Chugach feels

strongly that conducting parallel studies (which would also involve intensive field efforts) in other area lakes is not warranted for the following reasons:

1. One of the main objectives of the Cooper Lake Project technical studies is to describe baseline conditions for relicensing. As noted above, baseline conditions have been determined by FERC to be current conditions that may be affected by ongoing or future project operations. Surveys of similar habitat(s) on undeveloped water bodies may help estimate a pre-project condition but would not address the relevant baseline.
2. There would always be some question about the true similarity of the lake selected for comparison. The physical characteristics of Cooper Lake would be difficult to duplicate.
3. Resources to conduct relicensing studies are not unlimited, and the requested studies would add significantly to the time and cost of the Cooper Lake impacts assessment. Chugach feels that limited resources are best spent on detailed studies of Cooper Lake proper. The planned technical study, involving rigorous sampling of macroinvertebrates in the Cooper Lake littoral zone keyed to reservoir-level changes and fish abundance and distribution in the reservoir, should provide the necessary information to evaluate effects of the current reservoir operations on the littoral habitat.
4. The only operational change currently proposed for Cooper Lake is an increase in the maximum normal reservoir elevation of Cooper Lake water surface. The planned analysis of the benthic macroinvertebrates in the existing fluctuation zone should allow an evaluation of the potential impacts of a change in the maximum normal reservoir level.
5. Study results will be evaluated to identify any further information needs to evaluate Project effects, and additional study efforts will be conducted if warranted.

Additional Historical Research. The ICP comment letters included a number of requests to conduct additional research to identify, compile, and evaluate pre-Project historical records and anecdotal reports of fish use on Cooper Creek, Cooper Lake, Kenai River, Kenai Lake, and Porcupine Creek. Chugach disagrees that there is a need to conduct further effort specifically to collect and summarize historical information on pre-Project resources. The semi-quantitative and anecdotal information included in the ICP is adequate to characterize the pre-Project environment, which in any event is not the baseline for relicensing impacts analysis. Other rigorous relicensing studies (e.g., the Cooper Creek instream flow study and other hydraulic analyses of Project-related waters) are planned to provide the predictive capability to evaluate conditions under potential future Project operations, such as potential alternative fish habitat that would be available under alternative flow/temperature regimes in Cooper Creek. The draft license application will describe present seasonal use and spawning distributions of resident and anadromous fish in Cooper Lake, based on existing information and the results of relicensing studies. Comparable historical information is not likely to exist; however, any additional historical records and anecdotal reports identified or brought to Chugach's attention during the course of the relicensing studies will be reviewed and summarized in the draft license application.

Further Analysis of PCBs in Kenai Lake. In their ICP comment letters, the USFWS and ADFG requested relicensing studies to more fully characterize the nature and extent of PCB contamination in Kenai Lake, as related to the construction and operation of the Project. The scope of the requested study included additional sediment sampling near the powerhouse, in

Kenai Lake sediments, and along the edge of Kenai Lake; additional soil sampling in areas where PCB-containing transformers were formerly located; additional sampling and analysis of Kenai Lake trout and sculpin; and an ecological risk assessment to determine the risk of PCB contamination to higher trophic level species of concern. Chugach will not conduct additional sampling related to the PCB contamination study that was conducted in conjunction with the 1999–2000 powerhouse upgrade. In a letter dated June 13, 2002, FERC stated that, based on its review of Chugach’s Kenai Lake PCB study final report, it had determined that Chugach was not required to conduct further PCB sampling and analysis in Kenai Lake pursuant to paragraph (A)(3) of the February 1, 2001, “Order Modifying Kenai Lake Sampling Plan.” This determination was based on the results and conclusions in the final report indicating that there were no unacceptable PCB-related risks to human health from potential consumption of fish or water in Kenai Lake. Apart from FERC’s finding, the PCB contamination issue was related to the powerhouse upgrade activities and past practices at the powerhouse, and therefore is not an ongoing Project effect that needs to be evaluated as part of the impacts assessment for relicensing. Putting aside the fact that it is unrelated to relicensing of the Project, Chugach’s detailed argument and supporting technical rationale for declining to conduct further study of PCBs at the Project follows.

PCBs have already been thoroughly and completely studied at the Project powerhouse and the adjacent Kenai Lake. The results of the previous PCB studies are summarized in Chugach’s April 1, 2002, Final Report for the Sediment Fish and Food Web Sampling Project at the Cooper Lake Hydroelectric Project, and Chugach’s February 27, 2001, Final Report on Polychlorinated Bi-Phenyl (PCB) Cleanup. These reports have been previously provided to FERC, the U.S. Environmental Protection Agency (EPA), USFWS and ADFG. Furthermore, USFWS and ADFG were both provided with drafts and an opportunity to comment on the work plans for the studies summarized in both reports. The comments of USFWS and ADFG on the work plans were fully and fairly considered and changes incorporated where appropriate before the studies were conducted. The EPA approved the work plan for the powerhouse cleanup by letter dated August 9, 2000, and FERC approved it by letter dated August 15, 2000. In its letter dated June 13, 2002, FERC stated as follows regarding the April 1, 2002, Final Report:

It was found that PCB concentrations in lake trout and sockeye salmon collected from Kenai Lake were well below the level established in the Clean Water Act National Toxics Rule as a human health risk. Further, lake water concentrations of PCBs were found to be well below the drinking water standards of the U.S. Environmental Protection Agency and the State of Alaska. Based on these analyses you conclude that consuming fish or water from Kenai Lake would pose no unacceptable health risks to humans or to the fish. You, therefore, propose no further PCB sampling and analysis.

Our review of your report and the data supports your conclusion, therefore, you are not required to conduct further PCB sampling and analysis in Kenai Lake pursuant to paragraph (A)(3) of the February 1, 2001 order.

In summary, additional study is not warranted given the full characterization of PCBs and risk analysis already conducted in the studies approved by EPA and/or FERC. To further document

this conclusion, the specific comments of USFWS and ADFG in their ICP comment letters (at pages 8–10 and 16–17, respectively) are addressed below.

- USFWS E1 and ADFG 1 and 2: “Conduct additional sediment sampling.” An independent consultant has already collected 265 samples from sediments in Kenai Lake in the vicinity of the Powerhouse. Contrary to the statement by USFWS, the outer boundary of the Arochlor 1254 in sediments was determined in the studies. The sampling results show localized low levels of PCBs in a roughly 32 acre area of Kenai Lake bounded by the shoreline and maximum water depth of 300 feet. While the sampling results show some variability (likely due to the heterogeneity of the sediment particles), all of the levels are very low (April 1, 2002, Final Report at ES-2). During the studies, the independent consultant tried to obtain sediments for sampling in the areas noted by USFWS (near the powerhouse and the edge of Kenai Lake in between the high-low water line). Sediments could not be obtained in this area because the powerhouse is located on solid bedrock. As the April 1, 2002, Report states:

The initial shoreline investigation encountered no fine sediments between the existing water level and the high water mark in the vicinity of the Plant. The shoreline to the east of the Plant is bedrock. In front of the Plant, and to the west the shoreline is armored with boulders. Gravel, cobble, and boulders form the substrate for several hundred meters past the armored area. No discernible layer of fine sediment could be located for collection on any of these substrates.

(Final Report at 12.) A soil (gravel) sample 100 feet down lake (north) of the powerhouse near the shoreline was non-detect for PCBs (February 27, 2001, Report to EPA, attachment D). In summary, extensive sediment testing for PCBs was conducted where sediments were located to be sampled (265 samples). Further sediment sampling is not warranted. Congener specific sampling is also not warranted given the low levels of PCBs detected.

- USFWS E2: “Conduct additional soil sampling.” Contrary to the statement by USFWS, no PCB-containing transformers have ever been present at the Project. Soils at the powerhouse have been thoroughly investigated by an independent consultant. Results of the soil testing are appended to the February 27, 2001, Report to EPA. No soil samples contained concentrations of PCBs over the Alaska Department of Environmental Conservation (ADEC) regulatory level of 1 ppm. Further soil sampling is not warranted.
- USFWS E3 and ADFG 3: “Collect additional samples of Kenai Lake lake trout to further evaluate fish exposures, PCB burdens, and the implications of these burdens on human and ecological health.” The April 1, 2002, Final Report demonstrated that the risk to people from eating fish from Kenai Lake is no different than from other lakes and rivers in the region. Further, the concentrations in the fish pose no potential ecological risk to the fish themselves (Final Report at ES-3). The similarities between PCB levels in fish in Kenai Lake and other lakes in the region indicates that source of the PCBs in lake trout is a broad regional source (such as atmospheric deposition or salmon returning from the Pacific Ocean), not Kenai Lake sediments. Therefore, no further lake trout sampling is warranted.

- USFWS E4 and ADFG 4: “Conduct a bioassay of sculpin.” Nine locations for collecting sculpin were included in the work plan for the April 1, 2002, Final Report. However, sculpin could not be found at five of the locations, including near the powerhouse. Of the 16 individual sculpin collected, 11 were collected at the Lower Kenai Lake location, indicating that the presence of sculpin is habitat specific. While sculpins could not be collected at all locations, data were collected on lake trout, sockeye salmon, benthic fauna, and zooplankton (April 1, 2002, Final Report at 20). Given the low levels of PCBs found in the sediments, it is highly unlikely that a bioassay using sculpins would show any impact from PCBs in the sediments. Therefore, a bioassay using sculpin is not warranted.
- USFWS E5: “Perform an ecological risk assessment to determine the risk of PCB contamination to higher trophic level species of concern.” The studies summarized in the April 1, 2002, Final Report evaluated ecological risk using lake trout, the highest trophic level predator in Kenai Lake (and showed no risk to the fish themselves). The Final Report documents that PCB concentrations in lake trout from Lake Clark and Lake Louis were equal to or higher than the PCB concentrations in the lake trout from Kenai Lake (Final Report at ES-3). Therefore, the potential risks to bears, eagles, and other predators eating fish from Kenai Lake is no higher than from other lakes in the region. Hence, further ecological risk assessment is not warranted.
- ADFG 5: “If fish cannot be captured for bioassay, install semipermeable membrane device (SPMD) in the outfall plume and at a control location to analyze for PCB contamination.” In conjunction with the ADEC, Chugach conducted four quarters of low-level monitoring for PCBs in its effluent from the powerhouse. All results from this testing indicated the samples were non-detect for PCBs at a detection level of 0.000104 mg/L (see April 24, 2002, letter from Chugach to ADEC). Based on these data, and the low levels of PCBs found in the sediments and fish, no further PCB testing of the powerhouse discharge is warranted.

4 TERRESTRIAL RESOURCES

Chugach is developing a set of study plans for terrestrial resource studies to address information needs related to potential Project effects on existing and future resources. As described below, the planned studies include a terrestrial vegetation study, a sensitive and exotic plant survey, a study of water birds at Cooper Lake and Cooper Creek, and a terrestrial wildlife study. These studies will encompass the necessary evaluations to satisfy the majority of the study requests that were made in the ICP comment letters. One area of study requests, involving comparative field studies of Project- and non-Project areas, will not be included in Chugach’s relicensing study plans for the reasons described below in section 4.2.

4.1 Planned Studies

4.1.1 Terrestrial Vegetation Study

Chugach will conduct a study to characterize vegetation and habitat and evaluate Project effects on these resources in the Project area, including around Cooper Lake and Cooper Creek, along

the Kenai River, and along the Project transmission lines and access routes. Elements of this study include the following:

- GIS mapping of existing vegetation and habitat (existing vegetation composition and structure).
- Evaluation of the potential benefits of inundation of existing woody vegetation prior to the currently proposed stage increase in Cooper Lake.
- Evaluation of possible impacts on habitat and wildlife due to reservoir-level fluctuations.
- Characterization of existing vegetation and habitat along the transmission line from Quartz Creek Substation to Anchorage using existing information, verified through ground-truthing.
- Evaluation of the effects on vegetation and habitat of Chugach's vegetation management practices along the transmission line right-of-way.

The draft study plan for the terrestrial vegetation study is in preparation and will be issued to relicensing participants for review by early December.

4.1.2 Sensitive and Exotic Plant Survey

Chugach will conduct a sensitive and exotic plants survey for use in the preparation of a biological evaluation, to include surveying for the presence of sensitive and exotic plant species in the following areas:

- Perimeter of Cooper Lake
- Riparian corridor of Cooper Creek
- Snug Harbor Road and Cooper Lake Dam Road
- Project transmission lines

The draft study plan for the sensitive and exotic plant survey is in preparation and will be issued to relicensing participants for review by early December.

4.1.3 Cooper Lake and Cooper Creek Water Birds Study

The planned water birds study will evaluate the current and potential future effects of Project-related reservoir-level fluctuations on water bird nesting, habitat, and use of Cooper Lake. The purpose of the water bird study is to determine the effects of water-level fluctuations on water bird nesting success and evaluate the potential impacts on nesting of alternative reservoir operations. The study is also intended to identify and assess water bird use (including harlequin duck use) of Cooper Creek. For the purposes of this study, water birds are defined as freshwater waterfowl (ducks, geese), water associated raptors (eagles), shorebirds (pipers and plovers), gulls, loons, and terns.

An initial data-collection and investigation effort was made during the 2002 field season. The intent of this effort was to identify species, determine species use of Cooper Lake, identify the approximate location of bird nests, determine egg laying and incubation timing, and observe the effect of water-level fluctuations on nest success. A summary of this data-collection effort is included in the draft study plan for this study, which is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

4.1.4 Terrestrial Wildlife Study

The overall goal of the terrestrial wildlife technical study is to evaluate the current and potential future effects of Project operations on terrestrial wildlife. The study will include field investigations to evaluate the potential effects of increasing the maximum normal water surface elevation of the reservoir. In addition, terrestrial wildlife use of Cooper Creek will be evaluated and the effects of potential modifications to the flow regime in the creek will be assessed. The information from this study will be used in conjunction with the proposed study of water birds for Cooper Lake and Cooper Creek. Terrestrial resources along the 6.3-mile-long transmission line from the powerhouse to the Quartz Creek Substation and the 90-mile-long Project transmission line from Quartz Creek Substation to Anchorage also will be characterized and assessed to document existing conditions and evaluate the potential ongoing effects on terrestrial wildlife from continued vegetation management along the transmission line right-of-way.

Proposed study efforts include the following:

- Conduct seasonal wildlife surveys in the study area.
- Assess the possible impacts of Project-related human disturbance on brown bears in the Project area. Comparison of bear populations and defense-of-life-and-property incidents (DLPs) for Cooper Creek and other Kenai River tributaries will be accomplished using existing information on file at ADFG.
- Evaluate possible effects of Project operations on wildlife along the Kenai River using existing information and the results of the hydrology and water quality studies.
- Investigate the ongoing effects of the transmission line on bald eagles and other raptors by reviewing appropriate agency records to identify migration pathways and evidence of history of collisions with the Project transmission line. (It should be noted that the Project transmission lines do not pose an electrocution risk to birds because the spacing between the individual wires is greater than the wing span of the birds; therefore, evaluation of electrocution risk is not a component of this study.)
- Conduct an aerial survey for bald eagle nests along the transmission line and around Cooper Lake and Cooper Creek.
- Describe brown bear use of the Project area (including the transmission line corridor) using tracking data from the Interagency Brown Bear Study Team work and information from ADFG on brown bear sightings in the Project area to supplement data collected during the field season.
- Evaluate the possible impacts of Project-related human disturbances on brown bears within the Project area by applying the habitat model currently being prepared by USFS.
- Investigate possible ongoing effects of the transmission line and right-of-way on wildlife, for example associated with use of access roads and routine vegetation management activities. (Evaluation of recreation use and impacts of public vehicle use on vegetation and wildlife will be conducted in conjunction with the recreation and visual resources study [see section 5.1.1, below].)

Initial-phase data collection conducted in 2002 included reconnaissance-level/incidental observations of terrestrial wildlife around Cooper Lake and Cooper Creek during the 2002 field season. In addition, an aerial survey was completed for large mammals in October 2002. This preliminary information was used to inform development of the terrestrial wildlife study plan.

The draft study plan for this study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

4.2 Requests Not Addressed at This Time

Among the studies requested in the ICP comment letters were surveys of wildlife and vegetation along the riparian zone of a creek(s) similar to Cooper Creek and around the lakeshore of a lake(s) similar to Cooper Lake but not developed or impacted, for comparison with similar surveys at the Project. For reasons analogous to its arguments against conducting paired stream analysis and comparative studies of littoral habitats, Chugach declines to conduct the requested studies to compare habitat and wildlife on Cooper Creek and Cooper Lake with habitat around other rivers and lakes in the Kenai River basin. Chugach's rationale for this position is as follows:

1. One of the main objectives of the Cooper Lake Project technical studies is to describe baseline conditions for relicensing. As noted above in section 3.4.2, baseline conditions have been determined by FERC to be current conditions that may be affected by ongoing or future project operations. Surveys of similar habitat(s) on undeveloped water bodies may help estimate a pre-project condition but would not address the relevant baseline.
2. There would always be some question about the true similarity of a stream or lake selected for comparison. For example, there are pre-Project and ongoing mining impacts to the Cooper Creek drainage area that would be difficult to duplicate.
3. The vegetation communities and habitats in question are not unique, and existing information on typical wildlife use of such habitats can be used if necessary.
4. Resources to conduct relicensing studies are not unlimited, and the requested studies would add significantly to the time and cost of the Cooper Lake and Cooper Creek impacts assessments. Chugach feels that limited resources are best spent on detailed studies of Cooper Lake and Cooper Creek proper. The planned field surveys should provide the necessary information to evaluate effects of the Project on terrestrial habitat and wildlife.
5. The only operational change currently proposed is an increase in the maximum normal elevation of Cooper Lake water surface. Surveys of the habitat and wildlife in the existing fluctuation zone should allow an evaluation of the potential impacts of a change in reservoir level.
6. Study results will be evaluated to identify any further information needs to evaluate Project effects, and additional study efforts will be conducted if warranted.

5 RECREATION / VISUAL RESOURCES

5.1 Planned Studies

Two relicensing studies are currently planned for evaluation of recreation and visual resources associated with the Project: (1) a recreation and visual resources study, including a user survey to obtain information regarding current and potential Project-area recreation use and visual resources, and (2) a preliminary assessment of the recreational whitewater potential in Cooper Creek. These studies address the primary study requests made in the ICP comment letters, although there are some differences in approach between Chugach's study plans and the

methodologies recommended in the study requests. Chugach's planned studies are described below.

5.1.1 Recreation and Visual Resources Study

The purpose of the visual and recreation resources user survey is to document the public's perception of present and future recreational use in the area and the perception of the public with regard to the effect of existing facilities and management practices on visual quality. The results of this study will provide input into an evaluation of possible Project effects on recreation use and visual quality and will be used to identify potential protection, mitigation, and enhancement measures to address identified effects.

The study area will include the area around Cooper Lake and Cooper Creek, the Snug Harbor Road, the Kenai River in the Project vicinity, and the Project transmission line corridor between the Quartz Creek Substation and Anchorage. The study will comprise most of the specific elements that were requested in the ICP comment letters, such as review of National Visitor Use Monitoring (NVUM) program data and Project-area recreation use data from the USFS and ADNR; on-site surveys of recreation users of the Project area conducted in summer, winter, and fall; analysis of existing and potential future Project-related effects on recreation opportunities and use in the area; field observations regarding current uses, activities, and patterns; a travel corridor survey accomplished through interviews conducted at specific points along the travel corridor; and literature review to evaluate techniques for reducing visual impact of power facilities. However, Chugach does not agree with the request to broaden the survey effort to extend to residents of areas as distant from the Project as Anchorage; such a survey effort would need to be very extensive to obtain statistically meaningful results for the relicensing study.

The draft study plan for the recreation and visual resources user survey is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document. In addition to the visual resource study components included in the draft study plan, a baseline photographic inventory of Project elements from key viewpoints was accomplished in 2002. The visual resources evaluation will provide an assessment of Project-area visual characteristics in context with the surrounding landscape. The recreation resources analysis will describe current recreational facilities and quantify recreational use of all types in the Project area. Existing and future recreation needs and opportunities will be evaluated as part of the relicensing study and through consultation with resource agencies during the pre-filing phase of relicensing.

5.1.2 Cooper Creek Recreational Whitewater Potential, Preliminary Evaluation

In their ICP comment letters, American Whitewater and the National Park Service requested a study to quantify the whitewater opportunities in Cooper Creek and the impact of the Project on these whitewater opportunities. American Whitewater specifically requested a recreational instream flow study using controlled-flow methods in Cooper Creek. As indicated by the information provided in the ICP, conducting a controlled-release study, as requested, is not possible for Cooper Creek because of the lack of a release structure at the dam. However, to address the issue of the whitewater boating potential in Cooper Creek, Chugach will make a preliminary assessment of the recreational boating potential of Cooper Creek, under existing and alternative flows, to determine the need for further evaluation. The preliminary evaluation will

be made through a site visit to Cooper Creek by an experienced whitewater kayaker. The resulting expert opinion will be summarized in a written report. The draft study plan for the preliminary evaluation of Cooper Creek recreational whitewater potential is in preparation and will be issued to relicensing participants for review by early December.

6 CULTURAL RESOURCES

6.1 Planned Study

6.1.1 Cultural Resources Study

Chugach will conduct a cultural resources study encompassing the elements that were requested in the ICP comment letters and in accordance with all requirements of Section 106 of the National Historic Preservation Act.

The cultural resources study will include three primary components: (1) an inventory and assessment of archeological and historical resources; (2) an inventory and assessment of traditional cultural properties (TCPs); and (3) an inventory and assessment of the Project hydroelectric facilities. The general study area for the cultural resources study includes the area around Cooper Lake and Cooper Creek, the Snug Harbor Road, the Kenai River in the Project vicinity, and the Project transmission line corridor between the Quartz Creek Substation and Anchorage. Discussions with interested parties, including the USFS, the State Historic Preservation Officer, and Native American groups, have been ongoing to more precisely clarify the area of potential effect (APE) to be evaluated for the various components of this study.

The identification of historical and archeological resources in the Project APE will be accomplished through background research, field surveys, documentation of findings, and determinations of eligibility for the National Register of Historic Places (NRHP) for significant resources identified during the study. The inventory and assessment of TCPs will include continued consultation with the Native American groups who may ascribe traditional cultural significance to locations within the study area. In addition, field inspection of potential TCPs will be combined with surveys for archeological and historic sites. The inventory and evaluation of the Project hydroelectric facilities (e.g., the dam and powerhouse) will include gathering background information on the Cooper Lake hydroelectric facilities and assessing their eligibility for the NRHP within an appropriate historic context. The results of this work will be used to determine cultural significance and impacts and, if warranted, appropriate mitigation and management measures.

The ultimate objective of the cultural resources study is to form the basis for development of a Historic Properties Management Plan (HPMP), which will provide a framework for the management of NRHP-eligible cultural resources in the study area during the term of the new license. The HPMP will create a clear set of procedures for management of cultural resources in the APE based on the findings of the cultural resources study.

The draft study plan for the cultural resources study is being issued to relicensing participants for review in conjunction with this Stage 1 Response Document.

7 LAND USE

Information development planned for addressing land use issues related to relicensing of the Project focus largely on the status of Project-related roads and access routes. The study elements described below have been designed to address information requests from the USFS, one of the primary landholders in the Project area.

7.1 Planned Study

7.1.1 Road and Access Route Condition Survey

Chugach will describe the existing and proposed roads and access routes associated with the Project and will conduct a survey to describe the condition of Project-related roads and access routes. Included in this study effort will be the Cooper Lake Dam access road, the Snug Harbor Road, and unimproved maintenance access routes along the Quartz Creek Substation to Anchorage transmission line right-of-way. The aspects that will be described through this effort include the following:

- Proposed Project-related use of the road / access route including routine maintenance and/or emergency use, season(s) of use, and frequency of use.
- Types and sizes of equipment to be used on the road / access route.
- Existing road structures including bridges, culverts, gates, and access-exclusion berms.
- Surfaces of the roads and unimproved access routes.
- Slopes along each road /access route.
- Lengths of cut and fill, and extent (length and depth of rutting) on each road / access route. (Note that the cut-and-fill description will only be applicable to engineered roads, not the unimproved access routes.)
- Public use (such as vehicles or ATVs) currently occurring and/or apparent on the access routes. (Note that this study aspect will be accomplished in conjunction with the recreation and visual resources user survey.)

A draft study plan for the road and access route condition survey is being developed and will be issued to relicensing participants for review by early December.

In addition to the study elements described above, Chugach will also compile general land use information in conjunction with the relicensing studies, as requested by the USFS in its ICP comment letter. These efforts will include the following:

- Develop a GIS-based map describing current land use status in the area surrounding the Project.
- Map existing and proposed powerline access routes on National Forest System lands.
- Develop GIS-based maps showing the locations of Project area easements and USFS special use permit roads.

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