

20151007-5158



Homer Electric Association, Inc.

Corporate Office
3977 Lake Street
Homer, Alaska 99603-7680
Phone (907) 235-8551
FAX (907) 235-3313

Central Peninsula Service Center
280 Airport Way
Kenai, Alaska 99611-5280
Phone (907) 283-5831
FAX (907) 283-7122

October 7, 2015

The Honorable Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Secretary Bose:

RE: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Comments on Request to Lift the ILP Abeyance and Approve Proposed Modifications to the ILP Plan and Schedule

Homer Electric Association (HEA) appreciates the opportunity to file comments on the Alaska Energy Authority's (AEA) request to one (1) lift the Integrated Licensing Process (ILP) abeyance granted to AEA for the Susitna-Watana Project on January 8, 2015, and two (2) approve AEA's proposed modifications to the ILP plan and schedule. HEA supports AEA's request.

HEA strongly endorses using data collected in 2014 to ensure that the Commission makes a fully informed updated Study Plan Determination (SPD). HEA understands that another year of field study is needed to support the FERC license application and that the SPD will dictate what additional studies or study modifications the Commission will need to develop a defensible Environmental Impact Statement. Use of data collected in the 1980s and in 2012, 2013 and 2014 to make the SPD is a matter of common sense. To ignore data collected in 2014 that will be made fully available by November 6, 2015, could result in the Commission requiring unnecessary studies or it could result in a SPD that misses a critical study element that would need to be collected in a subsequent year, thereby adding additional cost and delay to the licensing process.

AEA's proposal to incorporate 2014 data is timely and will result in a more efficient licensing process. Using current information will decrease the uncertainty of what information the Commission will require for the license application and the associated licensing cost. Alaskans deserve to have the most informed SPD when the State makes its decision on how best to proceed with the project.

Regarding AEA's proposed schedule, participants will have until May 1, 2016, to file comments on the Initial Study Report (ISR), propose changes to the study plans and propose new studies. That is six (6) months from the date by which all 2014 data will be filed. That schedule is more than generous to incorporate 2014 data into comments that presumably have already been developed for the June 3, 2014, ISR.

Federal Energy Regulatory Commission
October 7, 2015
Page 2 of 2

As a potential purchaser of the project power, study costs may be passed on to future rate payers. The State of Alaska has already invested \$192 million in the Susitna-Watana Project in a good-faith effort to conduct studies. HEA supports conducting necessary studies, but encourages the Commission to consider the cost of studies in its SPD.

Thank you for your consideration in this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Bradley P. Janorschke", is positioned above the printed name.

Bradley P. Janorschke
General Manager

20151008-5150



Headquarters:
1689 C Street, #219
Anchorage, AK 99501-5131
Tel: (907) 272-0707
Fax: (907) 274-7125

Madison Branch:
229 Palmer Road
Madison, AL 35758
Tel: (256) 258-6200
Fax: (256) 258-6260

October 1, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Support of the Alaska Energy Authority's proposed ILP schedule and request to lift the licensing
abeyance.

Dear Secretary Bose:

Tyonek Native Corporation (TNC) requests that the Federal Energy Regulatory Commission (Commission) approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015.

In discussions with AEA, we understand that AEA proposes to incorporate 2014 studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

FERC and stakeholders will have the opportunity to consider all of the data and information collected to date, thus preserving the value of the work already done. The proposed schedule provides sufficient time for review of existing study material and new 2014 data. Most review times are doubled from FERC regulation schedule with over 100 days provided from new 2014 material being available before a full set of initial study report meetings.

Additionally, the Alaska Energy Authority will use existing funds to preserve the investment that the state has already made and advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule is cost effective and provides the most up to date materials to all stakeholders

Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available.

Tyonek Native Corporation works cooperatively with AEA and is interested in getting the most current data available to ensure TNC and others are making fully informed decisions as the project progresses. We fully support AEA's efforts to include all data through 2014 ensuring the Study Plan Determination includes up to date information in order for FERC and stakeholders to receive the best possible data. We believe the ILP Schedule requested by AEA is adequate enough time for stakeholders to review, so we urge the Commission to approve AEA's recommended ILP Schedule and lift the licensing abeyance in order for the project to progress to the next step.

Should you have any questions or need additional information, please do not hesitate to contact me at 907-272-0707. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'James Hoffman', with a large, stylized flourish extending to the left.

James Hoffman, CEO
Tyonek Native Corporation

20151008-5220

October 8, 2015

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

RE: Comments on AEA's request to lift the ILP abeyance and proposed modifications to the ILP plan and schedule, Susitna-Watana Hydrologic Project No. 14241-000.

On September 9, 2015, the Federal Energy Regulatory Commission (FERC) issued a notice soliciting comments on the Alaska Energy Authority's (AEA) request to (1) lift the Integrated Licensing Process (ILP) abeyance; and (2) AEA's proposed modifications to the ILP plan and schedule. On behalf of Chase Community Council, Susitna River Coalition, Talkeetna Community Council, Talkeetna Defense Fund, Alaska Center for the Environment, Alaska Survival, Center for Water Advocacy, Cook Inletkeeper, Natural Resources Defense Council, Trout Unlimited and Wild Salmon Center (collectively "NGO participants") we submit the following recommendations.

I. FERC should deny AEA's request to supplement the ISR with additional information collected after October 3, 2014.

On June 3, 2014, AEA filed its Initial Study Report (ISR) as required by the FERC approved Integrated Licensing Process (ILP) schedule. Then on September 17, 29 and 30, 2014, AEA filed 30 technical memoranda containing over 1,800 pages of additional information that was not incorporated into the ISR.

FERC modified the ILP schedule on October 3, 2014, to allow AEA to supplement the study data presented in the ISR with the 30 technical memoranda. In doing so, FERC recognized that the filing of the additional memoranda was not "inconsequential" and that it was "neither a milestone under the ILP regulations nor under the approved ILP plan and schedule for the project."¹ Now AEA wants to file even more information that will trickle in over a two month period between mid-September and November 6, 2015.

Again, AEA requests to submit additional information outside of the FERC approved ILP schedule and regulations. Licensing participants already have an enormous amount of

¹ Susitna-Watana Hydroelectric Project No. 14241, FERC Response to Filing of Technical Memoranda and Modification of ILP Process Plan and Schedule, October 3, 2014.

information to review in the ISR not to mention the 30 technical memoranda already submitted. As with the 30 original technical memoranda AEA does not plan to incorporate the new information into the ISR but rather simply make reference to it. Licensing participants then face the monumental task of trying to identify what modifications AEA made between the 2013 study season and the unsanctioned 2014 study season and attempt to decipher the datasets and analyze the results. If AEA is also allowed to submit another set of information then licensing participants are faced with reviewing three datasets that are not compiled. AEA's continued data-dumping puts an unfair burden on the public and government agencies who are attempting to respond and meaningfully participate in the process.

Given the difficulties faced during the 2013 study season and all of the variances listed in the ISR, modifications will need to be made to satisfy the objectives in the Revised Study Plan (RSP). AEA moved ahead with the 2014 study season with the knowledge that it may have to repeat data collection for some studies if FERC approves a study modification that AEA did not anticipate. FERC should not now allow AEA to drown licensing participants in additional information or confuse the study results to avert such a result.

No matter how AEA describes the information it still falls outside of the approved ILP process and FERC regulations, which provide for an orderly public review of first year studies culminating in a Director Resolution of any disagreement over the conduct of studies. The process is then followed by a second and possibly third year of study, which are also subject to public review and Director Resolution of any disagreement.² For these reasons, NGO participants request that FERC limit the review to the June 3, 2014, ISR and the 30 original technical memoranda that AEA has already submitted to the record, as determined by FERC in its October 3, 2014 letter ruling and ILP schedule.³

II. FERC should lift the abeyance only to allow review of the ISR and the 30 Technical Memoranda.

FERC should grant AEA's request to lift the ILP abeyance, however, the process should be restarted only to allow licensing participants to submit proposed modifications or new studies requests and follow the process through to the Director Resolution of any disagreement on amendments to any first year study, as provided in the FERC rules for the Conduct of Study of

² 18 C.F.R. § 5.15 (a)-(f).

³ It should be noted that AEA appears to be combining first and second year studies before first year studies have been reviewed by the participants, agencies and FERC, contrary to FERC regulations on the Conduct of Studies of an ILP. 18 CFR 5.15. AEA is asking to submit "Study Completion Reports" in several substantive areas, which presumes all study years are complete, contrary to the public comment provisions of FERC ISR regulations.

the ILP.⁴ It is clear that AEA does not have the funding to complete second and third year studies and complete an Updated Study Report as envisioned by FERC's ILP regulations. Therefore FERC should lift the abeyance for the limited purpose of completing only the ISR process.

On December 26, 2014, Governor Walker issued Administrative Order 271 which directed AEA to cease all discretionary spending on the Susitna-Watana project.⁵ Order 271 came after AEA completed only the first of two scheduled ISR meetings as required by FERC's modified ILP schedule.⁶ At the time, AEA was scheduled to hold a second set of meetings to review the 30 Technical Memoranda on January 7, 2015. Those meetings never occurred. AEA also never filed its meeting summary for the first set of ISR meetings as required by FERC regulations.⁷ As a result, AEA asked FERC for an extension of the ILP schedule. FERC agreed to hold the ILP in abeyance on January 8, 2015 until AEA had a more clear idea of how the project would proceed.

Given the uncertainty of the project, NGO participants stopped pouring resources into the ISR review, did not extend contracts with hired expert consultants and ceased efforts to prepare proposed modifications or new study requests consistent with FERC regulations. With the project paused by the Governor's office in December, and when the Legislature subsequently voted not to fund the project in April, NGO participants logically did not review the 2014 Technical Memoranda or prepare comments on the ISR. Now, over six months later, Governor Walker clarified that AEA may proceed with the project with the limited objective to "preserve the value of the FERC required studies, including those that are in process provided they are within existing appropriations."⁸ NGO participants agree that the ISR process should proceed to preserve the state's investment and the investment of all licensing participants up to this point. We however do not agree with AEA's proposed ILP schedule unless the review is limited only to the ISR and the 30 Technical Memoranda already filed on the record.

With the exception of the Susitna River Coalition, AEA did not consult with NGO participants about the proposed schedule. In addition, contrary to AEA's assertion in its August 26, 2015 letter to FERC, the Susitna River Coalition did not assent to AEA's proposed ILP schedule if AEA intended to introduce even more information on the 2014 unsanctioned field season.

⁴ 18 C.F.R. § 5.15 (a)-(e).

⁵ State of Alaska, Office of the Governor, Administrative Order 271, December 26, 2014.

⁶ Susitna-Watana Hydroelectric Project No. 14241, FERC Response to Filing of Technical Memoranda and Modification of ILP Process Plan and Schedule, October 3, 2014 at Attachment A.

⁷ 18 C.F.R. § 5.15(c)(3).

For the state, licensing participants and FERC to get the most value out of the ISR review process and credibly preserve AEA's work up to this point, FERC should lift the abeyance but limit the review to the information currently on the record.

III. After completion of the ISR review process, FERC should terminate the licensing process without prejudice.

On January 8, 2015, in response to Administrative Order 271, AEA filed a letter to the Office of Management and Budget detailing the remaining funds available to support the Susitna-Watana licensing process.⁹ At the time, AEA only had a little over \$33 million left from previous appropriations. AEA estimated that it needed at least \$102 million of additional funds to complete the ILP process. At the conclusion of the legislative session, no additional funds were appropriated to support the Susitna project. AEA does not have the funding to complete the Conduct of Studies phase of the ILP, and it has limited funding to complete the ISR first year study review process.

On July 6, 2015, the Governor again made it clear that AEA was allowed to essentially spend down existing funds to preserve the state's investment, but no new funds were available. The July 6th letter also emphasized that in fiscal year 2017, the Susitna project "will be revisited in the context of the fiscal environment and other competing major capital projects." Since that time, the Governor has prioritized the natural gas pipeline project over all other capital projects. In addition, given the grim outlook for oil prices to rebound in the near future, the fiscal climate for the State of Alaska is not likely to change anytime soon. AEA's proposed ILP schedule that ends after FERC's Director Determination for the ISR, only reinforces the fiscal uncertainty surrounding the Susitna project. There is no reasonably foreseeable funding source to complete the second and potential third year studies under the FERC approved study plan in a manner that is consistent with FERC regulations.¹⁰

Rather than allow the Susitna project to languish, FERC should terminate the licensing process without prejudice. Termination without prejudice preserves the value of the state's investment up to this point. Termination is also consistent with the "Commission's policy against site banking ...while an applicant waits for optimal economic circumstances."¹¹ Finally, it saves NGO participants, state and federal agencies and other stakeholders from spending public money to participate in a project that has no foreseeable future.

⁹ Alaska Energy Authority, Response to Administrative Order 271 regarding the Susitna-Watana Hydroelectric Project, January 8, 2015.

¹⁰ 18 C.F.R. § 5.15 (f).

¹¹ Main Tidal Power, 147 FERC P 62137 (May 21, 2014).

Sincerely,

James Tunnell
Board Member
Chase Community Council

Mike Wood
President
Susitna River Coalition

Whitney Wolff
Board President
Talkeetna Community Council

Ellen Wolf
Board Secretary
Talkeetna Defense Fund

Ryan Schryver
Deputy Director
Alaska Center for the Environment

Judy Price
Board President
Alaska Survival

Hal Shepherd
President
Center for Water Advocacy

Bob Shavelson
Executive Director
Cook Inletkeeper

Monty Schmitt
Senior Scientist, Water Program
Natural Resources Defense Council

Sam Snyder
Alaska Engagement Director
Trout Unlimited

Emily Anderson
Alaska Sr. Program Manager
Wild Salmon Center

20151008-5228



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

20151008-5228

Department of Natural Resources

OFFICE OF PROJECT MANAGEMENT & PERMITTING

550 West Seventh Avenue, Suite 1430

Anchorage, Alaska 99501

Main: 907.269.8690

Fax: 907.269.5673

8 October 2015

The Honorable Kimberly Bose
Secretary, Federal Energy Regulatory Commission
888 First Street
Washington D.C. 20426

Re: Support of Alaska Energy Authority's request to lift the ILP abeyance and approve proposed modifications to the ILP plan and schedule;
Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000

Dear Secretary Bose:

On behalf of the State of Alaska Resource Agencies, inclusive of the Alaska Department of Fish and Game, the Alaska Department of Environmental Conservation, and the Alaska Department of Natural Resources, this letter expresses support for the Alaska Energy Authority's (AEA) request to lift the Integrated Licensing Process (ILP) abeyance for the Susitna-Watana Project; to include the most current scientific data and analysis in the review, and to adopt the proposed schedule for amending the Director's Study Plan Determination.

We are in agreement with the proposed activities and licensing schedule. We also agree that providing a summary of data collection and analyses that have occurred since the June 2014 Initial Study Report is a reasonable course of action. This would provide the most up-to-date information for our review and informed determination of the need for any modified or new studies.

In addition, this letter is provided to confirm the State's commitment to the timely completion of the current phase of the ILP, as evidenced by the attached letter from the Alaska Office of Management and Budget authorizing AEA to advance the project to the Directors Study Plan Determination. Reaching this milestone will preserve the value of the Federal Energy Regulatory Commission (FERC) required studies by completing recent the multi-year process of developing study plans, implementing studies, and validating the initial study results.

The state has committed \$192 million to develop and implement studies in cooperation with FERC, state and federal agencies, Alaska Native entities, and the public (collectively referred herein as "Stakeholders") to reach the Directors Study Plan Determination. The FERC ILP process requires Stakeholders to keep up with the environmental studies and provide timely feedback to FERC and the project proponent on what should be studied, what results are required from the studies, and whether the studies as implemented provide the information required by FERC.

It is now time for the Stakeholders, including the state and federal agencies, to fulfil their responsibilities by providing feedback to FERC and the project proponent on whether the studies as implemented and data collected to date are providing the required information. To do otherwise is leaving the state in an uncertain position as to the status of the studies.

Reaching the Directors Determination makes it clear to the state what is needed to complete the studies required for submittal of a license application. Such knowledge is of great value to the state for assessing future project costs; provides a clear roadmap to the proponent and Stakeholders; and preserves the value of the \$192 million expenditure.

The State Resource Agencies are committed to the timely review of the results of the study implementation including the most recent scientific data and analysis. The purpose of the studies is to provide an environmental baseline and there is no distinct advantage gained by excluding the most recent data and analysis; it is in fact, the most cost effective method of reviewing the available results of the study implementation. Further, by excluding recent data and analysis, FERC could be placing the project in an unwarranted position of having study implementation deemed insufficient or incomplete when in actuality, after June 2014 the studies had produced the information required. The question at hand is why scientists and decision makers *would not want* the most up to date information? It is nonsensical to believe good decisions can be made without all the relevant information.

The state remains a strong proponent of timely decision-making and looks forward to working collaboratively with FERC and all stakeholders through this process, as well as any subsequent permitting of the proposed project. Should you have questions regarding these comments, or if our office can be of service in facilitating resolution on any outstanding issues, please don't hesitate to contact me at (907) 334-2185.



Sincerely,
Marie Steele, Large Project Coordinator
Office of Project Management and Permitting

cc: Commissioner Mark Myers, Alaska Department of Natural Resources
Commissioner Sam Cotton, Alaska Department of Fish and Game
Commissioner Larry Hartig, Alaska Department of Environmental Conservation
Director Pat Pitney, Alaska Office of Management and Budget
Assoc. Director Nathan Butzlaff, State and Federal Relations, Office of the Governor
Executive Director Sara Fisher-Goad, Alaska Energy Authority

Attachment: 6 July 2015 Alaska Office of Management and Budget letter to AEA authorizing advancement to Directors Determination.

State of Alaska

Bill Walker, Governor

Office of Management and Budget

PO Box 110020

Juneau AK 99811-0020

(907) 465-4660, fax 465-3008

MEMORANDUM

Date: July 6, 2015

To: Sara Fisher-Goad, Executive Director
Alaska Energy Authority

From: Pat Pitney, Director 
Office of Management and Budget

Subject: Susitna Watana Hydroelectric Project – Administrative Order 271

On December 26, 2014, the Governor issued Administrative Order 271. With regards to the Susitna-Watana Hydroelectric Project (Project), the Governor directed the Alaska Energy Authority (Authority) to cease all discretionary spending, and not to incur new or additional expenses or obligations or entering into or amending existing contracts. The administrative order also directed the Authority not to spend unobligated or unencumbered funds, and to submit a status report of the project to the Office of Management and Budget.

Based upon our review of this project, we concur that non-discretionary expenditures would include those necessary to advance the Project to complete and preserve the value of Federal Energy Regulatory Commission (FERC) required studies; including those that are in process provided they are within existing appropriations. Incrementally advancing the project toward the FERC study plan determination is deemed non-discretionary activity. The Authority may utilize the remaining \$6.6 million of the original \$192 million appropriation to continue to move the project through 2017, at which time the project will be revisited in the context of the fiscal environment and other competing major capital projects.

I appreciate the time that you and your staff have devoted to this project. Please feel free to call me to discuss further.

Cc: Fred Parady, Deputy Commissioner, Department of Commerce Community and Economic Development

Arnold Liebelt, OMB Policy Analyst, Office of Management and Budget

20151009-5000

denis ransy, Talkeetna, AK.

Denis Ransy FERC comment on Restarting Susitna Dam Licensing Process

October 7, 2015

I see no reason to allow AEA to complete the ISR process. From the very beginning of the licensing process, AEA has needed extensions and exceptions to the process. They have consistently shown themselves to be incapable of fulfilling the process requirements.

Meanwhile, the stakeholders have learned the intricacies of the process and followed the rules to the letter. This has led to endless inconveniences and rescheduling of comment periods and other deadlines.

In addition to these problems, there is virtually no funding available for the project so it has not gone forward for a significant period of time and will not go forward in the foreseeable future. AEA has shown itself to be unwilling and incapable of following the federally mandated process.

20151009-5002

Michael Wood, Talkeetna, AK.

Thank you for the opportunity to comment on Alaska Energy Authority (AEA)'s proposed schedule to re initiate the Federal Regulatory Energy Commission (FERC) Integrated license Process (ILP) for the Susitna-Watana hydroelectric project. My wife and I live on the Susitna River north of Talkeetna, commercial fish at the river mouth and have been involved in the licensing process since 2011. I believe the Integrated Licensing Process (ILP) has been the correct choice for this project in spite of the significant responsibility it has placed on licensing participants. The ability for the public to comment over the last four years has allowed for greater transparency and integrated local knowledge. However, after years of watching the Alaska Energy Authority muddle through the environmental study process: failing to meet their own deadlines; trespassing on private and Native lands; studies cut short and equipment damaged by extreme weather events, including two huge floods in 2013 and the latest river break-up in recorded history, and other anomalies; the environmental process has been fatally compromised. AEA's add-ons of scientific memoranda and schedule adjustments have created confusion. The vision established in the original study plan and agreed to by the stakeholders has been lost. Repeated diversions from the study plan presented a great challenge to federal agencies, intervenors and stakeholder reviewers and made it very difficult for the layman to follow.

At this point in the history of this ill-fated project the state needs FERC's direction to keep the study process as clear as possible. The deviations from the original study process need to be indexed and ideally integrated into a new ISR so agencies and NGO's can better follow the process and interpret and analyze the studies with less confusion and waste of money. Review of the first year of studies needs to be documented to illuminate shortcomings and gaps and present an accurate and balanced view of expert opinions of the status and quality of the first year of studies. This is necessary to ensure that second year studies are modified based on the lessons learned to-date.

I urge FERC to hold AEA to the study plan that was agreed upon in October 3, 2014, document all criticism from State, Federal and private citizens and make a final determination on the first year of studies and how the second year of studies should be conducted, thus adding clarity and honesty to the official record. I put a great deal of faith in the FERC process to help guide the state of Alaska in the best direction for all Alaskans - including those that depend on a healthy salmon river in the heart of Alaska's greatest and most visited wilderness. Please do not allow AEA to change the process once again before completing the first year of studies responsibly. In part, this is necessary to assess how much this licensing process will cost going forward. The price tag will hopefully give supporters a reality check and help the state of Alaska to evaluate its priorities. I wish the state would adopt the criteria that our late Governor Jay Hammond used to evaluate projects: "Is this project environmentally sound, desired by most Alaskans, and can it pay its own way without burdening the state and taxpayer?" Susitna-Watana does not pass Governor Hammond's test and is opposed by over 10,000 Alaskans! Please use the FERC process to help inform sound decisions for Alaska and the country.

Sincerely,
Mike and Molly Wood

20151009-5042

Rebecca Long
POB 1088, Talkeetna AK 99676

October 7, 2015

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First St. NE
Washington DC 20426

Re: FERC Project P-14241, Proposed Susitna Dam
Comments requested by FERC regarding Applicant's Proposed Restart and
Schedule of ILP

Dear Ms. Bose:

Summary of Comments Herein

1. FERC should deny applicant request to lift the abeyance of the ILP. The licensing process should not be restarted.
2. Recommendations if FERC lifts the ILP abeyance to restart the ILP, the ILP should be restarted where it left off when the Executive Order 271 stopped it.
3. Recommendations if FERC lifts the ILP abeyance to restart the ILP and accepts the second set of supplementary second year study data.

On August 30, 2015, this stakeholder (RL) filed Stakeholder Response to Applicant Alaska Energy Authority (AEA) 8/26/15 Transmittal Letter and Attachments 1-4 to Restart the Integrated Licensing Process (ILP) with Proposed Schedule. Reference will be made in these comments to this letter.

1. FERC should deny applicant request to lift the abeyance of the ILP.

The licensing process for the proposed Susitna Dam was stopped 12/26/15 by Alaska Governor Walker's Executive Order 271 and by FERC's 1/8/15 agreement to hold the ILP in abeyance.

This is a satisfactory time to end the licensing process. Too many federal and state resources have been spent on a proposal that does not pencil out economically in the long term especially given the negative impacts to our sustainable natural resources. Independent economic reviews of this large project show a growing cost burden. A cost/benefit analysis would show that the proposal does not survive the plausible market test. Substantial state assistance would be necessary.

With our current state budgetary crisis, no more money should be put into a Susitna Dam. Even the \$6.6 million allowed by Governor Walker should not be used by AEA for the dam. The money should be used for more responsible and reasonable renewable energy projects; not work to dam a free flowing river. Seven full time AEA staff continues to work on this proposal. While at the same time, the public has a hard time getting a

State Trooper to respond to threats of violence in the bush due to budget cuts to the Alaska Department of Public Safety. This is not something that sits well with Alaska residents.

The role of the state agency AEA is not to be a project proponent. It is to facilitate the proposal through the federal licensing and NEPA process in order to determine if this dam should even be built. But at every step of the way, starting back in November 2010, AEA has been a project booster. This is not protecting the best interest of the state.

The applicant has not even been able to fulfill the pre-licensing required schedule. At almost every step of the way, modifications to the schedule have been necessary. AEA has not been able to keep up with the schedule because this is such a large project impacting a large watershed.

Procedural Violation

The Study Process is one of the most important steps in the licensing process. As mentioned in RL letters of 3/5/14 and 8/30/15 filed with FERC there is a "regulatory process gap". It is a procedural violation. Essentially, the applicant conducted second year studies when the Initial Study Review Director's Determination had not been reached. Comments on first year studies in the ISR allow the licensing participants to review study results and recommend modifications and new studies. This is a fundamental important step inherent in the ILP. This step has been both skipped and muddled by the continual data dumps by the applicant.

The schedule modifications and applicant's rush to move the project forward as quickly as possible has significantly affected the scientific integrity of the data that will be used to analyze project impacts.

As a participant in the October, 2014 ISR meetings I can attest to the significant flaws in the studies: biometrics, sampling design, curtailing of studies on downstream effects, integration of modeled studies, decision support system, accurate fish species identification, accurate habitat models and habitat associations with fish distribution to name a few flaws.

In consideration of all of the above, FERC should not restart the ILP. There should be a caveat that stakeholders can file with FERC now to get on the public record the comments, modifications and requests for new studies. But the licensing process should end.

2. Recommendations if FERC lifts the ILP abeyance to restart the ILP. The ILP should be restarted where it left off when the Executive Order 271 stopped it.

Since the applicant is the state of Alaska, FERC will probably decide to restart the ILP process by lifting the abeyance. The ILP should be restarted where it left off when the Executive Order stopped it.

- There should be a continuation of the public review of the Technical Memorandums that AEA filed from September 2014 through December 2014. This data was an additional 1800 pages of project data issued to be considered as part of the Initial Study Report (ISR). On October 3, 2014, FERC modified the ISR to include this data in the ISR process. This stakeholder saw this as a compromise that FERC made with the applicant. Fortunately, FERC modified the schedule so that stakeholders could responsibly evaluate the data albeit even though it was over the holiday season. And a second set of meetings were established to deal with such supplementary information.
 - FERC should deny AEA's request to include approximately thirty 2014 Study Implementation Reports listed in the attachment 3 of AEA's 8/26/15 Request to Lift Integrated Licensing Process Abeyance. This is the same study modification or "trick" that AEA pulled in the fall of 2014. But this stakeholder refuses to accept the burden of a second supplementary set of second year reports. This data would further "muddy the waters" of a process designed to evaluate first year studies. It represents a further burden on the stakeholders. Is there never an end to the data stream that AEA will subject licensing participants to before the first year study milestone is even completed?
 - AEA's 8/26/15 Attachment 3 shows that AEA considers 10 studies completed. AEA Director said in an August 6, 2015 AEA Board meeting that 14 studies are completed. Thus, depending on the venue, AEA contends that 10-14 studies are completed. But since stakeholder input has not been provided to the Project Record, these studies should not be considered complete. This statement is a direct reference to US Fish and Wildlife Service 10/5/15 comments.
 - There should be ISR meetings to review those studies not covered by the October 2014 ISR meetings.
 - A Meeting Summary or Meeting Notes were not filed after the October 2014 ISR meetings. There were transcriptions of the meetings. But a Meeting Summary needs to be filed. And, of course, a Meeting Summary filed for the second set of meetings.
 - The continuation of the rest of the ISR process under 18 CFR 5.15 (c) – (e).
 - With the completion of the ISR, FERC should then terminate the licensing process without prejudice.
3. Recommendations if FERC lifts the ILP abeyance to restart the ILP and accepts the second set of supplementary second year study data.

FERC will probably accept the second set of AEA's second year study data using the same reasoning it used for the first set of supplementary data. The 10/3/14 FERC response to filing of Technical Memoranda and Modification of ILP Process plan and Schedule states:

“The Commission’s ILP regulations state that the purpose of the ISR meeting is for the potential license applicant and ILP participants to discuss the study results and any proposals for study plan modifications in light of the progress on the study plan and data collected.¹ The information presented in the technical memoranda supplement study data presented in the ISR; therefore, consistent with the stated purposes of the ISR meeting, presentation and discussion of the technical memoranda at an ISR meeting would help to inform the ILP participants on needed study plan modifications.

However, the filing of technical memoranda is neither a milestone under the ILP regulations nor under the approved ILP plan and schedule for the project. When the project’s ILP plan and schedule were last revised, at AEA’s request, in January 2014, there were no expectations on the part of ILP participants, including Commission staff, that technical memoranda would be filed and discussed at the October 2014 ISR meeting. The volume of additional information included in the 30 technical memoranda is not inconsequential in that it comprises over 1,800 pages, and when added to the several thousands of pages of material already provided in the ISR, would be difficult to present and discuss in the time allotted for the October 2014 ISR meetings. Therefore, this letter modifies the ILP process plan and schedule for the project to require AEA to hold a second set of ISR meetings in January 2015 to provide ILP participants with sufficient time to review the new material and provide sufficient time to discuss the new material at an ISR meeting. Subsequent ILP milestones are modified, accordingly in Attachment A.”

This same reasoning will probably be used to accept the second supplementary data in the ILP restart of the continuation of the ISR. If this should be the case, there are some questions that need to be resolved.

- Will biometricians from the stakeholders meet with the applicant’s biometricians in order to resolve data analyses concerns?
- Is the \$6.6 million that AEA has to spend on the licensing process sufficient to cover the ISR process including a full set of meetings on 58 studies and the de-commissioning of field sites to clean up the Susitna River, and the need for additional studies?
- The Services have stated that \$600,000 of fiscal year 2015/2016 Alaska state funds are left to them to contract consultants for additional study review for fish and aquatic studies, groundwater studies, model integration, structured decision support and winter juvenile fish habitat use studies. This may not be adequate. How will this be resolved?
- For the sake of public transparency, AEA needs to state publicly how much obligated funds are left from the original \$192 million appropriations. Is the figure \$28 million?
- Will the extensive documented Services concerns be resolved in the completion of the ISR process?

If FERC restarts the ILP and includes the second set of supplementary AEA data reports, NMFS recommendations and scheduling should be followed. These are:

- AEA should be required to prepare a complete, stand-alone ISR that includes all the study results from the first season and both sets of supplementary data. This would also include study results, study variances, study modifications and any new studies for stakeholder review.
- After the complete ISR is compiled, there should be 60 days for reengagement of stakeholder staffs.
- Then there should be 90 days of ISR review prior to the ISR meetings.

¹ See 18 C.F.R. §5.15(c) (2) (2014).

- Then there should be 60 days after the Meeting Summary in order to file meeting summary disagreements and recommendations for study modifications or new studies,
- Then there should be 60 days to file responses to the meeting summary comments,
- Then FERC should issue the Director Determination within 60 days.

Thank you for your consideration of these matters. Thank you for mandating an official comment period for stakeholders to respond to the applicant proposals.

Sincerely,

Rebecca Long

20151009-5051

October 9, 2015

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

RE: Comments on AEA's request to lift the ILP abeyance and proposed modifications to the ILP plan and schedule, Susitna-Watana Hydrologic Project No. 14241-000

On September 9, 2015, the Federal Energy Regulatory Commission (FERC) issued a notice soliciting comments on the Alaska Energy Authority's (AEA) request to (1) lift the Integrated Licensing Process (ILP) abeyance; and (2) AEA's proposed modifications to the ILP plan and schedule.

The Susitna River Coalition (SRC) filed substantive comments with recommendations to FERC. However, SRC is also a grassroots organization with over 10,000 members in Alaska and across the United States. Because we work so closely with members and volunteers, we also provided an opportunity for our members to weigh in. In doing so, we received nearly 600 total comments from supporters urging FERC to "deny AEA's request and terminate the licensing process."

Below, you will find the letter printed in full, followed by the list of names and locations of signers.

Sincerely,

The Susitna River Coalition

Dear Federal Energy Regulatory Commission,

Thank you for this opportunity to comment on FERC Project P-14241 and on the Alaska Energy Authority's (AEA) request to restart the licensing process for the Proposed Susitna Dam Project.

Since the licensing process started in 2012, AEA has failed to prove that it can meet licensing milestones or effectively implement the studies needed to understand the Susitna River and the impacts of a large dam on the river.

The State of Alaska and AEA have spent over \$190 million of state money on the Susitna dam. AEA has repeatedly mismanaged studies, failed to properly identify fish species, and misled

the public about the impacts the Susitna dam would have on the Susitna River and the wild runs of all five species of Pacific salmon it supports - home to the 4th largest king salmon run in the State.

AEA's wasteful spending is particularly troublesome given the fact that the federal government has also had to invest public money and resources to participate in the licensing process. The Susitna dam project is not only fiscally irresponsible but it is also opposed by over 60% of Alaskans.

Given AEA's repeated failure to meet pre-licensing milestones and the State of Alaska's lack of financial resources to meet licensing requirements in a timely manner, no more public money should be invested in this process.

Please deny AEA's request and instead terminate the licensing process.

Sincerely,

588 signatures, 296 Alaskans

First Name	Last Name	City	State	Zip
Pavel	Andrassy	Calgary	AB	T3G 1C8
Mary	Adams	Wasilla	AK	99654
Stacie	Argetsinger	Talkeetna	AK	99676
Ryan	Astalos	Anchorage	AK	99517
Sid	Atwood	Anchorage	AK	99508
Harry	Aulman	Talkeetna	AK	99676
Brad	Babic	Talkeetna	AK	99676
Ann	Baker	Anchorage	AK	99503
Andy	Baltensperger	Fairbanks	AK	99709
Laura	Bartholomae	Anchorage	AK	99517
Kate	Batten	Denali Park	AK	99755
River	Bean	Palmer	AK	99645
Linda	Blanchard	Willow	AK	99688
Zach	Blummer	Talkeetna	AK	99676
Gordon	Boeve	Willow	AK	99688
Tamara	Boeve	Willow	AK	99688
Talon	Boeve	Willow	AK	99688
Cicely	Boeve	Willow	AK	99688
Raymond	Boniface	Wasilla	AK	99654
Eric	Booton	Anchorage	AK	99501
Jaelene	Boyce	Talkeetna	AK	99676
Thomas	Branton	Wasilla	AK	99654
Roy	Brown	Eagle River	AK	99577
Tina	Brown	Juneau	AK	98221

Karen	Brown	Anchorage	AK	99502
Bruce	Burnell	Healy	AK	99743
Carmen	Bydalek	Anchorage	AK	99517
Diane	Calamar Okonek	Talkeetna	AK	99676
Greg	Campbell	Talkeetna	AK	99676
Kalene	Chartrand	Palmer	AK	99645
Aimee	Chartrand	Palmer	AK	99645
Michael	Chartrand	Palmer	AK	99645
Ivan	Chikigak- Steadman	Talkeetna	AK	99676
Van	Chu	Anchorage	AK	99501
Barbara	Churchill	Anchorage	AK	99515
Andre	Ciostek	Anchorage	AK	99645
Cheryl	Cline	Anchorage	AK	99501
Dora	Coen	Homer	AK	99603
Randall	Conrad	Big Lake	AK	99652
Margurete	Corey	Wilsonville	AK	97070
Michele	Cornelius	Haines	AK	99827
Gene	Cornelius	Haines	AK	99603
Mimi	Corneliussen	Wasilla	AK	99687
Adam	Corneliussen	Wasilla	AK	99687
Ed	Czech	Hope	AK	99605
Nick	D'Alessio	Girdwood	AK	99587
Kalie	Desorbe	Houston	AK	99694
Emma	Dieter	Seward	AK	99664
Sarah	Dobbs	Eagle River	AK	99516
Jules	Domine	Fairbanks	AK	99709
Jorene	Doria	Talkeetna	AK	99676
John	Duffy	Palmer	AK	99645
Louis	Dupree	Homer	AK	99603
Greg	Durocher	Anchorage	AK	99508
Steve	Durr	Talkeetna	AK	99676
Greg	Egan	Fairbanks	AK	99712
Shawn	Eisele	Juneau	AK	99801
William	Elam	Anchorage	AK	99503
Linda	Erdmann	Wasilla	AK	99654
Katherine	Erickson	Wasilla	AK	99687
Chris	Erickson	Talkeetna	AK	99676
Diane	Erickson	Eagle River	AK	99577
Amanda	Erickson	Talkeetna	AK	99676
Katherine	Erickson	Wasilla	AK	99687
Jeff	Fair	Palmer	AK	99645

Justin	Fantasia	Juneau	AK	99801
Ken	Flynn	Anchorage	AK	99508
Kevin	Foster	Talkeetna	AK	99676
Riley	Foster	Talkeetna	AK	99676-124
Brock	Freyer	Anchorage	AK	99517
Robin	Frost	Anchorage	AK	99507
Anne	Fuller	Juneau	AK	99801
Kenneth	Funk	Wasilla	AK	99623
John	Gaedeke	Fairbanks	AK	99709
Nj	Gates	Denali Park	AK	99755
Bryan	Gearry	Wasilla	AK	99654
Teresa	Gearry	Wasilla	AK	99654
Shelagh	Geller	Tok	AK	99780
Coley	Gentzel	Talkeetna	AK	99676
Meg	George	Anchorage	AK	99508
Meagan	Gerenday	Talkeetna	AK	99676
Robert	Gerlach	Talkeetna	AK	99676
Cathy	Gillis	Anchorage	AK	99507
Monica	Gilpin	Wasilla	AK	99654
Cj	Glasser	Wasilla	AK	99654
Susan	Gose	Anchorage	AK	99517
Carol	Gross	Talkeetna	AK	99676
Mark	Gutman	Talkeetna	AK	99676
Kat	Haber	Homer	AK	99603
David	Hagen	Anchorage	AK	99515
Marci	Hales	Talkeetna	AK	99676
Anne	Harrison	Fairbanks	AK	99709
Thomas				
Mike	Harsh	Eagle River	AK	99577
Karen	Harvey	Talkeetna	AK	99676
Austin	Haynes	Eagle River	AK	99577
Annie	Helmsworth	Talkeetna	AK	99676
Richard	Herron	Anchorage	AK	99503
John	Hettinger	Anchorage	AK	99507
Sarah	Hitchcock	Palmer	AK	99645
Nancy	Holland	Fairbanks	AK	99712
Robert	Humphreys	Anchorage	AK	99516
James	Hundley	Willow	AK	99688
Gael	Irvine	Hatcher Pass	AK	99645
Leann	Jaeger	Anchorage	AK	99516
Rick	James	Wasilla	AK	99687
Karyn	Janssen	Fairbanks	AK	99712

Robert	Jenkins	Homer	AK	99603
Shana	Jerde	Anchorage	AK	99517
Greg	Johnson	Anchorage	AK	99518
Dave	Johnston	Talkeetna	AK	99676
Dawn	Jones	Talkeetna	AK	99676
Steve	Jones	Denali National Park	AK	99755
Michael	Jones	Sutton	AK	99674
Lainie	Karisko	Palmer	AK	99654
Kelsey	Kaso	Talkeetna	AK	99676
Kathleen	Kaso	Talkeetna	AK	99676
John	Kasukonis	Soldotna	AK	99669
James	Kelly	Ft Yukon	AK	99740
Diane	Kendrick-Adey	Nenana	AK	99760
Gurubandhu	Khalsa	Wasilla	AK	99623
Virginia	King-Taylor	Wasilla	AK	99654
Michael R	Knapp	Wasilla	AK	99623
Rebecca	Knight	Petersburg	AK	99833
Shawn	Knudeson	Anchorage	AK	99503
Kirsten	Kremer	Chickaloon	AK	99674
Meagan	Krupa	Eagle River	AK	99577
C.	L.	Anchorage	AK	99507
Bill	Larned	Soldotna	AK	99669
Nancy	Larson	Talkeetna	AK	99676
Ryan	Leary	Cordova	AK	97624
Marc	Lewis	Anchorage	AK	99502
Sandra	Loomis	Talkeetna	AK	99676
Mark	Lovegreen	Big Lake	AK	99516
Bud	Lovel	Wasilla	AK	99654
Mary	Lovel	Sherman City Hall	AK	99654
Lynn	Lowman	Wasilla	AK	99687
Jenny	Lynes	Anchorage	AK	99508
S.	Magone	Unalaska	AK	99685
Marsha	Mak	Talkeetna	AK	99676
Andrew	Malavansky	Anchorage	AK	99518
Barbara	Mannix	Talkeetna	AK	99676
Tazlina	Mannix	Anchorage	AK	99516
Kenneth	Marsh	Trapper Creek	AK	99683
Darlene	Maryman	Talkeetna	AK	99676
Corinne	Marzullo	Talkeetna	AK	99676
Paxton	Mcclurg	Anchorage	AK	99502
Patrick	Mccormick	Eagle River	AK	99577

Ron	Medel	Ketchikan	AK	99901
Edna	Meier	Anchorage	AK	99502
Valerie	Melarvie	Palmer	AK	99645
Barbara	Mercer	Talkeetna	AK	99676
David	Michels	Soldotna	AK	99669
Lynn	Mickleson	Palmer	AK	99645
Jennifer	Miller	Palmer	AK	99645
Jon	Miller	Fairbanks	AK	99709
Leif	Mjos	Anchorage	AK	99508
Brita	Mjos	Anchorage	AK	99508
Dennis	Moore	Anchorage	AK	99501
Lisa	Moorehead	Eagle River	AK	99577
Jack	Morrell	Homer	AK	99603
Johnny	Murdock	Wasilla	AK	99687
Mike	Murphy	Mccarthy	AK	99588
Lori	Murray	Homer	AK	99603
Rosemary	Myrick	Wasilla	AK	99654
Sharon	Nahorney	Anchorage	AK	99504
Sharon	Nahorney	Anchorage	AK	99504
Nathan	Neas	Anchorage	AK	99515
Adam	Nicholson	Fairbanks	AK	99712
Stephen	Nickel	Anchorage	AK	99518
John	Nielsen	Palmer	AK	99645
Martin	Niemi	Douglas	AK	99824
J	Northrop	Anchoragr	AK	99503
Maggie	O'Brien	Palmer	AK	99645
Barb	O'Donnell	Ester	AK	99725
Gretchyn	O'Donnell	Anchorage	AK	
Katherine	Odneal	Talkeetna	AK	99676
John	Olofsson	Eagle River	AK	99577
Mary Ellen	Osland	Palmer	AK	99645
Mary	Ostermick	Talkeetna	AK	99676
Samuel	Palmer	Fairbanks	AK	99712
Chris	Pankratz	Soldotna	AK	99669
Harold	Parker	Chugiak	AK	99577
Scott	Patridge	Talkeetna	AK	99676
Jeff	Patterson	Eagle River	AK	99577
Marie	Pedoraza	Palmer	AK	99654
Marie	Pedoraza	Palmer	AK	99654
Lisa	Peltola	Anchorage	AK	99502
Spencer	Perason-Allen	Denali	AK	99755
Grete	Perkins	Talkeetna	AK	99676
Roger	Perry	Talkeetna	AK	99676

Peggy	Peterson	Sterling	AK	99672
Steven	Peterson	Anchorage	AK	99508
Geoff	Pfeiffer	Talkeetna	AK	99676
Misty	Phillips	Houston	AK	99694
Amanda	Piatt	Anchorage	AK	99501
Christine	Pieue	Ester	AK	99725
David	Plant	Eagle River	AK	99577
Alina	Pontynen	North Pole	AK	99705
John	Porter	Talkeetna	AK	99676
Jasmine	Porter	Anchorage	AK	99503
Claire	Priebe	Wasilla	AK	99687
James	Proch	Anchorage	AK	99503
Derek	Race	Talkeetna	AK	99676
Michael	Raffaeli	Denali	AK	99755
Matt	Rafferty	Anchorage	AK	99508
Richard	Ragle	Anchorage	AK	99504
Scott	Raneri	Fairbanks	AK	11226
Denis	Ransy	Talkeetna	AK	99676
James	Rayl	Big Lake	AK	99652
Arlene	Reber	Anchorage	AK	99517
Paul	Reichards	Fairbanks	AK	99709
Werner	Rhein	Whitehorse	AK	Y1A 7A1
Stephen	Rice	Wasilla	AK	99654
Luetta	Robinson	Talkeetna	AK	99676
Gretchen	Roetfen	Copper Center	AK	99573
Angela	Roland	Anchorage	AK	99611
Denise	Roselle	Anchorage	AK	99524
Christopher	Rosenvall	Wasilla	AK	99654
David	Rudolph	Wasilla	AK	99687
Shoo	Salasky	Talkeetna	AK	99676
John	Sanborn	Homer	AK	99603
Charlotte	Sartor	Palmer	AK	99645
Tracey	Schaeffer	Willow	AK	99688
Cici (Aka Lucille)	Schoenberger	Talkeetna	AK	99676
Karl	Schultz	Anchorage	AK	99508
Jennifer	Schveller	Wasilla	AK	99629
Trevor	Scott	Indian	AK	99587
Zach	Seabolt	Anchorage	AK	99517
Bruce	Service	Anchorage	AK	99507
Bob	Shavelson	Homer	AK	99603
Ruth	Sheridan	Anchorage	AK	99508
Ruth	Sheridan	Anchorage	AK	99508

Kathleen	Shoop	Palmer	AK	99645
Amelia	Sikes	Fairbanks	AK	99710
John	Sindell	Anchorage	AK	99507
Sandra C.	Sloan	Wasilla	AK	99654
Sandra C.	Sloan	Wasilla	AK	99654
Troy	Smiley	Talkeetna	AK	99676
Colette	Smith	Anchorage	AK	99508
Sam	Snyder	Anchorage	AK	99504
Philip	Somervell	Palmer	AK	99645
Helena	Spector	Anchorage	AK	99521
Barak	Sternberg	Chase	AK	99676
Mike	Stoltz	Talkeetna	AK	99676
Stephen	Stone	Anchorage	AK	99755
Kaarle	Strailey	Anchorage	AK	99645
Jeff	Stroke	Eagle River	AK	99577
Ruth	Strong	Talkeetna	AK	99676
William	Sullivan	Kenai	AK	99611
Jane	Sullivan	Juneau	AK	99801
Karlin	Swearingen	Anchorage	AK	99507
Janie	Taylor	Anchorage	AK	99517
Cathy	Teich	Talkeetna	AK	99676
Jessica	Thornton	Anchorage	AK	99503
Allen	Tigert	Anchorage	AK	99516
Karen	Timmers	Talkeetna	AK	99676
Jim	Trump	Talkeetna	AK	99676
Kathy	Trump	Talkeetna	AK	99676
Leonard	Van Sandt	Anchorage	AK	99577
Deborah	Vaughan	Talkeetna	AK	99676
Lucas	Veldhuis	Eagle River	AK	99577
Christophe	Venot	Anchorage	AK	99507
Paul	Venturini	Anchorage	AK	99503
Natalie	Wagner	Eagle River	AK	99577
Tom	Waite	Talkeetna	AK	99676
Norman	Wakeman	Willow	AK	99688
Eric	Walter	Denali Park	AK	99755
Mark	Walters	Coldfoot	AK	99709
Bill	Watkins	Denali Park	AK	99755
Vicky	Watson	Trapper Creek	AK	99683
Jill	Weitz	Juneau	AK	99801
Anthony	Wenzell	Anchorage	AK	99507
Debra	Wessler	Talkeetna	AK	99676
Adam	West	Eagle River	AK	99577
Jack	West	Talkeetna	AK	99676

Gordon	Wetzel	Anchorage	AK	99507
Tara	Wheatland	Anchorage	AK	99503
Paris	White	Talkeetna	AK	99676
Debbie	Whitecar	Talkeetna	AK	99676
Nicole	Whittington-Evans	Palmer	AK	99645
Shelley	Williams	Anchorage	AK	99516
Natasja	Williams	Talkeetna	AK	99676
D. Kevin	Williams	Anchorage	AK	99501
Don	Williamson	Homer	AK	99603
Terry	Wilson	Fairbanks	AK	99709
Michael	Witman	Anchorage	AK	99515
Kristi	Wood	Anchorage	AK	99504
Kirsten	Woodard	Palmer	AK	99645
Shawn	Woodhead	Wasilla	AK	99623
Laura	Wright	Talkeetna	AK	99676
Ian	Wright	Fairbanks	AK	99709
Diane	Zarnetske	Anchorage	AK	99515
Diane	Ziegner	Talkeetna	AK	99676
Heather	Zimmerman	Talkeetna	AK	99676
Eric	Zuber	Sterling	AK	99672
Robert	Bowker	Norfork	AR	72658
Kathy	Mccall	Fayetteville	AR	72703
Sean	Casey	Gilbert	AZ	85297
Cassalyn	David, Mph	Patagonia	AZ	85624
Maureen	Davies	Phoenix	AZ	85048
Tom	Ferguson	Mesa	AZ	85201
Rob	Findlay	Kingman	AZ	86409
Michael	Mijuskovic	Chandler	AZ	85224
Philip	Reily	Mesa	AZ	85213
Roslyn	Falk	Kamloops	BC	V2e2a1
Ann	Altstatt	Santa Cruz	CA	95060
Robert	Arellanes	Whittier	CA	90601
Sandy	Bailey	Cedar Ridge	CA	95924
Claire	Chouinard	Ventura	CA	93001
Matthew	Cunha-Rigby	Oakland	CA	94607
Matthew	Cunha-Rigby	Oakland	CA	94607
Dennis	Curley	Auburn	CA	95603
Ehrin	Davis	Oakland	CA	94610
Brittany	Davis	Oakland	CA	94611
Nereyda	De La O	Santa Cruz	CA	95060
Ryan	Delaney	Menlo Park	CA	94025
Trevor	Diloreto	Sacramento	CA	95822

Tara	Dirocco	Pescadero	CA	94060
Sheila	Gatton	Nice	CA	95464
Aimee	Harris	Oakland	CA	94610
Dane	Hennessey	Modesto	CA	95354
Greg	Jacobus	Murphys	CA	95247
David	Jeffries	Los Osos	CA	93402
Alan	Keller	Oakland	CA	94611
Alicia	Koch	Santa Monica	CA	90404
Mary	Kyle	San Rafael	CA	94901
Brian Patrick	Martin	Sacramento	CA	95827
Kyle	Meakins	El Portal	CA	95318
Corey	Miller	Santa Cruz	CA	95060
Mael	Nguyen	Charbuy	CA	89113
Jacob	Perrin	Loma Linda	CA	92354
Thomas J.	Peters	Paradise	CA	95969
Nathaniel	Ptacek	Ventura	CA	93001
Karen And Steve	Scauzillo	Pasadena	CA	91101
Derek	Shuman	Berkeley	CA	94709
Adam	Singer	Los Angeles	CA	90004
Matt	Stoecker	Ventura	CA	93001
Geoffrey	Stradling	Encino	CA	91316
Piers	Strailey	Quincy	CA	95971
Faith	Strailey	Quincy	CA	95971
Sebastian	Vazquez	Hercules	CA	94547
Rain	Waters	Fort Bragg	CA	95437
Casey	Watkins	Willits	CA	95490
Ron	Zigelhofer	Camino	CA	95709
Kari	Burns	Westminster	CO	80234
Will	Coggan	Boulder	CO	80301
Louis	Fletcher	Castle Rock	CO	80104
Timothy	Frade	Loveland	CO	80538
Shawn	Fullmer	Bayfield	CO	81122
Nick	John	Westminster	CO	80021
Alex	Lee	Leadville	CO	80461
Ben	Luck	Glenwood Springs	CO	81601
Jeremy	Nicholson	Boulder	CO	80305
Noelle	Northcutt	Aurora	CO	80010
Kelly	Schoeppler	Aurora	CO	80010
Dennis	Seider	Aspen	CO	81611
Alexander	Sollie	Boulder	CO	80301

Toni	Sullivan	Dillon	CO	80435
Marianne	Fitzgerald	Higganum	CT	6441
Will	Santora	New Canaan	CT	6840
Tara	Davis	Washington	DC	20016
Renee	Tyre	New Castle	DE	19720
Jeanne	Anderson	Orlando	FL	32803
James	Auletta	Largo	FL	33773
Philip	Corp	Atlantic Beach	FL	32233
Christopher	Davis	Ocala	FL	34476
Alan	Kearl	Boynton Beach	FL	33435
Cristina	Maldonado	Stuart	FL	34996
Johanna	Porter	Hollywood	FL	33019
Frank	Prince	Rockledge	FL	32955
Kevin	Quinn	Fort Lauderdale	FL	33305
Ronald	Whetstone	Winter Springs	FL	32708
Wayne	Esarove	Hampton	GA	30228
Joseph	Hagan	Columbus	GA	31904
Alex	Hanson	Atlanta	GA	30307
Carla	Kapreilian	Alpharetta	GA	30009
Matthew	Marcus	Atlanta	GA	30332
Jim	Smith	Decatur	GA	30033
Nico	Castellano	Honolulu	HI	96816
Robert	Putes	Kaneohe	HI	96744
Kim	Niles	West Des Moines	IA	50265
Johnny	Turpin	Jefferson	IA	50129
Kelly	Turpin	Jefferson	IA	50129
Brett	Williams	Iowa City	IA	52245
Chad	Aylesworth	Coeur Dalene	ID	83814
Erik	Heiden	Hailey	ID	83333
Kevin	Enos	Brighton	IL	62012
Travis	Haug	Cherry Valley	IL	61016
Mary	Murphy	Aurora	IL	60506
Matthew	Parks	Evanston	IL	60202
Laura	Bakken	Terre Haute	IN	47805
Mark	Dill	Boonville	IN	47601
Susan	Himes	Warsaw	IN	46580
Brett	Morick	Angola	IN	46703
Rick	Speigle	Warsaw	IN	46580
Cathy	Schmiers	Bardstown	KY	40004

Anita	Merrigan	Covington	LA	70433
Shanice	Bailey	Boston	MA	2215
Chelsea	Clarke	North Falmouth	MA	2556
Bud	Evans	Cambridge	MA	2139
Daniel	Finnegan	Mansfield	MA	2048
Harvey	Halpern	Cambridge	MA	2139
Ryan	Mooney	Charlemont	MA	1339
Jeremy And Lucy	Murray-Brown	Cambridge	MA	2138
Ben	Pelto	West Boylston	MA	1583
John	Caccamese	Towson	MD	21204
Geoff	Calhoun	Bethesda	MD	20817
Ellen	Hughen	Annapolis	MD	21401
Dwight	Mumper	Damascus	MD	20872
Ian	Wingert	Friendsville	MD	21531
John	Connelly	Falmouth	ME	4105
Walter	Field	Dexter	ME	4930
Matt	Gladd	Kittery	ME	3904
Heather	Benac	Kalamazoo	MI	49006
John	Canavan	Troy	MI	48085
Tim	Gott	Howard City	MI	49329
John	Kalnins	Beulah	MI	49617
Hilary	Millet-Clark	East Lansing	MI	48823
Scot	Murdoch	Rochester	MI	48363
Darryl	Sczepanski	Gaylord	MI	49735
Colleen	Baumtrog	St Paul	MN	55104
Linda And Steve	Bryan	Maplewood	MN	55109
Dan	Gilbert	St Paul	MN	55130
William	Keown	Minnetonka	MN	55345
Deuce	Lagrange	Minneapolis	MN	55419
Todd	Redmann	Le Sueur	MN	56058
Joanne	Reinhart	Sauk Rapids	MN	56389
Marcus	Salmen	Minneapolis	MN	55418
Jeff	Soderstrom	Orono	MN	55356
Scott	Thorpe	Minneapolis	MN	55406
Marilyn	Boehm	Washington	MO	63090
John	Caoile	Raymore	MO	64083
Ed	Parra	Kansas City	MO	64119
Ethan	Pinkley	Fredericktown	MO	63645
Sarah-Kelly	Mcginnis	Brandon	MS	39047
Nick	Bergmann	Bozeman	MT	59715

Jewell	Case	Missoula	MT	59804
Sophie	Hainline	Missoula	MT	59801
Matt	Klara	Helena	MT	59601
Cheyenne	Rogers	Missoula	MT	59801
Jacob	Schilling	West Yellowstone	MT	59758
Michael	Sedlock	East Helena	MT	59635
Stewart	Bryan	Chapel Hill	NC	27516
Kevin	Hollar	Asheville	NC	28801
Pat	Keller	Asheville	NC	28804
Peggy	Korte	Raleigh	NC	27605
Margaret	Palmer	Durham	NC	27707
Steve	Turner	Omaha	NE	68132
Lisa	Furlong	Ashland	NH	3217
Karen	Bowker	Flemington	NJ	8822
Sean	Brennan	Woodcliff Lake	NJ	7677
Ryan	Fitzgerald	Hoboken	NJ	7030
Michael	Hecht	Princeton	NJ	8540
Thomas	Leone	Mickleton	NJ	8056
Peter	Tranchik	Blackwood	NJ	8012
Mary	Beard	Santa Fe	NM	87504
Jillian	Brasch	Santa Fe	NM	87505
Charles	Cassagnol	Santa Fe	NM	87502
Ed	Lheureux	Santa Fe	NM	87501
Alonzo	Doswell	Las Vegas	NV	89129
Robert	Friend	Pahrump	NV	89041
Rose	Marteeny	Henderson	NV	89009
Lance	Rava	Reno	NV	89521
Carol	Sculles	Pahrump	NV	89041
Brianna	Castellano	Glens Falls	NY	12801
Michela	Catena	Amsterdam	NY	12010
Stephen	Chilson	Jordan	NY	13080
Taylor	Cole	Brooklyn	NY	11211
Jean	Curlee	Pleasant Valley	NY	12569
Ellen	Fauerbach	Denver	NY	12421
K	Foreman	Bohemia	NY	11716
Carol	Gibney	Yonkers	NY	10704
Mary	Huntley	Dundee	NY	14837
Deb	Laun	Syracuse	NY	13215
Richard	Leach	Queensbury	NY	12804
Macie	Mckitrick	New York	NY	12536

Gretchen	Page	New York	NY	10023
Johnathan	Strassheim	North Tonawanda	NY	14120
J	Telesca	Liverpool	NY	13090
Karen	Connors	Columbus	OH	43206
Brad	Dailey	Dayton	OH	45414
Mark	Kasubick	Cle. Hts.	OH	44118
Kathleen	Kovatch	Westlake	OH	44145
Kayla	Langhoff	Fairport Harbor	OH	44077
Zach	Nemec	North Royalton	OH	44133
Zach	Nemec	North Royalton	OH	44133
Joshua	Nemec	Broadview Heights	OH	44147
Alan	Rehmar	Columbus	OH	43206
Eve	Weber	Cleveland	OH	44111
Scott	Hood	Broken Arrow	OK	74011
Fred	Kirk	Tulsa	OK	74105
Patricia	Tracy	Eufaula	OK	74432
Taylor	Maavara	Waterloo	ON	N2L3G1
Ben	Marr	Mallortytown	ON	K0E 1R0
Bruce	Berryhill	Bend	OR	97703
Ken	Bierly	Salem	OR	97304
Justin	Boucher	Portland	OR	97209
Oakley	Brooks	Portland	OR	97218
Dale	Deason	Eugene	OR	97401
Cameron	Derbyshire	Florence	OR	97439
Gene	Downs	Salem	OR	97305
Elizabeth	Evaul	Portland	OR	97213
Cheri Rene	Fleming	Joseph	OR	97846
James	Godfrey	Portland	OR	97217
Jason	Grant	Redmond	OR	97756
Dan	Hart	Beaverton	OR	97005
Lori	Howk	Portland	OR	97229
Michael	Hudson	Bend	OR	97707
Janel	Hull	Portland	OR	97212
Gabriel	Juarez	Bend	OR	97702
Jared	Kennedy	Portland	OR	97212
Kim	Kosa	Portland	OR	97217
David	Lewis	Portland	OR	97209
Christopher	Mccabe	Portland	OR	97202

Richard	Moore	Dallas	OR	97338
Amee	Pacheco	Portland	OR	97213
Audie	Paulus	Portland	OR	97217
Alec	Peters	Portland	OR	97202
Douglas	Robinson	Bend	OR	97702
Carly	Rushford	Portland	OR	97201
Ervin	Siverson	Portland	OR	97211
John	Tilton	Welches	OR	97067
Stephen	Wages	Portland	OR	97232
Jordan	Wheeler	Portland	OR	97202
Guy	Genge	Hermitage	ot	RG18 9TD
Patricio	Herrera	North Parramatta	ot	2151
Lesley	King	Auckland Nz	ot	614
Aniol	Serrasolse	Bescano	ot	17162
Rod	Walker	Perth	ot	6156
Bernadette Marie	Ware	Cheviot Newzealand	ot	7310
Tanya	Dias	White Haven	PA	18661
Doug	Freese	Etters	PA	17319
Knox	Hammack	State College	PA	16803
Nancy	Hoffmann	Bryn Mawr	PA	19010
Douglas	Schloegel	Gaines, Pa	PA	16921
James	Zook	Trafford	PA	15085
Francois	Brassard	Quebec	QC	G1x2c1
Josh	Cohn	Charleston	SC	29403
Art	Denney	North Augusta	SC	29841
Lance	Beaber	Chattanooga	TN	37419
Alison	Bullock	Signal Mountain	TN	37377
Dom	Clark	Knoxville	TN	37919
Robert C	Foehring	Memphis	TN	38122
Lily	Tidwell	Sewanee	TN	37383
Beth	Bierman	Austin	TX	78746
Miles	Comeau	Austin	TX	78702
Adam	Hosterman	Austin	TX	78721
Emberley	Riddle	Houston	TX	77008
Ryan	Holmes	Alta	UT	84092
Annie	Studer	Slc	UT	84105
Matthew	Craig	Lynchburg	VA	24501
Chris	Preperato	Annandale	VA	22003
Arah	Robbins	Blacksburg	VA	24060

Mitchell	Smiley	Richmond	VA	23221
C. W.	Tucker	Richmond	VA	23227
Carol C.	Groom	Warren	VT	5674
Fay	Kathan	Warren	VT	5674
Arlene	Marrinan	Morrisville	VT	5661
Dan	Ushkow	Colchester	VT	5403
Tyler	Allen	Vancouver	WA	98665
Daniel	Briggs	Kenmore	WA	98028
Anne	Brink	Seattle	WA	98117
Mark	Brink	Seattle	WA	98117
Betsy	Bullman	Olympia	WA	98506
Lora	Cox	Lake Forest Park	WA	98155
Larry	Franks	Issaquah	WA	98027
Sherry	Jennings	Aberdeen	WA	98520
Wilson	Kern	Leavenworth	WA	98826
Janice	Klinski	Olympia	WA	98506
Ty	Lee	Seattle	WA	98178
Daniel	Lombardo	Lynnwood	WA	98087
Dawn	Maylor	Kenmore	WA	98028
Larry	O'Neil	Seattle	WA	98107
Lori	Pastucha	Bainbridge Island	WA	98110
Erica	Peters	Seattle	WA	98109
Erica	Peters	Seattle	WA	98109
Robin	Pitt	Seattle	WA	98119
Liz	Purdy	Seattle	WA	98119
Willie	Richards	Port Townsend	WA	98368
Angie	Sipe	Snohomish	WA	98290
Brad	Smith	La Conner	WA	98257
Haze	Sommer	Poulsbo	WA	98370
Colin	Keating	Madison	WI	53711
Ben	Siebers	Madison	WI	53703
Thomas	Brown	Morgantown	WV	26501
Joel	Alvis	Jackson	WY	83001
Emery	Rheam	Wilson	WY	83014

20151009-5183



October 9, 2015

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Support of the Alaska Energy Authority's proposed ILP schedule and request to lift the licensing abeyance.

Dear Secretary Bose,

Cook Inlet Region Inc. (CIRI) appreciates the opportunity to provide comments in support of the Alaska Energy Authority's proposed ILP schedule and request to lift the licensing abeyance. CIRI is an Alaska Native Regional Corporation formed under the Alaska Native Claims Settlement Act (ANCSA) and one of the largest private landowners in Southcentral Alaska, with more than 1.3 million acres of subsurface estate and large surface estates split between CIRI and its seven village corporations. CIRI owns significant subsurface acreage within the footprint of the proposed Susitna-Watana project. CIRI village corporations, including Tyonek, Ninilchik, Knikatu, Salamatof, Seldovia, and Chickaloon similarly own significant surface acreage. Benefits from this project have the potential to positively impact both CIRI and the aforementioned village corporations.

CIRI requests that the Federal Energy Regulatory Commission (Commission) approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015. In discussions with AEA, we understand that AEA proposes to incorporate 2014 studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

FERC and stakeholders will have the opportunity to consider all of the data and information collected to date, thus preserving the value of the work already done. The proposed schedule provides sufficient time for review of existing study material and new 2014 data. Most review times are doubled from FERC regulation schedule with over 100 days provided from new 2014 material being available before a full set of initial study report meetings.

Additionally, the Alaska Energy Authority will use existing funds to preserve the investment that the state has already made and advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule is cost effective and provides the most up to date materials to all stakeholders. Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available. Thank you for the opportunity to submit comments.

Sincerely,

COOK INLET REGION, INC.

Jason W. Brune
Senior Director, Land and Resources

20151009-5203

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

)	
Alaska Energy Authority)	
Susitna River Hydroelectric Project)	P-14121
)	

**SUSITNA RIVER COALITION’S RESPONSE TO THE NOTICE SOLICITING
COMMENTS ON REQUEST TO LIFT THE ILP ABEYANCE AND APPROVE
PROPOSED MODIFICATIONS TO THE ILP PLAN AND SCHEDULE**

The Susitna River Coalition (Coalition) provides these comments in response to the Federal Energy Regulatory Commission’s (Commission), “Notice Soliciting Comments on Request to Lift the ILP Abeyance and Approve Proposed Modifications to the ILP Plan and Schedule,” eLibrary no. 20150909-3014 (Sept. 9, 2015).

The Alaska Energy Authority (AEA) requests that the Commission lift the Integrated Licensing Process (ILP) abeyance.¹ This request is based on a Memorandum from the State of Alaska’s Office of Management and Budget directing AEA to spend those funds necessary to obtain a study plan determination from the Commission.² However, the memo does not authorize AEA to spend any additional funds to implement the study plan determination, even if the Director of the Office of Energy Projects (OEP) grants AEA’s request.

The Coalition agrees with AEA’s request to the extent that it seeks to bring closure to the first year of studies and establish the requirements for the second year of studies. We agree that if the State is to preserve its investment in first year studies, OEP Staff and licensing participants will need to review first year study results to determine whether the studies were conducted according to the approved study plan and the results deemed reliable. However, we disagree that OEP Staff and relicensing participants should review and provide comments on 2014 study results, beyond those already submitted at the time of the OEP Director’s “Modification of ILP Process Plan and Schedule” (Oct. 3, 2014),³ at this time. We also request that the OEP Director

¹ Letter from Wayne Dyok, AEA, to Kimberly D. Bose, FERC, eLibrary no. 20150826-5223 (Aug. 26, 2015) (AEA Request).

² “. . .we concur that non-discretionary expenditures would include those necessary to advance the Project to complete and preserve the value of [FERC] required studies, including those that are in process provided they are within existing appropriations. Incrementally advancing the project toward the FERC study plan determination is deemed non-discretionary activity. The Authority may utilize the remaining \$6.6 million . . . to continue to move the project through 2017, at which time the project will be revisited in the context of the fiscal environment and other competing major capital projects.” Memorandum from Pat Pitney, Director of Office of Management and Budget, to Sara Fisher-Goad, Executive Director AEA (July 6, 2015).

³ See eLibrary no. 20101003-3041.

make any amendments to the approved study plan subject to further review by OEP Staff and relicensing participants once it is known when AEA will conduct the second season of studies under the plan.

I. **BACKGROUND**

The ILP establishes procedures for developing an approved study plan, including specific timelines. Those procedures assume that the study plan process will be continuous, and that the applicant will conduct studies according to the approved study plan absent anomalous environmental conditions.

Relevant to AEA's instant request, the regulations require that the applicant prepare an Initial Study Report (ISR) after the first year of studies that describes "overall progress in implementing the study plan and schedule and the data collected, including an explanation of any variance from the study plan and schedule. The ISR must also include any modifications to ongoing studies or new studies proposed by the potential applicant."⁴ The applicant is required to convene a meeting with participants and OEP Staff to discuss the ISR, and then provide a summary of that meeting.⁵ The participants and OEP Staff then have an opportunity to submit comments on the meeting summary and the ISR.⁶ Such comments may include recommendations for study modifications or new studies. After AEA has an opportunity to respond, the OEP Director will resolve any disputes and "amend the approved study plan as appropriate."⁷ Under the regulations, this process is to conclude within 120 days of the ISR being filed.

This proceeding has deviated substantially from the ILP study plan procedures. The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) aptly described those deviations in their comments dated October 2, 2015⁸ and October 5, 2015,⁹ respectively. For the sake of brevity, we incorporate by reference, rather than restate, their statements of procedural background here.

⁴ 18 C.F.R. § 5.15(c)(1).

⁵ 18 C.F.R. § 5.15(c)(2)-(3).

⁶ 18 C.F.R. § 5.15(c)(4).

⁷ 18 C.F.R. § 5.15(c)(5)-(6).

⁸ Letter from James W. Balsiger, Ph.D, NMFS, to Kimberly D. Bose, FERC, eLibrary no. 20151005-5050 (Oct. 2, 2015), Enclosure 1.

⁹ Letter from Socheata Lor, Ph.D., FWS, to Nicholas Jayjack, FERC, eLibrary no. 20151005-5306 (Oct. 5, 2015), Enclosure 1.

II. **COMMENTS**

AEA's request proposes two additional deviations from the ILP study plan regulations which, if approved outright, could affect the substantive outcome of any eventual licensing decision. The first is that OEP Staff and participants consider all data that was collected outside of the approved study plan as part of the ISR review. The second is that the OEP Director issue a study determination that includes amendments to the approved study plan, but no opportunity for further review once the schedule for study has been established.

Approving AEA's request could affect the substantive outcome of any licensing decision because the approved study plan is foundational to the factual record on which the Commission must base its licensing decision. The purpose of the approved study plan is to

bring, to the extent possible, pre-filing finality to the issue of what information gathering and studies will be required by the Commission to provide a sound evidentiary basis on which the Commission and other participants in the process can make recommendations and provide terms and conditions.¹⁰

Under the Commission's standard practice, the study results provide the factual basis for the license application, the license application is the primary factual basis for OEP Staff's environmental document under the National Environmental Policy Act (NEPA), and Staff's NEPA document is the factual basis for the Commission's licensing decision. Thus, ensuring that studies are conducted according to the approved study plan and that the results are reliable is essential to the Commission's ultimate decision as to whether and under what conditions to issue a license to AEA under Federal Power Act (FPA) section 10(a)(1).

We are concerned that AEA's past and proposed changes to the study plan process will affect the integrity of the factual record for any licensing decision by the Commission and perhaps other decisions regarding the future of the Susitna River.

A. Data Collected Outside of the Approved Study Plan since October 2014 Should Not Be Considered in Connection with the ISR Review.

AEA requests OEP's permission to "update the June 3, 2014 [ISR] with the 2014 data collection and analysis effort."¹¹

The 2014 studies are not part of the approved study plan.¹² This point has been made repeatedly by several licensing participants. We acknowledge that the OEP Director's

¹⁰ 68 Fed. Reg. 51,070, 51,078 (Aug. 25, 2003).

¹¹ AEA Request, p. 1.

¹² See letter from Jeff C. Wright, FERC, to Wayne Dyok, AEA, eLibrary no. 20130401-3022 (April 1, 2013); letter from Jeff C. Wright, FERC, to Wayne Dyok, AEA, eLibrary no. 20130201-3041 (Feb. 1, 2013); see also letter

“Modification of ILP Process Plan and Schedule” granted AEA permission to present some 2014 study results prior to the study plan determination.¹³ However, that does not mean that AEA should be allowed to present even more information collected outside of the approved study plan at this time.

By letter dated April 17, 2014, the Coalition objected to OEP Staff’s consideration of 2014 studies without additional steps for quality control and clear understanding among the licensing participants for how information gathered outside of the approved study plan would be integrated into the study plan process.¹⁴ We cautioned that by conducting studies outside of the approved study plan, AEA was assuming the risk that the results of those studies could not be used to satisfy the requirements of the approved study plan. That concern was not resolved prior to AEA requesting a stay of the ILP.

AEA’s request attempts to sidestep the approved study plan again by asking OEP Staff and participants to consider additional technical memoranda produced after October 2014 along with the first-year study results, without addressing the prior objections. This is similar to AEA’s attempt to rely on 2012 study results, which preceded the approved study plan, as the basis for the Revised Study Plan despite the concerns of licensing participants.¹⁵

As stated above, these deviations are contrary to the purpose of having an approved study plan, which is to bring finality to the issue of what studies are needed to provide a sound evidentiary basis for the Commission’s licensing decision. The Coalition and other non-governmental organizations have commented that the numerous technical reports filed for studies done outside of the approved study plan create confusion and hardships for the participants.¹⁶ NMFS and FWS have expressed similar concerns. Prior to the ILP being stayed,

from James W. Balsiger, Ph.D, NMFS, to Wayne Dyok, AEA, eLibrary no. 20140923-5026 (Sept. 22, 2014), p. 2 (“... NMFS does not consider any 2014 study to be the second year of study under the ILP process.”).

¹³ eLibrary no. 20141003-3041.

¹⁴ “AEA should not presume that studies it has unilaterally proposed to conduct in 2014 outside of the approved ILP study process will satisfy the information needs of the Commission and resource agencies. Studies that depart from the approved study plan are not entitled to the same presumption of validity as studies that have been vetted by OEP Staff, the agencies, and other participants pursuant to ILP Regulations.” Letter from Nicholas Niir, WPLG, to Kimberly D. Bose, FERC, eLibrary no. 20140417-5110 (April 17, 2014), p. 4.

¹⁵ “In 2012, AEA conducted studies that were outside of the required ILP study process. They were described as exploratory pilot studies to define methodology for the official first year studies and contained data referenced in the Revised study Plan (RSP). . . . The 2012 study results trickled in starting in January 2013, with the last not submitted until mid-June 2013. This data was supposed to support the RSP determination, but much of it was not available to licensing participants until after the determination. Similarly now, it is unclear how licensing participants will be able to review the results of any studies conducted during 2014 and whether and how these results will be incorporated into the ILP study process.” Letter from Nicholas Niir, WPLG, to Kimberly D. Bose, FERC, eLibrary no. 20140417-5110 (April 17, 2014), p. 3.

¹⁶ See *id.* (“We expect that if AEA proceeds with 2014 studies, new data will be coming in while participants are in the middle of reviewing the ISR.”); see also letter from Emily Anderson, on behalf of the Chase Community

NMFS commented that it was not prepared to discuss 2014 studies at the October 2014 ISR meeting, stating, “[t]he limited time allocated would be more effectively spent addressing problems with the 2013 study implementation and discussing study modifications or new studies.”¹⁷

To date AEA has not provided a clear statement of the status of its implementation of the *approved study plan*. Instead, its reports on implementation of the approved study plan have been confused with data collected outside of the approved plan.

AEA’s reason for seeking to introduce the 2014 study results now is to ensure that the “SPD is based upon a complete and up-to-date record.”¹⁸ However, there is still no clear understanding for how 2014 study results should inform future decisions regarding the approved study plan. We strongly believe that the usefulness of the 2014 studies cannot be determined until review of the first-year studies is complete.

The Coalition has previously stated that the study conditions in 2013 – the only year AEA conducted studies under the approved study plan – indicated the need for critical review of the results prior to conducting additional years of study.¹⁹ We highlighted the following areas of concern that showed amendments to the approved study plan were likely needed prior to AEA conducting further studies: (1) lack of access to native lands prohibited data collection; (2) the proposed dam and reservoir were inaccessible; (3) occurrence of anomalous weather conditions; (4) natural events caused study timeline delays to fish and aquatic studies; and (5) low flow conditions necessary for instream flow studies were unavailable. AEA did not afford the participants an opportunity to revisit the study plan in light of these unexpected conditions prior to conducting studies in 2014, so the evidentiary value of studies it independently conducted is uncertain.

Under these circumstances, the participants should not have to invest time in reviewing additional data that AEA gathered outside of the approved study plan, prior to the systematic review of the first-year study results and the technical memoranda already submitted as of October 2014.

Council *et al.*, to Kimberly D. Bose, FERC, eLibrary no. 20151008-5220 (Oct. 8, 2015) (describing additional hardships posed by the potential introduction of technical memoranda prepared since October 2014).

¹⁷ Letter from James W. Balsiger, Ph.D, NMFS, to Wayne Dyok, AEA, eLibrary no. 20140923-5026 (Sept. 22, 2014), p. 2; *see also* letter from Socheata Lor, Ph.D., FWS, to Wayne Dyok, AEA, eLibrary no. 20151005-5306 (Oct. 5, 2015), Enclosure 2, p. 3.

¹⁸ AEA Request, p. 1.

¹⁹ Letter from Nicholas Niir, WPLG, to Kimberly D. Bose, FERC, eLibrary no. 20140417-5110 (April 17, 2014), p. 4.

B. Amendments to the Approved Study Plan Should Be Subject to Further Review Once the Schedule for the Second Year of Studies is Known.

AEA requests that the OEP Director issue a study plan determination by August 29, 2016.²⁰

As stated above, the steps and schedule for ISR review under the regulations show that the review is to occur in between seasons of study, but within a matter of months to allow for consecutive seasons of study. While we have requested or supported others' requests for additional time for ISR review given the sheer volume of information being presented and the unusual circumstances surrounding this original licensing, we disagree that a study process can work effectively when stretched over years and with non-consecutive years of study under the approved study plan, as proposed by AEA.²¹

At this time it is not known when the next year of studies under the approved study plan, as may be amended, will occur. Passage of time and schedule are relevant to the design and conduct of environmental studies. Recommendations for amending the approved study plan may differ depending on whether the next season of studies will occur in one year, five years, or ten.

We recommend that any study plan determination (1) make findings as to whether the first year of studies were conducted in accordance with the approved plan, (2) make findings as to whether the results are reliable, and (3) based on those findings, amend the approved study plan to establish the requirements for the second year of study, but make that decision subject to further review by participants and OEP Staff when the schedule for study is certain.

C. Procedures for Review

If OEP Staff decides to grant AEA's request to lift the abeyance, whether in full or as limited by these comments and/or comments submitted by the resource agencies, we request that Staff require the following additional procedures.

1. Schedule

We support the schedule for ISR review proposed by NMFS,²² which we interpret as consistent with FWS's proposal. The additional time to re-engage staff and consultants is reasonable given that this process has been on hold for several months.

²⁰ AEA Request, p. 1.

²¹ The Commission's procedures and deadlines under the traditional licensing process also indicate that studies should be conducted without delay. See 18 C.F.R. § 4.32(b)(7).

²² Letter from James W. Balsiger, Ph.D., NMFS, to Kimberly D. Bose, FERC, eLibrary no. 20151005-5050 (Oct. 2, 2015), p. 2.

2. Format of Initial Study Report

We generally support NMFS' request for a standalone ISR that summarizes study results, study variances, and study modifications. The ISR should include a comprehensive index, and limit cross-references to information not contained within the ISR. If information relied upon cannot be included in the ISR, then hyperlinks to the information should be provided. Further, any cross-references should be to specific page numbers in the document relied upon, not to the entire document.

For the reasons stated above, we believe the ISR should be limited to first-year studies that were included in the approved study plan and the technical memoranda that AEA had submitted as of October 2014.

III. CONCLUSION

If OEP is considering granting AEA's request, it should limit the ISR review to first-year studies and the technical memoranda AEA had submitted as of October 2014, and make amendment of the approved study plan subject to further review by participants and OEP Staff when the schedule for the second year of studies is certain.

Thank you for this opportunity to provide comments.

Dated: October 9, 2015

Respectfully submitted,



Julie Gantenbein
WATER AND POWER LAW GROUP PC
2140 Shattuck Ave., Suite 801
Berkeley, CA 94704
(510) 296-5590
jgantenbein@waterpowerlaw.com

Attorney for the SUSITNA RIVER COALITION

DECLARATION OF SERVICE

Alaska Energy Authority's Susitna River Project (P-14241-000)

I, Julie Gantenbein, declare that I today served the attached "Susitna River Coalition's Response to the Notice Soliciting Comments on Requests to Lift the ILP Abeyance and Approve Proposed Modifications to the ILP Plan and Schedule" by electronic mail to each person on the official eService list compiled by the Secretary in this proceeding.

Dated: October 9, 2015

By:



Julie Gantenbein
WATER AND POWER LAW GROUP PC
2140 Shattuck Ave., Suite 801
Berkeley, CA 94704-1229
Phone: 510-296-5590
Fax: 866-407-8073
jgantenbein@waterpowerlaw.com

20151009-5247

Ellen Wolf, Talkeetna, AK.
Ellen Wolf
HC 89 Box 8127
Talkeetna, AK 99676
October 8, 2015

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Dear Secretary Bose:

Thank you for the opportunity to comment on Alaska Energy Authority's (AEA) August 26, 2015, request that FERC lift the abeyance and modify the ILP plan and schedule for the proposed Susitna-Watana hydropower project. I am a concerned citizen who has been involved in this licensing process throughout.

The best course of action would be for FERC to deny the request to lift the abeyance of the ILP and terminate the licensing process.

If FERC does lift the abeyance and restart the process, it should be to complete the ISR process for reviewing the first year studies and technical memoranda from the fall of 2014, without including any studies that have occurred in the interim. Such closure of the ISR process would at least give the public, for the funds invested, a determination of the efficacy of studies completed and a body of data about the Susitna River that will be available to scientists, resource agencies, policy makers, and interested citizens to use in future planning for this valuable and viable river ecosystem. If this course is taken, the licensing process should then be terminated upon completion of the ISR

We are a time when the search for sustainable energy sources combined with a concern about climate change has brought renewed attention to hydropower. Certainly hydropower will again be an increasingly important energy source for our nation. Thankfully last century's experiences with building several thousands of dams - many of them that were huge, like the proposed Susitna dam - gave us a much better understanding of the kind of hydro projects that make sense in view of ecosystem trade offs. And thankfully, the legislation and guidelines that grew out those experiences have given us a clear process, under FERC's authority, for deciding whether a particular project like the proposed Susitna dam should be built.

One of the mechanisms giving the public confidence in these decisions is FERC's responsibility to study the environmental impacts of the proposed Susitna dam following NEPA guidelines before determining whether or not to issue a license. It is AEA's responsibility to conduct the environmental impact studies in a manner that allows FERC, and the public, to be confident in that study process. AEA has not done so; as

Resource Agencies and stakeholders have pointed out, the studies and handling of the ILP have been compromised by mismanagement, errors, and repeated deviations from schedules and plans. The disruptions to the schedule due to repeated abeyances throughout 2015 have compounded the problems. The fact that FERC has asked for input before making a decision about lifting the abeyance does instill confidence in the process and FERC's role in it; thank you.

Another reason to terminate the process is to end the substantial investment of public monies, government resources, and everyone's time, especially in view of the fact that The State of Alaska is in a budget crisis - there just isn't any further money in state coffers to be put toward this project. The state has already allocated \$190 million to AEA to pursue this license. Most of that is gone. There are enough funds remaining for AEA to see the ISR through if that is FERC's decision. However, AEA has said it would need another \$100 million in funding to complete the studies and licensing process. Again, the State does not have the money to continue the process. It makes no sense, then, for FERC and other federal agencies to continue to spend public monies on their end of this process.

Please terminate this licensing process, either now or after the completion of the ISR.

Thank you for your consideration.

Sincerely,
Ellen Wolf

20151013-0049

 ORIGINAL

10/1/2015

Edith Baller
Chickaloon Moose Creek Native Association
P.O. Box 875046
Wasilla, Alaska 99687

FILED
SECRETARY OF THE
COMMISSION

2015 OCT 13 A 9:55

FEDERAL ENERGY
REGULATORY COMMISSION

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Support of the Alaska Energy Authority's proposed ILP schedule and
request to lift the licensing abeyance.**

Dear Secretary Bose:

The Chickaloon Moose Creek Native Association requests that the Federal Energy Regulatory Commission (Commission) approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015.

In discussions with AEA, we understand that AEA proposes to incorporate 2014 studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

FERC and stakeholders will have the opportunity to consider all of the data and information collected to date, thus preserving the value of the work already done. The proposed schedule provides sufficient time for review of existing study material and new 2014 data. Most review times are doubled from FERC regulation schedule with over 100 days provided from new 2014 material being available before a full set of initial study report meetings.

Additionally, the Alaska Energy Authority will use existing funds to preserve the investment that the state has already made and advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule is cost effective and provides the most up to date materials to all stakeholders

Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available.

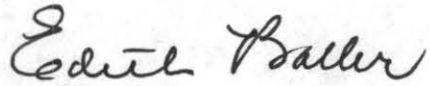
Moving forward with this proposal will be best for all parties involved as well as our corporation shareholders.

Should you have any questions or need additional information, please do not hesitate to contact me at

Chickaloon Moose Creek Native Association

907-373-1145 Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Edith Baller".

Edith Baller
President
Chickaloon Moose Creek Native Association

20151013-5000

Richard L. Anderson, Anchorage, AK.
United States Department of the Interior
NATIONAL PARK SERVICE
Alaska Region
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

IN REPLY REFER TO:
1.A.1. (AKRO-EPC
RR-15/0122

October 9, 2015

ELECTRONIC MAIL - NO HARD COPY TO FOLLOW

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 02426

Re: National Park Service comments on Alaska Energy Authority request to lift abeyance on Susitna-Watana Integrated Licensing Process; FERC P-14241-000

Dear Madam Secretary:

The National Park Service (NPS) appreciates the opportunity to comment on the August 26, 2015 request by the Alaska Energy Authority (AEA) to lift the abeyance on the pre-licensing studies phase of the Susitna-Watana hydroelectric project previously granted by Federal Energy Regulatory Commission (FERC) on January 8, 2015. The abeyance and proposed resumption of the Internal Study Report (ISR) phase of the Integrated Licensing Process (ILP) have impacts both on agency staffing and work planning, and on the validity of many of the resource studies for the project that will span the abeyance period. Therefore we encourage FERC to base its response not only on the interests of enabling AEA to achieve the major project milestone of a FERC study plan determination on the ISR within the timeframe allowed by state funding limits, but on the interests of resource agencies and other stakeholders.

The NPS's interests can be summarized as follows:

1) Additional workload associated with proposed supplemental ISRs and ISR completeness.

AEA's proposed additions to the ISRs are somewhat confusing. The NPS would prefer to review a single study report for each resource rather than determining whether the additional sets of supplemental data per

study add value to the reports to an extent that they meet study plan requirements. Material in the original ISRs had largely been presented in draft form and discussed during 2013-14 technical workgroup meetings before being packaged into the reports. The additional data, however, were collected and reported with little or no input or feedback from agencies and stakeholders, making it more challenging to analyze or compare to previous study efforts.

We note that the two focus group sessions recommended by FERC as part of the Recreation River Flow and Access Study (12.7) have not been conducted. No additions to the June 2014 ISR for this resource have been proposed by AEA, and it appears that AEA does not intend to complete this aspect of the study plan. This differs from commitments AEA and its consultants made at technical workgroup meetings. The omission of this part of the study means that essential aspects of the project's impacts on recreational users (expert whitewater boaters utilizing Devil's Canyon and winter recreationists utilizing the middle and lower river's frozen surface) will remain unknown. We recommend that AEA note that the 2014 ISR on this study is not complete per the FERC-approved study plan.

2) Staffing and work planning.

The NPS has expended considerable time reviewing the original set of ISRs filed in June 2014 and attending the October 2014 ISR meetings. We had anticipated completing remaining tasks associated with the ISR using a combination of NPS and contractor work hours. The contractor is only available to us until March 18, 2016.

We reiterate our request from our January 23, 2014 letter to the Commission that project stakeholders be given six months' notice of major changes to allow for agency planning and staffing. We request to be included in the consultation process. The NPS was not consulted when AEA reached out to other agencies and stakeholders on the proposed resumption plan.

We urge FERC to consider developing an improved framework for using the ILP to license major original projects. For example, please consider requiring applicants to have legal access to study area lands and waters before initiating the study planning process, and set reasonable limits on process delays. Please also consider adding schedule requirements to study plans for original projects for resources for which continuity is essential, i.e. unbroken periods of observations over multiple seasons.

3) Resource study continuity.

We appreciate AEA's decision to conduct a new set of ISR meetings instead of relying on the fall 2014 meetings. In our view, given that a year has elapsed since these meetings were held, it would be difficult for agencies or stakeholders to reconstruct discussions held during these meetings in order to formulate meaningful comments on the summaries.

We would like to reiterate the request we made in January 2014, that, in light of the repeated delays and interruptions in field work on this

project, the ISRs for each resource include an analysis of the effects of a lack of temporal continuity on achieving study plan objectives. We believe this topic should also be addressed during the ISR meetings.

Thank you for considering these NPS comments. If you have any questions, please contact Cassie Thomas, Alaska hydropower program coordinator, at 907-350-4139 or cassie_thomas@nps.gov.

Sincerely,

/s/

Debra Cooper
Associate Regional Director for Resources

20151013-5002

Ruth Wood, Talkeetna, AK.
October 9, 2015

To: Federal Energy Regulatory Commission

Re: P-14241-000 proposed Susitna Dam

Here are my comments on the Alaska Energy Authority's (AEA) request to restart the licensing process for the proposed Susitna dam project. Please deny AEA's request to restart the licensing process for the proposed Susitna dam project.

First, AEA has been unable to meet licensing deadlines, asking for numerous extensions. Second, AEA has failed to design and conduct the studies required (and needed) to identify biological resources (e.g., fish and wildlife) or to identify important physical processes (e.g. hydrological, geological) in the river. The inability to define and describe resources makes it impossible to judge impacts from the proposed design and impossible to designing mitigation requirements.

The world has changed since 2012. The State of Alaska is experiencing an extreme fiscal crisis. No additional monies were allocated to this project in last year's State budget, and it is highly unlikely that the State will allocate monies for this project next fiscal year. AEA is currently treading water. Their message to the legislature last year was leave us the money we have, and we can hold on for about 3 more years. Not only is this an irresponsible waste of limited State monies, but it means that AEA does not have and will not have the funds needed to pursue this project competently. Studies have been mismanaged and are incomplete. The second year's studies were designed and put into the field before results from the first year's studies were available for review. How can that kind of unscientific and irresponsible science be allowed to continue.

I recently ran into the Governor at the State Fair parade. I said to him, "Governor, we've got to stop that dam!" His reply was that given the State's current fiscal situation, he didn't see how we could do anything else. Well that's not an on-the-record, formal commitment, but it is the truth and everybody in Alaska knows it.

Please stop the proposed Susitna dam and stop it now!

Sincerely,

Ruth Wood
Talkeetna

20151013-5005

John Strassenburgh, Talkeetna, AK.
October 9, 2015

I write to urge FERC to deny AEA's request to restart the licensing process for the Susitna dam project.

AEA has mismanaged the project from the start, resulting in a colossal waste of public funds.... funds the state no longer has. The fiscal distress in the state of Alaska is extreme. We can't afford to maintain our roads, much less throw money at an enormous project that will return no revenue to the State. In short, we can't afford Susitna.

Given AEA's record to date, including missed deadlines and scientific studies that are too narrow in scope and so poorly conducted that the potential impacts of a dam are not being identified or assessed, my conclusion is that AEA lacks the capacity to properly carry out the licensing process.

I do not believe that the studies that AEA has overseen to date are either scientifically or legally defensible.

Susitna is the wrong dam in the wrong place at the wrong time, and I don't think the state or federal agencies should be throwing any more money at it.

I urge FERC to not restart the licensing process.... and otherwise bring Susitna Watana Dam to an end.

Sincerely,

John Strassenburgh
Talkeetna

20151013-5140



Headquarters:
1689 C Street, #219
Anchorage, AK 99501-5131
Tel: (907) 272-0707
Fax: (907) 274-7125

Madison Branch:
229 Palmer Road
Madison, AL 35758
Tel: (256) 258-6200
Fax: (256) 258-6260

October 9, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Support of the Alaska Energy Authority's proposed ILP schedule and request to lift the licensing
abeyance.

Dear Secretary Bose:

Tyonek Native Corporation (TNC) requests that the Federal Energy Regulatory Commission (Commission) approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015.

In discussions with AEA, we understand that AEA proposes to incorporate 2014 studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

FERC and stakeholders will have the opportunity to consider all of the data and information collected to date, thus preserving the value of the work already done. The proposed schedule provides sufficient time for review of existing study material and new 2014 data. Most review times are doubled from FERC regulation schedule with over 100 days provided from new 2014 material being available before a full set of initial study report meetings.

Additionally, the Alaska Energy Authority will use existing funds to preserve the investment that the state has already made and advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule is cost effective and provides the most up to date materials to all stakeholders

Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available.

Tyonek Native Corporation works cooperatively with AEA and is interested in getting the most current data available to ensure TNC and others are making fully informed decisions as the project progresses. We fully support AEA's efforts to include all data through 2014 ensuring the Study Plan Determination includes up to date information in order for FERC and stakeholders to receive the best possible data. We believe the ILP Schedule requested by AEA is adequate enough time for stakeholders to review, so we urge the Commission to approve AEA's recommended ILP Schedule and lift the licensing abeyance in order for the project to progress to the next step.

Should you have any questions or need additional information, please do not hesitate to contact me at 907-272-0707. Thank you.

Sincerely,



Connie J. Downing, Director, Alaska Land and Operations
Tyonek Native Corporation

20151013-5145



United States Department of the Interior

NATIONAL PARK SERVICE

Alaska Region
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

IN REPLY REFER TO:
I.A.I. (AKRO-EPC)
RR-15/0122

October 9, 2015

ELECTRONIC MAIL – NO HARD COPY TO FOLLOW

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 02426

**Re: National Park Service comments on Alaska Energy Authority request to lift
abeyance on Susitna-Watana Integrated Licensing Process; FERC P-14241-000**

Dear Madam Secretary:

The National Park Service (NPS) appreciates the opportunity to comment on the August 26, 2015 request by the Alaska Energy Authority (AEA) to lift the abeyance on the pre-licensing studies phase of the Susitna-Watana hydroelectric project previously granted by Federal Energy Regulatory Commission (FERC) on January 8, 2015. The abeyance and proposed resumption of the Internal Study Report (ISR) phase of the Integrated Licensing Process (ILP) have impacts both on agency staffing and work planning, and on the validity of many of the resource studies for the project that will span the abeyance period. Therefore we encourage FERC to base its response not only on the interests of enabling AEA to achieve the major project milestone of a FERC study plan determination on the ISR within the timeframe allowed by state funding limits, but on the interests of resource agencies and other stakeholders.

The NPS's interests can be summarized as follows:

- 1) Additional workload associated with proposed supplemental ISRs and ISR completeness.

AEA's proposed additions to the ISRs are somewhat confusing. The NPS would prefer to review a single study report for each resource rather than determining whether the additional sets of supplemental data per study add value to the reports to an extent that they meet study plan requirements. Material in the original ISRs had largely been presented in draft form and discussed during 2013-14 technical workgroup meetings before being packaged into the reports.

The additional data, however, were collected and reported with little or no input or feedback from agencies and stakeholders, making it more challenging to analyze or compare to previous study efforts.

We note that the two focus group sessions recommended by FERC as part of the Recreation River Flow and Access Study (12.7) have not been conducted. No additions to the June 2014 ISR for this resource have been proposed by AEA, and it appears that AEA does not intend to complete this aspect of the study plan. This differs from commitments AEA and its consultants made at technical workgroup meetings. The omission of this part of the study means that essential aspects of the project's impacts on recreational users (expert whitewater boaters utilizing Devil's Canyon and winter recreationists utilizing the middle and lower river's frozen surface) will remain unknown. We recommend that AEA note that the 2014 ISR on this study is not complete per the FERC-approved study plan.

2) Staffing and work planning.

The NPS has expended considerable time reviewing the original set of ISRs filed in June 2014 and attending the October 2014 ISR meetings. We had anticipated completing remaining tasks associated with the ISR using a combination of NPS and contractor work hours. The contractor is only available to us until March 18, 2016.

We reiterate our request from our January 23, 2014 letter to the Commission that project stakeholders be given six months' notice of major changes to allow for agency planning and staffing. We request to be included in the consultation process. The NPS was not consulted when AEA reached out to other agencies and stakeholders on the proposed resumption plan.

We urge FERC to consider developing an improved framework for using the ILP to license major original projects. For example, please consider requiring applicants to have legal access to study area lands and waters before initiating the study planning process, and set reasonable limits on process delays. Please also consider adding schedule requirements to study plans for original projects for resources for which continuity is essential, i.e. unbroken periods of observations over multiple seasons.

3) Resource study continuity.

We appreciate AEA's decision to conduct a new set of ISR meetings instead of relying on the fall 2014 meetings. In our view, given that a year has elapsed since these meetings were held, it would be difficult for agencies or stakeholders to reconstruct discussions held during these meetings in order to formulate meaningful comments on the summaries.

We would like to reiterate the request we made in January 2014, that, in light of the repeated delays and interruptions in field work on this project, the ISRs for each resource include an analysis of the effects of a lack of temporal continuity on achieving study plan objectives. We believe this topic should also be addressed during the ISR meetings.

Thank you for considering these NPS comments. If you have any questions, please contact Cassie Thomas, Alaska hydropower program coordinator, at 907-350-4139 or cassie_thomas@nps.gov.

Sincerely,

A handwritten signature in blue ink that reads "Brooke Menell, for". The signature is written in a cursive, flowing style.

Debora Cooper
Associate Regional Director for Resources

20151013-5366



KNIK TRIBAL COUNCIL

KNIK, THE OLDEST VILLAGE IN COOK INLET

October 4th, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Support of the Alaska Energy Authority's proposed ILP schedule and
request to lift the licensing abeyance.**

Dear Secretary Bose:

The *Knik Tribal Council* requests that the Federal Energy Regulatory Commission approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015.

In discussions with AEA, we understand that AEA proposes to incorporate studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

The Alaska Energy Authority has expressed intentions to use existing funds to preserve the investment that the State has already made to advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule seems cost effective and provides the most up to date materials to all stakeholders.

Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available.

Should you have any questions or need additional information, please do not hesitate to contact me at 907-306-3689 or dcall@kniktribe.org. Thank you.

Sincerely,

Debra Call
Vice President
Knik Tribal Council

20151013-5595



October 13, 2015

The Honorable Kimberly D. Bose
 Secretary
 Federal Energy Regulatory Commission
 888 First Street, N.E.
 Washington, DC 20426

**Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
 Response to Comments on Request to Lift Abeyance and Approve
 Proposed Modifications to ILP Plan and Schedule**

Dear Secretary Bose:

The Alaska Energy Authority (AEA) would like to respond to comments on AEA's August 26, 2015 request to lift the abeyance granted to AEA by the Federal Energy Regulatory Commission (Commission or FERC) of the Integrated Licensing Process (ILP) for the proposed Susitna-Watana Hydroelectric Project No. 14241 (Project), and to approve AEA's proposed modifications to the ILP plan and schedule (August 26 Request).¹

AEA appreciates the comments of the State of Alaska Department of Natural Resources, Cook Inlet Region Inc., Ninilchik Natives Association, Inc., Tyonek Native Corporation, Knik Tribal Council, Homer Electric Association, Inc., Chugach Electric Association, and Joseph R. Henri in support of AEA's request. Others filed comments opposing the request to lift the licensing abeyance and proposed schedule. AEA believes the record will be better informed with this response.

AEA filed its Initial Study Report (ISR) on June 3, 2014, documenting 2013 study results per the revised schedule approved by the Commission. By letter dated October 3, 2014, the Commission revised the ILP plan and schedule to accommodate the filing of 30 technical memoranda containing information not yet available when the ISR was filed, in order to bring the record up to date for the Commission's revised Study Plan Determination (SPD) then scheduled for April 2015. On January 8, 2015, the Commission granted AEA's request to hold the ILP in abeyance following an Administrative Order by the Governor of Alaska suspending discretionary spending on the Project.

¹ The Commission invited comments by public notice dated September 9, 2015.

On July 6, 2015, the Governor's office authorized AEA to proceed with the ILP using previously appropriated funds.² AEA then filed its August 26 Request, proposing to: (i) lift the abeyance, (ii) modify the ILP plan and schedule leading up to the Commission's issuance of a revised SPD by the end of August 2016; and (iii) supplement the record to include all data collected through the end of 2014, including data collected and/or analyzed following the filing of the 30 technical memoranda in September 2014. As to the last, AEA explained that by November 6, 2015, it would file additional technical memoranda and study reports reflecting the entire 2014 data collection effort along with a roadmap tying this supplemental information to the ISR.³

The National Marine Fisheries Service (NMFS) opposes lifting the ILP abeyance based on AEA's current lack of funding to conduct further studies, and argues that the ILP should be restarted only when the State has made "a financial commitment to the project."⁴ The State has invested \$192 million in the Project to date. It is unreasonable to suggest that unless the State makes an upfront commitment to fund the entire remaining licensing process, that the process should be terminated. Few hydroelectric projects would ever be built if that kind of commitment was required, and certainly no major infrastructure project on the order of magnitude of the Susitna-Watana Project. It is entirely reasonable and prudent for the State to reassess the Project a year from now with the benefit of the Commission's revised SPD. This type of risk assessment is common and recommended as part of project management best practices.

NMFS also comments that AEA "now requests another modification" to the ILP after the ILP has been modified several times.⁵ Throughout this licensing process, AEA has worked to be responsive to stakeholders and provide adequate time for review and participation—including NMFS. Virtually every modification AEA has requested to the ILP has been, at least in part, for the purpose of giving agencies and other stakeholders more time to review and comment on materials—often at their own request—thus making their participation less burdensome.

The ILP has ample flexibility to adjust to changes in circumstances. As with many other projects where the Commission has adjusted procedures and timeframes within the ILP when necessary, the Commission can do so here.

AEA is proposing to advance the Project to the SPD and for the Commission and licensing participants to review study progress to date. This approach will better enable the Commission to determine what additional work is needed to evaluate potential environmental effects. As part of the SPD, the Commission will decide whether any

² August 26 Request, Att. 2.

³ As explained in the meeting notes included in Attachment 4 to AEA's August 26 Request, AEA is developing an ISR Part D for each of the 58 studies which will provide a status report on the study implementation as well as a cross-reference to any pertinent technical memoranda. *Id.*, Att. 4 at 4.

⁴ Letter from James W. Balsiger, NMFS, to Kimberly D. Bose, FERC, at 2, Project No. 14241-000 (filed Oct. 5, 2015) (NMFS Letter).

⁵ *Id.* at 1.

studies are complete or have advanced appropriately. Therefore, it is seemingly circular reasoning for NMFS to argue that the ILP should remain suspended because “no study has advanced to where NMFS could request study modifications and new studies or assess AEA’s variations to the FERC-ordered study plan.”⁶ NMFS also advocates the SPD must include at least a second year of studies for all of the 21 fish and aquatic studies while acknowledging NMFS has not received or reviewed the results of the 2014 studies. Regardless of whether any additional study effort is factually necessary,⁷ NMFS presumes the outcome of the Commission’s revised SPD must require more studies.

Alternatively, if the Commission lifts the abeyance, NMFS, the U.S. Fish and Wildlife Service (USFWS), and the Susitna River Coalition advocate that the Commission’s revised SPD be based on a truncated licensing record that would exclude the 2014 study results which AEA has proposed to file by November 6, 2015. To exclude available information on the grounds it does not “fit” within a literal reading of the ILP regulations is to elevate form over substance. The Commission has not taken such an interpretation of its regulations in other proceedings, or even in this proceeding to date, and should not do so here. In AEA’s view, the ultimate purpose of the Commission-approved study plan is to develop the facts. The SPD itself can evolve through more than one iteration, and is likely to do so for a proposed project of this size. As articulated by the State of Alaska Department of Natural Resources in support of AEA’s proposal:

The purpose of the studies is to provide an environmental baseline and there is no distinct advantage gained by excluding the most recent data and analysis; it is in fact, the most cost effective method of reviewing the available results of the study implementation. Further, by excluding recent data and analysis, FERC could be placing the project in an unwarranted position of having study implementation deemed insufficient or incomplete when in actuality, after June 2014 the studies had produced the information required. The question at hand is why scientists and decision makers *would not want* the most up to date information? It is nonsensical to believe good decisions can be made without all the relevant information.⁸

The Environmental Protection Agency, the U.S. Army Corps of Engineers, and the Bureau of Land Management affirmatively agreed that the 2014 information would be helpful for FERC’s SPD.⁹ As noted in the August 5, 2015 NMFS, USFWS, and AEA meeting summary appended to AEA’s August 26 Request, NMFS also supported use of the most current study data prior to FERC issuing the revised SPD.¹⁰

⁶ *Id.* at 1.

⁷ *Id.* at 1-2.

⁸ Letter from Marie Steele, Alaska Department of Natural Resources, to Kimberly Bose, at 2, FERC, Project No. 14241-000 (filed Oct. 8, 2015) (emphasis in original).

⁹ August 26 Request, Att. 4 at 12-18.

¹⁰ *Id.*, Att. 4 at 21.

Both NMFS and USFWS request that if the ILP resumes, they be given time to re-engage their staffs, and review contract budgets and scopes of work.¹¹ AEA's proposed schedule accommodates these needs. The agencies will have more than three months from AEA's filing of supplemental information on November 6 to the ISR public meetings in mid-February 2016. In contrast, *the ILP regulations provide 15 days from the filing of the ISR to the public meeting.*¹² AEA has proposed two and a half additional months, to May 1, 2016, for agency and stakeholder comments on the ISR and supplemental 2014 data. By that time, the agencies will have had six months to review the supplemental 2014 information, and almost two years since AEA filed its ISR. *The ILP regulations provide 60 days from the filing of the ISR to the deadline for stakeholder comments.*¹³ Both NMFS and USFWS offered to provide comments on AEA's June 3, 2014 ISR, and have informed AEA they have those comments prepared. The only additional work will be review of the 2014 supplemental information AEA will provide on November 6.

In addition to review time, AEA has funded third-party contractors to assist NMFS and USFWS and has expended more than \$2 million to date, with more than \$600,000 remaining in funds allocated to NMFS and USFWS for this effort.

Finally, NMFS recommends that "FERC require AEA to prepare a complete, stand-alone ISR that summarizes all study results, study variances, study modifications, and any new studies for stakeholder review."¹⁴ AEA strenuously objects to this recommendation and questions the benefit to licensing participants. Participants already have reviewed ISR Parts A, B, and C, and agencies have prepared comments. AEA proposed the current format as a way to build upon the prior documents and as a convenience to NMFS and other participants to preserve the review they have done to date. AEA's ISR Part D will provide a roadmap for integrating the new information with information provided in the ISR. Completing a stand-alone ISR would be a time-consuming and costly effort with little benefit to any participant and could not be accommodated to meet the timeframe for a revised SPD of August 2016.

In close, AEA requests that the Commission act expeditiously and grant its August 26 Request. An expeditious decision is needed in order to be able to restart the ILP by November 6 as AEA has proposed.

¹¹ NMFS Letter at 2; Letter from Socheata Lor, USFWS, to Nicholas Jayjack, FERC, at 1-2, Project No. 14241-000 (filed Oct. 5, 2015).

¹² 18 C.F.R. § 5.15(c)(2) (2015).

¹³ *Id.* § 5.15(c).

¹⁴ NMFS Letter at 2.

If you have any questions related to this matter or need additional information, please do not hesitate to contact me at (907) 771-3955. Thank you.

Sincerely,

A handwritten signature in blue ink that reads "Wayne M. Dyok". The signature is written in a cursive style with a horizontal line underneath the name.

Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

20151016-0079



October 9, 2015

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION

2015 OCT 16 A 9:35

FEDERAL ENERGY
REGULATORY COMMISSION

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Subject: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Comments on Request to Lift the Integrated Licensing Process (ILP) Abeyance
and Approve Proposed Modifications to the ILP Plan and Schedule**

Dear Secretary Bose:

I am writing on behalf of Chugach Electric Association to comment on recent requests by the Alaska Energy Authority (AEA) relative to the Susitna-Watana Hydroelectric Project.

Chugach is Alaska's largest electric utility and a prospective purchaser of power from the project. We remain supportive of AEA's efforts to advance the project to a license application. We are also in support of moving forward in an efficient manner.

AEA has asked that FERC lift an abeyance of the Integrated Licensing Process and that you approve proposed modifications to the ILP plan and schedule. Chugach supports both of these requests.

AEA has proposed a schedule that would allow it to use data collected during the 2014 field season. In our opinion, that is a very reasonable request. It seems logical that the most recently collected information be incorporated into the review process. At Chugach, we are very familiar with project management in Alaska – as well as the cost of delay. If the 2014 study data is available on the schedule proposed by AEA, it only makes sense to use it now and not delay the process.

Project costs will be reflected in the proposed cost of power. If Chugach signs on to purchase power from the project, those costs will be borne by our customers. We are in favor of efficiency at every step of the process.

Sincerely,

Bradley W. Evans
Chief Executive Officer

Chugach Electric Association, Inc.

5601 Denham Drive P.O. Box 190300 Anchorage, Alaska 99519-0300 • (907) 573-1891 • Fax (907) 563-0017 • (800) 457-7194
www.chugachelectric.com • info@chugachelectric.com

20151027-3013

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
October 27, 2015

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: Letter Lifting ILP Abeyance

Dear Mr. Dyok:

On December 31, 2014, Alaska Energy Authority (AEA) requested that we hold the Susitna-Watana Integrated Licensing Process (ILP) in abeyance because discretionary spending on the proposed project was suspended by the governor, and therefore, AEA could not proceed with the ILP. We granted the request on January 8, 2015, holding the ILP in abeyance until further notice. On July 6, 2015, the Governor's office authorized AEA to proceed with the project up to the determination (SPD) on requested study plan modifications and/or the need for new studies. On August 26, 2015, AEA filed a revised process plan and schedule along with a request that we lift the abeyance and proceed with the ILP accordingly.

In its August 26 filing, AEA proposes to supplement the Initial Study Report (ISR) filed on June 3, 2014 and technical memoranda filed on various dates in September of 2014 with additional data it collected in 2014. To assist stakeholders in reviewing the ISR, technical memoranda, and additional study data, AEA proposes to file a document ("roadmap") that explains how the technical memoranda and additional data relate to the June 2014 ISR. The roadmap would also provide a status report on study plan implementation. AEA proposes to file all of this material by November 6, 2015. AEA proposes a 3-month review period for all of the filed material before holding ISR meetings on February 9, 10, 11, 23, 24, and 25, 2016.

On September 9, 2015, we requested comments on AEA's request to lift the ILP abeyance and proceed under the proposed revision to the ILP process plan and schedule. The Alaska Department of Natural Resources, Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Chickaloon Moose Creek Native

Association, Tyonek Native Corporation, Cook Inlet Region, Inc., Ninilchik Natives Association, Inc., Knik Tribal Council, Homer Electric Association, Inc., Chugach Electric Association, and Mr. Joseph Henry filed comments in support AEA's request.

The National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. National Park Service, several non-governmental organizations, and 12 individuals oppose reinstatement of the ILP but recommend, among other things, that if the abeyance is lifted, AEA be required to prepare a complete, stand-alone ISR that summarizes all study results, study variances, proposed study plan modifications and/or new studies to facilitate stakeholder review. In requesting a stand-alone ISR, these commenters argue that the volume of information found in multiple filings along with the interruptions in the ILP have made it very difficult to understand the relationships among the multiple study report filings.

In an October 13, 2015 response to those requesting a stand-alone ISR, AEA argues that its proposed "roadmap" will adequately guide the stakeholders and that AEA's proposed schedule provides stakeholders ample time (3 months) to review the information prior to the ISR meetings and to subsequently provide comments and requests for study modifications and new studies (6 months). AEA opposes preparing a stand-alone ISR, because it alleges that doing so would be costly, time-consuming, and of little value considering participants have already reviewed the June 2014 ISR, and the September 2014 technical memoranda.

Discussion

The ILP regulations (section 5.15) require a prospective applicant to file an ISR within one year of the study plan determination. The ISR is to describe a prospective applicant's overall progress in implementing the approved study plan and the data collected, including an explanation of any variances from the approved study plan (section 5.15(c)(1)). Because it has been over 2 years since the study plan determinations were issued in February and April 2013, and because the information usually included in one ISR has been filed in multiple documents over a nearly 1.5-year period, we are concerned that the responsibility of coordinating the documents could be unreasonably shifted from the potential applicant under the ILP, to the ILP stakeholders, especially if the roadmap does not adequately tie-together the record of information.

Therefore, until Commission staff can review AEA's roadmap, we cannot determine whether it, in combination with the rest of AEA's filings, will reasonably function as an ISR as defined in the ILP regulations. Please file the roadmap and other documents specified in your proposed revision to the process plan and schedule by November 6, 2015. We will review the roadmap to see how well it functions to tie together the record of information and by November 30 will make a decision on the ILP schedule going forward.

If you have any questions, please contact David Turner at (202) 502-6091 or David.Turner@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

cc: Mailing List
Public Files

20151102-5132

Rebecca Long
POB 1088, Talkeetna AK 99676

November 1, 2015

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

Dear Secretary Bose:

Re: FERC Project No. P-14241-000 Susitna Dam Proposal
Comments of Clarification, Boom & Bust Study Funding, Scientific Concerns,
Response to Applicant's 10/13/15 Letter

The Office of Energy Projects (OEP) of the Commission made a good decision in its 10/27/15 letter requesting that the applicant file the promised "road map" in order to analyze how the applicant will tie together the record of information. This looks out for the stakeholder interests and the general public interest.

OEP is building a public record that will be perused by future hydroelectric applicants as to the reliability and accountability of the relatively new Integrated Licensing Process (ILP) for original dam proposals licensing. Precedents will be set.

Clarification for the Public Record

The OEP's 10/27/15 letter regarding "Lifting ILP Abeyance" stated on page 2:

"The National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. National Park Service, several non-governmental organizations and 12 individuals oppose reinstatement of the ILP but recommend, among other things, that if the abeyance is lifted, AEA be required to prepare a complete, stand-alone ISR that summarizes all study results, study variances, proposed study plan modifications and/or new studies to facilitate stakeholder review."

In fact, there were more than several Non-Governmental Organizations. Eleven organizations filed a letter making three main points on the ILP restart request.

OEP also did not mention the 10/9/15 Susitna River Coalition member letter that was filed. This grassroots public letter should not be discounted in the public record. 588 people wrote that they did not want the abeyance lifted. 296 Alaskan residents from Unalaska, the Kenai Peninsula, Southeast, Southcentral, and the Interior all the way up to Fort Yukon wrote to terminate the licensing process. Outside of Alaska, 292 people representing 45 states, Washington DC, 5 Canadian Provinces, New Zealand and Australia made comments in opposition to the restart.

R. Long Further Comments on ILP Restart

Conclusion: The record clearly shows that the public who care enough to respond to FERC's request for comments support a free flowing undammed river for a variety of reasons. This is the grassroots public record.

Unresolved Scientific Issues

The goal of the ILP studies is to provide data for two reasons. This data is used to establish the baseline conditions which will be extrapolated for the whole watershed. The data is also to provide accurate model inputs for the end result to predict watershed-wide project impacts.

Both the National Marine Fisheries Service filing on 10/2/15 and the U.S. Fish and Wildlife Service 10/5/15 filing stated that the concerns they filed with FERC on 9/22/14 have not gone away. The concerns have not been resolved. The basic outline of the concerns is as follows.

1. Data Collection Issues:
 - quality assurance, quality control and methodologies concerns that could mean RSP study plan objectives will not be met;
 - data collection and analysis need improvement so that misidentification of juvenile fish for one does not occur;
 - inappropriate scale of sampling effort that means fish/habitat associations by species and life stage can't be made and extrapolated; and
 - the lack of a co-location of sampling sites means FERC recommended SPD might not be fulfilled.
2. Model Integration/Proof of Concept Concerns:
 - Biological relevance has not been met; and
 - Data is not sufficient to meet integrated modeling efforts and predictive modeling capabilities.
3. Lack of collaborative processes to develop Decision Support Systems (DSS).
A schedule for DSS development should occur so data gaps can be identified and added to the study plan.

This is just a general encapsulation of issues brought up by the Services. But these issues were supposed to be resolved before the second year studies occurred. Now it is apparent that the applicant continued to conduct studies in the field without these resolved. Stakeholders can only logically conclude that FERC modified RSPs goals will not be met in many instances.

The Services report their scientific concerns not just for the sake of the public interest. They have legal obligations which they must fulfill under the Magnuson-Stevens Fishery Conservation and Management Act, the Anadromous Fish Conservation Act, the Pacific Salmon Treaty Act, the Fish and Wildlife Coordination Act, the Endangered Species Act and the Marine Mammal Protection Act. They must have the accurate data to formulate recommendations under Section 10(j) of the Federal Power Act for protection, mitigation, and enhancement measures associated with the project. They have to be able to formulate informed decisions pursuant to Section 18 Fishway Prescription Authority under the Federal Power Act.

Conclusion: Data concerns causes questions of the scientific defensibility of the data and the model inputs. The ability of the federal agencies to carry out the laws they operate under is currently compromised. Thus, the integrity of baseline data conditions and project impact analysis are questionable. Both the Office of Project Management and Permitting of the Alaska Department of Natural Resources and the applicant in their comments emphasize the importance of preserving the value and investment of the state's \$192 million expenditure which is the study data which would become the data archive. Currently, the quality of that data is questionable which decreases the value of the state's investment.

Response to Comments in 10/13/15 Applicant Letter¹

Focus: Restart the ILP considering Alaska's budgetary crisis

NMFS "recommended that the ILP be restarted when a financial commitment to the project is established."² AEA responds to this comment on page 2 by saying:

"It is unreasonable to suggest that unless the State makes an upfront commitment to fund the entire remaining licensing process, that the process should be terminated. Few hydroelectric projects would ever be built if that kind of commitment was required, and certainly no major infrastructure project on the order of magnitude of the Susitna-Watana Project. It is entirely reasonable and prudent for the State to reassess the Project a year from now with the benefit of the Commission's revised SPD. This type of risk assessment is common and recommended as part of project management best practices."

Is this factually accurate? Or is this just a convenient cover for the fact that the state of Alaska may not have the kind of money for years to commit to this project license?

When the price of oil declined precipitously the end of 2014, the enormity of the state's deficits in fiscal years 2015 and 2016 were staggering to the Alaska Legislature, the Administration and the public, reverberating throughout the state's municipal governments. This is stated in the 6/04/15 Alaska Legislature Revenue White Paper.³

"The clear takeaway is that absent a rebound in oil prices or a massive restructuring the state's fiscal regime, there is only 3 to 4 years of savings remaining to preserve government services over the long term, as well as to finance and complete major projects."

The 11 NGOs in their comments to FERC⁴ stated "...on July 6, 2015, the governor again made it clear that AEA was allowed to essentially spend down existing funds to

¹ Alaska Energy Authority, "Response to Comments on Request to Lift Abeyance and Approve Proposed Modifications to ILP plan and Schedule," 10/13/15.

² NMFS, "FERC Project P-14241, Proposed Susitna Watana-Hydropower Project," 10/2/15, p.2.

³ Building a Sustainable Future (Governor Walker's program), "Potential Fiscal and Revenue Options for the Walker-Mallot administration, Revenue White Paper," 6/4/15.

⁴ "Comments on AEA's request to lift the ILP abeyance and proposed modifications to the ILP plan and Schedule, Susitna-Watana Hydrologic Project No. 14241-000," 10/8/15, p. 2-3.

preserve the state's investment, but no new funds were available. The letter also emphasized that in fiscal year 2017, the Susitna project 'will be revisited in the context of the fiscal environment and other competing major capital projects.' Since that time, the Governor has prioritized the natural gas pipeline project over all other capital projects. In addition, given the grim outlook for oil prices to rebound in the near future, the fiscal climate for the State of Alaska is not likely to change anytime soon.....There is no reasonably foreseeable funding source to complete the FERC approved study plan in a manner that tracks the ILP process consistent with FERC regulations."

Conclusion: The phased approach to funding the licensing process which AEA calls a type of risk assessment that is common to project management best practices is inappropriate for the state of Alaska in its current fiscal crisis. To question the restart of the ILP when there is no money forthcoming is reasonable to do.

Focus: The boom/bust, highly variable project funding and modifications

The study process is one of the most important steps in the licensing process. AEA argues on page 2:

"Throughout this licensing process, AEA has worked to be responsive to stakeholders and provide adequate time for review and participation—including NMFS. Virtually every modification AEA has requested to the ILP has been, at least in part, for the purpose of giving agencies and other stakeholders more time to review and comment on materials—often at their own request—thus making their participation less burdensome."

Licensing participants say that every modification has been proposed by the applicant because that particular milestone could not be met by the applicant. The Proposed Study Plan became the Revised Study Plan. The Study Plan Determination for the RSPs became truncated due to lack of adequate data for 13 studies. The Initial Study Review (ISR) was not ready by 2/3/14. In part, the state funding sources has caused this. In retrospect one can see there has been a "boom/bust" in project licensing funding.

The 1/6/14 AEA request for time extension to file the ISR was due to the extensive data collected and the lack of funding. Apparently, this meant the ISR could not be finished by 2/3/14. OEP stated in its 1/28/14 letter⁵:

"In support of its request, AEA states that during 2013, it collected an extensive amount of data through implementation of 58 individual studies, and the extension of time and revised schedule would benefit the process by providing AEA the time needed to complete its Initial Study Report. AEA also states that its modified schedule would allow AEA to reprioritize the studies scheduled for 2014 in light of stated budget shortfalls."

⁵ OEP, "Response to Extension of Time Request," 1/28/14, p.1.

Also AEA stated they would be postponing most second season studies scheduled for 2014 to 2015. It was decided by letter order that due to the lack of funding majority of second year studies would be postponed until 2015.

But then this changed again when AEA's budget doubled due to state funding. The studies to be postponed by FERC order were not postponed. They were continued in the field after the ISR was filed irrespective of the FERC order. In the fall 2014, AEA filed 30 technical memorandums of data from the continuation of the studies to be considered in the ISR.

As FERC stated in its 10/3/14 letter⁶:

" In the ISR filing, AEA also states that it had double the budget that it anticipated it would have when it made its extension of time request in January 2014, and therefore, included an updated and more extensive scope of work for summer 2014 studies." And

".... the results of second season studies that had been postponed until 2015 by Commission staff's January 28, 2014 letter order, but AEA decided to conduct one year ahead of schedule in 2014."

AEA's fiscal circumstances changed again with Executive Order 271 issued by Alaska Governor Walker on 12/26/14. On page 1, the order stated "With the extensive drop in market oil prices contributing to a large budget deficit, there is need to take immediate and responsible action to ensure the state remains in a healthy fiscal position. Consequently, pending further review, I am directing all state agencies to halt to the maximum extent possible discretionary expenditures for the following projects. Project C-Susitna-Watana Dam Project."

This EO was lifted on July 6, 2015 by Governor Walker. In spite of all this, AEA has forged ahead with studies without the benefits of ISR review. Currently as of 11/1/15, AEA has filed 28 reports on 16 studies. Four of those are completed studies. Six studies have 2014 study implementation reports. Four studies have 2014 and 2015 study implementation reports. The 2015 date shows that third year study data is reported.

Conclusion: Study modifications have occurred due to the ups and downs of state funding, land access issues and the extensiveness of data collection. The applicant requested modifications. In response the modifications have given stakeholders more time to review and comment. But this was initiated by FERC to benefit stakeholders not by the applicant.

Study Data without benefit of ISR public review process

The pre-licensing process now has thousands of pages of study data from the fall of 2014 and the fall of 2015 with some studies allegedly completed. FERC has made it clear that second year study work undertaken without the benefit of a SPD is risky. Does

⁶ FERC, "Response to filing of Technical Memoranda and Modification of ILP Process Plan and Schedule," 10/3/14, p.3.

the risk entail redoing of study work and/or significant modifications that could lead to third year of studies?

As 11 NGOs wrote in 9/16/14 letter⁷:

"After first year studies are complete, it is the ISR review process that assesses whether AEA has met the objectives in the RSP and what changes need to be made to second-year studies. The ISR review and subsequent FERC ISR determination provides the basis for whether proposed second-year field work is consistent with the RSP. AEA's process circumvents the entire ISR review process and FERC's regulations. It also casts uncertainty over any future evaluations or determination based on these studies-including the development of the Environmental Impact Statement to the National Environmental Policy Act (NEPA)."

Conclusion: AEA's risky pursuit of "unsanctioned" data does cast uncertainty. AEA made disparaging comments about stakeholders who have a literal adherence to form over substance. AEA's actions disingenuously place the burden on stakeholders. The form is important in order to ensure the scientific defensibility of the study data.

This proposed dam is a large infrastructure project affecting a large watershed. There are many good attributes of the ILP process that are important: increased public participation in pre-filing consultation, development by the potential applicant of a FERC approved study plan, good coordination between the agencies, and a good process to resolve disputes.

A key feature is the early involvement by the OEP in development, implementation and review of scientific studies. Stakeholders believe this is important in order to insure the scientific integrity of the data upon which the federal license and NEPA documents are dependent on.

A lot is at stake here.

Sincerely,

Rebecca Long

⁷ 11 NGOs, "Initial Study Report Meeting, Susitna-Watana Hydroelectric Project (P-14241)," 9/16/14, p.3.

20151104-5219

**WATER AND POWER
LAW GROUP PC**

2140 SHATTUCK AVENUE, STE. 801
BERKELEY, CA 94704-1229
(510) 296-5588
(866) 407-8073 (E-FAX)

November 4, 2015

Via eFiling

Ms. Ann F. Miles
Director of Office of Energy Projects
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Alaska Energy Authority's Request to Lift ILP Abeyance for the Susitna River Project (P-14241-000)

Dear Ms. Miles:

The Susitna River Coalition, Talkeetna Defense Fund, and Alaska Survival write in response to your letter to the Alaska Energy Authority (AEA) directing it to “file the roadmap and other documents specified in your proposed revision to the process plan and schedule by November 6, 2015.”¹ Office of Energy Projects (OEP) Staff has determined that these documents are necessary for it to issue a decision on AEA’s request to lift the ILP abeyance for the Susitna River Project and proposed go-forward schedule.² OEP indicates its primary concern is whether AEA’s proposed roadmap will function effectively “to tie together the record of information.”³

We appreciate OEP Staff’s caution as it considers AEA’s request. Contrary to AEA’s arguments that the ILP “has ample flexibility to adjust to changes in circumstances,” we agree with OEP Staff that the degree to which the ILP has been stretched in this case is cause for concern, not only because of the potential shifting of AEA’s burden to stakeholders,⁴ but also because of how it might affect the reliability of the scientific record for this proceeding.⁵ In

¹ Letter from Ann. F. Miles, FERC, to Wayne Dyok, AEA, eLibrary no. 20151027-3013 (Oct. 27, 2015), p.

2.

² *Id.*

³ *Id.*

⁴ *Id.* (Because it has been over 2 years since the study plan determinations were issued in February and April 2013, and because the information usually include in one ISR has been filed in multiple documents over a nearly 1.5-year period, we are concerned that the responsibility of coordinating the documents could be unreasonably shifted from the potential applicant under the ILP, to the ILP stakeholders, especially if the roadmap does not adequately tie together the record of information.).

⁵ As the National Park Service (NPS) stated, “[t]he abeyance and proposed resumption of the Internal Study Report (ISR) phase of the Integrated Licensing Process (ILP) have impacts both on agency staffing and work planning, and on the validity of many of the resource studies for the project that will span the abeyance period. See

Ann F. Miles
November 4, 2015
Page 2

these circumstances, where AEA has deviated significantly from the approved study plan and several issues already have been raised regarding the study results filed prior to the ILP abeyance, we believe it is reasonable for participants to raise concerns about AEA's proposal, including its request to introduce additional information gathered outside of the approved study plan.⁶

Contrary to AEA's arguments, the purpose of the Commission-approved study plan is not just "to develop the facts."⁷ Any study plan will develop facts, but those facts will not necessarily be agreed to by the interested parties. As described in the final ILP rule, the purpose of a *Commission-approved study plan* is to bring "pre-filing finality to the issue of what information gathering and studies will be required by the Commission to provide a sound evidentiary basis on which the Commission and other participants in the process can make recommendations and provide terms and conditions."⁸ An approved study plan is intended to prevent lingering disputes over "fundamental issues about what information gathering and studies are necessary."⁹ That has not happened here. Three years into the study process there appear to be serious disputes about whether the study results filed by AEA in 2014 will provide, even in part, a sound evidentiary basis for licensing.¹⁰

We urge OEP Staff to review the roadmap AEA will file on November 6 with the true purpose of the approved study plan in mind. Will AEA's proposed procedures, including format of study information and schedule for review, permit the Commission and other participants to resolve the issues of (1) what information gathered to date is reliable and useful, (2) what additional information is necessary to provide a sound evidentiary basis for the licensing and other permitting decisions, and (3) what methods should be used to collect any additional information, keeping in mind that AEA may not have adequate funds to undertake additional studies in 2016? Further, will those procedures avoid placing an undue burden on stakeholders to coordinate the study results? If not, then OEP should not grant AEA's request, or at least should not do so without further conditions. For example, if OEP is considering granting AEA's

letter from Debora Cooper, NPS, to Kimberly D. Bose, FERC, eLibrary no.20151013-5145 (Oct. 9, 2015), p. 1 (emphasis added) (NPS Letter).

⁶ Contrary to AEA's arguments, the Susitna River Coalition is not arbitrarily arguing that the study plan determination should be based on a "truncated record." Letter from Wayne Dyok, AEA, to Kimberly D. Bose, FERC, eLibrary no. 20151013-5595 (Oct. 13, 2015), p. 3 (AEA Response). As stated previously, the Coalition generally supports the gathering of data. However, we are concerned about the reliability of information unilaterally gathered by AEA outside of the approved study plan, as well as the possibility that AEA will seek to substitute this information for subsequent years of study required under the initial study plan determination. We are also concerned as to how the ISR and any subsequent data will be integrated to permit clear understanding of the potential project impacts and the implications for further information gathering.

⁷ AEA Response, p. 3.

⁸ 68 Fed. Reg. 51,070, 51,078 (Aug. 25, 2003).

⁹ *Id.*

¹⁰ See, e.g., Letter from James W. Balsiger, Ph.D, NMFS, to Kimberly D. Bose, FERC, eLibrary no. 20151005-5050 (Oct. 2, 2015); (NMFS Letter); Letter from Socheata Lor, Ph.D., FWS, to Nicholas Jayjack, FERC, eLibrary no. 20151005-5306 (Oct. 5, 2015); NPS Letter.

Ann F. Miles
November 4, 2015
Page 3

request to submit additional technical information,¹¹ it should extend the schedule for review as requested by the National Marine Fisheries Service.¹²

Thank you for considering these comments.

Respectfully submitted,



Julie Gantenbein
WATER AND POWER LAW GROUP PC
2140 Shattuck Ave., Ste. 801
Berkeley, CA 94704
jgantenbein@waterpowerlaw.com

Attorney for the SUSITNA RIVER COALITION

Mike Wood, President of the Board of Directors
SUSITNA RIVER COALITION
Post Office Box 320
Talkeetna AK 99676
mike@susitnarivercoalition.org

Judy Price, President of the Board of Directors
ALASKA SURVIVAL
Post Office Box 320
Talkeetna AK 99676
alaskasurvival101@gmail.com

Ellen Wolf, Secretary
TALKEETNA DEFENSE FUND
Post Office Box 371
Talkeetna, AK 99676
ellenmwolf17@gmail.com

cc:

David Turner, David.Turner@ferc.gov
FERC's eService list for P-14241

¹¹ There appears to be a significant amount of new information. See, e.g., eLibrary no. 20151104-5097.
¹² NMFS Letter, p. 2.

20151109-5039

November 6, 2015

Via eFiling

Ms. Ann F. Miles
Director of Office of Energy Projects Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Alaska Energy Authority's Proposed Schedule to Resume the Pre-License Application Phase of the ILP for the Proposed Susitna River Hydropower Project (P-14241-000)

Dear Ms. Miles,

In the event Office of Energy Projects approves Alaska Energy Authority's request to incorporate the recently released study "implementation" and "completion" reports in the ISR, we support National Marine Fisheries Service ISR schedule, as proposed in its October 2, 2015 filing.

Given the extent of new data and information contained in the recently released reports, the extended time line NMFS has proposed is appropriate and necessary in order to provide sufficient time for OEP, federal and state agencies, and the public to review this new material..

Even if the 2016 legislature were to authorize and appropriate funding for AEA's second year of studies—per the approved Study Plan—AEA would not be able to conduct those studies until the 2017 field season. Therefore, as long as the OEP Director's determination were to be made by December 2016, we believe AEA would have no significant difficulty securing the appropriate contractors for the 2017 field season.

Sincerely,

John Seebach
Vice President for River Basin Conservation
American Rivers

Jan Konigsberg
Alaska Hydro Project

20151118-5030

*Alaska Survival
Post Office Box 320
Talkeetna AK 99676*

November 17, 2015

Ms. Ann Miles
Director
Office of Energy Projects
Federal Energy Regulatory Commission
888 First St. NE
Washington DC 20426

Via electronic mail

Dear Ms. Miles,

Alaska Survival (AS) is a south-central Alaska-based public interest group. AS comments on the restart of the ILP for the proposed Susitna Dam P-14241, the applicant's roadmap document, and public review schedule.

AS wishes that OEP had made it clearer in the 10/27/15 letter filed, that the abeyance on the ILP had been officially lifted by that filing.

AS also wishes that OEP had officially solicited comments from the federal agencies that have jurisdictional mandates on this hydropower licensing about the "roadmap" document. The public process can be creaky and time-consuming. And federal agencies certainly cannot respond as fast as the ordinary citizen. But the end result is worthwhile.

The roadmap document represents an onerous burden on stakeholders. It does not tie together the public record in an effective way. It just adds to the number of documents the licensing participants have to review. Part D summarizes results, modifications and variances, but the details are in other documents.

For some studies, an effective review will have to access 4 documents: the June 3, 2014 ISR Parts A-C, the September 2014 Technical Memoranda, the Study Implementation Reports or Study Completion Reports filed recently, and the Roadmap Part D which explains what documents are necessary to review for each study. A plethora of documents to peruse is not the answer.

The schedule modifications and the applicant's rush to move the project forward as quickly as possible have significantly affected the scientific integrity of the data that will be used to analyze project impacts.

If the applicant had not filed with FERC the 30 Technical Memoranda over a year ago, and if FERC hadn't accepted those filings, we would be at least three quarters or maybe more of the way through the ISR process now. As it is, the ISR process is essentially starting over.

Alaska Survival supports the National Marine Fisheries Service 10/2/15 comments that were filed that AEA should prepare a complete, stand-alone ISR that summarizes all study results, study variances, study modifications, and any new studies for stakeholder review. We value their analysis that the type of study organization which AEA has ended up submitting via their roadmap is inefficient and make the document very difficult to review thoroughly. It will result in a less rigorous review of the data. This does not sit well with stakeholders.

We also support the NMFS schedule of the ISR restart. After the complete ISR is compiled, at least 60 days should be scheduled to re-engage agency staff, contract budgets, and scopes of work. Then 90 days should be scheduled for ISR review prior to the ISR meetings and 60 days for ISR meeting summary disagreements and recommendations for study modifications or new studies. This schedule would be doable. It would go along with Alaska Governor Walker's schedule described in his 7/6/16 Clarification of Executive Order 271. The project will be reviewed in 2017 in the context of the state's fiscal environment and other competing capital projects.

We also would like to ask the applicant if the Interdependencies of the studies and the relationship of the studies to each other that were filed at the end of every Revised Study Plan in 2013 are still accurate.

Becky Long
Board of Directors
Alaska Survival

20151118-5031

Classic Alaskan Roadmap to Nowhere

11/17/15

These are comments on the Alaska Energy Authority (AEA) “Roadmap”. The study and public/stakeholder participation process for the proposed Susitna project is completely, and possibly irrevocably, off track. The situation is a classic Alaska “Roadmap to Nowhere”.

There has been as yet no completed Initial Study Review process for first year studies. Meanwhile, AEA has happily gone ahead with alleged second and third year studies. Why is this? Is it even legal to totally eliminate one, or more, of the federally mandated public stakeholder comment periods?

AEA has churned out hundreds if not thousands of pages of studies for which there is as yet no reasonable time period for public participation and comment.

It is absolutely necessary to get this process back on a rational and possibly legal track. Then second and third year studies can proceed in an orderly fashion in their scheduled time periods.

Will AEA get a “pass” and continue to put this process into chaos?

I understand AEA’s impatience: they desperately want the project now, and not tomorrow. Unfortunately for them, this process can, at least theoretically tell us if the project is even feasible in many realms: economically, socially, environmentally and culturally. This has not been done, and AEA’s “ram it through” mentality is hindering, and not helping, the process.

I hope FERC will keep these facts in mind when considering present and future comment periods, public/stakeholder participations and lime lines.

Denis Ransy
Talkeetna

20151202-3022

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
December 2, 2015

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: ILP Process Plan and Schedule

Dear Mr. Dyok:

On January 8, 2015, we granted Alaska Energy Authority's (AEA) request to hold the Susitna-Watana Integrated Licensing Process (ILP) in abeyance until further notice. On August 26, 2015, AEA asked that we lift the abeyance and proceed with the ILP through the determination on requested study plan modifications and need for new studies. AEA's request included a revised process plan and schedule with a milestone for supplementing the Initial Study Report (ISR) filed on June 3, 2014 with additional data collected in 2014. To assist stakeholders in reviewing the ISR, technical memoranda, and additional new study data, AEA proposed to file a document ("roadmap") that explains how the technical memoranda and additional data relate to the June 2014 ISR. The roadmap was also to include a status report on study plan implementation. AEA proposed to file the roadmap and implementation reports by November 6, 2015.

On September 9, 2015, we requested comments on AEA's request to lift the ILP abeyance, and proceed under the proposed revision to the ILP process plan and schedule. After considering all of the filed comments, we lifted the ILP abeyance on October 27, 2015. However, we deferred approval of the proposed process plan and schedule pending our review of the "roadmap" and all of AEA's filings to determine whether they reasonably function as an ISR as defined in the ILP regulations.¹

On November 6, 2015, AEA filed its "roadmap" document entitled, *Initial Study*

¹ The ISR is to describe a prospective applicant's overall progress in implementing the approved study plan and the data collected, including an explanation of any variances from the approved study plan (section 5.15(c)(1)) (2015).

Report Part D—Supplemental Information to June 2014 Initial Study Report. For each of the 58 Commission-approved studies, the document supplements AEA’s previous filings by providing a summary of accomplishments for each study, a list of documents related to each study, a list of additional reports that have been prepared to reflect new analyses or data gathered since the June 2014 ISR (i.e., implementation and completion reports), and AEA’s proposed steps to complete the study. In addition, between November 4 and November 25, 2015, AEA filed 29 implementation reports and 10 completion reports describing in detail the methods, variances, and analyses conducted since the filing of June 2014 ISR.

On November 18, 2015, Susitna River Coalition, Mr. Ransy, and Alaska Survival filed letters stating that AEA’s “roadmap” does not meet the intentions of the ISR and that the disjointed nature of the study process and reporting to date places an undue burden on participants to coordinate the record of information. They reiterate their request that the Commission direct AEA to prepare an integrated ISR that functions to tie-together the record of information. They further request that the Commission defer approving the schedule until it determines, in consultation with the other jurisdictional agencies, appropriate procedures to coordinate the record.

Integrated ISR

As stated in our September 9, 2015 letter, the ILP regulations (section 5.15) require a prospective applicant to file an ISR within one year of the study plan determination, and that the ISR describe a prospective applicant’s overall progress in implementing the approved study plan and the data collected, including an explanation of any variances from the approved study plan (section 5.15(c)(1)). Although in this case, the amount of information is quite large and is not provided in a single comprehensive report as contemplated by the regulations, AEA’s filings serve the intent of the ISR. AEA’s additional November 2015 filings should also help the reviewer identify new information, thereby potentially preserving the review work that has been previously completed. There appears to be little additional benefit in requiring AEA to prepare a stand-alone ISR; therefore, AEA is not required to prepare an integrated ISR.

ILP Schedule

AEA’s proposed ILP schedule would provide stakeholders: (1) 102 days to review the record prior to holding ISR meetings on February 9, 10, 11, 23, 24, and 25, 2016; (2) 30 days for AEA to prepare and file an ISR meeting summary (March 17, 2016); (3) 45 days for stakeholders to file ISR comments and requested study modifications (May 1, 2016); (4) 60 days for AEA to file responses (June 30, 2016); and (5) 60 days for the Commission to issue its determination on requested study plan modifications (August 29, 2016). AEA’s proposed schedule stops with the Commission’s determination on study plan modifications. AEA requests that the

Commission establish the remainder of the schedule after its determination on study modifications.

The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) request that if the ILP abeyance is lifted, the Commission modify the schedule to allow agencies 60 days to re-engage staff and review contract budgets and scopes of work, 90 days to review the ISR prior to the ISR meetings, and 60 days to file ISR meeting summary comments, and recommendations for study modifications or new studies. They state that they need the additional time to review the large amount of material (over 10,000 pages to date). NMFS adds that because AEA says it can't implement any additional studies required by Commission staff's determination on study plan modifications until after the State reconsiders its commitment to the project in 2017, the additional time it requests would not constrain AEA's abilities to plan for studies. Several non-governmental organizations filed letters supporting the agencies' proposed schedule.

In a letter filed on October 13, 2015, AEA responded, in part, to the NMFS and FWS-proposed schedule changes. AEA asserts that its proposed schedule already accommodates the agencies' need to re-engage staff and contractors by providing more than three months to review the supplemental filings before the proposed February 2016 meetings. AEA argues this timeframe exceeds the one set by the Commission's regulations by two and half months.² Further, because the agencies have already reviewed and prepared comments on AEA's June 2013 ISR, AEA asserts that the only additional work required would be to review the supplemental material to be filed by November 6, 2015.

Because of the significant gap in the ILP process and the substantial amount of information in the record, it is reasonable to provide stakeholders additional time to review not only the new material but the other information in the record to prepare for upcoming ISR meetings. Therefore, we are granting the agencies request for additional time, and requiring AEA to schedule the ISR meetings for March 21-25, 2016 (150 days from our October 27, 2015 letter lifting the abeyance). For the same reasons, we are granting the agencies' request to extend the period to file requests for study modifications and new studies to 60 days. Subsequent ILP milestones are modified accordingly in Attachment A.

The process plan and schedule in Attachment A continues to the projected filing of the license application. If AEA is unable to meet this schedule, it should file notification with the Commission as soon as possible.

² 18 C.F.R. section 5.15(c)(2) (2015).

If you have any questions, please contact David Turner at (202) 502-6091 or David.Turner@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

cc: Mailing List
Public Files

ATTACHMENT A**REVISED SUSITNA PROJECT PROCESS PLAN AND SCHEDULE**

If a due date falls on a weekend, holiday, or other day on which the Commission is not open for business, the due date is the following business day.

Responsible Party	Pre-Filing Milestone	Date
AEA	Hold Initial Study Report Meetings	March 21-25, 2016
AEA	File Initial Study Report Meeting Summary (October 2014 and January 2015 Meetings, combined)	April 24, 2016
All Stakeholders	File disagreements with Meeting Summary and recommendations for modified or new studies	June 23, 2016
All Stakeholders	File responses to meeting summary disagreements and recommendations for modified or new studies	August 22, 2016
FERC	Issue Director Determination on meeting summary disagreements and recommendations for modified or new studies	October 21, 2016
AEA	Second Study Season	2017
AEA	File Updated Study Report	October 21, 2017
AEA	Hold Updated Study Report Meeting	November 5, 2017
AEA	File Updated Study Report Meeting Summary	November 20, 2017
All Stakeholders	File disagreements with Meeting Summary and recommendations for modified or new studies	December 20, 2017
All Stakeholders	File responses to meeting summary disagreements and recommendations for modified or new studies	January 19, 2018

Responsible Party	Pre-Filing Milestone	Date
FERC	Issue Director Determination on meeting summary disagreements and recommendations for modified or new studies	February 18, 2018
AEA	Third Study Season (if required)	2018
AEA	File Preliminary Licensing Proposal or Draft License Application	July 5, 2018
All Stakeholders	File comments on Preliminary Licensing Proposal or Draft License Application	October 3, 2018

20160329-0044

 ORIGINAL

Memo to Public Files

FILED
SECRETARY OF THE
COMMISSION

2016 MAR 29 A 11:44

FEDERAL ENERGY
REGULATORY COMMISSION

To: Public Files
From: Kenneth Hogan
Date: March 29, 2016
Docket: P-14241-000
Project: Susitna-Watana Hydroelectric Project

Subject: Comments of Licensing Participant Becky Long

On March 22, 2016, the Alaska Energy Authority commenced an Initial Study Report Meeting, pursuant to section 5.15 of the Commission's regulations for the proposed Susitna-Watana Hydroelectric Project (P-14241). During the meeting, Ms. Becky Long of Talkeetna, Alaska, provided written comments to Commission staff for inclusion in the Commission's public record. Ms. Long's comments are attached to this memo.

Becky Long Testimony

9.13 Aquatic Resources Study within Access Alignment, Transmission Alignment and Construction Area

Comments from Licensing Participant Becky Long, 3/22/16 ISR Meeting

1. Study Modification Request under 18 C.F.R. 5.15 (c) & (d)

Turbidity conditions, fine sediments, heavy metals, and hydrocarbons from construction related-activities and post project traffic and use will occur in the alignments, airport and temporary and permanent land development. A water quality testing component needs to be implemented in order to address background water quality conditions at stream crossings, buffer zones and project infrastructure. Currently there is no water quality study for the border of the construction area.

Revised Study Plan 9.13.1 General Description of Proposed Study states study goal as a baseline description for assessing potential project effects and to help in PM&E measures. An explicit study goal is to provide data for determining the least environmentally damage alternative for the purposes of the 404 C Dredge and Fill Permit by the Army Corps of Engineers. This modification would give more thorough baseline conditions of aquatic habitats.

2. Least Environmentally Damaging Access and Land Use are the Study Goals

[2.1] Can this goal be carried out adequately in one more study year is my major concern.

Will the second season studies be able to carry all the objectives out? The October 2014 meets stated that there will be a field crew of 3 people that can "knock out" (R2s phrase) 2 sites a day in a field season of 20 days. Is this still the plan to gather data? What about data for infrastructure areas? Second season must do data analysis and incorporate into project's geospatial database. Some of 9.13's data is dependent on other study data? Is this forthcoming?

[2.2] No data accumulation on the airport and project infrastructure have been included. The specific location of the airport and construction camps have not

been established. There is a significant distinct lack of detailed maps regarding the infrastructure. Within 3 miles north of the dam site in sections 13-16, 21, 22 of ~~T3N45E~~ ~~T3N45E~~ of the USGS map shows a lot of wetlands in the very general area of infrastructure.

At the October 2014 ISR meeting, I requested a more detailed map. That has not happened. We need to know about the creeks and wetlands in the land developed footprint.

3. Is the Chulitna corridor dropped for consideration?
4. Has any data been gathered for the Denali East option?
5. According to 4.10.61 of study 6.5 Geomorphology. Number 10 component is to characterize the geomorphic conditions at stream crossings along the access road/transmission line alignments. Has this been done yet? Why does this component not look into streams in the construction area and airport?

The Denali W. & Gold Creek corridors have 23 proposed stream crossings with no known historical data classified as unknown. RSP 9.13.4.22 states Alaska Department of Fish & Game requested at the TWB Meetings that waterbodies where no fish were found, that to adequately assess fish presence a sampling in a different season is necessary. With unknown fish presence at a number of streams and with a whole new corridor proposed, will AEA be able to get this done in 1 field season?

20160519-0049

**Willow Area Community Organization**

P.O. Box 1027
Willow - AK 99688
907-495-6633
www.waco-ak.org

May 11, 2016

 ORIGINAL

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

FILED
SECRETARY OF THE
COMMISSION
2016 MAY 19 A 10:30
FEDERAL ENERGY
REGULATORY COMMISSION

RE: Docket P-14241; Sustina-Watana Hydroelectric Project

Dear Secretary Bose,

As a community council recognized by the Matanuska-Susitna Borough, the Willow Area Community Organization (WACO) would like to respectfully request, if studies are continued, that a modification of the Recreational Resources (12.5) and the River Recreation Flow and Access Study (12.7) of the Susitna-Watana Hydroelectric Project. Further, WACO requests the inclusion of Willow in the Social Conditions and Public Goods/Services (15.6), Transportation Resources (15.7) and Health Impact Assessment (15.8) studies. These modifications would provide FERC with the opportunity to consider the dam's potential impact on the lower Susitna River, an important perspective omitted in the Initial Study Report (ISR).

WACO believes that the ISR Overview entirely overlooked the high levels of winter and summer recreational use on the lower Susitna River, from the mouth of Willow Creek, located at river mile (RM) 50, to the mouth of the Yentna River (RM 29.9). While FERC found there to be low levels of flow-dependent recreation on the Susitna River from the Parks Highway bridge (RM 88.9) to Susitna Landing (RM 61), this conclusion ignores the significantly greater flow-dependent recreation and accompanying social/economic farther downstream.

The Susitna River near Willow serves as a highway for outdoor enthusiasts. It is the main method of land travel from Willow westward, to the area of Skwentna and to the many lodges and private cabins scattered throughout the Susitna basin. Deshka Landing Outdoor Association, LLC in Willow estimates there are 10,000 recreational days enjoyed annually by its clients, all of whom use the Deshka Landing at RM 45.5 for boating and snowmachining onto the river. Other adventurers utilize the many trails weaving through and around Willow for river access. These trails, including the Corral Hill, Rolly Creek and Lucky Shot Trails, are all heavily managed and funded from both public and private sources. The Susitna River also serves as the stage upon which the world-famous events take place. The Iditarod Trail Sled Dog Race begins in Willow, and the first portion of race takes place on the Susitna River. The Iron Dog, a snowmachine race, begins in nearby Big Lake and covers a portion of the river as well.

All of these river travelers, whether serious competitors, freight haulers or weekend explorers, depend on consistent water levels and stable ice conditions for their safety. When weather variations change the conditions of the ice, river travel can become treacherous or non-existent. Large fluctuations of discharge from the dam during the winter months and low flow rates during the summer could have the potential to seriously and adversely affect river travel conditions.

We feel passionately that our area receive adequate attention, as outdoor recreation is such an integral part of our community. Situated adjacent to the Susitna River, Willow residents enjoy easy access to the sport fishing, hunting, and recreational trail activities that the river provides. Local and state businesses benefit from this river access as well, when visitors from Alaska and around the world come to enjoy the recreational activities Willow has to offer.

It has not gone unnoticed that despite Willow's strong ties to the Susitna River, and the dam's potential impact on our lives, there have been no public meetings held in our community. The oversight is particularly baffling in light of the fact that meetings have been held in other communities much farther removed from the river itself.

The Susitna River is of great import to our community and to our way of life. For this reason, WACO respectfully requests that there be modifications of the economic and recreational studies of the project down to the mouth of the Yentna River, RM 29.9. These modifications would allow FERC the time to adequately examine the dam's potential impact on the lower Susitna River and its surrounding communities.

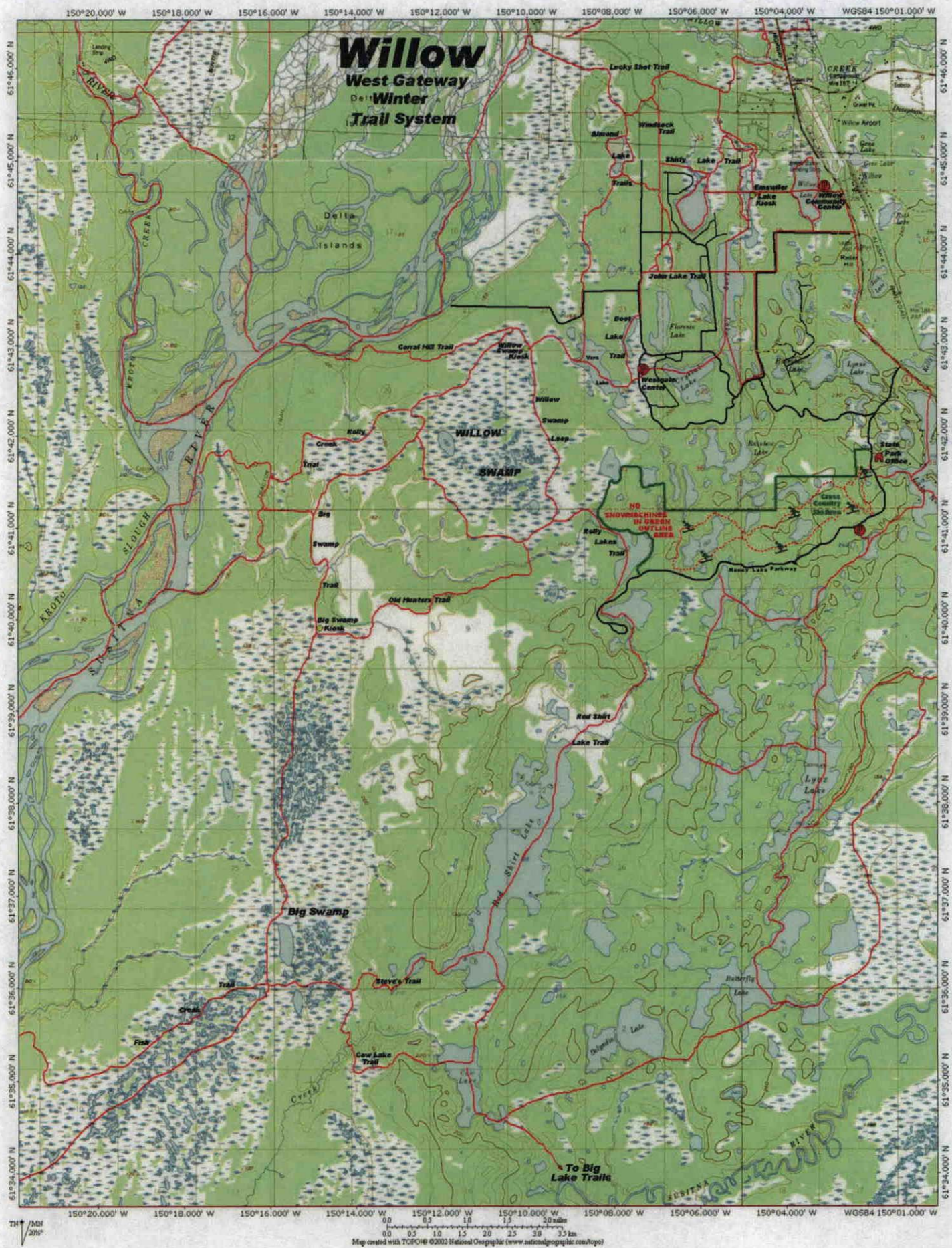
Sincerely,

A handwritten signature in black ink, appearing to read "Harry Banks".

Harry Banks, Chair
Willow Area Community Organization

cc: Senator Dunleavy
Representative Keller
Mayor Halter

attachment: Willow Trail Map



20160608-5117

Willow Community-A Donut Hole of Study Ignorance

Rebecca Long
POB 1088, Talkeetna AK 99676

June 2, 2016

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

Subject: Proposed Susitna Dam Project P-14241
Reference 20160519-0049(31471132)
Modifications to 12.5, 12.6, 12.7, 15.6, 15.7, 15.8

Dear Secretary Bose,

This filing:

- 1) Supports the 5/11/16 dated Willow Area Community Organization (WACO) letter to your office. Reference Filing No. 20160519-0049(31471132). WACO requests the Modifications to the Revised Study Plan to include the Willow area in 12.5, 12.7, 15.6, 15.7, and 15.8 Studies.
- 2) Furthermore, this licensing participant contends that 12.5 and 12.7 should be extended past Willow to PRM (Project River Mile) 29.9 which is Susitna Station. The Aesthetics Resource Study 12.6 should also be extended to PRM 29.9. Willow should be considered a Potentially Affected Community (PAC) in 15.6, 15.7, and 15.8.
Note: Throughout the ISR, the Project River Mile (PRM) for the Sunshine Gage at the Parks Highway Bridge has been referenced at various times as 87.9, 88, and 88.9.

Willow Community- a Donut Hole of Study Ignorance

There is large Upper Valley public support for the 5/11/2016 Willow Area Community Organization letter filed with FERC requesting study extensions of 12.5, 12.7, 15.6, 15.7, and 15.8 to the Lower River to include Willow. WACO is a Matanuska Susitna Borough recognized community council. This letter was passed unanimously by WACO Board of Directors.

WACO correctly states that the studies in the Initial Study Review (ISR) entirely overlooked the high levels of winter and summer recreation use on the lower Susitna River from the Willow Creek mouth PRM 50 to the Yentna River mouth PRM 29.9 (Susitna Station). The applicant focused on the flow dependent recreation from the Sunshine bridge area (PRM 88.9) to the Susitna Landing (PRM 61) which showed a low level of use. The applicant ignored the significantly larger flow dependent recreation going down river from Susitna Landing with the accompanying socio-economic impacts further downstream.

WACO estimates that there are 10,000 recreation days annually around the Willow area. Year round access at Doshka Landing PRM 45.5 has high traditional use. This includes more than commercial and individual recreational use. Freight hauling and transportation are a big part of the river use accessed at Doshka Landing.

How could the applicant miss this?

- 1.0 The Recreation and Aesthetics Studies (12. 6, 12.6, 12.7) should be modified to extend to PRM 29.9 Susitna Station

The Mandate

The 2/1/13 FERC Study Plan Determination (SPD) stated that AEA proposed to exclude from the River Recreation Flow Study that portion of Susitna River below the George Parks Hwy Bridge until the initial results of river flow, geomorphology and ice studies are available. Such results would determine whether the project effects are likely to occur along the lower river. If effects are likely, the recreational study area would be expanded.

The Result

By the time the June 2014 Initial Study Report came out, that is parts A, B, C, the decision was made that various studies would not be extended below the Parks Highway Bridge at Sunshine Gage. Project effects were determined to not be appreciable stating that they are within the normal variability of the biophysical attributes of the Lower River.

From a Licensing Participant's Standpoint: Brief History of this Decision Point for Many Studies

The January 2013 version 1 and the later Version 2 of the HEC-RAS open water flow routing model produced a flow and stage hydrograph modeled for maximum load-following operational scenario. Those results assumed that downriver of Talkeetna, the modeled operation flows and surface level were within the range of natural variability. Thus, potential changes to visual and auditory aesthetic attributes are expected to be undetectable below the Sunshine gage. Flows at Sunshine gage are not considered significant. Therefore, there would be no extensions of the recreation and aesthetics studies.

1.1 Fish and Aquatics Instream Flow Study 8.5 Input into the decision

Basically, the decision to not extend appears to have been made in the 8.5 Fish and Aquatics Instream Flow Study results in the ISR.

8.5 Part C Appendix K stated that version 1 of OWFRM in 2013 showed project effects were observed at the lower extent of the Susitna River at PRM 80 (Sunshine Gage). Because of that, the model was extended to 29.9. Version 2.0 of OWFRM for Sunshine gage OS-1b simulations showed stage reduction greater than 1 foot. According to Table 6, at Susitna Station the stage reduction in summer was up to 1.5 foot in dry years and 2.1 feet in wet years. Hourly stage fluctuations daily at Susitna Station may range from 0 to 3.1 feet under dry conditions and 0 to 4.3 feet under wet conditions.

But the applicant is making the assumption that project changes in stage and flow are undetectable and considered insignificant at Sunshine gage and below. The 12.7 Part A ISR report concludes that modeled changes in stage and flow at the end of Reach 3 are actually exaggerated at Sunshine Gage because it is an unusually narrow channel at that location. Applicant states PRM 87.1 transect measurements show the channel there is twice as wide as the Sunshine gage channel. They state PRM 87.1 is a more typical channel. Comparison of results between 87.1 and 88 under pre and post OS-1 resulted in a 12-19% less stage change at 87.1 than 88. So using the data from 87.1, it was stated that the results of the 1/31/13 Open-Water HEC-RAS Flow Routing does not support increasing the longitudinal scope of the river

recreation studies below the Sunshine gage bridge. They are saying a 12%-19% stage change is insignificant and indiscernible.

This assumption is questionable. In this instance, using the transect data at 87.1 skews the results. This enables false assumptions upon which decision points for study extensions were made. This seems flimsy reasoning especially since every other modeling effort is using the data from the sunshine gage at PRM 88 which has 61 years of data. This is both actual data and modeled data. The case has not been made to not extend.

1.2 Fluvial Geomorphology Below Watana Dam Study 6.6 Data Considerations

The 3/22/16 ISR Meeting Summary stated for 6.6 that the Bed Elevation Model was extended to PRM 29.9 based on stream flow assessment. So if the decision was made for 6.6 to extend to 29.9 should this not be extended for the recreation and aesthetics study?

According to the September 2014 Technical Memorandum The Decision Point on Fluvial Geomorphology Modeling below PRM 29.9, the open water flow project operation- induced changes modeling results showed generally reduced flows, sediment transport, water surface elevation, flow depth and velocities. The Lower River under existing conditions is generally aggradational. Post project will maintain aggradational trends at slightly reduced rate. The Susitna River channel is expected to narrow slightly. The 6.6 Tetra Tech, Inc. September 2014 Technical Memorandum stated that there was an early decision to extend from Sunshine to PRM 29.9 because appreciable changes were occurring at Sunshine and potential for future changes. So it was extended to 29.9.

1.3 Riparian Instream Flow Study 8.6 Data Consideration

In the 3/23/16 ISR meeting, AEA consultant Kevin Featherston of 8.6 Riparian Instream Flow Study stated they don't have the results of the 1D open water modeling of the entire river. They do not know what would change in the Lower River down to Willow or the Yentna River in terms of surface water. They do not know what stage changes would occur longitudinally through-out the Lower River with the project. Currently, this is unknown because they have not finished the modeling.

Without this data, how can there be a decision to not extend the recreation and aesthetic studies?

1.4 Defensible Science?

Licensing participants can only conclude that the studies and the models done so far cannot tell us now how much change the altered flow will cause on the Lower River nor the probability of that change. Without the Lower River baseline data, licensing flow requirements might not adequately protect the Lower River Resource Values.

Additionally, other resource impacts need to be considered besides water levels in order to determine the influences on recreation, aesthetics, and socioeconomic resources. Island formation, riparian vegetation and geomorphology are some of the changes that will affect recreation, aesthetics, and socioeconomics.

By the October 2014 ISR meetings, it was apparent that the decision had been made to not extend recreation and aesthetics past the Sunshine gage or the Parks Highway at the Talkeetna Spur Road.

Disagreement with this decision has been made consistently throughout the ISR process by licensing participants. The National Park Service in its 2013 Revised Study Plan comments stated the applicant risks having to come back and do more recreation studying if lower river extension does not occur during the Integrated Licensing Plan Study Plan.

1.5 National Park Service Mandate

Furthermore, there is a question about the study fulfillment of the NPS mandate. NPS might not be able to develop section 10(a) licensing recommendations adequately to mitigate impacts on recreation and aesthetics without Lower River baseline data.

The recreational study outputs feed into the socio-economic study inputs. Comprehensive lower river baseline data is necessary for accuracy in other studies.

2.0 The Social Conditions and Public Goods and Services Study (15.6) should be modified to include Willow in Potentially Affected Communities (PACs)

Willow was recommended by stakeholders in the 3/30/2016 ISR meeting to be added to this study. AEA responded that this should be formally requested. This is a formal request. Previously, the variance of the community of Houston was added to this study. The reason was Houston is on the road system and on the Alaska Railroad. Similarly, Willow is also on the road system and the railroad and should be considered..

A 15.6 study objective is to analyze the effects of manpower requirements including construction personnel who reside in the study area and who would commute to the site outside of the study area. Whichever way one looks at Willow, inside or outside of the study area, the community does fit this description. Workers may locate to Willow which will impact the local infrastructure and the area resources by increasing population numbers.

Currently, under 5.1.7.1 of 15.6, Quality of Life community overviews will only include Talkeetna, Trapper Creek, Cantwell, Chase/RR communities. Willow is adjacent to the Susitna River, is on the Parks Highway and the railroad runs through it. Stakeholders request that this study component include Willow.

The Recreation and Aesthetic Studies feed data into 15.6. The modification request has been made to extend these Studies down to PRM 29.9 which includes the Willow area. Thus, those studies will be able to contribute data to 15.6 study activities that include Willow.

3.0 The Transportation Resources Study (15.7) should be modified to include Willow and Lower River

15.7 needs to consider the basic river transportation activity based out of Willow and Lower River. Willow and Doshka Landing are the greatest points of use on the Susitna River for people to access the Susitna River down to the Yentna River to access private cabins and commercial lodges. Boats and barges are used for freighting to support abodes and lodges with fuel, supplies and basic transportation. It is a huge economic factor.

In general 5.3.5 of 15.7 has no robust overview of all the lodge and homestead barging. Boating is currently noted as a summer form of recreation with no mention of supply barging. This is not a realistic assumption.

For both 15.7 and 15.8 the variances of adding Seward, Point Mackenzie, Whittier, Wasilla and Houston to the list of potentially affected communities in the study area occurred in the ISR. Once again, Willow was in the donut hole left out.

4.0 The Health Impact Assessment Study (15.8) should be modified to include Willow in all its components.

Through a review of the FERC scoping meetings and ongoing community engagement, 15.8 is suppose to identify public issues and concerns about how community health might be affected during construction and project operations. Due to its proximity to the River, the Parks Hwy, the railroad, and being a center of recreational services, Willow will be impacted by project construction and operation.

According to the 5/11/16 WACO letter to FERC, "It has not gone unnoticed that despite Willow's strong ties to the Susitna river and the dam's potential impacts on our lives, there have been no public meetings held in our community. The oversight is particularly baffling in light of the fact that meetings have been held in other communities much further removed from the river itself."

Furthermore, 15.8 did not collect food consumption/nutrition data, community health observations and follow up discussions in Willow. Data was gathered in other communities in conjunction with Alaska Department of Fish and Game subsistence study. The Subsistence Study is collecting data from Willow. 15.8 data needs to be collected in the Willow area.

The study 15.8 is to identify data gaps and find efficient methods to fill these gaps through community consultation and coordination with the other studies of 14.5, 15.5, 15.6, and 12.5. Consultation with the Willow community needs to happen.

Respectfully Submitted,

Rebecca Long

20160620-5009

FERC PDF

20160620-5009

*Susitna-Watana Hydroelectric Project, FERC Project no. 14241-000;
Comments by the Nature Conservancy on the Initial Study Reports.*

Distributed as a posting of FERC eSubscription to Docket 14241.

Attachments accompanying letter:

- Preliminary framework for ecological risk assessment of large-scale hydropower on braided rivers in Alaska: Phase 1.
- Toward sustainable development of hydropower in Alaska: approaches to avoid and minimize risks to Alaska's Pacific salmon populations.
- Review of water quality studies to support ecological risk assessment of large-scale hydropower on braided rivers in Alaska.
- Review of water quality modeling study to support ecological risk assessment of large-scale hydropower on braided rivers in Alaska.
- Review of groundwater study to support ecological risk assessment of large-scale hydropower on braided rivers in Alaska.

Letter and attachments are catalogued as a document in the library catalog and is numbered SuWa 291. It is available in print format at ARLIS and is available online at:

<http://www.arlis.org/docs/vol1/Susitna2/2/SuWa291.html>

20160620-5128

R. Long ISR Mtg. Summary Comments

Rebecca Long
POB 1088, Talkeetna AK 99676

June 9, 2016

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

Subject: Proposed Susitna Dam Project P-14241
Stakeholder Comment Period to File Disagreements with Meeting Summary and
Recommendations for Modified or New Studies under 5.15(c)(4)
Stakeholder Comments on Parts A-D Initial Study Report (ISR)

Dear Secretary Bose:

Summary of Comments

Modification requests

1. Aquatic Resources within the Access alignment, Transmission Alignment, and Construction Area Study 9.13- page 2
2. Genetic Baseline Study for Selected Fish Species 9.14-p. 3
3. Social Conditions and Public Goods and Services Study 15.6-p.3
4. Glacial and Runoff Changes Study 7.7-p.4
5. Air Quality Study 15.9-p.7
6. Caribou Distribution, Abundance, Movements, Productivity, and Survival Study 10.6-p. 11

Study Concerns

7. Fluvial Geomorphology Modeling below Watana Dam Study 6.6 BEM Confluence Modeling Concerns- p. 10

Study Requests

8. Terrestrial Invertebrate-p. 13
9. Model Integration-p.13

Introduction

This Stakeholder is an Intervener in P-14241 Pre-Application Licensing Process and an active licensing participant in the Technical Work Group Meetings and general licensing process since 2011. Comments were made on Study Requests, Proposed Study Plan, and on the 2 groups of Revised Study Plan (RSP) truncated comment periods which culminated in the original Study Plan Determination (SPD) for RSP.

The P-14241 applicant has NOT been able to meet any of the Integrated Licensing Process (ILP) regulatory process deadlines. FERC has given great procedural leeway to the applicant in the ISR schedule. This leeway along with the Alaska Governor's December 2015 Executive Order, which caused an official abeyance of the ILP for almost a year, has caused a disjointed, scientifically questionable process.

R. Long ISR Mtg. Summary Comments

The disjointed ISR process has resulted in a Regulatory Process Gap that has disenfranchised stakeholders' involvement and the federal agencies' abilities to carry out their legal mandates.

I reference my comments filed to Secretary Bose regarding this:

- 3/5/2014 titled Stakeholder problems with AEA Technical Meetings as part of the Draft Initial Study Report Process,
- 8/30/2015 Stakeholder Response to applicant Alaska Energy Authority (AEA) 8/26/15 Transmittal Letter and Attachments 1-4 to Restart the Integrated Licensing Process (ILP) with Proposed Schedule, and
- 10/7/2015 Comments requested by FERC regarding Applicant's Proposed Restart and Schedule of ILP.

The Regulatory Process Gap is that the applicant has conducted 2 to 3 year studies with some study completions when the ISR process and its SPD have not been completed. In essence, what FERC terms "first year studies" are really multi-year studies over an approximate three and a half years from 2012-2016 including reconnaissance level 2012 studies. Many stakeholders wanted FERC to order AEA to postpone any proposed second year studies in the 2014 field season until after the first year studies were fully reviewed under the ISR process.

But AEA's continued implementation of studies beyond the first year study season without a SPD of the ISR has caused an important step to be skipped. Through critical review, the ISR process is to bring out first year study deficiencies so that follow-up studies can make corrections. First year critical review can change the requirements for data collection methods or the scope of the data. Without that, original errors and inadequacies can compound and cumulate. Assumptions and data analysis for impacts can be skewed. The current extreme gaps in the biophysical resources of the watershed have resulted because the applicant moved ahead without critical feedback from stakeholders and FERC.

Also the 4/24/16 Meeting Summary filed with FERC was supposedly for both sets of ISR meetings. However, any discussion of the October 2014 ISR meetings is absent. Were these meetings just a waste of stakeholder time? Because of this, stakeholders find it necessary to repeat their comments from 2014 in these 2016 comments.

The Current Process

A proposal to modify a study must be accompanied by a showing of good cause why the proposal should be approved. In drafting this ISR policy, FERC intentionally left the meaning of "good cause" ambiguous in order to be able to evaluate "case-specific facts." The FERC regulations also allow stakeholders to file concerns about inaccuracies or incompleteness of the studies

FERC is ultimately required to ensure that the ILP studies are sufficient to support a licensing decision. The following comments of modification requests and disagreement with study conclusions are made in order to implement that FERC goal.

1.0 Modification Request- 9.13 Aquatic Resources Study within Access Alignment, Transmission Alignment and Construction Area

This modification request was made by this licensing participant in both the March 22, 2016 ISR meeting and in the October 2014 ISR meeting.

R. Long ISR Mtg. Summary Comments

Turbidity conditions, fine sediments, heavy metals, and hydrocarbons will occur in the alignments and airport along with the temporary and permanent infrastructure land development areas. Construction-related activities and post-project traffic and use will cause these conditions. A water quality testing component needs to be implemented in order to address background water quality conditions at stream crossings, buffer zones and project infrastructure.

The study goal under 9.13.1 General Description of Proposed Study is to create a baseline description for assessing potential project effects and to help in PM&E measures. An explicit study goal is to provide data for determining the least environmentally damaging alternative for the purposes of the 404c Dredge and Fill Permit by the Army Corps of Engineers. Water quality sampling would give more thorough baseline conditions of aquatic habitats.

2.0 Modification Request- 9.14 Genetic Baseline Study for Selected Fish Species

The 3/22/16 ISR meeting showed that preliminary analysis of population structure of Chinook salmon shows high genetic divergence between the Oshetna and Kosina River collections. Additional analyses are needed to determine if the divergence is stable and indicative of self-perpetuating populations. The divergence could be unstable due to variables such as low study sample size, family effects and other population migrations. For the USR, genetic collections for further purposes of 9.14 should occur as part of future fish study work.

3.0 Modification Request- 15.6 Social Conditions and Public Goods and Services Study

Section 5.1.6.2 Part A of 15.6 stated that there is no known data on individuals' non-use benefits for ecosystem services occurring in the Susitna River corridor and upper watershed. There was a literature search on this in the same section. This is a data gap. Actual data is needed to ensure the objective of 15.6 is met. An online survey reaching the national public should be developed to attain this data. In May 2012, 11 Non-Governmental Organizations¹ filed a study request for a National Level Economic Valuation Study. The cost/benefit, loss/reward to the nation of a free flowing river versus a dammed Susitna River should be explored and defined.

FERC rejected the study request. During the Proposed Study Plan and Revised Study Plan process, stakeholders continued to support this request. The current request is a modification to 15.6. It is not as exhaustive as originally proposed in 2012 and 2013 by stakeholders. Thus, it is also a cheaper study action to carry out.

The 1986 Federal Power Act (FPA) amendments tasked FERC to give equal consideration to the non-power purposes of a river. Section 4(e) of FPA states this. The United States Supreme Court has said that this determination can only be made after there is an exploration of all issues relevant to the public interest. Thus, in order for FERC to understand the non-power values of the Susitna River, FERC must have accurate, credible information and analysis of the value that Americans put on a free-flowing, salmon-bearing watershed.

The Susitna River is a national trust resource. The FERC licensing process is a national action. A relevant population for this federal licensing action is the national population. The Susitna River watershed

¹ National Heritage Institute, American Whitewater, Alaska Center for the Environment, Alaska Survival, Coalition for Susitna Dam alternatives, Center for Water Advocacy, Cook Inletkeeper, National Wildlife Federation, Alaska Chapter Sierra Club, Talkeetna Community Council, Inc., Talkeetna Defense Fund.

R. Long ISR Mtg. Summary Comments

economies go beyond the constituencies of the Alaskan regional populations. People from all over the United States and the world visit, recreate, hunt, and fish in the Susitna River watershed. The value of the wild salmon populations and their unique genetic diversity is enormous and of national importance.

Project impacts could mean a significant reduction in the non-use value for people outside of the geographical area. A survey to establish the value the American public places on an undeveloped river is necessary to determine project effects on non-use values. The public interest is served. The current 15.6 ISR as it stands now will provide no data to inform the non-use values.

4.0 Modification Request for 7.7 Glacier and Runoff Changes Study

A Susitna River Basin and Ecosystem-wide study of climate change impacts on the environmental and socioeconomic resources and on the project construction and operations should be implemented. This would include the cumulative data for climate change and post project impacts combined.

This is necessary in order for FERC to fulfill its section 4(c) statutory duty of the Federal Power Act. The baseline of the River system is changing due to changing climate. The current ISR study attempt to document climate change is only a narrow geographic scope from the glaciers to the dam site. Below the dam site will be left unstudied. A basin wide climate model will be an updated environmental baseline to analyze project impacts and on the project itself.

4.1 Current Stressed Regional Susitna River Ecosystems

A prime example of current stressed ecosystems can be shown in Susitna River tributary data. I reference FERC submittal 20150407-5245 and 20150413-5300 which is my cover letter and the study itself entitled Stream Temperature Monitoring Network for Cook Inlet Streams 2008-2012 Synthesis Report by Cook Inletkeeper respectively. The Stream Temperature Monitoring Network is coordinated by Cook Inletkeeper with 15 different partnership entities of federal and state agencies, tribal entities, and community-based organizations and volunteers.

Long term stream temperature datasets in Alaska are limited. Thus the report activities were implemented to describe current water temperature profiles and identify watershed characteristics that make specific streams sensitive to climate change impacts. Thirteen of the 48 non-glacial streams are Susitna River tributaries: Alexander Creek, Byers Creek, Cache Creek, Chijuk Creek, Deception Cr, East Fork Chulitna river, Kroto (Deshka) Cr, Montana Cr, Moose Cr (Talkeetna), Trapper Creek, Troublesome Cr, Willow Cr, and Little Willow Cr.

The Alaska Department of Environmental Conservation adopted maximum water temperature criteria under the Alaska Water quality Standards in 18AAC70. The standards must meet the federal Clean Water Act's fishable and swimmable goals which includes criteria threshold for assessing thermal impacts on Alaska's salmon streams. The criteria for egg and fry incubation have a parameter of 13 degrees C. All 13 Susitna streams exceeded Alaska State water temperature criteria for the protection of fish at majority periods of time during the five year period from June 21 to September 22. The excessive temperatures ranged from 13 degrees C to 20 degrees C.

R. Long ISR Mtg. Summary Comments

Furthermore, the 1980s Susitna Dam studies showed that some places in the mainstem river exceeded the temperature criteria for salmon migration.²

4.2 Frontline of Climate Change- Sub-Arctic Alaska

Alaska is warming at twice the rate of the Lower 48 states. Annual temperatures are increasing by 3 degrees Fahrenheit. Average winter temperatures are increasing by 6 degrees F. This has happened over the past several years. The Susitna River Valley average temperature has increased 4.5 degrees F since the 1980s. Anecdotally, Alaskans living in Southcentral and the Interior have been living with noticeable changes to the climate since the mid 1990s.

Alaska just had its warmest spring on record³. Meteorological spring is considered from March 1 to May 31. Thirteen Alaskan communities broke individual average high temperature records this spring including Talkeetna at 41.9 degrees F. These broke the previous high temperature records of 1998. According to meteorologist Christian Cassell of the National Weather Service the temperature difference is huge. The causes are hypothesized as higher Pacific Ocean sea temperatures especially the coastal sea waters, lack of Bering Sea ice, and lack of snowfall all of which can set up a feedback loop.

The Third National Climate Assessment stated that the rate of climate change in Alaska is occurring at a faster pace than previously projected due to major climatic shifts.

4.3 The Precarious Future of the Susitna River Water Supply

AEA did do a modeling of some future climate impacts on the Upper River outside of the ILP study plan process. These results show that FERC should consider further basin wide climate change studies. Climate change impacts need to be modeled for the Middle and Lower River segments.

These results were included in the Final Study Report dated October 2015 for 7.7. Predictive modeling was done to predict if there would be enough water to run the dam. In particular it was modeling the effects of future glacial wastage and retreat in Upper Susitna Basin and how that would affect reservoir inflow. Obviously beyond the FERC SPD's literature review requirement, the applicant felt the need to look at climate changes and the sustainability of the fuel for their turbines to meet the electrical requirements.

Their models combined hydrological data from 2012-2014 and combined it with the 1980s historical data. This data was used to calibrate and validate the Water Flow and Balance Simulation Model (WaSiM0). The modeling results are significant on future hydrological resources in the Upper Basin.

- Established that the Susitna headwater glaciers lost more mass in 2012-2014 than 1981-83. Modeling showed that by the end of 2100, total glacier area loss will be 40% from the glacial area in 1971.
- From 2010-2029 and 2080-2099 the basin-wide mean annual temperature will rise 2.5 degrees C, total precipitation will rise 2% with a 13% decrease in snowfall and a 20% increase in rainfall.
- At the dam site (PRM 187.1) from 1976-1995 to 2016-2035, there will be a 1.5% in mean specific runoff. From 2016-2035 to 2080-2099 there will be a decrease of 7.3% in runoff.

² Susitna-Watana Hydroelectric Project Water Quality and Sediment Data Gap Analysis, Tetra Tech, Inc., 7/26/2011

³ Alaska just had its warmest spring on record", 6/19/2016, Alaska Dispatch News.

R. Long ISR Mtg. Summary Comments

- In the same time frame, reduced glacial runoff contribution will be reduced significantly. Page 60 of FSR states that "Glacial runoff in the Upper Susitna Basin holds relatively steady for the first 30 or 40 years of simulations, 1971-2010, but thereafter start a steady decline nearly to zero by the end of the 21st century."
- Evapotranspiration rates will increase which will further reduce total runoff and become an important contributing hydrologic flux.
- The end of 21st century, peak spring runoff will occur 1 month earlier and late summer runoff will be reduced to about half of its original volume.

The modeled 7% decrease in runoff by the 2080s on is significant and has the potential to change downstream physical changes and the biological responses to the physical changes. For example, the change in nutrients and how they are utilized. This decrease is important to the alluvial geomorphology studies and many other studies. Although the above bullet points show overall increases and decreases, the models show that there will be large inter-annual variability over the coming century. This variability has its own impacts.

4.4 The Necessity of Climate Change Modeling Analysis Basin-Wide

Stakeholders, including the mandatory conditioning agencies, have requested licensing study information on climate change assessment since 2012. The 2013 FERC SPD response was to deny such stating that future climate change impacts of water supply fluctuations can be dealt with by adjustments to dam operations. Operational flexibility and standard reopener articles in the license would provide sufficient amelioration. This assumes a stationary environmental baseline with minor fluctuations. But a relatively static hydroclimatic condition is a flawed assumption and not scientifically defensible.

In March 2013, the National Marine Fisheries Service filed a Notice of Study Dispute. The resulting Study dispute Resolution Panel did agree that a climate change model was necessary. Unfortunately, the final order went against that panel recommendation. However in the final order, there was a caveat in Commissioner Norris' opinion about future consideration of climate study. He stated that "as climate change modeling continues to advance, it may eventually yield data and knowledge that can and should be used to formulate license requirements that respond to environmental effects caused by climate change." That time has come now.

The science of climate change modeling has advanced to where dynamic downscaling technology can be used on a regional basis. New methodologies have ensured a lower climate modeling error uncertainty. Also scientific studies are showing the importance of understanding climate change impacts on dam infrastructure in northern regions. This would be due to unstable winter conditions of more frequent freeze/thaw cycles and river break-ups.

Climate change assessments have become status quo in the American societal functions.

- Since 2013, President Obama has enacted Executive Orders 13693, 13690, 13677, and 13653. These call for federal agencies to prepare for climate changing impacts on their missions, operations, and planning and managing statutory mandates. Within these actions, modeling has become an acceptable and appropriate method to determine impacts.
- In 2014 the Council on environmental Quality of the Obama Administration published revised guidelines for federal agencies to incorporate climate change assessments in baseline environmental conditions and environmental assessment.

R. Long ISR Mtg. Summary Comments

- Environmental Protection Agency, National Oceanic Atmospheric Administration, Bureau of Land Management, Bureau of Reclamation, National Park Service, National Aeronautical and Space Administration, Army Corp of Engineers, Federal Emergency Management Agency, US Forest Service, and Department of Defense are all using climate change modeling tools in their work.
- State and municipal entities are using climate change assessments in their work.
- Federal courts are also accepting the appropriateness and importance of climate change impacts in environmental review.

Unfortunately, for the American public and the public trust, FERC considers itself an independent agency not subject to the Administrative orders and directives.

Conclusion

Altered flow, thermal and sedimentation regimes of the Susitna River will be changed by project operations and changing climactic conditions. Climate change impacts can affect the structural integrity of the dam infrastructure. All this needs to be considered either under 7.7.

5.0 Modification Requests for Air Quality Study 15.9

The applicant has filed its Study Completion Report (SCR) for 15.9. This study should not be considered complete.

5.1 Modification of SCR 5.2 Project Emissions to Consider Reservoir Greenhouse Gas (GHG) Emissions

Research shows reservoirs can contribute significantly to global warming and climate change. Inundated reservoir vegetation produces GHG emissions of carbon dioxide or methane which are released into the atmosphere from the surface water or when the water passes through the dam turbines. Organic material decays as a result of bacterial action. If the decay is well aerated, carbon dioxide is produced. But when oxygen is limited, as at the reservoir bottom, a group of bacteria called methogens breaks material down to produce methane. Methane is a potent GHG that can trap heat 21 times more effectively than carbon dioxide. The trees and ground vegetation which were once carbon sinks (carbon storage) will become sources of GHG emissions.

FERC's 2/1/13 SPD B-69 states that "AEA intends to assess greenhouse gas emissions in its License application based on unspecified guidelines for projects in boreal regions and using existing information from studies that show such emissions from reservoirs in boreal regions are low. While greenhouse gas emissions initially increased under construction, within 10 years they returned to levels similar to natural water bodies. (Tremblay 2009)"

Both FERC and AEA are basing their low GHG emission conclusions based on the 1 study which is Tremblay 2009⁴ which states GHG emissions from boreal regions are low. GHG emissions initially increased under construction. But within 10 years, they returned to levels similar to natural water bodies.

⁴ Bastien,, Julie and Maud Demarly, Alain Tremblay. " CO2 and CH4 diffusive and degassing emissions from 2003 to 2009 at Eastmain 1 hydroelectric reservoir, Quebec, Canada."2009.

R. Long ISR Mtg. Summary Comments

Tremblay did make this conclusion but there is a caveat to that statement in his study which states:

- There must be further measurements in the Eastman 1 Hydroelectric reservoir in Quebec to confirm this trend.
- The values in the study have significant uncertainty due to the biological nature of organic matter degradations, sampling method diversity and spatial and temporal variation of emissions.

Thus, a low emission assumption across board should not be made. The science of determining reservoir emissions is evolving. In separate studies, researchers have seen methane jump 20 and 36 fold during reservoir drawdowns.

Reservoir GHG calculation should be done in this study. AEA has continually used the quantification of carbon dioxide emissions that supposedly will be displaced by the proposed dam in the media, to its Board of Directors and in many public meetings before the ISR ever came out. Their emission statement is being promoted as fact. The public deserves to know that a dam can cause GHG emissions.

5.2 Quantitative Analysis of Future Permafrost Degradation in the Project Area

Melting permafrost emits GHG emissions of methane and carbon dioxide based on the aerobic or anaerobic conditions. We know from 7.7 study and the draft Watana Transportation Access Analysis that the majority of the whole project area including all the access alternatives is underlain with discontinuous permafrost. Also a recent study that has come out called Distribution of Near-Surface Permafrost in Alaska⁵ shows that the probability of near surface permafrost (NSP) in the project area is 10-40%. NSP permafrost is within 1 meter of the surface.

Permafrost in a discontinuous permafrost zone is relatively warm. Thus, it is prone to degradation by climate warming. Simulations show that NSP degradation is more probable in central Alaska. The remobilization potential of frozen soil carbon pools under warming air and soil temperatures is nearly double the global average. Frozen soil carbon maps and future permafrost projections indicate that the substantial portion of the permafrost carbon pool of Alaska may be vulnerable to climate-induced permafrost thaw. Central Alaska region is more vulnerable to NSP degradation and this will be more pronounced in the upland ecosystems in the first half of the 21st century.

The Alaska Public Lands Information Center has stated, "Study results show that much of the undisturbed discontinuous permafrost south of the Yukon River has warmed significantly, and some of it is thawing. That raises the possibility that roads, buildings, and other structures on thawed areas will collapse. Another problem could arise as well. As permafrost thaws, it can release methane and carbon dioxide gases that contribute to the greenhouse effect and accelerate global warming."⁶

The proposed abutments at the dam site have significant permafrost. The 10/22/14 ISR meeting on 4.5 Geology and Soils stated that frozen ground could be 235 feet deep on the south abutment area. I don't know the recent calculations for the north side, but the 1980s studies stated a depth up to 60 feet. The temperatures for the permafrost areas are close to 32 degrees F.

⁵ Pastick, Neal and M. Torea Jorgenson, Bryce Wylie, Shawn Nield. "Distribution of near-surface permafrost in Alaska: Estimates of present and future conditions."

⁶ June 6, 2016, Destruction of Alaska Continues under Record Heat. Seattle Post-Intelligencer.

R. Long ISR Mtg. Summary Comments

The development in permafrost areas that causes melting and emissions along with an increased warming climate that causes permafrost degradation needs to be quantified as an air quality emission for the USR.

5.3 Quantitative Analysis of Cement Manufacturing Emissions Request

The applicant will not commit to the decision on where the cement for the dam infrastructure will be made. The quantitative analysis of emissions if a Portland cement plant in the project area is located will be put off until the draft license application. Whether there will be a Portland cement plant used or cement transported in will be based on the analysis of the amount needed. This study affirms that this decision cannot be made now because the Project Engineering and Feasibility Studies are not to that point where a decision can be made.

Section 3.3.1.1 of the Preliminary Application Document states 5.2 million cubic yards total volume of concrete will be needed in the dam structure. This does not include the 35 foot diversion tunnel, a 1800 foot concrete lined tunnel and also the spillway. Author Gregg Erickson of the study Dreams, Risks and Realities: An Economic Analysis of Plans to Dam Alaska's Susitna River stated "In the course of evaluating the effect of the project on greenhouse gas emissions, I asked AEA for an estimate of the amount of cement or concrete the dam will require. (They said) we don't have a firm and exact figure as we continue to work with the Board of Consultants to refine the dam design and optimize safety. Our original estimate was about 5 million cubic yards according to Emily Ford AEA Director of Communications on 1/31/14.

This is a lot of concrete to not be talking about in this air quality emissions study. The excuses, whether the lack of data in Engineering Report or the Board of Consultants' decisions, should not stop this study from making a quantitative analysis of cement making emissions.

Conclusion: The above three emission sources should be quantitatively analyzed in 15.9 in order for the study to adequately describe both the short and long term air emissions from the proposed project. Without such analysis, it is not credible to say that the proposed project does not violate the National Ambient Air Quality Standards or the state air quality standards in Alaska Administrative Code (AAC).

5.4 Disagreement with 4.2.1 Variance

The RSP for this study required a quantitative analysis. However, this now finished study is requesting a variance for this study after the fact. This is to defer the quantitative analysis of Project Emission Estimates to a qualitative analysis. Similar to what is happening in other ILP studies such as Transportation. The applicant has stated throughout that such quantitative analysis is dependent on further, more complete, Project Engineering and Feasibility Studies. It is to the point that only qualitative analysis can be done now and in the USR. This is true through so much of the ISRs. Many of the ISR studies are suggesting variances to switch from quantitative analysis to qualitative analysis. Thus maybe the whole ILP study plan process should be put on hold until the engineering studies can be done.

5.5 Inaccurate Comparison of Emissions (5.4 of SCR) and Baseline Fossil Fuel Generation Emissions

The Baseline Fossil Fuel Generation Emissions are based on old information and thus inaccurate. The SCR states on page 5 under sec. 4.4 that it did not collect information on this after 2013. New information has come out from Chugach Electric Association. Their October 2014 newsletter headlined Railbelt-wide residential usage declines. They showed data from the five different railbelt utilities of

R. Long ISR Mtg. Summary Comments

total kilowatt-hours. The downward trend of residential usage started around 2004 and is clear across the region.⁷ So that is more recent information that needs to be considered in emissions analysis. More recently, Charles Wohlforth in an Alaska Dispatch 6/2/16 article stated that "Power use has been declining even here in Alaska's railbelt. Energy conservation is working."⁸

If components of Railbelt electrical use continue to decline for reasons such as conservation and state budget shortfalls affecting the economy, then these emission data will change significantly. The amount of GHG emissions that the proposed project would displace will change. And that figure will be compared with the GHG emissions from project construction, operation, and maintenance.

5.6 Disagreement with Conclusion, section 7

I do not agree with the conclusion that the primary goal and objective of the air quality analysis was met. Violations of the National Ambient air Quality Standards and state air quality standards in the Alaska Administrative Code could occur With-Project.

This conclusion does not consider quantitative project emissions nor quantitative reservoir or melting permafrost emissions.

The Representative Monitoring Data (5.1.33) shows that for the study time period NAAQS was exceeded at Palmer, Anchorage and Fairbanks during mostly the winter months when inversions were common and when fuel burning activities are at the highest. The same thing could happen in the Project Area.

The draft May 1983 Environmental Impact Statement for the proposed 2 Susitna River dam appendix G states the following.

"An important feature characteristic of Alaska and the project area in particular in terms of air quality is the so-called 'extreme' meteorology. Because of the dramatic topographical and meteorological conditions in Alaska, the potential for air pollution is far greater than in the rest of the U.S. The winter inversions in Alaska are among the strongest anywhere in the world. Strong inversions occur when ground surface cools faster than the overlying air, a condition common in the arctic winter when there is little sunlight to heat the ground surface. The long winter nights prolong these inversion periods, and a strong potential for air pollution may last several weeks."⁹ (italics mine)

6.0 Fluvial Geomorphology 6.6 Scientific Accuracy Concerns regarding Bed Evolution Model (BEM) for the 3 Rivers Confluence at Talkeetna

The Talkeetna Community Council, Inc., a Mat-Su Borough recognized community council per Borough Code, and the NGO Susitna River Coalition have been concerned that project changes will affect the 3 Rivers confluence area negatively. Establishment of the fluvial geomorphic relationship in the confluence area with project effects is imperative because of the environmental and socio-economic impacts on the community of Talkeetna and the commercial and public users.

⁷ Chugach News pdf, www.chugachelectric.com, October 2014 No. 320. Data sources USDA RUS Form 7 and FERC Form 1.

⁸ 6/2/16, Alaska's Oil Glory Days aren't Coming Back. Charles Wohlforth, Alaska Dispatch News. Email confirmation from author saying information source was oral interview with Chugach Electric Association.

⁹ P. G-3, May 1983 FERC's Office of Electric Power Regulation

R. Long ISR Mtg. Summary Comments

The Talkeetna town area had to be evacuated in the September 24, 2012 flood. Four years later amongst the plethora of federal, state, and borough agencies the funding and the actual mitigation of the flood impacts has yet to occur. From this experience, concern about With-Project impacts is legitimate.

Consistently, and in the recent ISR 2014 and 2016 meetings, SRC and TCCI have stated their concerns. In particular, stakeholders postulate that it is the Susitna and Talkeetna Rivers that keep the Chulitna River flows away from eroding the land area of the Talkeetna town site. With project low flows, the mainstem will not be able to move the sediment delivered by the tributaries. The Chulitna River could become a "hungry river". Licensing participants have stated in the ISR meetings that the Peace River dam in British Columbia has shown a lot of change in the last 49 years where the tributaries have come into the mainstem. This example spurs concerns.

During the early 2013 Revised Study Plan SPD process, TCCI requested that FERC require that 2-D modeling be done on the confluence area to determine project effects. FERC's SPD agreed to require a 1-D model effort.

6.6 did take winter samples at RM 7.2 and 9.7 on the Chulitna and RM 2 and 4.1 on the Talkeetna for the BEM. The 1-D BEM relies on input data of bed materials gradation for quantification of material for simulations of bed response. The ideas it to complete the development and calibration of the 1-D BEM in order to perform the model runs for the final 1-D BEM for Existing (baseline conditions) and with Project.

The stakeholder concern is that of the 2 transects on the Chulitna River, only the results of the 1 transect can be used for various reasons. And the field work is complete. The concerns is how scientifically defensible is only 1 transect data-reading to represent the whole Chulitna River confluence? Scientific credibility is at stake.

7.0 Caribou distribution, Abundance, Movements, Productivity, and Survival Study 10.6 Modifications and Concerns

The Study Implementation Report for 2015 for 10.6 is to be filed by July 1. The caribou in the project area is a significant Alaskan resource.

Healthy caribou herds need large amounts of undeveloped land due to their migratory nature. Their movements are wide-ranging and may shift over the years. Their patterns of movement and centers of distribution are based on conditions of the range for survival and productivity. These conditions include regeneration of food sources, quantity and quality of vegetation, predation pressure, insect harassment and weather patterns.

Human development in relatively undisturbed areas causes early succession of vegetation which is not useful to caribou. Their food choices are later successional stages such as climax stage.

The herds do tend to stay in the same greater calving grounds. The Talkeetna Mountain calving grounds are considered the most important single geographic area to the Nelchina herd. Currently, in the early summer months after calving, the Nelchina herd has located in the Deadman Lake and Watana Creek area which are significant areas in the project area.

R. Long ISR Mtg. Summary Comments

7.1 Modification of RSP Objective One- Inclusion of Additional Caribou Groups in Project Area

A permanent Chulitna group in the Chulitna Hills and a migratory group centered in the Cantwell area need to be documented regarding seasonal use and migratory patterns. RSP and the ISR have no recognition of these groups which will be impacted significantly by the project.

7.2 RSP Objective 2 Unfulfilled

The second RSP objective is to "Assess the relative importance of the Project area to both the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH). Because of this objective, ABR's Brian Lawhead and Van Ness Feldman's Chuck Sensiba were incorrect in their statements to licensing participants in the 10/21/14 ISR meeting. They both postulated that 10.6 is not suppose to predict or assess project impacts. But how can objective 2 be met without considering impacts. Other studies are considering project impacts. For instance, 10.16 Breeding Survey Study of Landbirds and Shorebirds is focused on the potential impacts of reservoir filling and on construction of the dam, access roads and transmission lines. This is according to Terry Schick of ABR on page 5 of the 4/24/16 Meeting Summary Attachment 4.

This objective should be expanded to consider the impacts on the caribou in the Cantwell area and that overwinter in the Chulitna Mountains. These animals will be greatly impacted by the infrastructure corridors and construction which will include the expansion and upgrade of the Denali Highway and its intersection with the Parks Highway, and the expansion of the railroad siding at Cantwell.

This objective is very important in order for adequate and scientific decision making regarding the chosen project access and transmission routes and corridors.

7.3 Modification Request to Evaluate Infrastructure Impacts

There is no objective to evaluate impacts of roads and transmission line on the caribou herds specifically during their migrations. These kinds of impacts have been recognized by researchers. And this kind of evaluation would be valuable information in the route and corridor decisions.

7.4 Cumulative Impacts

In 1987, Pitcher (1987) study stated:

"Most importantly, the Susitna hydroelectric project should be viewed as one of a number of developments which have or may occur on the Nelchina caribou range. While no single action may have catastrophic results, the cumulative impacts will likely be a reduced ability of the Nelchina range to support large numbers of caribou."

The proposed project will open up the Project Area to new human use and development. These have to be considered along with the current uses and their impacts.

- The Tier 1 hunting pressure is overwhelming with the use of ATV vehicles that penetrate further into the remote areas. Anecdotally, hunters say that "the Nelchina Caribou herd has hunting pressure like never before." The general area around and adjacent to both the Denali East and Denali West proposed access and transmission corridors has been characterized as a "war zone".
- The project corridors will open up roadless and relatively isolated areas to increased use by hunters. Heavy human use can cause avoidance behavior and increased mortality.
- Joint Pacific Range Alaska Complex (JPARC) Fox 3 and Paxon Military Operation Areas (MOA) can be increased overflight use for low and high altitude training from 500 feet up to 5000 feet. The

R. Long ISR Mtg. Summary Comments

subsonic noise levels for Fox3 can be as much as 50dB. For the Paxon, it would be 54dB. The average number of sonic booms per training day could be 5.2. Emissions and pollution from chaff and flare use are a consideration.

- Mineral Exploration and Mining leases with their attendant aircraft and heavy equipment use can impact the herds' calving grounds and migration routes. For instance, there is the recent MMG Mineral Exploration Drilling Project on both state and tentatively approved state land east of the Susitna River within the 10.6 study area. Helicopter noise is a proven intrusive factor.

The above projects coupled with the road building, dam construction, inter-tie building that will accompany the project must be part of the data for assessment of the relative importance of the project area to the caribou and for impact assessment.

8.0 Terrestrial Invertebrate Study Request

The Copper Country Alliance request for a new study on the terrestrial invertebrates in the Project Area is necessary to fill a data gap. The ecosystem value of the terrestrial invertebrates includes pollination, decomposition, prey food, and aesthetics to name a few. I support this study request.

9.0 Model Integration Study Request

I support the National Marine fisheries Study Request for Model Integration that was presented in the March 23, 2016 ISR meeting in Anchorage. In response, AEA stated that model integration would be discussed in the next day's meeting. But that never happened.

Without a strong focus on model integration, stakeholders hold little faith in the analysis of baseline data for future impacts. Currently, there is a high degree of scientific uncertainty in the ISR study data. Without a study of how the multitudes of models and different model versions are integrated, scientific uncertainty will remain high.

Respectfully Submitted,

Rebecca Long

20160621-5029



COPPER COUNTRY ALLIANCE

HC 60 Box 306T
Copper Center, Alaska 99573
Phone (907) 822-3644
cca@coppervalleyak.net

a 501(c)(3) non-profit corporation

"Protecting the rural and wild natural environment of the
Copper River/Wrangell Mountains region."

June 20, 2016

Kimberly C. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426
Via online submission to: <http://www.ferc.gov>

Re: Docket #P 14241 Susitna-Watana Hydropower Project

Dear Secretary Bose:

Copper Country Alliance is a volunteer grassroots 501(c)(3) organization that addresses conservation issues in Alaska's Copper River Basin, which adjoins the Susitna River watershed. Our members take special interest in the proposed Susitna-Watana hydro project for a number of reasons, including: 1) Many of us depend upon the Nelchina caribou herd—which migrates across the proposed dam lake—for our meat supply; we also enjoy seeing the herd as it migrates through the Copper River Basin and the Denali Highway area. 2) Many of us also depend upon salmon for food. In our case, they come from the Copper River, but we believe that damming an important salmon river, the Susitna River, would set a dangerous precedent, not just for humans but also for the whole ecosystem that the salmon use. 3) Killing many organisms and displacing others by removing 37 square miles of river, riparian, and terrestrial habitat, and fragmenting a vast and largely undisturbed wild region with an access road, powerlines, and facilities is something that we do not believe is acceptable in modern Alaska. Because of our concern from the project's start, Copper Country Alliance is an intervener.

PROBLEMS THAT INVOLVE MANY STUDIES

Incomplete studies: There are interrelationships among the studies. (See discussion of caribou and ice, below, for example.) Yet some studies have been or will soon be completed without the benefit of information from related studies. We suggest that a better approach is a "tentatively completed" stage. None of the studies would be completed until all studies are tentatively completed and researchers have reviewed related studies. Alternatively, FERC will not accept "completed" studies as truly completed and will require more work. We understand that some of this will come up in the licensing process, but it seems better to do some of this needed work now, while the study teams are intact.

Climate change: Climate change factors into the future of the plants, animals, water conditions, and many other aspects of the study area. It is very important to have the best possible forecast of what changes climate change will bring, with and without the dam project. (See, for example, the reference to climate change in our Terrestrial Invertebrates discussion, below on page 7.) Why is this not being done?

STUDY 10.6 CARIBOU

An objective of the caribou study is “Analyze data from historical caribou studies and synthesize with recent data for the NCH and DCH, as a continuation of the caribou task of the 2012 study.” Because caribou change their migration routes and the areas they use so much from year to year, the three years of research—although done in more detail than previous studies—will not give a complete picture of what caribou do over decades. The 10.6 study maps the public can view so far of movements and seasonal utilization cover only 2012-2013, so they do not even show all of those three years. It is frustrating that the anticipated project completion date (July 1, 2016, per the transcript of the March 29, 2016 meeting) is just eight days after the end of this public comment period. The lack of historic and 2014-2015 information in currently available 10.6 study reports makes it difficult for the public to ask relevant questions.

One of our concerns relates to ice shelves and caribou. What happens when the water level beneath the ice falls during drawdowns? Will it break totally free of the shore and drop with the water, or will it form a sloping sheet? We have seen cases of the latter. In such cases, a sort of “crevasse” forms between the shore and the top of the ice sheet. Then snow covers and disguises the “crevasse,” and it becomes a hidden danger that could cause broken legs. If these slanted sheets form, how steep will they be, considering the range of drawdown amounts? We understand that the cumulative drawdown is 200 feet. How many sheets will form if there are multiple drawdowns?

If ice does break totally free of its pre-drawdown shore attachment, what will the surface of the frozen lake be like? Will it have cracks and ridges?

ADFG caribou researchers are on the verge of finishing a completion report for the caribou study, but it appears that studies of ice in the inundation zone (part of Study 5.6) have not been completed, and that ADFG’s research has not addressed questions about how caribou respond to crossing slanted ice shelves or jumbled ice.

The discussion of this topic in the March 29, 2016 meeting (see transcript, p. 89-91/PDF p.91-93) illustrates the difficulty of lack of coordination between studies. And looking at the Study Objectives for Study 5.6, we have to ask: Will the study even address our questions about slanting ice sheets and ice cracks and ridges, or will it just consider the relationship between ice processes and water quality? **It appears that there may be significant gaps that should be filled in both studies. The problem of crossing ice needs to be addressed for other mammals as well.**

STUDY 10.10 TERRESTRIAL FURBEARERS

We are pleased that the researcher included data on all tracks observed, and not just on the four target species. Of the non-target species, all but weasels are target species in other studies. It is disappointing, however, that the study objective did not include weasels. The second highest number of tracks counted in aerial surveys was those of weasels. A discussion of their habitat occupancy and use would have been possible if short-tailed and least weasels had been added as target species. Why have they been omitted?

STUDY 12.5 RECREATION USE

We are puzzled by the statement in ISR Part A for Study 12.5 that “The Wildlife Harvest Analysis (Study 10.20) provided baseline wildlife harvest data which was used to characterize existing hunting opportunities and hunter distribution.” How can this be, when Study 10.20 has not been done?

STUDY 10.20 WILDLIFE HARVEST ANALYSIS

The Wildlife Harvest study—essentially a desktop study-- has not been done yet. When it is written, we request that it make clear two difficulties and limitations in estimating the trapping harvest:

1) In the transcript of the April 25, 2016 meeting, there was passing reference to the fact that only certain species are required to be taken to an authorized sealer for sealing. We can be more specific; the following are required to be sealed in Unit 13:

- River otter
- Lynx
- Wolf
- Wolverine
- Beaver

There is no requirement for reporting the take of these species in Unit 13:

- Marten
- Coyote
- Red fox
- Mink
- Weasel (short-tailed and least)
- Muskrat
- Squirrel (red, flying, and ground)
- Marmot

Furthermore, there is no limit on how many individuals of each species a trapper may harvest in Unit 13, so a maximum number cannot be derived from the number of licensed trappers.

There are voluntary trapper questionnaires. ADFG combines these into an annual report. The most recent report (2012-2013)¹ posted online observes that because not all species are required to be sealed, "...information on the numbers, distribution, and harvest of many furbearers is limited."

The Furbearer Harvest Report (on report pages 34 and 35/PDF pages 42 and 43) is a table within the annual report that breaks out, by Game Management Subunit, the numbers of each species actually reported on questionnaires. The report cautions, "It would be helpful to know what proportion of the total harvest the questionnaire numbers represent. For species that require sealing, the number sealed represents our best information about the statewide harvest. The table below [on report page 35/PDF page 43] gives the harvest totals reported on the questionnaire as a percentage of the total number sealed. Assuming the proportions for species that are not required to be sealed also fall within the ranges observed below, **the totals reported above [Furbearer Harvest Report] could be between 7% and 100% of the actual statewide harvest of species [emphasis ours].**"

At the end of the annual report, trappers themselves suggest some problems with providing accurate information in their reports; e.g., that they are not provided with a log book and memories can be faulty by the end of the season.

2) The ADFG *Alaska Wildlife Action Plan* (draft revision)² states, "Although legal take [by hunters and trappers] can be regulated, illegal take cannot; and illegal take may approach legal take in magnitude (Person and Russell 2008)."

TERRESTRIAL INVERTEBRATES

We request a new study, with the subject of the study being terrestrial invertebrates. In reading through study reports and meeting presentations, we suddenly realized that there is a major data gap: There is no study of terrestrial invertebrates. This is astonishing, since terrestrial invertebrates, being important at the base of many food chains, are of great significance to so many other forms of life, including humans.

It appears that terrestrial invertebrate studies might not normally be done for hydropower projects. Our proposal is an opportunity to correct this significant oversight. Such has been the case with the value of natural soundscapes, once ignored in Environmental Impact Statements, and now a regular feature.

INTRODUCTION: THE VALUE OF TERRESTRIAL INVERTEBRATES:

- Keystone species: "Invertebrates are often keystone components of the habitats and ecosystems of the more familiar vertebrate species that we value."³

¹ Alaska Department of Fish and Game, 2013, Trapper Questionnaire Statewide Annual Report, 1 July 2012—30 June 2013. PDF may be downloaded at <http://www.adfg.alaska.gov/index.cfm?adfg=trapping.reports>

² Alaska Department of Fish and Game, 2015, Alaska's Wildlife Action Plan, draft as submitted to USFW. The draft may be downloaded at <http://www.adfg.alaska.gov/index.cfm?adfg=species.wap2015revision>

³ Alaska Department of Fish and Game, 2005, Alaska's Wildlife Action Plan. Appendix 4(e) Terrestrial Invertebrates may be downloaded at <http://www.adfg.alaska.gov/index.cfm?adfg=species.wapview>

- **Pollination:** The general public might think of pollination as being important only to farmed crops, but it is equally important in the wild. Moose, for instance, subsist on willow stems during the winter, so pollination of willows is highly important for moose. In summer both caribou and moose eat willow leaves and a variety of sedges and forbs. Humans, carnivores, and carrion eaters in turn eat the caribou and moose. We could look at many other terrestrial animals and see how important pollinators are to their food sources.
- **Decomposition:** Numerous invertebrates are involved in decomposing dead animals and plants into soil, which is essential for plants, and in turn, for all animals.
- **Food:** Birds immediately come to mind when we think of animals that eat invertebrates. Protein from invertebrates is important for growing young birds and continues to be important food for many adults. Alaska's bats depend upon insects and spiders. Frogs, too, are dependent upon invertebrates.
- **Aesthetics:** Many invertebrates are simply beautiful and/or intriguing. As Kenn Kaufman writes, "If variety is indeed the spice of life, then insects are the spiciest creatures on earth."⁴ Alaska is home to such beauties as the Giant Sulfur (*Colias gigantea*), Yukon Blue (*Agriades optilete yukona*), Northern Marble (*Euchloe creusa*), and the Western Bumblebee (*Bombus occidentalis*). The public, both in Alaska and the United States at large, is becoming more interested in invertebrates, as evidenced by the growth of such organizations as the Xerces Society, the popularity of butterfly houses, and publication of many field guides for the general public.⁵
- **Ethics:** We humans have a moral obligation to ensure that we do not cause another species to become extinct. Lacking knowledge of such basic information as what terrestrial invertebrates inhabit the area planned to be flooded, how can we even know if we are endangering a species? Further, a number of once-common terrestrial invertebrate species across the United States are in decline, including the Western Bumblebee (*B. occidentalis*) which appears not to be declining in Alaska. Therefore, protecting habitat becomes ever more important.

The current *Alaska's Wildlife Action Plan*⁶ provides additional information on the value and functions of terrestrial invertebrates. The draft 2015 revision of *Alaska's Wildlife Action Plan*⁷ lists Species of Greatest Conservation need, and they include the following groups of terrestrial invertebrates:

- *Hymenoptera* (Order- ants, bees, wasps, hornets)
- *Diptera* (Order- flies, midges, mosquitoes, gnats)
- *Odonata* (Order- dragonflies, damselflies, skimmers)
- *Lepidoptera* (Order- butterflies and moths)
- *Arachnida* (Order- spiders)

⁴ Eric R. Eaton and Kenn Kaufman, 2007, Kaufman Field Guide to Insects of North America.

⁵ A small sample: Kenel W. Philip (posthumous) and Clifford D. Ferris, 2015, *Butterflies of Alaska: A Field Guide*; John H. Hudson and Robert H. Armstrong, 2005, *Dragonflies of Alaska*; Eaton and Kaufman, op.cit.; Joseph S. Wilson and Olivia Messinger Carril, 2015, *The Bees in Your Backyard: A Guide to North America's Bees*.

⁶ Alaska Department of Fish and Game, 2005, op. cit.

⁷ Alaska Department of Fish and Game, 2015, op. cit.

WHY THE NEW STUDY REQUEST SATISFIES THE STUDY CRITERIA IN § 5.9(B)
 (For clarity, we place this ahead of the other 4 elements of the statement showing good cause):

1. Describe the goals and objectives of the study proposal and the information to be obtained:

Goal: The study would determine what species of terrestrial invertebrates exist in and near the area that would be dammed and which, if any, rare or potentially endemic terrestrial invertebrate species are present. Recent research in other areas of Alaska, for example, found Alaska's first known representatives of a class (not just genus, not just family, but class) of terrestrial invertebrates.⁸ Additional information to be collected to the extent feasible would be: which terrestrial invertebrate species are most important as food for bats, birds, and wood frogs; which are most important as pollinators for willows, and which are most important in decomposing plant and animal remains.

Objective: A field survey would be performed to answer, to the degree possible in one field season, the questions posed in the goal. Visits would begin shortly before green-up and end by freeze-up and would occur with enough frequency during the field season to detect the presence of these invertebrates in their various life stages. The study would take place, perhaps with the use of sample plots and/or transects, in representative habitats within the area of the proposed lake and a 2-mile buffer on each side. It would utilize whatever observation and capture techniques are best suited to the invertebrate groups and situations (e.g., pitfall traps, Malaise traps, Berlese funnels, sweep netting, and hand collecting). Field observations would be combined with researchers' prior knowledge and literature searches to determine the ecosystem function of each species.

2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

As described in our Introduction, the State of Alaska Department of Fish and Game has a current Wildlife Action Plan. Included in the Plan is the following goal:

Ensure terrestrial invertebrates remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.⁹

3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study:

Public interests are described in our Introduction and also in the first paragraph of this letter.

4. Describe existing information concerning the subject of the study proposal, and the need for additional information:

⁸ Derek S. Sikes and Robert T. Allen, 2016, *First Alaskan records and a significant northern range extension for two species of Diplura (Diplura, Campodeidae)*, ZooKeys 563: 147-157.

⁹ Alaska Department of Fish and Game, 2005, op. cit.

Data on terrestrial invertebrates are absent from the other Susitna-Watana studies. According to the Alaska Department of Fish and Game, “Our knowledge of the status of terrestrial invertebrates is less than that of any other taxonomic group.”¹⁰ The value of information on terrestrial invertebrates is described in our Introduction.

5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

The proposed project would eliminate about 37 square miles of terrestrial invertebrate habitat. The presence of a large body of water would change the temperature and humidity level of the surrounding land.

An important cumulative effect is climate change, which has already been affecting terrestrial invertebrates in North America.¹¹ Sikes and Allen point out:

Alaska has warmed about 2°C since the 1950s and 3.5°C in the interior during the winter (US Global Change Research Program, National Assessment 2001). The growing season has lengthened by about two weeks, shrubs are invading the tundra and alpine zones, fires are more frequent and intense, permafrost and glaciers are melting, and Alaska’s climate is shifting beyond the physiological optimum for one of its dominant boreal forest species, *Picea glauca*.... We sit on the edge of this enormous ecological transition unlike anything modern humans have experienced before. It is therefore with great urgency that we document the current entomofauna of Alaska.¹²

Results of this proposed study would provide baseline data on an important resource. License requirements could require periodic follow-up studies during construction and beyond.

(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

The proposed methodology copies that of some of the Susitna Watana studies: sample plots and/or transects, the use of a two-mile buffer, repeated visits during a field season, and literature search. The proposed duration is shorter than what was planned for some of the studies, but in actuality, some of those studies, for various reasons, were changed to only one field season.

(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

¹⁰ Alaska Department of Fish and Game, 2005, op. cit.

¹¹ Scott Hoffman Black, Spring 2016, *North American Butterflies: Are Once-Common Species in Trouble?*, Wings: Essays on Invertebrate Conservation, p.5-9.

¹² Sikes and Allen, 2016, op. cit.

We believe that a direct, focused survey of terrestrial invertebrates would be more cost-effective and provide more information in one field season than would modification of existing studies. We will explain this further below at element 2.

OTHER ELEMENTS OF STATEMENT OF GOOD CAUSE:

1. Any material changes in the law or regulations applicable to the information request:

None that we are aware of.

2. Why the goals and objectives of any approved study could not be met with the approved study methodology:

Studies of terrestrial insects were not, but could have been (with varying difficulty, according to the study), included in some of the approved studies, namely:

- 10.13 Bat Distribution and Habitat Use
- 10.16 Landbird and Shorebird Migration, Breeding, and Habitat Use
- 10.18 Wood Frog Occupancy and Habitat Use.

This is because “habitat” includes food, and “use” includes feeding.

DNA analysis of bat fecal pellets is proving useful in determining which invertebrates are bat prey.¹³ Study 10.13, however, found that although bats were widely distributed in the area, their efforts resulted in the capture of only one bat and failed to locate roosts. This suggests that collecting sufficiently representative fecal samples would require considerably more time and effort.

The difficulties of studying what terrestrial invertebrates are utilized by birds are that direct observation is tedious and it is often impossible to determine small invertebrate species at the usual bird viewing distances, and examining stomach contents requires killing a large enough number of birds for a valid sample. Most researchers are reluctant to do this.¹⁴

Only 7 wood frogs were captured in Study 10.18. Killing a larger number for examination of stomach contents would probably be necessary to determine their various prey species.

Modifying these existing studies to include terrestrial invertebrates might be desirable, but we suggest that this would be more difficult, time-consuming, and expensive than conducting a new study focused solely on terrestrial invertebrates. Furthermore, modifying those studies would address only one suite of terrestrial invertebrates: those which are food for other organisms. Pollinators and decomposers would be left out. Rare species or previously unknown endemic species could be missed. (We note that when researchers focused on finding rare species in

¹³ Eero J. Vesterinen, Thomas Lilley, Veronika N. Laine, and Niklas Wahlberg, 2013, Next Generation Sequencing of Fecal DNA Reveals the Dietary Diversity of the Widespread Insectivorous Predator Daubenton's Bat (*Myotis daubentonii*) in Southwestern Finland, published online at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3842304/>

¹⁴ https://web.stanford.edu/group/stanfordbirds/text/essays/Determining_Diets.html

another group of organisms, plants in Study 11.8, they discovered and confirmed the presence of two rare plant species.)

3. Why the request was not made earlier:

Copper Country Alliance is a small non-profit organization with no paid staff. We deal with a number of issues, not just hydropower projects. The amount of time we can devote to researching the proposed Susitna-Watana project is limited. Some of the documents are quite long, and there are many of them. When we started reading some of the Initial Study Reports, the meeting presentations, and the meeting summaries, we followed what is probably the normal human inclination of focusing on what was there instead of what was not, but it eventually occurred to us that information on terrestrial invertebrates is totally lacking.

4. Significant changes in the project proposal or that significant new information material to the study objectives have become available:

None that we are aware of.

Thank you for the opportunity to comment on these important studies.

Sincerely,

COPPER COUNTRY ALLIANCE

Cliff Eames, Board Chair

20160622-5099

**Susitna-Watana Hydroelectric Project, FERC Project
No. 14241-000 ; Review of Initial Study Reports**

**by U.S. Fish and Wildlife Service, Anchorage Fish and
Wildlife Field Office**

Due to the size of this document, it is not available here.

This document is numbered SuWa 292, and is cataloged separately in the library catalog with a link to the electronic version. It is available in print at ARLIS under call number: TK1425.S8S92 no.292

20160622-5183

**Susitna-Watana Hydroelectric Project, FERC Project
No. 14241-000 ; Review of Initial Study Reports.**

**by United States National Marine Fisheries Service,
Alaska Regional Office**

Due to the size of this document, it is not available here.

This document is numbered SuWa 293, and is cataloged separately in the library catalog with a link to the electronic version. It is available in print at ARLIS under call number: TK1425.S8S92 no.293

20160623-0019

P-14241

Charlie and Linda Rutledge
P.O. Box 91
Copper Center, AK 99573

June 21, 2016

ORIGINAL

FILED
SECRETARY OF THE
COMMISSION

2016 JUN 23 A 9:56

FEDERAL ENERGY
REGULATORY COMMISSION

June 21, 2016

Kemberly C. Boser, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426
Re: Docket # P 14241

Good day,

Due to family concerns I have not been able to review the research in the Alaska Dept. of Fish and Game power point/slide show for the Susitna-Wantana Hydro project to the extent I wished. Consequently, I will direct my comments to Spring Study ADF&G Ref. 10.6 Caribou. (March 29th presentation)

The graphics clearly show that caribou extensively use the Wantana area (proposed dam site) in the Spring. The area is vital to the Nelchina and Delta Caribou Herds. This is their calving area and where they rear the newborn calves in early life. While caribou are known to change range, this is not the case with calving grounds. Conditions need to be optimum for a high survival rate of newborn calves. Specifics include of a rich food source, colder temperatures to keep the mosquitos and flies down, predator viewsheds, and isolation from noise and human activity. Wantana Creek and the surrounding area, judging from the study, provides this habitat. It must remain intact.

ADF&G in their analysis stated the importance of reviewing data of historical use of the area to complete the picture of the caribou's need. These studies are essential.

over

How the caribou always calved and rear
newborns here? Our family, who have honored
and hunted the Nelchina caribou herd for
the past 40 years, have seen the caribou
bring their young out of the mountains year
after year. We must nurture, not destroy,
this truth.

Sincerely,
Charlie and Linda Rutledge

20160623-3024

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D.C. 20426

June 23, 2016

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 – Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Betsy McGregor
Environmental Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary for the Susitna-Watana Hydroelectric Project

Dear Ms. McGregor:

We have reviewed Alaska Energy Authority's Initial Study Report filed with the Commission on June 3, 2014, and Study Implementation and Study Completion Reports filed between November 4, 2015 and November 25, 2015.¹ Staff attended the Initial Study Report Meeting held on March 22 through March 24, 2016, and March 29 through March 30, 2016, in person and via teleconference, and have reviewed the Initial Study Report Meeting Summary filed on April 24, 2016. Based on a review of the documents and attendance at the meeting, we are providing comments in the attached Appendix A pursuant to 18 C.F.R. section 5.15(c)(4).

We are not requesting study modifications or new studies at this time. Instead, our comments either seek clarification of the reported results and methods, which may inform our decision on future study needs, or offer suggestions to improve reporting related to the proposed future studies and the development of the Updated Study Report. Unless otherwise noted, please address these comments in your reply comments due August 22, 2016.

¹ Study Implementation Reports and Study Completion Reports provide information collected during the 2014 study season in addition to information presented in the Initial Study Report filed June 3, 2014.

Project No. 14241-000

2

If you have questions please contact me at (202) 502-6091, or at
David.Turner@ferc.gov.

Sincerely,

David Turner, Chief
Northwest Branch
Division of Hydropower Licensing

Enclosure: Appendix A – Staff’s Comments on the Meeting Summary and Initial
Study Report

cc: Mailing list
Public files

Appendix A

Staff's Comments on the Meeting Summary and Initial Study Report

General Comments

Schedule for Model Completion and Preliminary Model Results

1. Information in the project record suggests that you have made progress towards developing the models proposed in your revised study plan, including but not limited to, models for: water quality (study 5.6), fluvial geomorphic processes (study 6.6), groundwater processes (study 7.5), ice processes (study 7.6), aquatic habitat (study 8.5), and riparian processes (study 8.6). However, because the models remain unfinished, it is not possible at this time to assess whether the models will perform with sufficient accuracy and resolution to adequately represent existing conditions and predict potential project effects. You indicated at the Initial Study Report (ISR) meetings that you intend to include in the Updated Study Report (USR) the preliminary modeling results for each model developed as part of study 8.5. However, the USR should include the preliminary modeling results for all models that were required by the Commission approved study plan in order to determine whether the models will be sufficient to provide the information needed for our analysis of potential project effects. Therefore, we recommend that you include in the USR for each model developed as part of the Commission-approved study plan the preliminary modeling results for at least two scenarios: (a) the existing condition, and (b) the maximum load-following operational scenario. We also recommend that you include a complete description of how each model was configured, parameterized, calibrated, and validated, as well as a description of sensitivity analyses and uncertainties in key model parameter values.

Baseline Water Quality Study (Study 5.5)

1. Conflicting information presented in section 4.3 of the Study Completion Report (SCR) makes it difficult to interpret baseline water quality monitoring efforts and results. For example, the second paragraph on page 6 of the SCR states, "Water quality was monitored at a total of 17 sites in 2013 and 2014 distributed in the basin as follows: Susitna River mainstem (10 sites), Susitna River off-channel (1 site), and tributary (6) locations." The following paragraph reads, "In 2013, fifteen mainstem water quality monitoring sites were located below the proposed dam site and two were located above the dam site." This suggests that you monitored water quality at 24 different sites between 2013 and 2014, not 17. In addition, the number of sites presented in Tables 4.1-1 and 4.3-1 of the SCR differ from that presented in the text, and the large scale of figure 4.1-1 on page 66 of the SCR does not help define the sampling locations. Please clarify where water quality samples were collected

and reconcile it with the tables. Please include a description of where continuous water temperature and other baseline water quality monitoring occurred, and whether each site was a mainstem, off-channel, or tributary site.²

2. Throughout the SCR, conductivity and specific conductivity appear to be used interchangeably. For example, in the first paragraph of section 5.4.9 page 25 discusses specific conductivity, the following paragraph discusses conductivity, and the third paragraph again discusses specific conductivity. Conductivity is defined as the reciprocal of the resistivity normalized to a 1-centimeter cube of liquid at a specified temperature, whereas specific conductivity is a conductivity measurement corrected to standard temperature, usually 25 degrees Celsius (°C) (USGS, 1988). Please clarify your use of conductivity or specific conductivity in the SCR.

Groundwater Study (Study 7.5)

1. Page 6 of the Study Implementation Report (SIR) states, “Model code selection and calibration procedures followed American Society for Testing and Materials (ASTM) standard D6170 (ASTM 2010) and D5981 (ASTM 2008) respectively.” ASTM D6170 section 6.3 states, “A major element of the code selection process is the formulation of the conceptual model of the groundwater system in the context of project objectives and constraints. The conceptual model represents the general understanding of the system being studied in terms of driving forces (stresses), physical and chemical processes, interactions, geometric factors, and boundary conditions. An important aspect of the conceptualization phase is the determination of the relative importance of the system processes and stresses. The detail included in a conceptual model should represent the site characterization data base that will be used in the calibration and predictive modeling stages of the project, (that is, all input variables and parameters required to run the selected code should be available).” We are concerned that you have not adequately followed these procedures (i.e., the characterization of geometric factors and boundary conditions, and determination of the relative importance of system processes and stresses). This could result in a groundwater model that will not produce

² In addition to continuous water temperature monitoring, baseline water quality monitoring consists of single, in-situ monthly measurements of physical parameters (dissolved oxygen, pH, specific conductivity, redox potential, turbidity, color, residue, and water temperature), and single, monthly grab samples for laboratory analysis (hardness, nutrients, total dissolved and suspended solids, fecal coliforms, hydrocarbons, radioactivity, and metals).

results sufficient for analysis of project effects on riparian vegetation and upwelling/downwelling in relation to spawning incubation (study plan objectives 5 and 6). While section 4.1 of Appendix B describes the conceptual model framework, the supporting data is so sparse and far from the site (two wells four miles away and one well 25 miles away) that it may not meaningfully relate to the actual depth and shape of bedrock at Focus Area (FA) 128, or provide meaningful stratigraphic and hydrogeologic information (distribution of parameters) at FA-128. In keeping with the ASTM standard, please explain why a more rigorous evaluation of the conceptual model, including more information on unconsolidated thickness, stratigraphy, regional inflow, and anticipated inflow rates (upland recharge), specific to FA-128 is not needed to achieve the study objectives. For example, if processes, boundary conditions, or stresses are insignificant to the scale of the model for evaluating project effects, then please provide a clear and defensible justification as to how you reached that conclusion.

2. Related to the preceding comment, page 6 of the SIR also includes the statement: “The model simulates groundwater processes in the alluvial aquifer, which was assumed to be uniformly 100-ft thick throughout the active model domain.” Given that bedrock appears to be very shallow at the valley walls and from that point increases in depth in the direction of the river, it appears that your assumption of uniform thickness, which essentially means a nearly flat bottom normal to the river flow direction, is not reasonable. Please evaluate and report on the sensitivity of this assumption in the USR.
3. Page 17 of the SIR states, “The storage coefficient was initially set to 0.2, but was eventually reduced to a value of 0.001 to achieve a better match to the observed GW elevation response. This value is somewhat low for an unconfined aquifer and may suggest the aquifer is semi-confined.” In addition, page 7 of Appendix B states, “Recharge was estimated as total annual precipitation (25 in/year) minus total annual evaporation (14.5 in/year).”³ These model inputs for storage coefficient and/or recharge rate do not make sense to us because we would expect there to be more surface runoff and less aquifer recharge than 10.5 inches per year if the aquifer truly is confined (i.e., overlain by a lower permeability layer). Please explain why you believe it is appropriate to classify the aquifer as confined and yet use a storage coefficient and/or recharge rate that would be more indicative of an unconfined aquifer.
4. Page 5 of Appendix B of the SIR states, “There is little to no data on the regional groundwater system or aquifer properties within the deeper bedrock system; therefore the regional system was not explicitly simulated in the

³ These values would equate to an aquifer recharge rate of 10.5 inches per year.

- model.” The regional system often has a significant effect on local flow systems. Please describe how you intend to separate and evaluate the potential for regional flow effects from project effects.
5. Page 9 of Appendix B of the SIR, states, “Rather than attempt to interpolate between relatively sparse distant points, river stages were assigned throughout the MODFLOW model based on the results of other project hydrologic modeling conducted for open water flow in the Susitna River and FA-128 side channels.” Please explain why it would not be better to calibrate the model with measured boundary condition data interpolated from the results of the open water flow model. In our view, doing so would produce a data set that is more representative of what actually occurred, such as at station 128-11-SW, where there is little resemblance between modeled and observed surface water elevations. Our concern with your approach is that using non-representative boundary condition data to drive model responses, combined with internal model uncertainty, will result in compounded errors and make an already complex model intractable.
 6. Pages 13–14 of Appendix B of the SIR, state, “An initial value of 2.1 ft²/day per linear foot was assigned to the model based on estimated regional groundwater fluxes to the Susitna River valley as reported in the 1980s (HESJV 1984b). This value was based on estimated values using professional judgement of regional aquifer properties, gradients, and thicknesses, but not empirical data. The specific flux was later reduced by an order of magnitude (0.21 ft²/day per linear foot) during the calibration of the steady state model because it resulted in a better match to target water levels.” Usually, expected regional groundwater flux is computed based on factors such as valley recharge and contributory groundwater drainage area. You have the data to do this calculation; therefore, please include it and its basis in the USR.
 7. Page 18 of Appendix B of the SIR states, “Despite the poor match to groundwater elevation changes at some stations, the calibration statistics for the transient model were relatively good (Table 5-1).” Attachment 1 of the report gives plots of simulated versus observed hydrographs at 15 well locations. All of the wells not located next to surface water (the stressing boundary condition) exhibit little to any correlation between observed and simulated data. This seems to indicate that the transient model presented in the report is uncalibrated. Please clarify whether the model has been calibrated, and if not, when and how you intend to do so.
 8. Page 5 of Appendix A of the SIR states, “Groundwater elevations are lower than paired SW elevations at stations 128-2 and 128-5 during most periods suggesting losing conditions towards the large island at those locations.” However, well 128-3 is immediately south of 128-2 and consistently shows a higher groundwater level, similar to the groundwater level at 128-2-SW

immediately to the north. Based on these results, it appears as though one or possibly two of your gages has shifted. Please clarify whether well movement or survey errors are responsible for the low levels observed at station 128-2.

Salmon Escapement Study (Study 9.7)

1. Sections 5.1.4.3 and 5.1.4.4 of the ISR state that the Middle Fork Chulitna River and Talachulitna River sonar data for year 2013 were in the process of being analyzed; however, these data were not provided in later reports (i.e., ISR Part D, September 30th Tech Memo, or the SCR). Please include the 2013 data for both locations in the USR.
2. Table H-1 in Appendix H of the SCR states, “These data are preliminary, and additional aerial spawner surveys are planned for August (these data will be added to the table later).” Please explain whether you intend to report these data in the USR or if you intend to revise the SCR to incorporate these data, and if so, when.

River Productivity Study (Study 9.8)

1. Section 4.3 of the SIR states that no benthic macroinvertebrate or benthic algae sampling occurred in 2014 at the middle and lower Susitna River stations. In contrast, the September 2014 technical memorandum states that benthic macroinvertebrates, benthic algae, benthic organic matter, drifting invertebrates and seston, and emerging adult insects were collected during spring 2014. The approved study plan requires benthic macroinvertebrate and benthic algae sampling in study years 2013 and 2014 during three sampling periods (April through October) to capture seasonal variation in benthic macroinvertebrate community structure and benthic algae productivity. Additionally, the SIR does not report the missing seasons or missing year of data collection as a variance to the study plan. Please clarify the reporting discrepancy between the September 2014 technical memorandum and the SIR, and identify and address all variances to the approved study plan as appropriate.
2. The approved study plan, required that you consult with resource agencies to identify two focus areas appropriate for stable isotope sampling, where each type of stable isotope samples would be collected, and the number of adult salmon tissues to be collected. It is unclear where in the study consultation record that you provided documentation of the required consultation. Please provide an explanation of when the required consultation was completed.
3. Section 4.9.1.2 of the ISR indicates that published and unpublished length-weight equations were used to estimate the dry mass of prey items found in fish stomach contents to improve accuracy and better achieve the study

objective. However, the specific equations are not presented in the ISR, SIR, or associated technical memoranda. While it is implied that equations from Benke et al. (1999) (among other authors) were used for analysis, Benke et al. (1999) provides a myriad of equations for many different taxa primarily from the southeastern United States. As such, these may not be representative of the length-weight relationship of taxa in the Susitna River or central Alaska. Please provide in the USR the length-weight equations used to estimate the mass of prey items in the stomach contents of sampled fish as well as an explanation for each equation why the equation is applicable to the study.

4. One objective of the approved study plan is to develop Habitat Suitability Criteria (HSC) for Susitna benthic macroinvertebrate and algal habitats to predict potential changes in these habitats downstream of the proposed dam. However, no discussion of the status of the development of HSC and Habitat Suitability Indices (HSI) for benthic macroinvertebrates and algal habitat was included in the SIR or the 2014 technical memorandum. On page 11 of the ISR Part D, you state that you plan to complete all remaining data collection and analysis for development of HSC and HSI, with no modifications. Please clarify what remaining activities, data collection, or analyses are necessary to complete the above study objective.
5. The approved study plan states, “Benthic organic material is one of the most important ‘interrelated environmental factors’ influencing the macroinvertebrate community, and damming the river will have significant consequences for the transport of organic matter from the upper watershed. Therefore, to address the importance of organic matter to productivity in this type of system, quantifying benthic organic matter as part of this study is essential.” Sampling was to occur in 2013 and 2014 to characterize organic matter sources. In 2013, benthic and seston organic matter resources were sampled, but in 2014, only seston samples were collected. You did not report this as a study variance in the SIR. Please explain why you did not collect benthic organic matter in 2014 and how it affects achievement of the study objectives.
6. An objective of this study was to estimate benthic macroinvertebrate colonization rates in the Middle Susitna River segment under current baseline conditions in 2013 and 2014 to support an evaluation of potential project effects. As such, benthic macroinvertebrate colonization rates were to be monitored under four treatments: (1) turbid/warm, (2) clear/warm, (3) turbid/cold, and (4) clear/cold conditions during the 2013 and 2014 study seasons. You deployed Hester-Dendy samplers at different locations in the Whiskers Slough. Temperatures classified as cold were temperatures less than 13°C; whereas, temperatures classified as warm were greater than 13°C. However, the parameters for the turbidity cutoffs were unidentified. Please specify the turbidity cutoff among the four treatments. In addition, given the

large geographic extent of the Middle Susitna River segment, and that Whiskers Slough is located far downstream of the proposed dam location, please explain how colonization rates in Whiskers Slough are representative of the entire Middle Susitna River segment.

Characterization and Mapping of Aquatic Habitats Study (Study 9.9)

1. Based on the imagery provided in Appendix A, a number of habitat units appear to be mislabeled (e.g., single main channel runs through mid-channel, side-sloughs that appear connected to the main channel); however, we recognize this may be the result of varying flows between the aerial image capture event and aerial video mapping efforts. To help clarify, please include a table that describes the background photo date and associated flow for each line map provided in Appendix A of the SCR.
2. Table 4.1.1 which defines mesohabitats in the SCR includes a footnote reference for off-channel habitat and for upland slough, but the footnotes are missing. Off-channel habitat designations including upland sloughs have been a source of dispute during meetings and should be clearly defined to avoid future discrepancies. Please provide a revised table with the footnotes.

Distribution, Abundance, and Habitat Use by Large Carnivores Study (Study 10.8)

1. Sections 5.1.1.1 and 5.1.1.2 of the ISR describe smoothing functions generated for environmental variables (elevation and slope/aspect interaction for black bears; x and y coordinates, distance to salmon spawning location, slope, and non-vegetative habitat for brown bears). However, the discussion of the density surface model (DSM) fit diagnostics is limited to the reporting of the deviance explained by the final model (38.1 percent for black bears and 14.6 percent for brown bears). Your discussion of the DSM is not sufficient to evaluate the study results and the validity of the model. For example, it is not clear whether additional variables were considered but excluded from the final models, or whether all listed variables were included. The discussion of the methods for model generation are also limited and do not indicate whether generation of the DSM used training, testing, and validation data sets or whether the DSM was generated using all available data. It is also not clear how you derived the final population estimates from the model. The model is based on three years of survey data, but the study report does not indicate whether each survey covered the entire study area, or, if not, to what extent the surveys spatially overlapped. Because three years of survey data were incorporated into the model, please clarify how the final population estimates account for potential duplicate observations of bears over the three year survey period

In summary, please provide in the USR additional information related to DSM generation, selection of independent variables used for smoothing functions, model validation, and methods for population estimates from the model results. Please provide tables with the generalized cross validation score, percent deviance explained, and estimated degrees of freedom for each independent variable or interaction included in the final model.

Rare Plant Study (Study 11.8)

1. In Appendix A of the ISR, the spp./var. information for the plants *Arnica lessingii* and *Mertensia paniculata* is not provided, and therefore it is unclear as to whether they are the same species as those listed in table 4.1-2 of the ISR (i.e., *Arnica lessingii* ssp. *norbergii* and *Mertensia paniculata* var. *alaskense*). If the spp./var. information is known for those plants populations documented in 2013, please provide it in the USR.
2. Figure 3-1 of the ISR shows both past and planned transects for rare plants. For the reservoir area, it appears that much of the past and proposed sampling focuses on the northern shore. The report does not explain why that is the case. We suspect that other habitat mapping exercises have provided evidence that these areas likely have a moderate or high potential for supporting rare plants. Please explain why the survey effort you propose along the south shore of the proposed reservoir is sufficient to achieve the study objectives, considering habitat needs of the species in question.

Aesthetic Resources Study (Study 12.6)

1. The ISR (Part C) indicates that access restrictions prevented visiting previously identified analysis locations (ALs). Please clarify whether you intend to access any of these ALs during future studies, or if alternative sites have been identified that would be sufficiently representative to complete the visual resource analysis. In the latter case, did you consult with stakeholders to select the alternate analysis locations, what were their concerns with the proposed sites, and how did you address their comments?

Recreation River Flow and Access Study (Study 12.7)

1. The ISR notes that you intend to gather additional information on ice-dependent winter travel and recreation on the river in coordination with the Transportation Resources Study. Given the overlap between the two studies, we recommend that future focus group discussions be closely coordinated to provide a thorough understanding of desired ice conditions needed for winter travel or recreational purposes, as well as how project operation may affect such use.

Cultural Resources Study (Study 13.5)

1. According to the 2014 ISR, a location model developed for the project identified 262 “high-potential test areas” in the direct Area of Potential Effects (APE). These are areas considered to contain a high potential for the presence of archaeological sites. Only 26 of these areas were tested in 2013 due to logistical challenges. We cannot tell from the information provided which of the 262 high potential test areas have been surveyed and which remain to be studied and when they would be studied. Please provide a map or table providing this information. If you do not intend to study certain high-potential test areas, please explain why and how you would achieve the study objectives without this information.

References

- Benke, A.C., A.D. Huryn, L.A. Smock, and J.B. Wallace. 1999. Length-mass relationships for freshwater macroinvertebrates in North America with particular reference to the southeastern United States. *Journal of the North American Benthological Society*. 18(3): 308-343.
- USGS (United States Geological Survey). 1988. Specific Conductance: Theoretical Considerations and Application to Quality Control. U.S. Geological Survey Water Supply Paper 2311. 23 pp.

20160623-5045



United States Department of the Interior
NATIONAL PARK SERVICE

Alaska Region
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

IN REPLY REFER TO:
I.A.1.(AKRO-EPC) 20160636

JUN 22 2016

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

***Re: Comments on the Initial Study Reports (ISR) for the Susitna-Watana
Hydropower Project, Alaska (FERC No. P-14241)***

Dear Madam Secretary:

The National Park Service (NPS), Alaska Region offers the following comments on the Initial Study Reports for the proposed Susitna-Watana hydropower project in Alaska.

Under the Federal Power Act (FPA), license applicants must consult with the NPS on recreational, historical and archaeological resources. Some land management and aesthetics report requirements related to scenic and recreational values are also of special interest to NPS. In addition to its responsibilities as a Federal land management agency for the National Park units, the NPS has broader responsibilities for river conservation and outdoor recreation that extend beyond National Park unit boundaries, which derive from the Wild and Scenic Rivers Act of 1968 and the Outdoor Recreation Act of 1963. Under the Wild and Scenic Rivers Act, NPS is authorized to assist, advise, and cooperate with state governments, landowners, or individuals to plan, protect and manage river resources. Under the Outdoor Recreation Act of 1963, NPS provides technical assistance and promotes coordination of activities generally relating to outdoor recreation resources including rivers and associated trails. NPS frequently makes recommendations under FPA section 10(a) for measures involving hydropower project design and operations to protect, mitigate and enhance recreation and aesthetics, including recreational facilities, public access, recreation management and riparian corridor protection.

NPS has participated in the review of the various pieces of the 58 initial study reports prepared for the Susitna-Watana project over the past two years, attending both the October 2014 and the March 2016 meetings. While we focused our review on the three studies we requested during the study planning phase of this project -- 12.5 Recreation Resources, 12.6 Aesthetic Resources, and 12.7 River Recreation -- we also reviewed the initial results of many the other 55 studies, because the resources subject to our purview are dependent on numerous biophysical conditions which could change if the project is licensed and constructed.

We offer general and specific comments in response to these recently completed ISRs along with requests for modifications to some study plans. While we are aware that the timing of the

next year of study (TNYOS) for this project is uncertain, we offer these comments for the record in order to inform FERC, the applicant, and current and future project stakeholders about concerns that we have at this point in the licensing process.

General Comments

Schedule uncertainties have had an impact on our ability to engage on the project. Based on this experience, we reiterate our suggestion that a version of the Integrated Licensing Process (ILP) that better address the unique needs of original project licensing be developed. The existing two year pre-licensing study period in the ILP will be inadequate if model integration is performed and validated prior to the second year of study.

We request that resource model calibration, validation, and integration between the multiple resource studies that rely on modeling be completed prior to TNYOS and prior to the Updated Study Reports (USR). Consistent time horizons should be used as the models are integrated and run. It should be clear whether predictions involve point-in-time conditions, at say year 50 post impoundment, and when and if steady-state conditions are expected to develop.

The basis for this request is twofold. First, the ISR meetings revealed that there are gaps in biophysical resource modeling that, when resolved, could create the need for significant changes in data collection methods for TNYOS. Examples of this include: a) the fact that 2-D modeling has been limited to focus-area tributary mouths, making it difficult to predict conditions at other tributary deltas. If it is determined that 2-D modeling is needed at all tributaries, these data should be collected during TNYOS. b) There has been insufficient groundwater data collection and modeling, which makes it difficult to understand the relationship between surface water, groundwater, and habitat. If more groundwater data collection is needed to support model integration, this should be accomplished as an interim step so that models can be validated (with an opportunity for feedback from stakeholders) prior to TNYOS and preparation of the USR. c) Riparian vegetation modeling is incomplete in the ISR, so the wildlife habitat use study (10.19) upon which several other studies rely has not started. Wildlife habitat models cannot be validated until the wetland and riparian vegetation mapping and modeling supports the habitat use estimation models.

Second, several of the 58 study plans include requirements to assess likely project effects. The intermediate steps should ensure that the models to predict change are capable and accurate, or the effects analyses in the USR will be suspect.

An additional comment concerning pre-licensing studies involves the scenarios that will be used to assess project effects for those study reports that require this. At the ISR meetings, the Alaska Energy Authority (AEA) stated its intent to model a single with-dam operating scenario in USR, probably moderate winter load-following operations. However, the FERC study plan included a requirement to assess the effects of run-of-river (RoR) operations. RoR likely represents the smallest adverse effects on most resources of any with-dam alternative, because, although it involves impacts to fish passage, requires extensive new infrastructure, inundates a large area, and alters ice and sediment dynamics, it changes the natural hydrograph for the river far less than would winter load-following. By comparing RoR impacts with baseline conditions, the FERC would be able to assess the minimum adverse effects a large dam and reservoir would have on the Susitna River and associated resources. We are concerned that

without an assessment of RoR operations in the USR, it would be challenging to weigh tradeoffs between energy production and resource impacts.

For an original project, RoR and the proposed operating regime represent the two ends of the with-dam impact spectrum. Agencies, stakeholders and the FERC are likely to propose modifications to the applicant's proposed operations in order to mitigate impacts, and there are likely to be some tradeoffs between resources in terms of flow regime optimization. When the time comes for resource agencies and stakeholders to develop prescriptions and protection, mitigation and enhancement (PME) measures, and for the FERC to perform its equal consideration analysis, we will need to know the project limits. Without a RoR impact analysis, using the integrated models generated by the project studies, our PME will be based on conjecture.

With an indefinite pause in pre-licensing studies, it is important to recognize that much of the baseline data collected will become out-of-date. This will be particularly true for resources sensitive to climate change, and to changing sociological and economic conditions. We recommend that FERC include a requirement in its ISR determination that the scope and methods for each of the 58 studies be re-examined before TNYOS commences.

Comments on ISR and Requests for Study Modifications

5.5 Economics

Given the pause in pre-licensing studies for this project, we request a study modification for a collaborative decision between the applicant, FERC, resource agencies and stakeholders on which model (IMPLAN, REMI, or other) is best suited to achieve the goals of the study prior to its resumption. The reason for this is that economic conditions in Alaska are changing rapidly.

7.6 Ice Processes

There are gaps between work to date and study goals. We will not know if more or less ice will be generated at various points downstream of the dam under various flow and temperature scenarios until a valid model is run. Mid-season breakups and re-freezing have not been studied. The effect of snow on ice dynamics has not been included in the model. Anchor ice formation has not been modeled, or the effects of large wood.

The project reservoir should be added to the scope of this study. Ice formation and stability will be an important factor for many species of wildlife, especially caribou, because the 42-mile long reservoir may interrupt migration. The stability and safety of the reservoir ice sheet will also be important to humans, for transportation, subsistence and recreation. It will be impossible to develop wildlife, access and recreation management PME without knowing more about ice processes.

12.5 Recreation Resources Study

We agree with AEA's Study Implementation Report summary and remaining tasks to complete the approved study plan. We do not, however, agree that the ISR results of the Instream Flow Study (8.5), Ice Processes Study (7.6), and Geomorphology Study (6.5) are conclusive with

respect to resolving the question: Will the project have effects on Recreation downstream of Talkeetna?

Several other studies involve resources which, if affected by the project in the reach between river miles 79 and 29.9, would likely affect recreational use and access in this segment. Such studies include those relating to fluvial geomorphology, riparian vegetation, wildlife habitat and use, fish barriers and groundwater. There are numerous species of wildlife important to sport hunting, trapping and non-consumptive viewing that could be affected by changes in the availability or access to habitat along the entire river, including the Lower River. Groundwater changes that affect sportfish egg incubation or rearing habitat and fish barriers that cut off access to tributary habitat or eliminate sport fishing opportunities at tributary mouths, would in turn affect recreation.

With respect to Geomorphology Study (6.5), it was stated during the ISR meetings that the bulk of the project affects assessment will be done in TNYOS for at least one project scenario, and presented in the USR (paraphrasing from page 263 of the meeting transcript). However, FERC left the door open in its study plan determination to extend the Recreation Resources, Aesthetics and River Recreation studies to include the Lower River depending on results of this assessment. If the Lower River is not added to the geographic scope for these three studies prior to the USR, and one or more of the other biophysical studies indicates that there will be changes to the river, floodplain, riparian vegetation or fish and wildlife, the applicant will have to extend the three recreation and aesthetics studies to include field work in this area in at least one additional year of study.

With respect to the Instream Flow Study (8.5), AEA's assertion that Lower River studies of recreation resources are not need because post-project biophysical conditions will be "within range of existing variability" only accounts for the magnitude of with-dam flows. Flow dependent biophysical resources, upon which recreation and aesthetics resources depend, will be affected by not only flow magnitudes but by the frequency, duration, seasonality and rate of change of with-dam flows. It is too early to state that the with-dam flow regime for the entire Susitna River, including the segment between river mile 79 and 29.9, will result in no changes to any of the biological resources or physical conditions upon which users ranging from moose hunters to birdwatchers, anglers, trappers, snow machiners, fat bikers and more rely.

In its Study Plan Determination, FERC stated with respect to the Fish Barrier Study that there was "no information in the record to definitively determine that project-related effects from winter load-following operations would be attenuated below three rivers confluence" (p. B-30 of Study Plan determination). Based on this absence of evidence of no effect, FERC required the fish barrier study to include the Lower River. NPS questions why a different rationale was used for the three recreation and aesthetics studies.

There is no evidence in the record to definitively determine that project-related effects from winter load-following operations would be attenuated below the three rivers confluence. To the contrary, we heard during the ISR meetings, that the Lower River channel may narrow by as much as 10% (Fluvial Geomorphology Study 6.6, ISR transcript p. 304), that aggradation in the Lower River will be reduced (ISR transcript p. 278), that the floodplain will likely narrow (an area highly important for moose habitat and other huntable and watchable wildlife), and that not enough is known about tributary mouths to say whether fish barriers may develop post-project,

in these segments or in the Middle River which were not studied (Study 9.12: Fish Passage in Upper and Middle River).

Barriers would exclude migratory fish that are associated with sport fishing and (indirectly, as sources of food) associated with huntable and watchable wildlife from this important habitat, and would decrease the availability of prime sport-fishing sites at tributary mouths. Consequently, we request that FERC extend the geographic scope for all three recreation and aesthetics studies to river mile 29.9.

Locations such as Deshka Landing, which provides a major point of access to the Susitna River and its tributaries for the general public for subsistence, recreation and transportation, and Willow, where winter snow machine and mushing use is concentrated and spreads across the Susitna Valley to roadless areas on the western side, are of prime importance to the region and beyond. Baseline recreational use and access at these locations should be studied in order to make the assessment of project effects.

Seasonal trails in the Lower River area including trails within the existing floodplain (which may narrow due to the project) should be mapped using the same methods and standards as trails in the existing study area.

12.6 Aesthetics

We agree with AEA's summary of work performed to date and remaining tasks to complete the study plan.

The omission of the Lower River from the scope of the study makes it difficult to appropriately assess project-related effects and seek measures to avoid, minimize, mitigate or compensate for such effects. A narrowed river channel, narrowed floodplain, or increased encroachment of forest into riparian areas would change the Lower River's aesthetics. Baseline data, in the form of soundscape measurements and key observation points and routes (e.g. Iditarod trail route) should be collected and assessed using similar methods as have been used in the existing study area.

12.7 River Recreation

We agree with AEA's summary of work performed to date on this study and remaining tasks to complete the study plan.

15.7 Transportation

The Port of Whittier has been identified as the potential site for transferring project construction materials and equipment from ships to the Alaska Railroad. Whittier is also an important location for recreational access to Prince William Sound, especially since the Anton Anderson tunnel opened to public vehicles in 2000. Whittier has limited accessible land area and port infrastructure. Consequently, the transshipment of large amounts of project materials could significantly impact recreational access and experiences during the construction phase of the project. These impacts should be included in the NEPA assessment for the project, with PME measures developed as appropriate. NPS requests that Whittier and its port alternatives be added to the geographic scope of study 12.5, Recreation Resources.

We appreciate the opportunity to participate in study planning and implementation for this project and commend AEA for the cooperative atmosphere and quality of work on the three recreation and aesthetic studies to date. Although project licensing is uncertain at this point, we wish to recognize the effort by the FERC, AEA, its consultants, other resource agencies and stakeholders that has gone into producing a major body of data and modeling of multiple resources. We are hopeful that the results of this effort can be used to benefit other decisions affecting Alaska's resources. Should you have questions about our comments, please contact Cassie Thomas, Hydropower Assistance Program manager, Alaska Region, at cassie_thomas@nps.gov or 907-350-4139.

Sincerely,



for
Debora Cooper
Associate Regional Director for Resources

20160623-5128



DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

June 23, 2016

Regulatory Division
POA-2011-1107

Ms. Kimberly D. Bose
Secretary of the Commission
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Dear Secretary Bose:

This is in regard to the Initial Study Report (ISR) meetings held the last two weeks of March 2016, by the Alaska Energy Authority for the Susitna-Watana Hydroelectric Project, FERC No. 14241-000. Due to scheduling conflicts, the Corps of Engineers (Corps) was unable to attend many of the ISR meetings. The Corps' review of the studies has been limited to our regulatory authorities under Section 404 of the Clean Water Act and Section 10 of the River and Harbors Act of 1899. Below are the Corps' comments on Section 11.7 of the, "Wetland Mapping Study in the Upper and Middle Susitna Basin" dated November 2015.

1. The Corps understands that wetland mapping field work was completed in 2015, and review/revision of the potential wetland boundaries are being revised by the applicant currently. We requests that we be provided data and the proposed delineated boundaries as soon as that information is available for review to ensure the final products are suitable and appropriate for the Corps' potential future use and consideration.
2. The Corps understands that the functional assessment for wetlands in this project's area will be assessed using the 1988 Magee Functional Assessment as stated within the February 2013 Wetlands Final Technical Memorandum. The Corps would like an opportunity to review any aquatic site assessment methodology, including any proposed modifications to the method, intended for use on this project prior to implementation.

Sincerely,

Roberta K. Budnik
Project Manager

20160623-5139

June 20, 2016

Kimberly C. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426
Via online submission to: <http://www.ferc.gov>

Re: Docket #P 14241 Susitna-Watana Hydropower Project
Talkeetna Community Council, Inc. ISR comments / Request for Study Modifications

Dear Secretary Bose:

These comments are submitted by the Talkeetna Community Council, Inc. (TCCI) , the elected local advisory body that represents public interests for the community of Talkeetna, Alaska, an unincorporated National Historic Townsite located within the Matanuska-Susitna Borough 90 river miles south of the proposed Susitna-Watana Dam site.

The Talkeetna Community Council, Inc. has many concerns regarding the proposed Susitna Watana Dam and the Initial Study Report. With this statement, TCCI presents the most critical concerns with the studies conducted by AEA and its contractors to date. These studies must accurately reflect baseline conditions prior to the proposed project operations and attempt to gauge potential impacts from these operations. TCCI requests FERC be dutiful in its responsibility to ensure that these Initial Study Reports confirm studies are meeting or will meet the objectives of the Revised / Approved Study Plan.

TCCI concerns include, but are not limited to, the following key issues:

Geomorphology (6.6) & Ice Processes (7.6) at the Three Rivers Confluence of Susitna, Chulitna and Talkeetna Rivers. Modification Request to incorporated 2D modeling.

During the 2012/2013 RSP comment period, TCCI requested the Commission require additional data be collected concerning the three rivers confluence of the Susitna, Chulitna, and Talkeetna Rivers within Study 6.6. At that time, tributary focus areas did not include this critical area. In its SPD on April 1, 2013, FERC requested “additional information on the models and methods for addressing several aspects of the study plan”.

See below from the July 1, 2013 AEA Fluvial Geomorphology Modeling Filing:

“When approving the Study of Fluvial Geomorphology Modeling Below Watana Dam Study (RSP Section 6.6), the Commission recommended that AEA file a technical memorandum that

provides additional information on the models and methods for addressing several aspects of the study plan. The recommendations were:

1. Modeling in Focus Areas

We recommend that AEA file by June 30, 2013, the proposed technical memorandum related to the selection and application of the one- and two- dimensional models (proposed for development in the second quarter of 2013). We also recommend that the technical memorandum include the following information:

- 1. Specification of the one- and two-dimensional models to be used in the fluvial geomorphology modeling pursuant to this study as well as the aquatic habitat models pursuant to Study 8.5 (fish and aquatics instream flow);*
- 2. Location and extent of one- and two-dimensional geomorphology and aquatic habitat modeling in project reaches, focus areas, and other study sites;*
- 3. Rationale and criteria for model selection including an overview of model development;*
- 4. For fluvial geomorphology modeling only, a detailed description of the processes and methods by which ice and large woody debris (LWD) would be incorporated into the modeling approach (as described in our 20130701-5260 FERC PDF (Unofficial) 7/1/2013 3:33:57 PM recommendations for incorporating large woody debris and ice processes into fluvial geomorphic modeling); and*
- 5. Documentation of consultation with the Technical Work Group (TWG), including how the TWG's comments were addressed.*

2. Interaction of Geomorphic Processes in the Mainstem and Tributaries

We recommend the study plan be modified to include a defined approach to evaluating geomorphic changes at the confluence of the Chulitna, Talkeetna, and Susitna rivers. The evaluation should extend from the mouth of both the Chulitna and Talkeetna rivers to the potentially affected upstream reaches of these tributaries. We recommend that AEA prepare a technical memorandum detailing a proposed approach for evaluating geomorphic changes in the three rivers confluence area, including explicitly stated objectives for evaluating geomorphic changes, an overview of the technical approach, additional data collection required, models and model components to be used, and additional analyses that would be conducted to address the stated objectives. We recommend that AEA file by June 30, 2013, this technical memorandum to include documentation and consultation with the TWG, including how the TWG's comments were addressed.

3. Incorporating Large Woody Debris and Ice Processes into Fluvial Geomorphic Modeling

As noted above in our analysis and recommendations for Modeling in Focus Areas, we are recommending that AEA file a technical memorandum with additional information on AEA's proposed model selection process. We recommend that an additional provision be added to the technical memorandum requiring that AEA describe in detail how ice and LWD would be incorporated into both one- and two-dimensional modeling approaches. The technical memorandum should explicitly state where and how each of the five scenarios for incorporating ice processes into one-dimensional and/or two-dimensional fluvial geomorphology modeling

would be implemented, as well as details regarding where and how LWD pieces and/or accumulations would be incorporated into two- dimensional modeling.

In part 2 of this 7/1/13 AEA filing, "Overall Modeling Approach", the need for both reach-scale and local-scale modeling is discussed in the selection of sites for both 1D and 2D modeling. While TCCI understands that "considering the broad physical expanse of the Susitna River system, the general hydraulic and sediment transport characteristics of the various geomorphic reaches that make up the overall study area will be evaluated using 1D computer models" - we continue to assert that the confluence of the three rivers warrants the more in depth 2D modeling. Our main concern is that the 1D methodology is limited in its ability to capture "both the magnitude and direction (in the horizontal plane) of the velocity" provided by 2D models which are "superior in defining detailed hydraulic conditions in areas of special interest such as key habitat units." (7/1/13 prior noted filing) The 10 focus areas selected for this 2D modeling, are "representative of important habitat types," geomorphic reaches, channel classifications types and their relationship to other relevant studies. TCCI requests the three rivers confluence be viewed as an important habitat /channel type as well as representative of a unique geomorphic, hydraulic, riparian system not found in the suite of currently selected focus areas.

TCCI initially requested 2D modeling be applied to the confluence area in our RSP comments. In our response to the afore mentioned July 1, 2013 Modeling filing suggesting 1D modeling be used for the TRC, TCCI states our opposition to the 1D choice below: (italics note prior filing)

TCCI's primary objective for requesting additional focus on the Three Rivers Confluence (TRC) was to gain insight into potential project related changes to channel patterns, channel dimensions, impacts to riparian habitat and resulting erosion.

The potential for changes in hydraulic conditions resulting in erosion, scour, sediment transport etc. will only be addressed in local scale analysis and 2D modeling. 1D will only represent down river flows - it will not address lateral flows, or complex hydraulics associated with the confluence.

Modeling Selection Details

From page 36 of the July 1, 2013 TM:

*"1D models cannot simulate such phenomena as point bar formations, pool riffles formations, and **planform changes such a river meandering or local bank erosion***

"2D modeling will be used to evaluate the effects of altered hydraulics and ice conditions on local erosion, mobilization and sediment transport. 2D modeling will also be the only method for analyzing potential for changes in riparian vegetation that could alter lateral habitat boundaries"

"2D - the fullest level of integration of ice process and instream flow studies...particularly how they relate to the assessment of potential changes in channel width and pattern"

“2D provides much more detail and accurate representation between main channel and lateral habitat than 1D”

TCCI requests that AEA provide 2D modeling of at least the immediate confluence mouths of the Susitna, Chulitna, and Talkeetna Rivers to adequately assess project related changes which could affect the safety of downstream communities. We are particularly concerned with the effects of the elevated winter flows (potentially 10, 000 cfs) under ice conditions proposed in the load following operations model. TCCI requests the BEI be applied to the confluence area

In conclusion, TCCI states ***“ TCCI requests a comprehensive analysis of the Three Rivers Confluence which include the potential for erosion, winter sediment and ice transport and all other geomorphic project related effects - most of which 1D modeling cannot simulate. .. TCCI hopes to gain more insight upon review of the Initial Study Reports on these critical topics”.***

Flash forward to the Fall 2014 & March 2016 ISR meetings - during presentation of the 6.6 Study Report, consultants presented a minimal data set was being used for the additional reaches of the Chulitna and Talkeetna Rivers (2 winter samples at each, only one of which is usable on the Chulitna) When asked whether the complex relationship between the three rivers was being analyzed - the response was no. When asked if confluence lateral changes and bed evolution could be analyzed, the answer was no. John Zufeld (7.6) also contributed to this discussion regarding potential ice processes at the confluence and the challenges of modeling anything other than ice thickening - ie. models will not show potential collapse and transport scenarios in connection to variable winter flows at the confluence. Unfortunately, the confluence has not been included in the Ice Model to date, so he could only speculate as to what effects the confluence might experience under winter project operations. For this reason, TCCI is requesting the 2D Ice Process Model be extended to the confluence utilizing 1D data already available.

Simply having a static snapshot of each of the Chulitna and Talkeetna tributary reaches does not achieve FERC’s directive to “ include a defined approach to evaluating geomorphic changes at the confluence of the Chulitna, Talkeetna and Susitna Rivers”. Cumulative changes to one fork of the confluence will have effects on the other two - it must be studied as a systemic focus area. The risk of stronger Susitna winter flows eroding its southern bank and flowing perpendicularly to the Talkeetna revetment must be considered. The question of a weaker summer Susitna flow and how it may interact with consistently strong Chulitna River and Talkeetna River flows / sediment transport at the confluence must be considered. Will the Chulitna approach the Talkeetna revetment without the Susitna to push it west?

TCCI requests enhanced 2D modeling and a potential Confluence sub study / component of 6.6 and 7.6 be focused on the confluence as its own Focus Area. This could include review of the existing data available in studies 6.6 Geomorphology, 7.6 Ice processes, Riparian, and Instream Flow studies. A modified confluence element to 6.6 would require a change in study perspective for analysis of the interplay at the confluence versus limited parcelling of the reaches independently. The 7.6 Ice Processes model should be extended from PRM 103.8 to 186.8 to

include the three rivers confluence. This request may require more robust data collection using the same methodologies currently employed in 6.6 and 7.6, but most of this data is already available. This sub study need not address the intense various habitat suitability factors etc. of the existing FA's - but should receive additional attention due to its importance to human communities, it's volatility, and proximity to the townsites of Talkeetna, Trapper Creek across the Chulitna, and Alaskan residents in the vicinity who may be effected by project related changes (ie. flooding and resulting damage to flood assets, challenges to transportation, access for state boat launch , impacts to a variety of seasonal access for recreation and commerce due to aggradation, degradation or ice)

This study modification request challenges the position below that no additional analyses for the confluence are anticipated. As a licensing participant, TCCI was open to the methodologies below in concept if the confluence could be accurately characterized. After several years of study, the approach below does not appear to be producing the specific confluence study objective. The only results appear to be two additional isolated tributary reach 1D models / studies with no connectivity to the combined geographic feature. or cumulative impacts.

There are no additional analyses for the Three Rivers Confluence anticipated beyond what is currently planned for the 1-D modeling of the Susitna River because the Chulitna and Talkeetna Rivers will be included as tributary reaches in the 1-D modeling. The reach-scale 1-D modeling of the Susitna, Chulitna, and Talkeetna Rivers will provide information on potential Project effects on hydraulics, sediment transport, and channel form through the analysis of:

- *Velocity*
- *Depth*
- *Water-surface elevation*
- *Sediment loads*
- *Effective discharge*
- *Coincident flows and stage*
- *Aerial photo analysis of channel change* • *Bed material gradation*
- *Aggradation and degradation*
- *Channel profiles*
- *Channel width*
- *Channel plan form*

NOTE - the mouth of the Talkeetna River hosts the Talkeetna revetment system (as noted in the TCCI June 5, 2013 attached response memo under "Background") under the jurisdiction of the US Army Corp of Engineers (USAGE) , the MSB Flood plain coordinator and MSB Emergency Services Dept. Following the 2012 Talkeetna flood, TCCI has been working with the USACE and FEMA to repair and mitigate future damage to the revetment system. **This effort has resulted in AK project work # 80 receiving app. \$1.3 million in federal disaster funds. Work will begin on repairs in 2017.** It is essential that the confluence receive adequate attention regarding both specific baseline conditions and potential project related changes: to

include the hydraulic relationship of the three rivers and highlighting their flooding characteristics - both open water and under ice. Local, State and Federal agencies have invested too many resources to the confluence area for the proposed dam project to ignore its importance.

(Though the above request is not formatted to the guidelines of “why the new study request satisfies the study criteria in 5.9 (B)” - all points within the requirements are addressed)

Social and Economic Conditions of the Northern Susitna Valley. Limited Study of communities between RM 29.9 and the Parks Hwy Bridge (RM)

TCCI’s mission as a licensing participant is to highlight the baseline social and economic conditions of the residents of the Susitna watershed and clarify how the project impacts will alter the current quality of life of residents who live along the Susitna River.

In general, the ISR does very little to characterize the base line conditions of those who reside in the watershed and along the river. Much attention is paid to the recreational preferences and opportunities, which is a critical and worthy study scope. None the less, only a handful of studies such as the subsistence interviews, the HIA, and public goods and services studies look at the actual “habitat suitability” of residents. The following are modifications TCCI requests to enhance the attention on impacts of the project affecting residents.

TCCI request Willow be added to the following studies :

Transportation - the ISR covers all methods of transportation potentially affected by the SuWa project except river transportation which will be conducted “qualitatively” vs. quantitatively. This is unacceptable that AEA did not conduct a comprehensive study of river transportation. and does not intend to. The Susitna River hosts transportation barges at the Willow area servicing the Yentna and lower Su Rivers. These uses should be documented quantitatively.

Social Conditions / Public Goods and Services / HIA - In response to impacts resulting from transportation of construction materials and overall proximity to the Susitna River ie. potential altered flow regimes and geomorphic channel changes.

Recreational Resources :

“The Recreation Resources Study is designed to identify recreation resources and activities (by both visitors to Alaska and Alaska residents) that may be affected by the construction and operation of the proposed Project, and to help assess the potential impacts of Project construction and operation on those resources and activities.

As set forth in Section 12.5.1 of the RSP, the specific goals of the study are to:

***Identify and document recreation resources and facilities that support commercial and non-commercial recreation in the Project area.**

***Identify the types and levels of current recreational uses and future reasonably foreseeable future uses based on surveys and interviews, consultation with licensing participants, regional and statewide plans, and other data.**

***Evaluate the potential impacts of Project construction and operation on recreation resources, needs, and uses in the Project area.**

***Develop data to inform AEA's future development of a Recreation Management Plan for the Project.**

River Rec Flows and Access Study- to contribute data to the Recreation Resource Study (12.5) concerning the relationship between river flows and river recreation opportunities and uses, by:

*** Documenting river recreation use and experience for the respective river recreation and transportation opportunities on three mainstem Susitna river reaches.**

*** Describing the potential effects of altered river flows on existing and potential boating activity and other river recreational uses of the Susitna River.**

*** Understanding river ice preferences for the respective river ice-dependent winter recreation and transportation on the Susitna River.**

Willow, Alaska - Study Modifications or New Study Request:

WHY THE NEW STUDY REQUEST SATISFIES THE STUDY CRITERIA IN § 5.9(B)

1. Describe the goals and objectives of the study proposal and the information to be obtained:

Goals - the goal of an overall Willow study component would be to document baseline conditions in this community adjacent to the Susitna River. (this documentation is required for PM&E be considered should project operations prove to impact the community.)

Objectives -

1. Seek to characterize existing conditions in the Willow area including but not limited to those addressed in the other "potentially affected communities". Specific attention should be paid to the remote Yentna communities and their dependance on river barging for supplies, as well as recreational resources of the area.

2. In light of the extension of the 6.6 Geomorphology study to RM 29.9, and multiple aquatic studies extending to this RM, one can assume there will be changes to the lower Susitna River south of the Parks Hwy Bridge RM 88.9. The objectives of a Willow / Lower Su River Use component would include an overview of social conditions, transportation, and recreational uses from the RM 88.9 to 29.9.

Willow should be included in 15.6 Social Conditions and Public Goods and Services, 15.7 Transportation, 15.8 HIA,

12.5 Recreational Resources and 12.7 River Recreational Flow and Access Study.

A. Recreational Resources Study 12. 5 - ISR meeting discussions have focused primarily on the potential of extending the Recreational Resources Study area to include the Willow area and lower Susitna River to RM 29.9. AEA and its contractors have taken the hard position that they have determined any changes below the Parks Hwy Bridge (RM 88.9) to be “insignificant” or within environmental acceptance.

This premise is not confirmed through completed models or finalized data. It is a hypothesis which still requires ample proof and should not dictate the omission of baseline data. Only the comparison of baseline data to projected conditions with the project can conclude whether impacts are significant or not. AEA’s decision point to negate extension of the Rec Resources study are based primarily on data derived from an alternative transect below the Parks Hwy bridge. During the fall 2014 ISR meetings, licensing participants were alarmed to find out that the operation flow tables used for all other studies were no longer applicable for this decision - but that a new gauge was being utilized which generated flows with less stage difference than those at the historic bridge gauge. These new figures were buried in the elusive appendix K in the Open Water Hydrology Data Collection and Flow Routing Model , ISR Part C / Study Implementation Report. (?!!) They have since been replaced with another Appendix B. This new transet gauge has none of the historical data of the prior gauge used by all the other interrelated studies. While AEA asserts this gauge more accurately reflects the lower braided river, it feels unorthodox from a licensing participant point of view. to “change gauges in mid stream” to favor a decision point outcome.

B. The study areas within 12.5 are varied ie. Recreational Effects analysis area, Recreational Use Study Area, and Recreational Facilities Study Area. a Willow component could be added to the Recreational Use Study Area which currently stops at the Parks Hwy “Y” at Talkeetna (mile 99) This extension would take into account several heavily used sport fisheries at Montana Creek, Goose Creek, Sheep Creek. It would capture all of the Willow dog mushing and snow machine trails (attached in WACO filing) including the Iditarod Trail and others dependent on consistent ice and frozen river conditions. Finally, the Susitna and Deshka Landings would be incorporated for both recreational boating and snow machining access. (currently, the study includes facilities from the Richardson Hwy Corridor, and Glenn Hwy facilities from Glennallen to Chickaloon - but does not include recreation currently occurring on the Susitna River at Willow!)

A Willow component modification to the Recreation Use study area could be pared down without the broad intercept or mail surveys of the main study. Interviews with key recreational groups and facilities could provide a cost effective and basic overview.

2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied:

Sustainable salmon policies apply. The Susitna is included as one of the relevant indicator rivers under the Governor's Chinook Salmon recovery goals.

3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study:

See WACO ISR comments for specific public interest considerations.

TCCI serves as the local advisory body representing residents in our council district as ordained by the Matanuska Susitna Borough. Talkeetna, Trapper Creek, and Willow all host local community councils which unite to form representation of the northern portion of MSB Assembly District 7. Talkeetna, Trapper Creek and Willow are all served by the same Assemblyman and often work together on issues critical to the Northern Susitna Valley. Throughout the ILP process, TCCI has been requesting on the record that Willow be included as a potentially affected community. The public interest considerations to the proposed study is the general inclusion of all communities proximal to the Susitna River which could sustain impacts from the proposed project.

4. Describe existing information concerning the subject of the study proposal, and the need for additional information:

There is currently no information regarding the Willow area in the RSP or ISR resulting in the need for additional information

5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements:

According to study 6.6 and the resulting extension of the study to RM 29.9, geomorphic changes from the proposed project will affect the lower Susitna River. Though the most dramatic changes may be in the Middle River, there is speculation that the lower river may respond to cumulative years of changed flow regime by experiencing lateral channel change and even morphing from a wide braided river, to a single channel. The social and economic resources of the Willow community would be greatly affected if the currently active, adjacent eastern channel were to change in stage or disappear as a result of project operations. Results of a Willow community social and economic overview would allow for either PM&E or could contribute to analysis of the need for potential environmental flows in licensing requirements.

(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge:

Proposed study methodology would be either utilization of ongoing methodologies in the studies for which Willow is added (ie. Social 15.6, Transportation 15.7, HIA 15.8 , 12.5 Recreation 12.7 Rec River flows) or an independent overview of the Willow area. Methodologies for the Willow overview could include:

- * existing data review from the MSB regarding population, tax information etc.
- * interview with Yentna Homeowners Association including quantitative data regarding population, transportation etc.
- * A summer and winter field season of data from Deshka Landing facility to quantify use of both summer river boat / barge and winter snow machine transportation uses and traditional corridors supporting owners of remote properties. (Winter oil/gas frozen river roads should also be included in this transportation overview)
- * recreation based economic factors should be collected to include providers of recreational services and use patterns in the area. Similar methodologies could be used from the existing studies such as the which excluded Willow. (Such as the ROS or other methodologies)

These methodologies are consistent with generally accepted practice in the scientific community and consulting / study industry.

(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

There are no proposed alternative studies looking at the Willow area. No current AEA ILP study is sufficient to meet the need for informational base line data on the Willow area.

The cost of adding Willow to the social oriented studies as a potentially affected communities (PAC) is minimal and would require primarily literature review. Addition of Willow to the Rec Resources Study would entail additional data collection. (It's unfortunate that AEA's Rec Use study team did not collect relevant lower river / Yentna data while surveying at Deshka landing. Instead they only sought data for those heading to recreate above the Parks Highway bridge into the existing study area - contrary to the common local uses. The existing study would have costs for expenses occurred by having reps at the Deshka Landing site for the prior study season. One surveyor could collect both recreational and transportation data as they are at the same Deshka facility. Additional data would be required for adding a fourth reach (88.9 - 29.9) to study 12.7 but methodologies could be altered and simplified to accommodate a more regional use pattern.

Discussion of the cost of adding Willow to ongoing studies has been discussed at the FERC mandated ISR study meetings. In the past years, inclusion of several of Willow's neighboring communities such as Wasilla and Houston, have been added to studies such as the social conditions & public goods and services (15.6) and transportation study (15.7) , without any discussion of cost or effort being exorbitant or prohibitive.

OTHER ELEMENTS OF STATEMENT OF GOOD CAUSE:

1. Any material changes in the law or regulations applicable to the information request:

n/a

2. Why the goals and objectives of any approved study could not be met with the approved study methodology:**Transportation Study Objectives:** transportation effects of project construction and operation

Willow is the heart of river barge transportation. It's location on the Park's Hwy corridor and rail corridor make it susceptible to impacts of project construction freighting. Willow is not currently included in the approved study so effects are not being thoroughly captured.

Social Goods and Services Objectives - define existing conditions in communities within close proximity to the components of the project. But many additional communities have been added through the Transportation Study. "The inclusion of these communities is necessary to fully achieve the study objective of describing the effects of the movement of Project construction equipment, materials, and workers on local government public services, including police and medical services." Many of the additional communities added, such as Houston and Wasilla, will see increased road or rail traffic - all increased road and rail traffic in these added communities must pass through Willow on route north to the project site. The current approved study fails to incorporate the effects of project construction equipment movement on the community of Willow.

HIA Objectives - Willow meets the PAC criteria - High likelihood for change in transportation infrastructure. Due to transportation oriented impacts coupled with the proximity to the Susitna and potential project induced changes, Willow should be included but is not in the approved study

Recreational Resources Study Objectives -The Recreation Resources Study is designed to identify recreation resources and activities (by both visitors to Alaska and Alaska residents) that may be affected by the construction and operation of the proposed Project, and to help assess the potential impacts of Project construction and operation on those resources and activities.

As set forth in Section 12.5.1 of the RSP, the specific goals of the study are to:

- *Identify and document recreation resources and facilities that support commercial and non-commercial recreation in the Project area.

- *Identify the types and levels of current recreational uses and future reasonably foreseeable future uses based on surveys and interviews, consultation with licensing participants, regional and statewide plans, and other data.

- *Evaluate the potential impacts of Project construction and operation on recreation resources, needs, and uses in the Project area.

- *Develop data to inform AEA's future development of a Recreation Management Plan for the Project.

Exclusion of Willow recreational uses and flow based recreation/boating transportation renders the approved study incomplete and hence it is not meeting its objective to characterize recreation which MAY BE effected by construction or operation of the project.

12.7 Objectives-River Rec Flows and Access Study- to contribute data to the Recreation Resource Study (12.5) concerning the relationship between river flows and river recreation opportunities and uses, by:

- * Documenting river recreation use and experience for the respective river recreation and transportation opportunities on three mainstem Susitna river reaches.**
- * Describing the potential effects of altered river flows on existing and potential boating activity and other river recreational uses of the Susitna River.**
- * Understanding river ice preferences for the respective river ice-dependent winter recreation and transportation on the Susitna River.**

3. Why the request was not made earlier: Licensing participants have been requesting the inclusion of the Willow area in the Recreational Resources Study, the Social Goods and Services Study, the IHA, and the Transportation Study at the Sept 2014 ISR meetings, the March 2016 ISR meetings, during the ISP and resulting RSP, and in Scoping comments.

4. Significant changes in the project proposal or that significant new information material to the study objectives have become available:

Economic changes in the state of Alaska have cast a profound uncertainty on the state budget. The critical reduction in revenue from oil has affected all communities who depend on state revenue contributions. Now more than ever, communities outside of core areas are relying on their natural resources for commerce and social goods. It is essential to capture this baseline use prior to licensing of a project which may impact resources communities depend on.

General overall ISR study objective Issues:

In general, the ISR baselinbe objectives seem to be focused on more than the corresponding impacts associated with the project. Assessment of impacts is integral to many of the study objectives, yet confirming these impacts can be addressed with current methodolgies seems to be postponed until the USR. A review of the meeting summary transcript finds this to be true with a host of studies. TCCI requests confirmation that assessment of impacts is currently inclusive within studies. Participants should not have to wait until the USR to determine methodologies are limited in impacts assessment.

Sincerely,

Whitney Wolff / Chair - Talkeetna Community Council Inc.

20160623-5145



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Natural Resources
OFFICE OF PROJECT MANAGEMENT & PERMITTING
550 West Seventh Avenue, Suite 1430
Anchorage, Alaska 99501
Main: 907.269.8690
Fax: 907.269.5673

23 June 2016

The Honorable Kimberly Bose
Secretary, Federal Energy Regulatory Commission
888 First Street
Washington D.C. 20426

**Re: Comments on Initial Study Report for Susitna-Watana Hydroelectric Project,
FERC No. 14241-000**

Dear Secretary Bose:

This letter provides comment on the Initial Study Report (ISR) on behalf of the State of Alaska Agencies (the State), including the Departments of Fish and Game, Environmental Conservation, Natural Resources, and Health and Social Services. We understand the purpose of this comment period is to file any disagreements with the applicant's 24 April 2016 ISR Meeting Summary and to comment as to whether the studies as implemented and the data collected are providing the information required by the Federal Energy Regulatory Commission (FERC) approved study plans, and if they are not, to provide FERC with recommended modifications to ongoing studies, or to propose new studies based on specific criteria outlined under 18 CFR 5.15 (d) and (e).

Overall, we have found the studies were conducted as intended. The project has produced a significant amount of the information necessary to provide a baseline and the remaining field work can be completed within a year. We have no disagreements with the ISR Meeting Summary and are not requesting new studies or study modifications beyond recommendation to add two communities to the Subsistence Survey. It is time to finish the study process and complete the license application. The State requests that no further studies be approved unless a critical need for the FERC decision making process can not be met with the current studies.

We would like to thank the authors of the ISR Part D for providing a comprehensive roadmap which enables easy access to all the documents and data relating to the ISR in one location. The extraordinary 34-page Part D Overview document provides a virtual ISR encompassing the entirety of the ISR and the study effort to date through links to each of the 58 FERC-approved studies, to the associated reports, to the new analyses and data gathered since the 2013 study season, to the applicant's proposed study modifications, identifies the completed studies and outlines the steps to complete each remaining study. Providing this tool to FERC

Secretary Kimberly Bose
State of Alaska Agency ISR Comments FERC No. 14241

23 June 2016

and the stakeholders significantly reduced the burden on reviewers to determine which documents to review and kept the various reports in context.

The State continues its support of FERC's use of the Integrated Licensing Process (ILP) for this project. The ILP provides a structure which sets standards for both the project to stay on schedule and for stakeholders to provide timely feedback to FERC and the project proponent. The ILP structure and schedule is particularly important in Alaska where field seasons fit into a very small window of opportunity each year. This seasonal constraint requires timely feedback from stakeholders to keep the process on track. Delays in the FERC review periods significantly impede the ability of the project to incorporate stakeholder concerns in a timely manner. We note the substantial leeway FERC extended to stakeholders to ensure they had ample time to review and comment but notice there is little recognition of how extended review periods create a process where stakeholders are reviewing stale information and force the proponent to produce supplemental reports on an ad-hoc basis. As it is not practical to require a project to sit idle during stakeholder review, it is important to recognize that extensions of review periods create significant redundancies for the reviewers and the project.

Finally, the State would like to thank FERC for their patience while the project stood down at the end of the 2014 season due to the Governor's executive order reevaluating the state's large capital projects. Allowing the project to complete its work to reach the FERC milestone of the Directors Determination ensures that the effort expended to date is captured and preserved for future use.

The State looks forward to working collaboratively with FERC and all stakeholders through any subsequent permitting of the proposed project. Should you have questions regarding these comments, or if our office can be of service in facilitating resolution on any outstanding issues, please don't hesitate to contact me at (907) 334-2185.

Sincerely,



Marie Steele, Large Project Coordinator
Office of Project Management and Permitting

cc: Acting Commissioner Marty Rutherford, Alaska Department of Natural Resources
Commissioner Sam Cotton, Alaska Department of Fish and Game
Commissioner Larry Hartig, Alaska Department of Environmental Conservation
Associate Director Nathan Butzlaff, Office of the Governor
Executive Director Sara Fisher-Goad, Alaska Energy Authority
Executive Director Sara Longan, ADNRC Office of Project Management & Permitting

The Alaska Departments of Environmental Conservation (ADEC), Natural Resources (ADNR), Health and Human Services (DHSS), and Fish and Game (ADFG) provide the following comments on the Initial Study Report (ISR) for the Susitna-Watana Hydroelectric Project (FERC No. 14241).

I. ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

The Alaska Department of Environmental Conservation supports timely completion of Study 5.6 and agree with the Alaska Energy Authority (AEA) that the remaining steps¹ to complete the study include:

1. Import ice cover and thickness from ice processes model into the models. Conduct river temperature simulations for calibration. Provide output for development of the River1D Ice Processes Model (Study 7.6)
2. Conduct river model scenario simulations and incorporate alternate operational scenario outputs for the 60-year hydrologic period from the reservoir model.
3. Refine Focus Area models to represent mechanisms responsible for lateral variability in Focus Areas. Conduct scenarios. Transfer Focus Area model results to habitat modeling studies.
4. Complete reservoir model simulation of suspended solids transport to evaluate reservoir trapping and provide downstream river loading.
5. Conduct sensitivity analysis of temperature and solids response within all models.
6. Configure and calibrate water quality model, using organic matter and nutrient loads determined from monitoring data.
7. Configure toxics and mercury model following calibration of the nutrient cycling model.
8. Conduct simulations in reservoir and riverine models to evaluate water quality and sediment transport impacts under various alternative operational scenarios.

While all of the remaining steps to complete the study are important for DEC to be able to evaluate the projects potential impacts, there is one item in particular. Item 8, “Conduct simulations in reservoir and riverine models to evaluate water quality and sediment transport

¹ 23 March 2016 ISR Meeting Study 5.6 Water Quality Modeling presentation slides 16-17.

impacts under various alternative operational scenarios.” The ability to examine the modelled impacts of various alternative operational scenarios is critical to conduct a robust analysis for evaluating the project for its Section 401 Water Quality Certification. Without completion of Study 5.6 there will be insufficient information to submit a robust application for the Section 401 Water Quality Certification.

II. ALASKA DEPARTMENT OF NATURAL RESOURCES

The Alaska Department of Natural Resources (ADNR) agrees to AEA’s recommended modifications to the ISR and finds no compelling reason for further modifications, new studies and or additional years of study. We believe AEA has made significant progress and is on track to meet FERC-approved study objectives.

As the State’s landowner, ADNR is particularly interested in timely completion of the studies and license application. Due to the state fiscal situation, it is incumbent that study efforts are focused solely on the critical components necessary to make permitting decisions. We recommend studies be constrained to what is absolutely essential for completion of the license application.

Groundwater (Study 7.5)

The purpose of this study is to understand the effects of project operations on ground water/surface water interactions at multiple spatial and temporal scales as they relate to aquatic and floodplain species in the Susitna River. We believe AEA has made significant progress on the study for understanding site-specific controlling parameters and potential effects on nearby shallow groundwater wells. AEA is on track to meet FERC-approved study objectives.

Cultural Resources (Study 13.5)

The purpose of this Cultural Resources Study is to systematically inventory cultural resources within the Area of Potential Effects (APE), evaluate for National Register of Historic Places (NRHP) eligibility the inventoried cultural resources within the APE that may be affected by the Project, and assess Project-related effects on National Register-eligible historic properties (NRHP) within the APE (36 CFR § 800.5). Information from this study will be used to develop

a Historic Properties Management Plan for the appropriate management of historic properties affected by the Project.

The State of Alaska Office of History and Archaeology (OHA) and Alaska State Historic Preservation Office (SHPO) staff have been engaged in consultation with the AEA and FERC since this project's inception. This includes regulatory review of actions and documents connected to the development of both the 2012 Revised Study Plan (RSP) and a comprehensive review of the ISR Part A-D for the 13.5 Cultural Resources Study. We have also reviewed selected portions of other ISR studies with a direct relationship to evaluating cultural resources potential, including some habitat and subsistence studies. We believe significant progress has been made and the study is on-track to meet the FERC-approved study objectives. We offer the following observations regarding the study effort to date.

OHA regards the cultural resources studies commissioned by AEA for the both the RSP and ISR to be well conceived and well executed. AEA and its cultural resources contractor, Northern Land Use Research Alaska (NLURA), have consulted regularly with OHA regarding compliance with the Alaska Historic Preservation Act (AS. 41.35. 070) and the Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) during the ISR process. These consultations have been timely and effective. Permit applications made to perform field research on State lands were similarly well-coordinated. NLURA also provided ample opportunity for the State Archaeologist to observe field operations and to review annual reports. Through its website, AEA has given the public appropriate access to ISR cultural resources documents, redacted to protect sensitive site location data. OHA access to the unredacted versions has been equally good.

Several accomplishments made by AEA and NLURA during the FERC licensing studies are noteworthy and deserve individual comments. During preparation of the RSP, AEA contracted with NLURA for a data gap analysis of previous cultural resource studies connected with the Susitna-Watana project of the 1980s. Completed in 2011, this study included review of the original field data, project reports and subsequent publications in the academic literature. The NLURA report for this sub-task became a vital contribution to planning for the ISR cultural resource studies. It should also prove to have long-term value for subsequent cultural resource studies throughout the region. During the ISR phase studies, reported in 2014, NLURA

implemented a quantitative GIS approach to site location modeling. This approach enabled optimal allocation of field survey resources during site inventory and provided for iterative improvements to the survey strategy during future licensing studies. The addition of ethnographic data to the cultural resource studies, including georeferenced place-names, is also an important improvement over the studies performed in the 1980s. Finally, AEA commissioning of a paleoenvironmental study, performed by the University of Alaska Fairbanks and reported in March 2015, is a major step forward in placing the archaeological record in the study area in its proper context. Information of this kind derived from modern research methods was nearly absent in the Susitna-Watana Hydroelectric Project area prior to ISR, and there had been little improvement in our state of knowledge since the 1980s generation of research.

OHA/SHPO has some concerns regarding the effects of modifications and variances to the ISR, as identified in the Cultural Resources Study Plan Section 13.5, Part D (November, 2015). The addition of the Denali East Option to the direct Area of Potential Effects may have affected the sequence of Phase I site inventory and Phase II NRHP evaluation in portions of the study area. The FERC-approved Study Plan indicated that Phase I inventory should be conducted before Phase II NRHP evaluation. Addition of the Denali East Option created the need for additional archaeological inventory. In light of this modification and other variances, Part D identified additional steps necessary to complete the ISR. These included completion of systematic inventory and evaluation of archaeological and historic cultural resources within the APE. Also identified was assembly of ethnographic and linguistic information, particularly as related to Traditional Cultural Properties. NLURA reported some progress in these aspects of the study during the March 30, 2016 meeting, but it is not clear whether a formal report has been produced. If not yet addressed, these data gaps should be remediated in the near term. A second concern is that archaeological survey of the indirect Area of Potential effects was not completed, including some areas that may be of high archaeological potential. This is of special concern within a segment of the Susitna River corridor that extends from the Denali Highway Bridge at Milepost 41 downstream to the beginning of the Impoundment Max Pool at Goose Creek.

Looking ahead, our office encourages AEA to capitalize on the advances made in background research, modeling and preliminary field studies during the ISP to inform its on-going management of the FERC licensing process for the Susitna-Watana project. These studies have set the stage for a highly productive completion of the intensive identification efforts and site evaluations. In addition, we believe that the researchers responsible for the achievements made during the ISP should receive support and encouragement to bring their results into the professional literature as current funding allows. We regard this as a significant step due to the fact that archaeological field studies for large projects inevitably result in a consumptive use of non-renewable cultural resources. Although this effect on individual sites may be small, the cumulative effect on the dozens of sites under study is often substantial. Off-setting this effect is the conversion of information about the prehistoric past contained in archaeological sites into data intended to be conserved in permanent repositories, including museums, libraries and publications. This step reflects the underlying intent of both State and Federal cultural resource management legislation to conserve the information value of archaeological resources. It is also of direct benefit to the public by making synthesis of the sensitive information protected by redaction of the public documents available in a form which does not reveal site locations. A small investment in this will leverage benefits received from expenditures of public funds already made on cultural resources studies for the RSP and ISR licensing stages.

III. ALASKA DEPARTMENT OF HEALTH AND SOCIAL SERVICES

The Alaska Department of Health and Social Services (DHSS) agrees with AEA's summary of work performed to date and remaining tasks to complete the Health Impact Assessment (HIA; Study 15.8). These additional tasks include providing the baseline data to describe and rate potential health impacts. DHSS finds the initial work was conducted according to the study plan objectives and did not include any variances. While the HIA is not yet completed, DHSS did collect a large amount of baseline health data, including local and traditional knowledge related to health. The baseline health data was extremely useful to the HIA and to DHSS. Data collected will help inform other HIAs, including Alaska LNG, where FERC is also the lead federal agency for the permitting process.

IV. ALASKA DEPARTMENT OF FISH AND GAME

Alaska Department of Fish and Game (ADF&G) comments and one study modification request are provided below. Overall, the studies have been conducted in a professional manner and will provide valuable information on affected resources and ecological processes and will increase our understanding of Alaska's fish and wildlife resources and habitats.

Baseline Water Quality (Study 5.5)

The goal of the study effort was to assess the effects of the proposed project and its operations on water quality in the Susitna River basin with particular reference to state water quality standards. The study provided baseline water quality data and information to inform project development and potential impacts. All of the field work, data collection, data analysis, and reporting for this study are complete and we believe no modifications or further studies are needed to meet FERC-approved study objectives.

Water Quality Modeling (Study 5.6)

The goal of the Water Quality Modeling Study is to utilize the extensive information collected from the Baseline Water Quality Study to develop a model(s) to evaluate potential impacts of the proposed Project and operations on various physical parameters within the Susitna River watershed. We agree with Alaska Energy Authority's (AEA) decision that extension of the water quality model downstream of PRM 29.9 is not warranted.

Based upon the work completed, we believe the data is sufficient to complete the modeling and objectives for the Water Quality Monitoring Study and therefore no additional field work is needed to meet FERC-approved study objectives.

Geomorphology (Study 6.5)

The Geomorphology Study focused on characterization of the geomorphology of the Susitna River and evaluation of the effects of the project on the geomorphology and dynamics of the river by predicting the trend and magnitude of geomorphic response. This information has included sediment-transport relationships for the lower and middle river, macrohabitat mapping of the middle river, dam effects on downstream channel, floodplain, and riparian plant

communities, and geomorphic reach delineation and characterization for the upper, middle and lower Susitna River segments.

The results of this study, along with results of the Fluvial Geomorphology Modeling study to predict the potential for alteration of channel morphology from project operation. This information has provided new insights and understanding to the Susitna River geomorphology and will be used to predict the potential for alteration of channel morphology from project operation and potential project impacts. We believe significant progress has been made and the study is on-track to meet the FERC-approved study objectives.

Fluvial Geomorphology Modeling Below Watana Dam (Study 6.6)

The purpose of the modeling study, in combination with the Geomorphology study, is to assess the potential impact of the project on the behavior of the river downstream of the proposed dam, with particular focus on potential changes to instream and riparian habitat. This study will also provide information for evaluation of project effects for other studies. We agree with AEA's recommendation to not extend the 1-D Bed Evolution Model below PRM 29.9, based on the analysis provided and that the additional data will not provide meaningful results to further inform the decision process. We agree with the study modification to include groundwater flows as point source inputs to the 2-D hydraulic models at lateral features that are identified as having persistent groundwater sources. Based on the information presented, we agree with AEA's determination that open water flows do not appear to contribute appreciably to bank erosion at FA-128 (Slough 8A) and that bank erosion is more likely related to ice processes. We also concur with AEA's recommendation to not continue the Bank Energy Index analyses for open water conditions at the remaining Focus Areas, if similar results are observed at one other focus area.

We also agree with the study modification to the 2-D bed evolution modeling of existing and future conditions to select the number of water years used in the model based on tributary fan development.

We believe significant progress has been made and the study is on-track to meet the FERC-approved study objectives.

Groundwater (Study 7.5)

This study investigated groundwater (GW)/surface water (SW) interactions at both the watershed and local scales. Information from this study is to be used in evaluating project effects on GW/SW interactions and resulting effects on other aquatic and terrestrial studies. This study has provided valuable information on groundwater relationships in the Susitna River and furthered our understanding of these processes and importance to fish habitat, including information on winter flows and how it relates to GW/SW interactions. When linked to the Ice Processes model, it will enable evaluation of project effects on GW/SW water interactions during the winter ice covered periods. These data, in combination with the habitat suitability curves (HSC)/habitat suitability index (HSI) curves and the 2-D Fish Habitat models, will provide information to calculate habitat quantities by species and life stage under different winter-time flow conditions. Information from the Groundwater model will also inform project operational effects on GW/SW interactions and effects on the riparian community. We believe significant progress has been made and the study is on-track to meet FERC-approved study objectives.

Ice Processes (Study 7.6)

The purpose of this study is to advance understanding of natural ice processes in the Susitna River and to model pre- and post-project ice processes in the Susitna River. The study also will provide ice processes information for other resource studies with winter components. We appreciate AEA's decision to provide updated visualizations of freeze-up progression and open lead survey information. The new format greatly improves the ability to comprehend the large amount of technical information in a visual manner. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Fish and Aquatic Instream Flow Study (Study 8.5)

The goal of this study is to provide quantitative indices of existing aquatic habitats that enable a determination of the effects of alternative project operational scenarios. This study focuses on establishing an understanding of important biological communities and associated habitats, and of the hydrologic, physical, and chemical processes in the Susitna River that directly influence those resources. The Instream Flow Study (IFS) is divided into eight study components: 1) IFS

Analytical Framework, 2) River Stratification and Study Area Selection, 3) Hydraulic Routing, 4) Hydrologic Data Analysis, 5) Habitat Suitability Curve Development, 6) Habitat-Specific Model Development, 7) Temporal and Spatial Habitat Analysis, and 8) Instream Flow Study Integration.

The formulation of a Focus Area approach to the study design is seen as a highly effective and practicable approach to such a large and diverse drainage basin. Preliminary results confirm 1980 findings that the highest amount of biologic productivity along the Susitna River, including salmon spawning and rearing, tends to occur in the side channel, side sloughs and other off-channel habitats. Salmon spawning locations from the 1980's studies were observed to occur in nearly identical locations. This is not surprising given that information from the geomorphology study shows that the middle reach has been very stable over past several decades. This also corresponds with observations from other large glacial systems in Alaska where salmon seek out clear water refuges for spawning and rearing. We believe this study, combined with field data collection, modeling efforts, and linkage to other resource studies, will provide the information needed to inform and characterize the resources and ecological processes needed for evaluation of project impacts.

We acknowledge the field effort and data collection by AEA's contractors. In particular, the winter field studies to identify fish distribution and habitat preferences were well designed and executed. These are very difficult studies to perform under challenging winter conditions.

ADF&G staff have spent considerable time and resources on the development of study plans and we believe that the HSC/HSI sampling design is robust and will provide scientifically sound results. We support the approach to use accepted instream flow methods and field protocols to guide the data collection and modeling processes. ADF&G biometricians have reviewed proposed HSC/HSI methods and analysis and concur with the chosen approach and use of a generalized linear mixed model. Information collected has been informative and meets study objectives for the primary target species. Secondary target species were acknowledged to be of lower density and would be more difficult to meet HSC goals. Accordingly, the study plan anticipated this potential outcome and identified alternative methods to complete this information, if necessary.

We believe AEA has made significant progress and is on track to meet FERC-approved study objectives.

Riparian Instream Flow (Study 8.6)

The purpose of this study is to assess the effects of the proposed project and its operations on the floodplain plant communities in the Susitna River basin. The study will model potential impacts to downstream floodplain vegetation from project operational flow modification of the existing flow, sediment, and ice regimes. Observations of ice effects and tree ice scar mapping have provided insight on these processes and relationships. We agree that additional evapotranspiration measurements are not warranted based on the determination that the Susitna Valley region is not a precipitation limited region. We agree that evaluating habitat associations by size instead of age will continue to meet the objective of documenting the seasonal life stage use, growth, and condition of species by habitat type. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Fish Distribution and Abundance in the Upper River (Study 9.5)

The purpose of this study is to describe the current fish assemblage including spatial and temporal distribution, and relative abundance by species and life stage in the Susitna River upstream of the proposed Watana Dam. We were consulted on the variety of methods used for sampling. Sampling focused on mainstem river habitat and more intensely within tributary habitat up to an elevation of 3,000 feet. We support the sampling design and use of the generalized random tessellation stratified samples methodology, and the proposed modifications to provide a more robust and representative sampling effort. We agreed with replacing the rotary screw trap in Kosina Creek with fyke nets near the confluence of Kosina Creek and the Susitna River and siting a rotary screw trap in a mainstem Susitna River location near the proposed dam site. We support AEA's tagging efforts and concur that variances will not impact AEA's ability to meet the study objective of describing seasonal movements of selected fish species within the zone of hydrologic influence upstream of the project. We concur and acknowledge some of the areas likely support low densities of fish species and information from other studies can help describe the seasonal use of habitats. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Specific Comments:

1. Section 2.1: The last sentence needs to be corrected to convey the actual length sampled if the entire unit was not. Currently it says the sample length was up to 00 m (656328 ft). We believe it should read 200m (656 ft).
2. 4.3.1.1 Field Methods: Capture efficiency varies by species/life stage, habitat and gear type. Comparisons of CPUE between gear types will not provide reliable information. Collecting CPUE using multiple gear types will make comparisons between habitat types (or species, sites or life stages) unrealistic, if each habitat type (or other factor) is sampled with different gear.

Fish Distribution and Abundance in the Middle and Lower Upper River (Study 9.6)

This study assessed current fish assemblages including spatial and temporal distribution, and relative abundance in the Susitna River downstream of the proposed Watana Dam. A variety of equipment and sampling techniques were used to collect information on fish distribution and abundance.

Given the large project area, number of fish species and diversity of fish habitats, we believe AEA and their contractors have done a commendable job characterizing fish distribution and abundance in the Middle and Lower Susitna River. We acknowledge the difficulty AEA contractors have faced in the identification of juvenile Chinook and coho salmon over this large area and variability in development timing. Combined with the measures taken and the genetic sampling, we believe this issue has been appropriately addressed and will not affect interpretation of study results or the decision making process.

We support AEA's modifications to collect additional tissue samples for genetic analysis, implement the Chinook and Coho salmon identification protocol, and to sub-sample fry and parr during winter and early spring sampling.

Specific Comments:

1. Appendix 3: Gear Selection Protocol- Figure 4
 - a. The table states that the number of divers for a reach = stream width/visibility. Using this formula, if the stream width is 25 feet and the visibility is 5 feet, the formula

- indicates that 5 divers would snorkel survey a 25 foot stream. Does this assume the diver has 5 feet of total visibility (2.5 feet either side)? The number of divers this formula generates seems to be excessive.
- b. Section 4.5.1 Emergence timing – document states that salmon redds were monitored on a monthly basis, but Table 2-1, Objective 3A, states that bi-weekly sampling was conducted. More frequent monitoring would provide AEA with more precise emergent timing information as addressed in 5.2, Objective 3, paragraph 3.
2. Table 4.1-2 Tributary Sampling Effort – The RSP states that the sample length criterion is 100 m or 20x the wetted channel width.
- a. The table states that Tsusena Creek is 30.7 m wide (wetted width) so the criterion requires that either 614 m (30.7 x 20) or 100 m be sampled per reach. 8 Sites were sampled for a total of 709 meters. So the mean sample length was 88.6 meters per site.
 - b. The table state that Devils Creek wetted width is 21.2 meters. 6 sites were samples totaling 424 meters which averages 92.3 meters/site.
 - c. Neither of the targets developed for the sampling lengths were achieved at these sites. If sampling efforts continue at some future date, efforts should be made to ensure that minimum sample lengths are achieved.

Characterization and Mapping of Aquatic Habitats (Study 9.9)

This study characterized aquatic habitats of the Susitna River using a hierarchical and nested classification system based on historic and current data. This information was used in the development of study plans and will be used in the evaluation of study results. We believe AEA has successfully completed all aspects of this study and has met all FERC-approved study objectives.

Specific Comments:

1. Study Area, Page 3, please complete the last sentence of footnote 1. “Mapping and characterization in the Lower River segment has been completed (see Section 4.4) using.....” Not clear what is intended.

2. Table 5.2-17 Instream Cover: The table indicates that only 5 of the 28 streams surveyed contained undercut banks. Was this data collected using aerial video, ground surveys, or both? Was the depth (horizontal distance) of the undercut measured? If aerial video was used on much of the habitat assessment how were undercut banks identified? For example, in Fog Creek 35.0% of the instream cover were undercut banks. Does the 35% represent 35% of the bank lengths or 35% of water surface area? If the actual depths of the undercut are not measured, then the calculation of what % that undercuts contribute to fish cover may not be accurate and should be described more clearly.

Fish Passage Barriers Middle and Upper Susitna River and Susitna Tributaries (Study 9.12)

The goal of this study is to evaluate the potential effects of project-induced changes in flow and water surface elevation on fish access into, within, and out of suitable habitats. We noticed that there was no upper Susitna River fish passage barrier information presented in the ISR report. The uppermost site described in the report was Tsusena Creek, below the proposed dam site. Upper River barriers need to be identified in future results/studies.

We are in agreement with the target fish species and passage criteria developed for the selected fish species. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Terrestrial Furbearer Abundance and Habitat Use (Study 10.10)

The purpose of this study was to assess the abundance and habitat use of four species of terrestrial furbearers: coyote, red fox, lynx, and marten. As noted in the ISR report, although the two objectives pertaining to population estimates of marten and lynx could not be fulfilled due to laboratory analytical problems, we agree that sufficient data on habitat use, occupancy, and abundance were obtained to assess project impacts and develop potential PME measures. We also agree that the spatially explicit ground-based occupancy surveys that were added to this study provided useful information on the habitat use, current distribution, and relative abundance of these species. We believe AEA has successfully completed all aspects of this study and has met all FERC-approved study objectives.

Aquatic Furbearer Abundance and Habitat Use (Study 10.11)

The purpose of this study was threefold: to evaluate the number and distribution of beaver lodges and assess overwinter survival; locate winter tracks of river otter and mink to assess their relative numbers, distribution, and habitat associations during winter; and identify muskrat pushups to assess muskrat distribution. We agree with the proposed study modification to conduct aerial surveys of muskrat pushups in spring 2016 and to substitute the two seasons of incidental observations of muskrats obtained in 2013 and 2014 for one year of surveys instead of conducting a second year of muskrat surveys. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Landbird and Shorebird Migration, Breeding, and Habitat Use (Study 10.16)

This study characterizes the occurrence, distribution, abundance, and habitat use for breeding landbirds and shorebirds in the project area. We agree with the three proposed study modifications and based on the reasons provided, we believe the additional fieldwork is not necessary to meet study objectives.

Recreation Resources (Study 12.5)

This study evaluates recreation resources and activities that may be affected by the construction and operation of the proposed project by assessing the potential impacts of project construction and operation on those resources and activities. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

River Recreation Flow and Access (Study 12.7)

This study will conduct a recreation flow analysis on mainstem reaches of the Susitna River that considers the relationship between river flows and ice conditions, river recreation and transportation. Efforts to date have involved documenting river uses including transportation river uses. We believe significant progress has been made and that the study is on-track to meet FERC-approved study objectives.

Subsistence Resources (Study 14.5)

This study documents the extent to which communities harvest and use subsistence resources within or near the project area, use project area lands to access other lands for subsistence harvest and use, and/or harvest and use resources that migrate through the project area and are later harvested in other areas. This study will conduct survey, interview and mapping research to document the customary and traditional use of subsistence resources occurring in the watershed and project area. Research will also document subsistence harvest of resources that migrate through the project area. Efforts to date have included subsistence surveys, interviews and mapping of residents in 15 communities. Of those, 13 were identified during the initial study plan. The 2012 revised study plan identified the need to expand survey work to the Talkeetna Area and as a result, Talkeetna and Trapper Creek were surveyed.

Study Modification

We anticipate the need for research in two additional communities, research provided for in the approved 2012 study plan, or research identified as necessary immediately after adoption of the 2012 study plan. The 2012 study plan addressed the need for subsistence survey work in the greater unincorporated “Talkeetna Area.” Research was completed in the enclaves of Talkeetna and Trapper Creek, but the remainder of the Talkeetna Area was not surveyed, an area south of the Talkeetna Spur Highway known as “Susitna North.”

In addition, although the community of Chickaloon was left off the initial list of 13 study communities, it became apparent during tribal, public and agency working group discussions that Chickaloon should also be surveyed.

An accurate assessment of the project’s impact on subsistence will depend on a complete survey sample. We understand that households in both Chickaloon and Susitna North use the project area for subsistence hunting, as reflected in State hunting permit data. We propose additional survey work for those two communities.

----- **END OF COMMENTS** -----

20160623-5148

Cathy Teich, Talkeetna, AK.
P.O. Box 155
Talkeetna, AK 99676
6-23-16

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

Dear Secretary Bose:

RE: Proposed Susitna-Watana Dam Project P-14241

I am concerned that AEA studies have questionable accuracy, for several reasons.

- AEA has not been able to meet the ILP deadlines.
- In December, 2015, the Alaska Governor's Executive Order brought about an abeyance of the ILP for almost a year.
- Studies that have been called "first year studies" are actually multi-year studies.
- Some studies have not been done: i.e., Wildlife Harvest Analysis
- Three years of Caribou studies will not give an accurate picture of how caribou migrate over decades.
- Studies of how ice cracks and ridges on a frozen lake would affect caribou have not been done. (the water level would fall under the ice when water level on the lake would drop).

Other studies that one might not think important without considering the entire food chain/ecosystem should be critical. The Copper Country Alliance has brought up a significant study that should have been considered from the start: Terrestrial Invertebrates. This population is key in any ecosystem.

Even though I have voiced concern about this in former comments, I have to say again that the Susitna has immense value to the American Public as a Free-Flowing River. As large hydro has become an outdated technology and dams are being torn down in the lower 48, I would think that the Susitna would be more valuable to the American Public as a free flowing river.

I ask that you seriously consider these comments. Once a dam as destructive as the one proposed is done, it can't really be undone.

Respectfully,

Cathy Teich

20160623-5149

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

Susitna Watana Hydroelectric Project)

Alaska Energy Authority)

P-14241

**COMMENT ON STUDY REPORT SECTION 15.6 AND NEW STUDY REQUEST FOR
SOCIAL CONDITIONS AND PUBLIC GOODS AND SERVICES STUDY**

In response to the “Initial Study Report Part D: Supplemental Information to June 2014 Initial Study Report of Alaska Energy Authority under P-14241” submitted by Alaska Energy Authority on November 6, 2015, the undersigned request new information in order to ensure an objective of the “Social Conditions and Public Goods and Services Study” (Section 15.6) is achieved.

ILP regulations (18 C.F.R. § 5.15 (d)(2)(e)) state “any proposal for new information gathering” constitutes a new study.

The regulations (18 C.F.R. § 5.15 (d)(2)(e)(1-5)) also require the request for new information meet certain criteria, including conforming to the criteria listed in § 5.9(b).

We address the suite of criteria (bolded) below.

1. Study objective for which new information is required.

The study objective for which we request new information be developed is:

Describe, based on other studies, what bio-physical attributes of the Susitna River system may change as a result of the Project and what those changes might mean to commercial opportunities related to fishing, logging, agriculture, mining, and recreational activities, recreation and subsistence use values, quality of life, community use patterns, non-use environmental values, and social conditions of the area.¹

Specifically, we believe that new information is necessary to determine the Project’s effect on non-use environmental values. Economists have long recognized that individuals who make no active use of a particular beach, river, bay, or other such natural resource and who might never

¹ Alaska Energy Authority, “Social Conditions and Public Goods and Services Study,” Initial Study Report, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, June, 2014 Part A, p. 2.

make active use of it might derive satisfaction from its mere existence. “This concept has come to be known as ‘existence value’ and it is the major element of what are now referred to as ‘non-use’ or ‘passive-use’ values.”²

2. Describe the goals and objectives of the study proposal and the information to be obtained.

The goal of the study is to determine the value to the American public of the extant free-flowing river and its relatively pristine watershed.

The objective is to develop and administer a survey to obtain the necessary data from which information about the non-use value can be ascertained.

3. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.

The U.S. Fish and Wildlife Service and National Marine Fisheries Service have stewardship responsibilities for public-trust fish and wildlife resources in the basin.

The resource management goal of the Fish and Wildlife Service is no net loss of fish and wildlife resources, to conserve the nation’s existing fish and wildlife and their habitats in the Susitna River Basin, and to prescribe fishways pertaining to this project pursuant to Section 18 of the Federal Power Act.

National Marine Fisheries Service has jurisdiction over the nation’s marine, estuarine and anadromous fishery resources, with the goal of maintaining native and natural aquatic communities for their intrinsic and ecological value and their benefits to people, including the authority to prescribe fishways pertaining to this project pursuant to Section 18 of the Federal Power Act.

4. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

The requesters are not resource agencies. The requested study is in the public interest because the approved Study Plan will provide no information about the value the American public places on the Susitna as a free-flowing river and a relatively pristine watershed.

5. Describe existing information concerning the subject of the study proposal, and the need for additional information.

The “Non-Use Benefits” section of AEA’s Social Conditions and Public Goods and Services Study explains “there are no known data on individuals’ non-use benefits for ecosystem services occurring in the Susitna River corridor and upper watershed . . .”³

² Kenneth Arrow et al., “Report of the NOAA Panel on Contingent Valuation,” January 11, 1993, p. 2.

³ Section 5.1.6.2, Part A, p. 25.

The section summarizes the literature; some key points are:⁴

- People place value on preserving “a particular natural asset . . . even if they knew they would never visit it.”
- “A person’s lack of knowledge of a natural asset does not mean that the individual holds no non-use value of the asset . . .”
- “Even if ‘individuals place no value on resources of whose existence or usefulness they are entirely unaware,’ this does not deny that such individuals could suffer a loss of well-being on learning of their loss.”

Undeniably, the major effect of the project would be to irrevocably change the free-flowing character of the river and watershed ecology by virtue of eliminating 40 miles of river and altering the natural hydrograph downstream of the head of the reservoir. Therefore, regardless of the specific mitigation measures, the river and watershed will sustain permanent injury. A permanent injury to a unique resource, such as the Susitna River watershed, could result in a significant reduction in nonuse value, even for those residing in areas far removed geographically from the site where the injury occurred.⁵

Such was the case in the valuation of the impacts of the *Exxon Valdez* oil spill on the aquatic and related ecosystems of Prince William Sound, which revealed that many Americans, who have not visited Alaska and never intend to do so, nevertheless place high value on maintaining the pristine coastal and aquatic ecosystems of Alaska.⁶

Before issuing an original license, the Commission must determine the project is in the national interest: the nation as a whole would be better off with the project than without it. With respect to a federal hydroelectric license, the “public” whose interest the Commission is authorized to ascertain is that of the entire country, not that subset of the public that resides in Alaska or even more narrowly, that population of Americans residing in the Railbelt, which is the region to be supplied by the electricity from the proposed Susitna dam. A plausible standard for deciding a project is in the public interest is the “gainers” must gain more than the “losers” lose; the gainers must be able to compensate and/or mitigate the losses; and society must be better off after the change than before. Hence, the seminal issue of this license proceeding is whether the Susitna River and its watershed is more valuable to the nation left undeveloped.⁷

⁴ Ibid., 25-26.

⁵ Ibid., 26.

⁶ Committee on Assessing and Valuing the Services of Aquatic and Related Terrestrial Ecosystems, *Valuing Ecosystem Services: Toward Better Environmental Decision-Making*, National Research Council, 2004.

⁷ The 1986 amendment to the Federal Power Act requires the Commission give “equal consideration” to non-power values when deciding to license a hydropower project. The equal-consideration requirement is not only procedural,

From the state's perspective, there are plenty of salmon-bearing, free-flowing rivers, but in the national context, salmon-bearing, free-flowing rivers in pristine watersheds are in short supply. Consequently, economic theory would suggest the American public would value the non-use benefits of the Susitna River and its watershed more highly than those who would benefit directly from developing the watershed for its hydroelectric potential. Yet, the "Social Conditions and Public Goods and Services Study" has information only on regional economic conditions, which will enable an assessment of project effects on the regional economy. Consequently, this assessment is almost wholly concerned with those who would experience the direct economic costs and benefits of the proposed project.

Alaska Energy Authority's cost/benefit analysis of the project estimates short-term benefits during the dam's 10-year construction period are \$2.6 billion in construction contracts; \$1.8 billion in indirect and induced economic output (from the direct project spending); and \$630 million in labor income, for a total of \$5 billion. Once the dam is constructed and generating power, AEA estimates long-term benefits of hydroelectric generation are \$11.2 billion in

but also substantive: In its decision on appeal by the Platte River Whooping Crane Critical Habitat Trust, the US Court of Appeals reasoned

. . . equal consideration must be viewed as a standard, both procedural and substantive, that cannot be satisfied by mere consultation or by deferring consideration and imposition of environmental conditions until after licensing. Protection, mitigation and enhancement of fish and wildlife, energy conservation, and the protection of recreational opportunities are a potential cost of doing business for hydropower projects. (Platte River Whooping Crane Critical Habitat Maintenance Trust v. FERC, 876 F.2d 109, (D.C. Cir.1989))

Further, the Court of Appeals, when explaining that a key objective of the ECPA was to give environmental factors *equal weight* [emphasis added] as power production in licensing deliberations, refers to the Conference Committee report to elucidate the historic import of the equal-consideration amendment:

The conferees believe that as a Nation we have come a considerable distance in recognizing the importance of our heritage. This legislation extends that "distance" a bit more. The amendments expressly identify fish and wildlife protection, mitigation and enhancement, recreational opportunities and energy conservation as non-developmental values that must be adequately considered by FERC when it decides whether and under what condition to issue a hydroelectric license for a project. We agree that there are instances in which careful and thoughtful consideration of the impact of a proposed project would and *should lead to the conclusion that an original license ought not to be issued* [emphasis added].

Thus, one possible outcome of equal consideration of non-power values is the Commission's denial of a license, ostensibly because the public would be worse off with the project than without it. This outcome would seem to be more likely in original-license proceedings than relicensing, where the baseline condition is the post-project environment and where environmental improvement is change in project operation (e.g. increased minimum flow) and/or project infrastructure (e.g. fish passage).

Denying an original license would be a weighty decision for the Commission, presumably due to the Commission having determined that the nation would be worse off if the project were built. In other words, the Commission would find that no amount of compensation for and/or mitigation of the impacts to non-power values from developing the river for power, irrigation, flood control, and water supply results in a net improvement to society.

production-cost savings;⁸ \$345 million from retirement of power plants; \$1.1 billion in avoided power outages; and \$1.7 billion in avoided carbon taxes/fees (all, 2014\$).⁹

Since FERC must ascertain whether the project is in the national interest, it follows that the Project's cost and benefit to the people of the United States must be examined as well. Hence, developing information about the value of the undeveloped river and its watershed to the nation is as necessary as developing information about the value of developing the Susitna River's hydropower potential, which benefits mainly, if not exclusively, the Railbelt energy consumers.

6. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

The information from the proposed study would inform the decision about whether the project should be licensed; however, the information would not have a direct bearing on the development of license requirements

7. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Economic value is the capacity of goods, services, and resources to make a positive contribution to people's well-being. The conceptual measure of that capacity is the sacrifice people are willing to make of other valued things in order to gain or retain access to the goods or services at issue. This can be measured either in terms of what they are willing to give up or in terms of what they would have to be provided with before they would voluntarily relinquish their claims.

⁸ The Engineering Feasibility Study prepared for Alaska Energy Authority by MWH Americas explains "total annual net savings to the system will depend on the ultimate cost to develop the Susitna-Watana Project, as well as the future price of natural gas. When the Susitna-Watana Project production cost savings, together with fixed cost savings – because of standby plant retirements – are combined with the annual project fixed costs (including project debt service), the result is the impact on system operating costs of building the project." (Susitna-Watana Hydroelectric Project Engineering Feasibility Report, Report 14-21-REP v0.0," December 2014, p. 5-17). Further, Alaska Hydro Project argues AEA over-estimates the production-cost savings by nearly 100% (see Jan Konigsberg, "An Appraisal of State-Sponsored Solutions to the Railbelt Energy Supply and Affordability Problem," January 2016).

⁹ Ibid., ES-2. However, the cost savings from retiring some power plant and avoided power outages AEA would attribute to hydropower generation seem quite problematic, because the improvement to the transmission system is expected to reduce power outages due to increased capacity and reliability and because replacement of old generation by new more efficient power plants will occur even if the dam were not constructed. Moreover, cost savings from an avoided carbon tax/fee is also problematic; to be counted only if the federal government were to enact this tax/fee and only if Alaska utilities were not exempt from the tax/fee. Therefore, the most significant (and relatively assured) cost savings from Susitna River hydropower would be the variable-production costs, given AEA's assumption about future natural gas pricing.

In conventional economic analysis, this leads to the “willingness-to-pay” or “willingness-to-accept compensation” measures of economic value.¹⁰

AEA’s “Social Conditions and Public Goods and Services Study” observes “the available evidence supports the conclusion that Alaska’s unique, pristine natural environment produces billions of dollars of non-use value every year for U.S. citizens.”¹¹

The lawsuit filed by the State of Alaska and U.S. Department of Justice over natural resource damages from the Exxon Valdez oil spill relied on a survey conducted by the state to estimate the value that the American public placed on the natural integrity of Prince William Sound. It did not focus on people who lost recreational or business opportunities but looked instead at people who might not have and might not ever visit Alaska but who were nonetheless upset by the damage caused by the spill.¹²

In his decision upholding FERC’s denial of a license for the Kootenai Falls project in northeastern Montana in 1984, the Administrative Law Judge concluded that while monetization of some values associated with Kootenai Falls and the affected river reach may be problematic, those values are substantial enough and, given the uncertainty of the need for power from the project licensing the project would not be in the public interest.¹³

We propose a survey to estimate the value that the American public place on the undeveloped river. We would suggest the applicability of the study design and implementation methodology used to determine the non-use values in the Klamath River Basin.¹⁴

The potential applicant should confer with resource agencies, tribes, and nongovernmental organizations to develop this study.

8. Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

¹⁰ Thomas M. Power and Ernie Niemi, *The Economic Consequences of River and Wetland Restoration: A Conceptual Manual*, report prepared for US EPA Region 8, March 1998.

See also, Richard T. Carson et al., “Contingent Valuation: Controversies and Evidence,” *Environmental and Resource Economics*, July 2000.

¹¹ Section 5.1.6.2, Part A, p. 25.

¹² Ibid.

¹³ John W. Duffield, “The political economy of hydropower and fish in the Western US,” in *Modern Cost-Benefit Analysis of Hydropower Conflicts* (Per-Olov Johansson & Bengt Kriström, eds), Edward Elgar, Cheltenham, UK • Northampton, MA, USA 2011.

¹⁴ See Carol Mansfield et al., “Klamath River Basin Restoration Nonuse Value Survey,” January 19, 2012 (see especially, Table 2-1, Previous Valuation Studies of Dam Removal or Related Restoration Efforts).

The cost of a survey of this type depends on the sample size and the data collection method. If the data were to be collected through an online panel, the cost of the survey might be \$250,000 to \$350,000. However, a mail survey to 10,000 households nationwide, with an expected response rate around 20% would cost from \$800,000 to \$1 million. If data is collected instead through in-person interviews, or augmented through in-person interviews, the study will be more costly.

The proposed study methodology is the most widely accepted methodology.

9. Explain why the goals and objectives of the approved study could not be met with the approved study methodology.

As explained above, the approved study methodology is limited to the Railbelt region, and further, as AEA explains, it is not intended to measure non-use values, even as it acknowledges the non-use facets of the resource can be valuable to even to those who will never visit the area.

10. Explain why the study request was not made earlier.

Some of the undersigned did request that FERC's approved study plan include a "National-level Economic Valuation" (May 2012), which would have entailed a more exhaustive and complete analysis of non-use values.

We believe the information most crucial to the licensing decision is whether Americans place a higher value on maintaining the Susitna River in its pristine condition. Hence, we have pared the original study request to gather just this information, which we believe will significantly simplify the study and significantly reduce the cost of the study.

It seems to us the "Social Conditions and Public Goods and Services" study itself makes a compelling argument for gathering the data that is necessary to determine the value the American public places on the salmon-bearing, free-flowing Susitna River and its relatively pristine watershed.

Further, given the validation of contingent valuation in the courts and in settlements, we are confident the study, particularly the methodology, we have requested would withstand legal challenge.¹⁵

Respectfully submitted,

Jan Konigsberg
Project Director
Alaska Hydro
Ft. Bragg, California

Rupak Thapaliya
National Coordinator
Hydropower Reform Coalition
Washington, D.C.

¹⁵ See Richard T. Carson & Robert C. Mitchell, "Contingent Valuation and the Legal Arena," in *Valuing Natural Assets: The Economics of Natural Resource Damage Assessment*, Raymond J. Kopp, V. Kerry Smith, editors, Resources for the Future, 1993.

Chris Williams
Senior Vice President for Conservation
American Rivers
Washington, D.C.

Tom O'Keefe, PhD
Pacific Northwest Stewardship Director
American Whitewater
Seattle, Washington

John Buckley
Executive Director
Central Sierra Environmental Resource Center
Twain Harte, California

Melissa Heuer
Director
Susitna River Coalition
Talkeetna, Alaska

Chris Shutes
FERC Projects Director
California Sportfishing Protection Alliance
Berkeley, California

Lee Willbanks
Executive Director
Save The River
Clayton, New York

Kevin Lewis
Executive Director
Idaho Rivers United
Boise, Idaho

Landis Hudson
Executive Director
Maine Rivers
Yarmouth, Maine

Michael Page
Spokesperson
The Friends of the Kinni
River Falls, Wisconsin

Greg Haller
Conservation Director
Pacific Rivers Council
Portland, Oregon

Dr. Kenneth D. Kimball
Director of Research
Appalachian Mountain Club
Gorham, New Hampshire

Kevin Zak
President
Naugatuck River Revival Group, Inc.
Naugatuck, Connecticut

Judy Price
President of the Board of Directors
Alaska Survival
Talkeetna, Alaska

Cliff Eames
Board Chair
Copper Country Alliance
Copper Center, Alaska

Jim Schramm
Chairman
Michigan Hydropower Reform Coalition
& Great Lakes Council of the International
Federation of Fly Fishers
Pentwater, Michigan

Ronald Stork
Senior Policy Staff
Friends of the River
Sacramento, California

Samuel Snyder, PhD
Trout Unlimited- Alaska Program
Anchorage, AK

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

<hr/>)	
Susitna Watana Hydroelectric Project)	
)	
Alaska Energy Authority)	
<hr/>)	P-14241

CERTIFICATE OF SERVICE

I hereby certify that I have this day electronically served the forgoing “Comment on Study Report Section 15.6 and New Study Request for Social Conditions and Public Goods and Services Study” upon each person designated on the official service list compiled by the Commission for the above-captioned proceeding.

Dated: June 23, 2016



Rupak Thapaliya
Associate Director
Hydropower Reform Coalition
1101 14th St. NW, Suite 1400
Washington, D.C. 20005
Tel: 202-347-7550
Email: rupak@hydroreform.org

20160623-5173



June 23, 2016

Hon. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Via online submission to: <http://www.ferc.gov>

**REQUEST FOR FURTHER STUDY OF THE IMPACTS OF CLIMATE CHANGE IN
THE SUSITNA RIVER BASIN FOR THE SUSITNA-WATANA HYDROPOWER
PROJECT (FERC PROJECT P-14241)**

On behalf of our more than 2 million members and online activists, the Natural Resources Defense Council (“NRDC”) submits the following comments regarding the proposed hydroelectric dam and power-generating facility on the Susitna River in Alaska (“Project,” FERC Project P-4241).¹ In the studies the Alaska Energy Authority (“AEA” or “Applicant”) submitted in its Initial Study Report (“ISR”) application filed June 3, 2014 (and supplemented through November 6, 2015 in ISR Parts A, B, C, and D) as part of its pre-license application before the Federal Energy Regulatory Commission (“FERC” or “Commission”), AEA failed to include a basin-wide study of climate change impacts as they affect the operation of the Project and surrounding natural resources.

¹ NRDC hereby incorporates by reference all of its past comment letters, and asks that these comments be placed in the record of the Initial Study Report (“ISR”) proceeding pursuant to 18 C.F.R. § 5.15(c)(4). NRDC, Mot. to Intervene (March 13, 2012); NRDC, Comments on Pre-Application Document and Scoping Document 1 for the Alaska Energy Authority Proposed Susitna-Watana Hydroelectric Project (FERC Project P-14241) (May 30, 2012). NRDC, Comments on Proposed Study Plan and Requested Modifications to the Proposed Study Plan of the Alaska Energy Authority for the Susitna-Watana Hydroelectric Project (FERC Project P-14241) (November 14, 2012) [hereinafter NRDC Comments on Proposed Study Plan]; NRDC, Comments on the Revised Study Plan for Studies 5.5, 5.6, 5.7, 6.5, 7.5, 7.6, 8.5, 8.6, 9.5, 9.9 and 11.6 of the Alaska Energy Authority for the Susitna-Watana Hydroelectric Project (FERC Project P-14241) (March 18, 2013) [hereinafter NRDC Comments on Revised Study Plan]. NRDC Submission of Report on Climate Impacts Associated with Dams for FERC Review of the Susitna-Watana Hydroelectric Project (FERC Project P-14241) (September 29, 2013); NRDC, Comments on Study Dispute of the National Marine Fisheries Service (“NMFS”) Before the Federal Energy Regulatory Commission (“FERC”) of FERC’s Study Plan Determination for the Susitna-Watana Hydroelectric Project (FERC Project P-14241) (April 1, 2013).

Licensing participants now have the opportunity to review the ISR and file comments and proposed “modifications to ongoing studies or new studies.”² NRDC requests that FERC require in the Study Plan an analysis of the cumulative impacts of climate change and the Project throughout the whole Susitna River basin, including the ecological impacts of predicted changes to surface water temperature and flow. Specifically, “NRDC’s Study Request” or “NRDC’s Requested Study” asks that the Applicant:

- a. Develop a climate model for the entire basin, using downscaled climate projections to simulate future non-stationary environmental conditions (including changes to evapotranspiration, glaciers, permafrost, hydrology, and surface water temperature) in accordance with the lifespan of the project (anticipated to last 100 years); and
- b. Apply this updated environmental baseline to analyses of Project impacts on the aquatic, riparian, and terrestrial habitat and species both upstream and downstream of the proposed dam.

It is only with this basin-wide climate study that the Commission can adequately discharge its statutory duty under Section 4(c) of the Federal Power Act (“FPA”), which requires FERC to give equal consideration to the “protection, mitigation of damage to, and enhancement of fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality” when making a decision to grant a hydropower licenses.³ Furthermore, this information is necessary for the National Marine Fisheries Service (“NMFS”) and the United States Fish Wildlife Service (“USFWS”) to develop recommendations to protect, mitigate damage to, and enhance affected fish and wildlife and habitat, as authorized in the FPA.⁴ Therefore, failure to require a basin-wide climate study will prevent FERC and the Services from understanding the potential impacts of the proposed Project, and consequently prevent them from making informed licensing decisions in accordance with their statutory obligations and authorities.

As noted in comments filed by other participants and agencies, the Applicant’s ISR contains inaccurate and incomplete environmental baseline data and analyses.⁵ NRDC agrees with the following requests for new studies, requests for modification of ongoing studies, and disagreements with the Applicant’s ISR meeting summary: Comments by The Nature Conservancy on the Initial Study Reports (June 17, 2016),⁶ NMFS Review of ISR (June 22,

² 18 C.F.R. §5.15(c)(4)

³ The Federal Power Act, 16 U.S.C. § 797(c).

⁴ *Id.* §§ 801(a), 803(j), 811.

⁵ NMFS preliminary comments on June 3, 2014 Initial Study Report for discussion at October ISR meeting NOAA Fisheries Service, Alaska Region under P-14241 (Sept. 22, 2014) [hereinafter NMFS ISR Comments]; USFWS comments on new study reports (2014) filed for P-14241 (October 10, 2014) [hereinafter USFWS ISR Comments]; Comments from Ctr. for Biological Diversity regarding the Revised Study Plans, Project P-142410 (Dec. 14, 2012) [hereinafter Ctr. for Biological Diversity Comments on the RSP].

⁶ Comments from Corinne Smith, The Nature Conservancy, to Kimberly Bose, Secretary, FERC, on the Initial Study Reports (Susitna-Watana Project, P-14241) (June 17, 2016).

2016),⁷ USFWS Review of ISR (June 22, 2016)⁸ and Wild Salmon Center Comments on the ISR and Proposed Modifications (June 23, 2016)⁹. While NRDC supports these comments, NRDC's comments below focus on the need for developing a predictive modeling framework to assess the cumulative impacts of climate change and the Project on the watershed's ecosystem.

The Susitna Project is particularly vulnerable to the impacts of climate change because of its location in subarctic Alaska, a region profoundly affected by global warming.¹⁰ The state is warming at twice the rate of the nation, with annual air temperature increasing by 3 degrees Fahrenheit and average winter temperature increasing by 6 degrees Fahrenheit over the past several years.¹¹ Such warming causes a cascade of hydrologic effects, including melting glaciers and permafrost and associated alterations in river temperature and flow regimes.¹² Wild salmon in this subarctic region depend on cold surface water temperatures, glacial sediment, riparian vegetation, and the seasonal flows tied to ice processes.¹³ Yet hydroelectric dam operations, like the proposed Susitna, release water according to electricity and demand, which dramatically alters natural flows and the temperature of the river.¹⁴ Thus, a study of the effects of both the operation of the dam *and* of a warming climate on river and ice processes and surface water temperature across the basin must be undertaken to fully understand the environmental impacts on sensitive fisheries habitats that occur above and below the dam.

⁷ NMFS, ISR review, Study Modifications, New Study Request, and Comprehensive Plan for the proposed Susitna Hydropower Project under P14241 (June 22, 2016).

⁸ USFWS, ILP Initial Study Report of USFWS Anchorage Field Office under P-14241 (June 21, 2016).

⁹ Wild Salmon Center, Comments on the Alaska Energy Authority's Initial Study Report, 2014 Technical Memorandum, and Supplemental Filings and Recommended Proposed Modifications, Susitna-Watana Hydrologic Project No. 14241-000 (June 23, 2016).

¹⁰ See F.S. Chapin, III et al., *Ch. 22: Alaska*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 514, 515 (J. M. Melillo, Terese Richmond, and G. W. Yohe eds., 2014), <http://nca2014.globalchange.gov/downloads> [hereinafter CLIMATE CHANGE IMPACTS IN ALASKA].

¹¹ See *id.* at 516.

¹² See *id.* ("Because of its cold-adapted features and rapid warming, climate change impacts on Alaska are already pronounced, including earlier spring snowmelt, reduced sea ice, widespread glacier retreat, warmer permafrost, drier landscapes, and more extensive insect outbreaks and wildfire.").

¹³ See generally M. D. Byrant, *Global Climate Change and The Potential Effects on Pacific Salmonids in Freshwater Ecosystems of Southeast Alaska*, 95 CLIMATIC CHANGE 169 (2009).

¹⁴ See generally ANCHOR QEA, PHASE 1 EXECUTIVE SUMMARY: PRELIMINARY FRAMEWORK FOR ECOLOGICAL RISK ASSESSMENT OF LARGE-SCALE HYDROPOWER ON BRAIDED RIVERS IN ALASKA, prepared for The Nature Conservancy, 8 (June 2015),

https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/scak/Documents/TNC_AKHydropower_ERA_Ph1ExecSum_June15.pdf [hereinafter TNC, ECOLOGICAL RISK ASSESSMENT].

FERC has yet to require an Applicant to undertake a comprehensive study of the impacts of climate change in a hydroelectric licensing proceeding.¹⁵ Three years ago, when the issue was before FERC, the Commission declined to require AEA to undertake a basin-wide study of climate change, and instead ordered the Applicant to conduct a literature review of the issue.¹⁶ However, FERC noted in its decisions that the science of climate change is rapidly changing and that it may in the future require climate change assessment as part of the licensing process.¹⁷ NRDC submits that it is time for FERC to require analysis of climate change in the Project's environmental review given recent advancements in climate science and the growing trend of other federal agencies undertaking climate impact assessments. A component crucial to informing FERC's decision-making is the assessment of potential effects of climate change on water resources, geomorphology, and terrestrial, riparian, and aquatic resources of the entire Susitna River basin, not just inflow to the upper basin as studied by AEA. The rationale that FERC has used in past hydroelectric relicensing proceedings—that climate science was too speculative and reliable data was minimal¹⁸—is not applicable this Project. As will be discussed, advances in climate science, and trends in law and policy, demonstrate that such arguments are no longer relevant.

NRDC's Study Request for an expanded basin-wide study modeling climate change impacts on the Susitna watershed and its ecosystem is supported by and is consistent with FERC's Initial Study Review regulations, which allow a participant to propose a "study modification" or a "new study" after the applicant has filed the results of its first year studies.¹⁹ The arguments and facts set forth in detail below meet the requirements for a "study modification" and a "new study," thereby supporting FERC's approval of either.

The facts and arguments below establish that, consistent with FERC regulations, the following conditions exist in support of expanding the study of climate change impacts:

¹⁵ See, e.g., *Eagle Crest Energy Co.*, 147 FERC ¶ 61,220 (June 19, 2014) ("It would be too speculative to attempt to predict future scenarios that may occur due to climate change."); *Mahoning Hydropower*, 148 FERC ¶ 62,231 (September 26, 2014) (same); *Clean River Power MR-3*, 153 FERC ¶ 62,257 (December 30, 2015) and *Clean River Power MR-5*, 153 FERC ¶ 62,258 (December 30, 2015) (same); *Dominion Cove Point LNG*, 151 FERC ¶ 61,095 (May 4, 2015) (denying rehearing and stay, and contending that its initial order did not fail to analyze all of the impacts of climate change on the project, particularly from intense winds and storms).

¹⁶ *Alaska Energy Authority*, 144 FERC ¶ 61,040 (July 18, 2013).

¹⁷ See, e.g., 144 FERC ¶ 61,040 (Norris, concurring); *Eagle Crest Energy Co.*, 147 FERC ¶ 61,220 (June 19, 2014) ("If there is a need to modify project operations or facilities to accommodate changes because of climate change or related factors during the license term, and reliable data became available to justify such modifications, the Commission has retained the authority to reopen the license to determine whether additional environmental measures are necessary."); *Mahoning Hydropower*, 148 FERC ¶ 62,231 (September 26, 2014) (same); *Clean River Power MR-3*, 153 FERC ¶ 62,257 (December 30, 2015) and *Clean River Power MR-5*, 153 FERC ¶ 62,258 (December 30, 2015) (same).

¹⁸ See, e.g., 147 FERC ¶ 61,220; 144 FERC ¶ 61,040.

¹⁹ 18 C.F.R. § 5.15 (c)(4).

- a. Environmental conditions have changed in a material way since FERC determined a basin-wide climate change study was not required;²⁰
- b. There have been material changes in the law and policy governing how federal agencies incorporate climate-related considerations into their environmental assessments;²¹ and
- c. There is significant new information relating to the study of climate change, including advances in, and federal agency applications of, modeling techniques²² (see Appendix for detailed lists of recent advances in climate change science and related federal agency and White House actions).

1. FERC has the statutory authority to approve a modification or new study

FERC's role at this Initial Study Review phase of the license application is to make certain that studies presented by AEA provide accurate and adequate information regarding the environmental impacts of the proposed Project. Pursuant to its regulations, FERC has the broad discretion to require AEA to address deficiencies by ordering new studies or significantly modifying existing studies.²³

FERC has a duty under its regulations to independently assess the studies before the Commission and decide—based on the evidence presented in the study and by the agencies and the participants—whether it should order study modifications or request new studies. Study modification proposals must demonstrate that the study was not conducted as provided for in the approved Study Plan, that there were anomalous environmental conditions during the time the study was conducted, or that environmental conditions changed in a material way.²⁴ A proposal for a new study must demonstrate that new relevant information has become available or that relevant laws and regulations have changed.²⁵ If FERC determines that a proposal adequately provides a showing of “good cause” by meeting these criteria, then the Commission has the authority to order the modified or new studies.²⁶

The purpose of these “Conduct of Studies” regulations is to provide an opportunity early on for the participants, agencies, tribal entities, and FERC staff to scrutinize whether an Applicant is following the approved study plan and whether circumstances have changed such that there is cause to include any new studies.²⁷ It is during the Initial Study Review phase of the license pre-application that study results can elucidate the need or value of new studies or the need to modify

²⁰ *Id.* § 5.15 (d)(2).

²¹ *Id.* § 5.15 (e)(1).

²² *Id.* § 5.15 (e)(4).

²³ See *Georgia Power Co.*, 111 FERC ¶ 61433 (June 20, 2005). FERC has broad discretion in determining whether to require pre-licensing studies.

²⁴ 18 C.F.R. § 5.15 (d).

²⁵ *Id.* § 5.15 (e).

²⁶ NRDC's Study Request meets the criteria for both a study modification and a new study. FERC has the discretion to determine whether to grant a new study or study modification.

²⁷ 18 C.F.R. § 5.15.

ongoing studies. It is crucial to point out deficiencies in these early studies so that they can be corrected in follow-up studies. Second Year and Third Year follow-up studies should not commence until FERC and all parties are satisfied that First Year studies are accurate and complete.²⁸

AEA's First Year studies are poorly conducted and should not serve as the foundation for a second year of study. Instead, they must be redone as First Year studies, so that they can provide an accurate foundation for later Second and Third Year studies, and eventually form the basis of an updated study report.²⁹ Despite the quantity of data collected by AEA's numerous consultants, the federal agencies responsible for reviewing the data and the participants in the Initial Licensing Process ("ILP") proceeding have raised serious concerns.³⁰ Many of AEA's studies require modification or were not conducted pursuant to the FERC approved Study Plan and were conducted during anomalous environmental conditions that occurred during the first year of studies.³¹

In sum, FERC's role at this stage in the proceeding is to sift through the data and analyses and determine whether to modify any of the ongoing studies, or to grant any requests for new studies.³² FERC's failure to require AEA to study how climate change will affect the sections of

²⁸ AEA has essentially conducted its "First Year Studies" over a period of more than two years (2013-2015). *Documents*, SUSITNA-WATANA HYDRO, <http://www.susitna-watanahydro.org/type/documents/> (last visited June 17, 2016).

²⁹ 18 C.F.R. § 5.15(f).

³⁰ NMFS ISR Comments; USFWS ISR Comments.

³¹ *Id.*; Ctr. for Biological Diversity Comments on the RSP; NRDC Comments on Proposed Study Plan; NRDC Comments on Revised Study Plan; Water and Power Law Group, AEA's Update Regarding Study Plan Implementation During the 2014 Field Season for the Susitna-Watana Hydroelectric Project (P-14241).

³² See 18 C.F.R. § 5.15(c)(4) ("Any participant or the Commission staff may file a disagreement concerning the Applicant's meeting summary within 30 days, setting forth the basis for the disagreement. This filing must also include any *modifications to ongoing studies or new studies* proposed by the Commission staff or other participant." (emphasis added)); *id.* § 5.15(d) ("*Criteria for modification of approved study*. Any proposal to modify an ongoing study pursuant to paragraphs (c)(1)–(4) of this section must be accompanied by a *showing of good cause* why the proposal should be approved, and must include, as appropriate to the facts of the case, a demonstration that: (1) Approved studies *were not conducted as provided for in the study plan*; or (2) The study was conducted under *anomalous environmental conditions* or that environmental conditions have changed in any material way." (emphasis added)); *id.* § 5.15(e) ("*Criteria for new study*. Any proposal for new information gathering or studies pursuant to paragraphs (c)(1)–(4) of this section must be accompanied by a *showing of good cause* why the proposal should be approved, and must include, as appropriate to the facts of the case, a statement explaining: (1) Any material changes in the law or regulations . . . ; (2) Why the goals and objectives of any approved study could not be met with the approved study methodology; (3) Why the request was not made earlier; (4) Significant changes in the project proposal or that significant new information material to the study objectives has become available; and (5) Why the new study request satisfies the study criteria in 5.9." (emphasis added)).

the Susitna River below the dam prevents full compliance with the FPA³³ to ensure adequate protection and enhancement of fish and wildlife, because it leaves unstudied an integral part of the river's ecosystem.

2 NRDC's Study Request meets the requirements of sections 5.15(d) and (e) for a showing of good cause why the proposal should be approved

NRDC makes its Study Request for a basin-wide climate study as either a modification or a new study and presents the following evidence to meet criteria for both. There is "good cause" to approve NRDC's Study Request given the overwhelming evidence in the record of this proceeding that hydropower dams vastly reduce salmon abundance and productivity by disrupting the natural river processes and habitats upon which salmon rely. The dam will block passage of salmon that spawn and rear upstream and alter the existing flow regime for approximately 180 miles downstream of the dam site.³⁴ According to a study of the Susitna Project conducted by the environmental consulting firm Anchor QEA, "Changes to flow regimes and sediment supplies will cause a cascade of habitat effects that may take decades to reach a state of dynamic equilibrium following construction."³⁵ Regional ecosystems are already under stress due to climate change;³⁶ the Project will only amplify these existing threats to fish, wildlife, and habitat.

While AEA has analyzed the potential impacts of glacial wastage and retreat on the Project (including changes to runoff and sediment delivery), it has not assessed the potential impacts of climate change on the Susitna watershed and ecosystems (on both the upper *and* lower river basin). These studies are needed to determine how anticipated seasonal, annual and long-term changes in temperature and precipitation will influence the efficiency, longevity and ecological

³³ The FPA guides FERC in how to assess the evidence submitted in the ISR and requires FERC to give equal consideration to environmental consequences of its actions when exercising its licensing authority for hydroelectric projects. FERC must review studies submitted in the pre-license phase of an application with the same standards applicable to a hydropower license, which provide in pertinent part: "In deciding whether to issue any license under this Part for any project, the Commission, in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the *protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.*" 16 U.S.C § 797(e) (emphasis added). FERC's role in review of the ISR studies is further prescribed in section 10(a)(1), which conditions all licenses on a requirement that: "the project adopted...shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the *adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes* referred to in section 797(e) of this title." *Id.* § 803(j) (emphasis added).

³⁴ NMFS Request for Rehearing, at 2.

³⁵ TNC, ECOLOGICAL RISK ASSESSMENT, at 8.

³⁶ See CLIMATE CHANGE IMPACTS IN ALASKA, at 515, 533.

impacts of the Project. Without this information, studies assessing the environmental impacts of dam operations will be based on conditions that will not exist in the future and are therefore inaccurate.

NRDC requests that FERC modify the Study Plan or order a new study and reverse its prior decision not to study climate impacts throughout the entire basin.³⁷ The impact of the dam's operation together with the rapidly changing climate in the region will result in altered hydrology across the entire basin, with potentially devastating consequences to sensitive fisheries habitat that occur above and below the dam.

3. NRDC's Study Request meets FERC's requirement for a "study modification"

3.1 Section 5.15(d)(2) Environmental conditions have changed in a material way³⁸

Climate change has already altered environmental conditions in the region of the proposed Project since FERC issued its Study Plan Determination ("SPD") in 2013. The Third National Climate Assessment, released in 2014, summarizes how major shifts in Alaska's climate are occurring at a rate faster than previously projected.³⁹ From December of 2014 through February of 2015, average temperatures in Alaska were as much as 10 degrees Fahrenheit higher than average. As a result, the state experienced significantly diminished levels of snowpack, an important source of runoff and water supply.⁴⁰ These conditions raise concerns over the rate of climate change in the subarctic, given that recent increases exceeded the level of warming previously predicted to occur over the course of a century.⁴¹

In the SPD, FERC suggested that simply monitoring hydrologic conditions and operating the dam to accommodate any water supply oscillations could sufficiently ameliorate future potential adverse environmental effects.⁴² However, using a stationary environmental baseline around which minor fluctuations may occur is no longer accepted practice by the scientific community

³⁷ In its Study Plan Determination ("SPD"), FERC ruled: "[W]e do not recommend extending the geographic range of climate change assessment or adding an analysis of natural resources impacts as recommended by the National Marine Fisheries Service ("NMFS") and others." Letter from Jeff C. Wright, Dir., Office of Energy Projects, FERC, to Wayne Dyok, Susitna-Watana Project Mgr., AEA, Re: Study Plan Determination for the Susitna-Watana Hydroelectric Project, Project No. 14241-000, B-5 (Feb. 1, 2013), http://www.susitna-watanahydro.org/wp-content/uploads/2015/11/20130201_FERC_SPD.pdf [hereinafter "Study Plan Determination"].

³⁸ 18 C.F.R. § 5.15(d)(1) ("Approved studies were not conducted as provided for in the approved study plan") is not applicable.

³⁹ CLIMATE CHANGE IMPACTS IN ALASKA, at 515, 533.

⁴⁰ Tom DiLiberto, "Winter" in Alaska, CLIMATE.GOV (Mar. 18, 2015), <https://www.climate.gov/news-features/event-tracker/%E2%80%9Cwinter%E2%80%9D-alaska>.

⁴¹ See Gerd Wendler et al., *The Climate of Alaska for 2015*, ALASKA CLIMATE RESEARCH CTR, <http://akclimate.org/Summary/Annual/2015> (last visited May 16, 2016).

⁴² Study Plan Determination, at 18.

and many federal agencies.⁴³ The paradigm's core assumption of relatively static conditions is flawed, particularly in snow-dominated regions like Alaska where changes to precipitation and temperature will impact the magnitude, timing, and temperature of streamflow.⁴⁴ The Glacier and Runoff Changes Study and the Fluvial Geomorphology Study (Section 7.7 and Section 6.5 of the ISR, respectively) cannot establish an accurate baseline of environmental conditions, nor develop a realistic projection of future trends, without taking into account the recent impacts of climate change and modeling future changes on both the upper and lower Susitna River. Given that the proposed Project would be built in a location that is experiencing exceptionally rapid climatic change, the study should be modified to require a basin-wide climate model that will inform analysis of ecological impacts.

4. NRDC's Study Request meets FERC's requirements for a "new study"

4.1 Section 5.15(e)(1) Material changes in the law and regulations require a new study

Since FERC ruled in 2013 that a basin-wide climate change study was not warranted, federal law and policy has changed significantly. It is now well established that the potential impacts of climate change can have significant implications for the construction, maintenance, and operation of major infrastructure and building projects such as the proposed dam. Increasingly, other federal agencies are considering the impacts of climate change in the design of these projects, especially those projects located in climate-vulnerable areas.

President Obama has issued several executive orders since 2013 directing agencies to prepare for the impacts of climate change on federal facilities and their operation.⁴⁵ These orders seek to ensure that federal agencies are advancing climate change preparedness and resilience. For example, Executive Order 13653 specifically requires federal agencies to develop, implement, update, and regularly report on comprehensive adaptation plans that integrate considerations of

⁴³ U.S. ARMY CORPS OF ENG'RS, GUIDANCE FOR INCORPORATING CLIMATE CHANGE IMPACTS TO INLAND HYDROLOGY IN CIVIL WORKS STUDIES, DESIGNS, AND PROJECTS, NO. 2014-10, ENG'G & CONSTRUCTION BULLETIN 1 (2014) [hereinafter USACE GUIDANCE]; Sebastian Vicuna et al., *Basin-Scale Water System Operations with Uncertain Future Climate Conditions: Methodology and Case Studies*, 46 WATER RESOURCES RESEARCH 1, 1 (2010).

⁴⁴ Xuezhi Tan & Thian Yew Gan, *Nonstationary Analysis of Annual Maximum Streamflow of Canada*, 28 J. CLIMATE 1788, 1788 (2015); NMFS, Susitna River Project Effects Under Changing Climate Conditions Study Request, Project No. 14241-000, 11 (May 31, 2012) (citing P.C.D. Milly et al., *Stationarity is Dead: Whither Water Management?* 319 SCIENCE 573-74 (2008), <http://science.sciencemag.org/content/319/5863/573>) [hereinafter NMFS Study Request].

⁴⁵ See, e.g., Exec. Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, 80 Fed. Reg. 15872 (Mar. 25, 2015); Exec. Order No. 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, 80 Fed. Reg. 6425 (Feb. 4, 2014); Exec. Order No. 13677, *Climate-Resilient International Development*, 79 Fed. Reg. 58229 (Sept. 26, 2014); Exec. Order No. 13653, *Preparing the United States for the Impacts of Climate Change*, 78 Fed. Reg. 66817 (Nov. 6, 2013); EXEC. OFFICE OF THE PRESIDENT, THE PRESIDENT'S CLIMATE ACTION PLAN (June 2013), <https://www.whitehouse.gov/sites/default/files/image/president27climateactionplan.pdf>.

the challenges posed by climate change into their operations and mission objectives.⁴⁶ Executive Order 13693 builds upon this requirement by calling for agencies to, among other things, incorporate climate-resilient design and management elements into the operation, repair, and renovation of existing buildings as well as the design of new buildings.⁴⁷

In concert with the President's actions, the Council on Environmental Quality ("CEQ") released revised guidelines in 2014, calling for federal agencies to incorporate climate change projections into assessments of both the baseline environmental conditions and the impacts of proposed federal actions.⁴⁸ CEQ clarifies that considering how climate change affects the nexus between project operations and effects on the resource "falls squarely" within the realm of National Environmental Protection Act reviews.⁴⁹ Furthermore, such analysis is necessary in order to determine whether to proceed with the proposed action, to evaluate mitigation and adaptation strategies, and to weigh alternatives with "preferable overall environmental outcomes."⁵⁰ Environmental assessment must therefore address how the proposed action may exacerbate the impacts of climate change, as the latter "can increase the vulnerability of a resource . . . and result in a proposed action's effects being more environmentally damaging."⁵¹ This revised guidance has direct implications for the Project, as the dam's operation will indeed increase the vulnerability of the entire Susitna River Basin by disrupting natural river flows and temperature patterns. According to the guidelines, evaluating how climate change will influence the environment and the impacts of a project is particularly important in areas especially vulnerable to climate change, such as the subarctic.⁵² The document states: "For example, a proposed action may require water from a stream that has diminishing quantities of available water because of decreased snowpack in the mountains."⁵³ This example directly reflects the precarious future of the Susitna River's water supply and its ecosystem. In order to assist federal agencies in anticipating how climate change will influence the environmental consequences of a project facing this situation, the guidelines provide examples of existing climate science tools and information. More specifically, CEQ highlights modeling as an appropriate method for determining these reasonably foreseeable effects on the environment, affirming that resources are currently available to analyze climate change in environmental assessments.⁵⁴

Numerous government agencies have recently issued guidance outlining how the agencies and project applicants should assess the impacts of climate change on a project (see Section 4.5.5 for

⁴⁶ Exec. Order No. 13653, *Preparing the United States for the Impacts of Climate Change*, 78 Fed. Reg. 66817 (Nov. 6, 2013).

⁴⁷ Exec. Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, 80 Fed. Reg. 15872, 15874-75 (Mar. 25, 2015).

⁴⁸ Council on Env'tl. Quality, *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, 79 Fed. Reg. 77801 (proposed Dec. 24, 2014).

⁴⁹ *Id.* at 77823.

⁵⁰ *Id.* at 77823.

⁵¹ *Id.* at 77828.

⁵² *See id.* at 77830.

⁵³ *Id.* at 77828.

⁵⁴ *See id.*

examples). These guidelines demonstrate the agencies' understanding that assessing climate change impacts is critical to a meaningful environmental review and falls within the scope of their missions and existing mandates.⁵⁵ The Environmental Protection Agency ("EPA"), National Oceanic and Atmospheric Administration ("NOAA"), Bureau of Land Management, Bureau of Reclamation ("Reclamation"), Department of the Interior, National Aeronautics and Space Administration, Army Corps of Engineers ("USACE"), and the Federal Emergency Management Agency have all developed guidance plans, technical guides, assessment tools, datasets, or models to aid the agencies in incorporating climate change science and modeling into environmental assessments.⁵⁶ This trend has also gained approval from entities such as the Government Accountability Office that argue in favor of incorporating climate change analysis into project licensing in order to reduce the government's long-term fiscal exposure to associated environmental risks.⁵⁷

As a result, federal agencies are examining the effects of climate change on proposed projects and their affected environment with increasing sophistication. The Sabin Center for Climate Change Law at Columbia Law School ("Center") documented this trend in its review of how federal Environmental Impact Statements ("EIS") prepared between 2009 and 2014 address climate-related considerations.⁵⁸ The Center found that some EISs contained a robust discussion

⁵⁵ See JESSICA WENTZ, *ASSESSING THE IMPACTS OF CLIMATE CHANGE ON THE BUILT ENVIRONMENT UNDER NEPA AND STATE EIA LAWS: A SURVEY OF CURRENT PRACTICES AND RECOMMENDATIONS FOR MODEL PROTOCOLS 1, 16* (Sabin Ctr. for Climate Change Law, Aug. 2015) [hereinafter *ASSESSING THE IMPACTS OF CLIMATE CHANGE UNDER NEPA*].

⁵⁶ For example, in March of 2015, the Federal Emergency Management Agency began requiring states to incorporate climate change considerations, such as changes to precipitation and flooding patterns, in their project scoping and development. FED. EMERGENCY MGMT AGENCY, *STATE MITIGATION PLAN REVIEW GUIDE*, FP 302-094-2 (revised March 2015), <https://www.fema.gov/media-library/assets/documents/101659>. According to the revised guide, State Hazard Mitigation Plans must now consider "changing future conditions, including the effects of long-term changes in weather patterns and climate on the identified hazards" in their risk assessments.

⁵⁷ See Jessica Wentz, *Assessing the Impacts of Climate Change on the Built Environment: A Framework for Environmental Reviews*, 45 ENVTL. L. REP. 11015, 11017 (2015). .

⁵⁸ See *ASSESSING THE IMPACTS OF CLIMATE CHANGE UNDER NEPA*, at 27-30. The report concluded that it is technically feasible and necessary to consider climate change when conducting reviews under NEPA or state equivalents and offered a set of model protocols for assessing the impact of climate change on infrastructure projects and selecting appropriate risk mitigation measures. The report explained that agencies should assess the impacts of climate change in particular circumstances, including evaluating future baseline conditions, the potential for climate change to increase the vulnerability of the affected environment and any resources impacted by the project, and whether the impacts of climate change may exacerbate the environmental consequences of the project or generate new consequences which would not have otherwise occurred. The scope and depth of this analysis should be proportional to the magnitude of the risk posed by climate change and the correlated vulnerability of the action and its affected environment to the impacts of climate change. Finally, the analysis of climate change impacts

of climate change impacts and that this analysis ultimately influenced final design decisions in some cases. Environmental assessments for water management projects in particular contained the most comprehensive and analytical assessments of climate change impacts and their implications on project operation. The majority of USACE projects that examined climate-related impacts, for example, discussed the effects of climate change on *the project itself* in addition to the impacts of climate change on the surrounding environment.⁵⁹ Reclamation and the U.S. Forest Service have also served as lead agencies on major infrastructure projects for which the EISs prominently illustrate an understanding of the impacts of climate change on the project and its affected environment.⁶⁰

In addition to assessments conducted at the federal level, climate change analyses are also being incorporated into state and local planning efforts, and several jurisdictions have promulgated laws, policies, or agency guidance that explicitly require the consideration of climate change effects on actions subject to environmental review.⁶¹ California's environmental impact assessment statute, for example, requires consideration of climate change impacts. Accordingly, many California state agencies now consider climate impacts when conducting environmental reviews.⁶² Similarly, Massachusetts has expressly amended its environmental review statute to require decision-makers to consider the effects of climate change on public projects.⁶³ These trends in agency decision-making at all government levels demonstrate that it is possible for agencies to account for and draw meaningful conclusions about, climate change impacts on public infrastructure.

The courts have also recognized the feasibility and importance of examining climate change impacts on major projects undergoing environmental review. In *Massachusetts v. EPA*, the Supreme Court explained that the "harms associated with climate change are serious and well recognized[,]"⁶⁴ and suggested that agencies bear the responsibility of taking action to minimize

should inform the selection of design features, alternatives, site location, mitigation measures, and other aspects of the final decision undertaken by the agency. *Id.* at 59.

⁵⁹ See *id.* at 35.

⁶⁰ See, e.g., CAL. DEPT. OF WATER RES. & U.S. BUREAU OF RECLAMATION, BAY DELTA CONSERVATION PLAN/CALIFORNIA WATER FIX PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT ES1–ES3 (2015); U.S. BUREAU OF RECLAMATION & STATE OF WASHINGTON DEPT. OF ECOLOGY, CLE ELUM POOL RAISE PROJECT: A COMPONENT OF THE YAKIMA RIVER BASIN INTEGRATED WATER RESOURCE MANAGEMENT PLAN: FINAL ENVIRONMENTAL IMPACT STATEMENT ES-i, ES-ii (2015); U.S. DEPT. OF THE INTERIOR & U.S. BUREAU OF RECLAMATION, SHASTA LAKE WATER RESOURCE INVESTIGATION: ENVIRONMENTAL IMPACT STATEMENT S-9 (2014); U.S. DEPT. OF AGRICULTURE, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE FLAGSTAFF WATERSHED PROTECTION PROJECT ii (2015).

⁶¹ See ASSESSING THE IMPACTS OF CLIMATE CHANGE UNDER NEPA, at 44-49.

⁶² See *id.* at 14.

⁶³ See *id.* at 44.

⁶⁴ *Massachusetts v. EPA*, 549 U.S. 497, 499 (2007).

the effects of climate change.⁶⁵ Other state and federal courts have repeatedly found that environmental analyses and decisions that failed to consider climate change and its potential impacts were inadequate.⁶⁶

Overall, the consideration of climate-related impacts on infrastructure projects falls squarely within the scope of agencies' environmental reviews, and many federal, state, and local agencies have incorporated such considerations into their environmental assessment processes. Thus, FERC should take action consistent with other federal agencies in thoroughly considering the impacts of climate change on projects proposed in vulnerable areas, which would improve the climate-resiliency of both the Project and the affected resources.⁶⁷

4.2 Section 5.15(e)(2) The goals, objectives, and methodology of prior studies are inadequate

The climate change studies approved by FERC as part of the Applicant's Study Plan (Sections 6.5 and 7.7) incorrectly assumed a mere literature review of glacial changes would provide an adequate understanding of how "climate change can affect Project operations and environmental resources."⁶⁸ The studies fail to properly assess all relevant future hydrologic changes and their effects downstream of the dam. AEA's studies narrowly focus on reviewing future glacial wastage and surges in the upper basin and how these changes will impact sedimentation and flow into the dam's reservoir. The entire basin, not just glaciers and not just the upstream reaches of

⁶⁵ See *id.* at 525 (2007) ("While it may be true that regulating motor-vehicle emissions will not by itself *reverse* global warming, it by no means follows that we lack jurisdiction to decide whether EPA has a duty to take steps to *slow* or *reduce* it.").

⁶⁶ See, e.g., *Ctr. for Biological Diversity v. Salazar*, 804 F. Supp. 2d 987, 1008 (D. Ariz. 2011) ("The BiOp does not analyze or even mention climate change."); *South Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, 723 F. Supp. 2d 1247, 1274 (E.D. Cal. 2010) ("The court cannot conclude that global warming's potential impacts are so slight that NMFS could ignore them without discussion."); *Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1184 (E.D. Cal. 2008) ("Plaintiff's motion for summary adjudication is GRANTED as to the climate change claim issue based on NMFS's total failure to address, adequately explain, and analyze the effects of global climate change on the species."); *NRDC v. Kempthorne*, 506 F. Supp. 2d 322, 370 (E.D. Cal. 2007) ("FWS acted arbitrarily and capriciously by failing to address the issue of climate change in the BiOp. This absence of *any* discussion in the BiOp of how to deal with any climate change is a failure to analyze a potentially 'important aspect of the problem.'"); *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) ("The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.").

⁶⁷ NRDC requests FERC to reverse the precedent of its prior decision on climate change study in the context of NEPA because of the rapidly changing science and policy of climate change. See *supra* note 8.

⁶⁸ See DIV. OF GEOL. & GEOPHYSICAL SURVEYS, ALASKA DEP'T OF NAT. RES. & UNIV. OF ALASKA FAIRBANKS, SUSITNA-WATANA HYDROELECTRIC PROJECT (FERC NO. 14241) GLACIAL AND RUNOFF CHANGES STUDY, STUDY PLAN SECTION 7.7: INITIAL STUDY REPORT – LITERATURE REVIEW A-1 (June 2014), http://www.susitna-watanahydro.org/wp-content/uploads/2014/05/07.7_GLAC_ISR_PartA.pdf.

the river, will be influenced by climate change. The narrow geographic scope of the studies therefore neglects to address the impacts to sensitive fish and wildlife habitats downstream.

Furthermore, the studies fail to assess how climate change could exacerbate the effects of the Project on natural resources. Again, a literature review cannot inform FERC of how climatic changes will interact with Project operations to impact fish and wildlife behavior and habitat. In order to obtain this information critical to licensing decisions, FERC should require AEA to develop a modeling framework using downscaled climate projections to predict and simulate hydrologic changes throughout the basin, or modify the studies to include this methodology.

4.3 Section 5.15(e)(3) A climate modeling study has been requested previously, and now is the time to grant the request

Due to the pressing need to better understand the cumulative impacts of climate change and Project operations, the request for a basin-wide climate modeling study has been made several times already during the licensing process. In its final SPD, FERC left the door open to reconsidering the request if new information became available.⁶⁹ Recent advancements in climate science, and the ability to effectively incorporate this science into federal and state environmental reviews now warrants such reconsideration (see Appendix).

The Services first made the study request for a basin-wide climate change study on May 31, 2012, and this request has been repeated by the Services and echoed by participants multiple times throughout the process due to the value of the information to be obtained.⁷⁰ In its proposed study plan, AEA planned to develop a “hydrologic modeling framework . . . to predict the impacts of climate change.”⁷¹ Yet the SPD did not approve this study, maintaining that conventional hydrologic studies were sufficient and that operational flexibility could address any changes in future hydrologic conditions.⁷² In response, NMFS filed a notice of study dispute, requesting that AEA’s originally proposed climate modeling “study be required and that the study consider the effects of climate change on aquatic, riparian, and terrestrial habitat and species to determine an appropriate baseline for assessing the project’s effects on these resources.”⁷³ NMFS disagreed with FERC that operational flexibility and standard reopener articles would provide sufficient protection for important fisheries habitat, particularly given the

⁶⁹ See 144 FERC ¶ 61,040 (Norris, concurring).

⁷⁰ NMFS Study Request; USFWS, Study Request; Ctr. for Biological Diversity Comments on the RSP.

⁷¹ See Alaska Energy Auth., Susitna-Watana Hydroelectric Project Alaska Energy Authority (FERC Project No. 14241) Proposed Study Plan (July 2012), <http://www.susitna-watanahydro.org/type/documents/>; Alaska Energy Auth., Susitna-Watana Hydroelectric Project Alaska Energy Authority (FERC Project No. 14241) Revised Study Plan, 7-56 to -57 (Dec. 2012), http://www.susitna-watanahydro.org/wp-content/uploads/2012/12/03-RSP-Dec2012_3of8-Sec-7-8-HydrologythroughInstreamFlowStudies-v2.pdf.

⁷² FERC, Study Plan Determination.

⁷³ NMFS, Notice of Study Dispute and Request to combine portions of the proceedings for Project No. 14241-000 Susitna Hydropower Project; Applicant: Alaska Energy Authority 1 (February 20, 2013) [hereinafter NMFS Study Dispute].

irreversible consequences of increased fish mortality.⁷⁴ Furthermore, they maintained that such measures did not supplant the need to determine an accurate baseline for assessing the Project's environmental effects.⁷⁵ Consequently, the Commission convened a Study Dispute Resolution Panel ("Panel"). The Panel agreed with NMFS that a climate model was necessary and also recommended including an additional analysis of water temperature.⁷⁶ The Commission Director's SPD finally agreed that the literature review ought to be required but maintained that developing a modeling framework was unnecessary. Subsequent requests for rehearing of the determination were denied in the Director's final order issued on July 18, 2013.⁷⁷

While the final order determined a climate change study unnecessary, Commissioner Norris foresaw the potential need for future reconsideration in his concurring opinion. The Commissioner wrote: "[A]s climate change modeling continues to advance, it may eventually yield data and knowledge that can and should be used to formulate license requirements that respond to environmental effects caused by climate change."⁷⁸ Since then, climate science, and especially downscaling techniques, has indeed advanced and is relied upon in the environmental review process for federal and state actions, as mandated by recent policy and law. This additional information now prompts a reconsideration of the scope of studies necessary to understand the nexus between project impacts and effects.

4.4 Section 5.15(e)(4) Significant new information material to the study objectives has become available

Climate modeling reliability and accuracy has advanced significantly since FERC issued its SPD in 2013, and has become a valuable tool in guiding planning and design of federal projects. In 2014, updated versions of the most widely relied upon international and national climate science reports were released, and the new data and analyses have subsequently been incorporated into federal interagency resources. Information from any or all of these resources could be reliably used to assess the impacts of climate change with respect to NRDC's Study Request.

In November of 2014, the Intergovernmental Panel on Climate Change ("IPCC")⁷⁹ released its Fifth Assessment Report on climate change science.⁸⁰ Scientists found that the models of surface

⁷⁴ See NMFS Request for Rehearing of Director's Formal Study Dispute Determination, Project No. 14241-000 (May 28, 2013) [hereinafter NMFS Request for Rehearing].

⁷⁵ See *id.*

⁷⁶ Findings and Recommendations of Study Dispute Panel for the Susitna-Wantana Hydroelectric Projects (April 12, 2013) [hereinafter Recommendations of Study Panel].

⁷⁷ NMFS Request for Rehearing; Center for Water Advocacy, Request for Reconsideration of the Center for Water Advocacy to April 1, 2013 Study Plan Determination, Project No. 14241-000 (May 28, 2013).

⁷⁸ 144 FERC ¶ 61,040 (Norris, concurring).

⁷⁹ The IPCC, established by the United Nations and World Meteorological Organization, is the leading international body for the assessment of climate change. WMO & UNEP, *IPCC Fact Sheet: What is IPCC?* (Aug. 30, 2013), http://www.ipcc.ch/news_and_events/docs/factsheets/FS_what_ipcc.pdf.

temperature and precipitation have improved in recent years, and there is now “very high confidence” in the temperature models in particular, as they have been proven to reliably reproduce observed conditions.⁸¹ This is particularly significant for hydropower projects and river ecosystems in Alaska, where rising temperatures are the primary driver of rapid ice loss and these glaciers supply approximately half of the total freshwater input to the Gulf of Alaska.⁸² The five best-ranked general circulation models (“GCMs”) were used to inform downscaled projections of regional climate change information in the Scenarios Network for Alaska and Arctic Planning (“SNAP”) dataset.⁸³ AEA utilized these simulations and projections in their voluntary climate modeling study, which demonstrates the reliability and utility of these updated tools and downscaling techniques.⁸⁴

In May of 2014 the United States Global Change Research Program⁸⁵ also released its own climate science report for the country: the Third National Climate Assessment. According to the report, “substantial new information” and “evidence from improved models and updated observational data” shows that Alaska’s environment is experiencing major shifts at a faster rate than previously projected.⁸⁶ The latest data suggest that the average annual temperatures are now projected to rise by an additional 8 degrees Fahrenheit in interior Alaska by the end of the century (or by 2050 if global emissions continue to increase).⁸⁷ The impacts are widespread: earlier spring snowmelt and shrinking glaciers will affect the productivity of both hydropower and the state’s fisheries, while thawing permafrost will degrade infrastructure and wildlife habitat.⁸⁸ The report highlights that the projections for glacier mass loss are particularly robust, leading scientists to assert with a high confidence level that there will be related impacts on hydropower production, such as a reduction in water input to reservoirs over the long-term.⁸⁹

⁸⁰ RAJENDRA K. PACHAURI ET AL., IPCC, CLIMATE CHANGE 2014: SYNTHESIS REPORT: CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2015), <http://www.ipcc.ch/report/ar5/syr/>.

⁸¹ *Id.* at 56.

⁸² *See* CLIMATE CHANGE IMPACTS IN ALASKA, at 519.

⁸³ DIV. OF GEOL. & GEOPHYSICAL SURVEYS, ALASKA DEP’T OF NAT. RES. & UNIV. OF ALASKA FAIRBANKS, SUSITNA-WATANA HYDROELECTRIC PROJECT (FERC NO. 14241) GLACIER AND RUNOFF CHANGES STUDY FINAL STUDY REPORT, 42 (October 2015), http://www.susitna-watanahydro.org/wp-content/uploads/2015/10/GlacierRunoffChangesStudy_FSR_FINAL_20151028.pdf [hereinafter FINAL STUDY REPORT].

⁸⁴ *See id.*

⁸⁵ The U.S. Global Change Research Program was established by Congress to analyze climate science with the goal of predicting and responding to climate change. *See About USGCRP*, U.S. GLOBAL CHANGE RESEARCH PROGRAM, <http://www.globalchange.gov/about> (last visited May 17, 2016).

⁸⁶ CLIMATE CHANGE IMPACTS IN ALASKA, at 515, 533.

⁸⁷ *Id.* at 516.

⁸⁸ *See id.* at 515. Based on the evidence, the authors rate the confidence that glacier mass loss will result in impacts on hydropower production and fisheries as “high,” and that the evidence on the impacts of melting permafrost on infrastructure is “rapidly accumulating.” *Id.* at 535.

⁸⁹ *Id.* at 535.

Ultimately, the latest National Climate Assessment finds that climate modeling for Alaska has improved to the extent that it is reliable. AEA's required studies should be updated accordingly.

In addition to these reports, new academic research has improved methodologies for projecting the impacts of climate change on northern watersheds and regional hydropower. Since FERC issued its SPD in 2013, scientists have established techniques for incorporating dynamically downscaled climate projections into planning for hydropower operations in snow and ice-dominated hydrologic regimes.⁹⁰ Further research has established frameworks for evaluating the combined effects of climate change and development on subarctic freshwater ecosystems. For example, a 2015 peer-reviewed study describes an integrated hydrologic model for assessing climate induced ecological risks to salmon in an Alaskan watershed, as a backdrop for assessing project induced risks.⁹¹ The researchers evaluated how altered hydrologic regimes and stream temperatures would adversely affect suitability of spawning gravel, duration of incubation, and exposure of salmon to temperature stress.⁹² Their "quantitative approach to estimating climate-mediated changes in ecological conditions" provides a new tool for determining impacts in "any ecosystem where climate and other proposed development activities could interact to compound ecological risk to sensitive receptors,"⁹³ as is the case in the Susitna River basin. This study demonstrates that modeling the combined impacts of climate change and the Project on natural resources in this context is indeed possible and reliable, and the authors argue that such a framework is actually required in order to create a robust baseline condition against which project induced changes can be compared.

These reports and studies represent only a few of the many examples proving that climate science has advanced enough to successfully achieve the objective proposed in NRDC's Study Request of modeling the impacts of climate change across the basin. Additionally, recent legal and policy developments have clarified how federal agencies should use the latest science to inform their environmental review process, as described in Section 4.1. As will be discussed in Section 4.5.5, guidance from the White House and scientific community has prompted federal agencies to develop and adopt climate models for use in water resource management. In light of these recent and significant advancements in climate change science, policy, and law, there is sufficient "new information" to meet FERC's requirements and justify a new or modified study modeling the climate change impacts related to the Project.

⁹⁰ See, e.g., *Some Aspects of Ice-Hydropower Interaction in a Changing Climate*, 7 ENERGIES 1641 (2014), www.mdpi.com/1996-1073/7/3/1641/pdf [hereinafter *Some Aspects*]; Solomon Gebre et al., *Sensitivity to Climate Change of the Thermal Structure and Ice Cover Regime of Three Hydropower Reservoirs*, 510 J. HYDROL. 208 (2014), <http://www.sciencedirect.com/science/article/pii/S0022169413009207> [hereinafter *Some Aspects*].

⁹¹ See Cameron Wobus et al., *Hydrologic Alterations from Climate Change Inform Assessment of Ecological Risk to Pacific Salmon in Bristol Bay, Alaska*, 10 PLoS ONE 1, 19 (2015), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0143905>.

⁹² *Id.* at 1.

⁹³ *Id.* at 18.

4.5 Section 5.15(e)(5) The new study request satisfies the study criteria in Section 5.9(b) outlined below

As outlined in the following section, the new study request satisfies all study criteria of Section 5.9(b), demonstrating good cause for approval by addressing public interest concerns, the need for additional information to understand Project impacts, how the study employs scientifically accepted practice, and how the relatively low cost is justified.

4.5.1 Section 5.9(b)(1) A basin-wide climate model is required to achieve the goals and objectives of NRDC's Study Request⁹⁴

The goal of the NRDC's Requested Study is to evaluate the cumulative impacts of climate change and the Project on the Susitna watershed ecosystem.

As previously mentioned, the objectives of NRDC's Requested Study are to:

- a. Develop a climate model for the entire Susitna basin, using downscaled climate projections to simulate non-stationary future environmental conditions (including changes to glaciers, permafrost, hydrology, evapotranspiration, and surface water temperature) in accordance with the lifespan of the project (anticipated to last 100 years); and
- b. Apply this updated environmental baseline to analyses of Project impacts on the aquatic, riparian, and terrestrial habitat and species both upstream and downstream of the proposed dam.

This study proposes to expand upon Section 7.7 and Section 6.5 to include modeling of climate change impacts to hydrology across the entire basin. This analysis is needed in order to project environmental changes in the basin over the next 100 years and evaluate the vulnerability of fish and wildlife, and their habitat, to this altered temperature and hydrology regime. The nexus of Project operations and effects on the natural resources cannot be understood absent information obtained through this study, given that these changes will be driven by the combination of the Project and climate change.

4.5.2 Section 5.9(b)(3) Protecting the public interest requires FERC to use the best available science in its determination

In determining whether the study is in the public interest, FERC must account for a wide range of considerations, including the "public interest in preserving reaches of wild rivers and wilderness areas, the preservation of anadromous fish for commercial and recreational purposes, and the protection of wildlife."⁹⁵ FERC must ensure sufficient protections for fish and wildlife based on recommendations of the Services and state fish and wildlife agencies, pursuant to the Fish and Wildlife Coordination Act, 16 U.S.C. 661 *et seq.* ("FWCA").⁹⁶ Maintaining the ecological integrity of the Susitna River basin is of the utmost importance to the public interest in the preservation of fish, wildlife, and wilderness habitat.

⁹⁴ 18 C.F.R. § 5.9(b)(2) ("Relevant resource agency management goals") is not applicable as NRDC is not an agency.

⁹⁵ *Udall v. Fed. Power Comm'n*, 387 U.S. 428, 450 (1967).

⁹⁶ 16 U.S.C. § 803(j).

The Susitna watershed, set in the high, rugged peaks of the Alaska Range, is Alaska's most popular destination for hunters and anglers.⁹⁷ More than 375,000 tourists spend approximately \$201 million annually in the Matanuska-Susitna area.⁹⁸ The diverse ecosystem of boreal forest, tundra, and undisturbed glacially-fed rivers hosts resources of unique value to the public, including NRDC's membership of outdoor recreationists.⁹⁹ This productive habitat is home to wildlife of national significance, including bear, caribou, and bald eagles, as well as the state's second largest recreational fishery for Chinook salmon, which migrate, spawn, and rear upriver of the proposed dam site.¹⁰⁰ In fact, resident and tourist anglers in the Matanuska-Susitna Borough spend \$63 to \$163 million on sport fishing, an industry which provides 900-1,900 local jobs.¹⁰¹ Commercially, the Susitna is one of the largest salmon producing rivers in the upper Cook Inlet fisheries, which harvest four million salmon annually, generating \$34.2 million for the state's economy.¹⁰²

This industry will suffer considerably if the naturally abundant fish populations decline as a result of negative impacts on downstream fisheries habitat caused by the combination of dam operations and climate change. Failing to use the best available science to predict those adverse effects, such as warming surface water temperatures and diminished flows, throughout the entire basin will prevent FERC from fulfilling its obligation to thoroughly address these public interest concerns.

4.5.3 Section 5.9 (b)(4) Additional information is needed to adequately evaluate the impacts of the Project

While AEA has submitted a study of climate change and how it will affect the Project, its analysis falls far short of providing an accurate assessment of how these changes, in conjunction with the operation of a mega-dam, will affect the Susitna river ecology. FERC limited the required analysis of climate change to: a) conducting a literature review of glacial retreat and associated predicted changes in runoff in south central Alaska and the upper Susitna River watershed (Section 7.7 submitted by AEA in June 2014), and b) analyzing the predicted changes to sediment delivery into the reservoir due to these glacial surges (Section 6.5 submitted by AEA in November 2014).¹⁰³ These studies alone are inadequate to assess the likely impacts associated with the proposed operations of the dam. Outside the ILP process, AEA commissioned the Alaska Department of Natural Resources to model the effects of future glacial wastage and

⁹⁷ *Susitna Economies*, SUSITNA RIVER COALITION, <http://susitnarivercoalition.org/wp/susitna-economies/> (last visited May 18, 2016) [hereinafter *Susitna Economies*].

⁹⁸ *Id.*

⁹⁹ *See id.*

¹⁰⁰ *Susitna Salmon*, SUSITNA RIVER COALITION, <http://susitnarivercoalition.org/wp/susitna-salmon/> (last visited May 18, 2016) [hereinafter SRC, *Susitna Salmon*].

¹⁰¹ Letter from Hilda Sexauer, W. Div., Am. Fisheries Soc'y, to Kimberly Bose, Secretary, FERC (Mar. 3, 2015), http://wdafrs.org/download/resolutions/WDAFS_SusitnaLetter_AKLegislature_Final_3Mar15.pdf [hereinafter Letter from Am. Fisheries Soc'y].

¹⁰² *Susitna Economies*.

¹⁰³ 144 FERC ¶ 61,040.

retreat on runoff in the upper Susitna basin. Given that this study is voluntary, it is not included formally as a FERC-approved study in the ISR, but proves that such a study is feasible and provides information of great value to the Applicant.

The following information is needed to adequately assess the project effects:

a. A predictive climate model for the Susitna basin

The literature reviews in Section 7.7 and 6.5 are insufficient because there is an absence of existing studies regarding climate change in the Susitna River watershed and available information at the regional level is too imprecise, given that patterns in glaciation, precipitation, transpiration and evaporation are unique to individual glacial basins.¹⁰⁴ AEA therefore voluntarily chose to develop a climate modeling framework to analyze how glacial wastage and retreat in the upper basin would affect reservoir inflow.¹⁰⁵ This demonstrates that the Applicant itself found that the literature review was inadequate and saw the need for a predictive model to provide additional information. In fact, FERC staff acknowledged this during the Study Dispute Resolution Technical Conference by stating that AEA had chosen to conduct modeling because it was “to their benefit” “to know that they’re going to have the water to run” the Project.¹⁰⁶ For this reason, the Panel recommended requiring the modeling study, stating it “would provide valuable information that would inform potential project operations, resulting from changes in the timing, magnitude and duration of inflows to the project across a range of potential future conditions.”¹⁰⁷ However, this voluntary study narrowly focuses on potential future changes in runoff into the proposed reservoir and therefore still ignores important environmental impacts throughout the basin, particularly to river ecology downstream of the dam.

b. Analysis of projected surface water temperature

The current study also neglects to include an analysis of future changes in stream temperature, a factor that greatly influences the health of aquatic ecosystems.¹⁰⁸ This is a glaring omission given the predicted decreased snowpack and increased air temperatures that are likely to modify the thermal regime of the Susitna River.¹⁰⁹ These changes are likely to result in adverse effects on fish behavior and habitat, which in turn will have direct consequences on Project operations needed to meet license conditions and NMFS mitigation measures.¹¹⁰ The Study Panel recognized the need for this additional information and recommended modifying AEA’s study to

¹⁰⁴ See USFWS, Scoping Comments, Recommendations and Study Requests Notice of Intent to File License Applications; Filing of Pre-Application Document; Commencement of Licensing Proceeding and Scoping; Request for Comments on the Pre-Application Document and Scoping Document 2, and Identification of Issues and Associated Study Requests for the Susitna-Watana Hydroelectric Project No. 14241-000, 3 (May 31, 2012) at 3 [hereinafter USFWS Study Request].

¹⁰⁵ See FINAL STUDY REPORT.

¹⁰⁶ Transcript of Technical Conference at 70, Study Dispute Resolution Panel, Susitna Hydroelectric Project (April 3, 2013).

¹⁰⁷ See Recommendations of Study Panel.

¹⁰⁸ USFWS Study Request, at 4.

¹⁰⁹ NMFS Study Request, at 9.

¹¹⁰ *Id.*

include a water temperature component in the hydrologic modeling.¹¹¹ If it is to provide meaningful information in the licensing process, analysis of changes in runoff requires assessment of not only volume and timing, but temperature as well.

c. Analysis of ecological impacts

Existing information is limited to the impacts of climate change on the dam itself (e.g. changes to incoming runoff and sedimentation). In order to give equal consideration to the “protection, mitigation of damage to, and enhancement of fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality” as required of FERC under the FPA, the Commission must require a study of climate change impacts to the affected resources, not just to the Project. Similarly, in order for the Services to fulfill their obligation to issue conservation recommendations under the FWCA, they need information from a study that considers the effects of climate change on aquatic, riparian, and terrestrial habitat and species.

d. Analysis of basin-wide impacts

The current study fails to include the impacts of climate change throughout the basin and overlooks critical climate-induced environmental changes beyond glacial retreat. The seasonal, annual, and long-term changes in volume, timing, and frequency of precipitation and flows, above *and* below the dam, will be influenced by both reservoir releases and climate-induced changes to tributary hydrology. These alterations are likely to affect fish habitat, as well as the efficiency and longevity of the Project. The Services need data from models predicting future hydrologic and temperature conditions in the middle and lower reaches as well, in order to understand potential changes to biologic responses, such as migration timing in response to temperature, flows, and ice processes.¹¹² Without modeling changes across the entire basin, there is no way to assess the real impacts of dam operations.

Overall, the approved study is limited to assessing potential changes to inflow of water and sediment to the proposed dam’s reservoir, thereby ignoring hydrologic and ecological changes throughout the basin induced by both climate change and Project operations. The current information is too imprecise and limited to understand the impacts to the basin’s resources and a climate model using downscaled regional projections is needed to resolve this data gap.

4.5.4 Section 5.9(b)(5) A climate modeling study is necessary because the nexus between Project operations and effects on the resource is mediated by climate change

The effect of the Project on water, fish, and wildlife resources cannot be understood absent a climate model as the Project is likely to magnify the negative impacts of climate change on habitat throughout the basin. While AEA is required to conduct other fish and wildlife studies, none of them address how these impacts will interact with climate change to exacerbate the ecological consequences. A study of climate change would therefore greatly inform a cumulative effects analysis. These combined effects will be complex and varied, and could include:

a. Altered thermal and flow regime

¹¹¹ Recommendations of Study Panel, at 5.

¹¹² See NMFS Request for Rehearing, at 24.

The operation of the dam, in conjunction with climate change, will change the timing, magnitude, and temperature of river flows, which will adversely impact the behavior and abundance of native fish species. The dam is designed to release lower flows in the summer and warmer water during the wintertime, disrupting the river's natural freeze-thaw cycle.¹¹³ Climate change will alter these temperature and flow regimes as well, as surface water temperatures rise and warming air temperatures melt the state's snowpack earlier in the year.¹¹⁴ The net result is reduced flows of critical cold water during the summer. These conditions restrict pool habitats and often strand juvenile salmon in warmer off-channel habitat,¹¹⁵ ultimately leading to higher mortality rates and lower growth rates.¹¹⁶ Furthermore, disrupting the natural riverine processes to which resident fish are suited, especially while also introducing new reservoir habitat upstream, creates hospitable conditions for invasive piscivorous fishes that prey on native salmon.¹¹⁷ NMFS summarizes how climate change and Project operations will jointly impact the aquatic community downstream of the proposed dam in the following way:

Reduced summer flows of cold water can compound the effects of rising water temperatures, especially in off-channel habitat that are likely to become more isolated from the main channel through project-induced channel incision. Thus, project operations will not be able to mitigate for climate caused temperature changes by altering temperature of water discharged from the dam since these habitats will have become physically isolated from main stem river flows. Also, the project will effectively bisect the Susitna River watershed with a very large dam, preventing fish from being able to expand their range into the upper watershed which could serve as refugia from warming conditions in the lower portions of the watershed.¹¹⁸

Taken together, these changes to river temperatures and flows will hinder the ability of an already vulnerable fish population to successfully migrate, spawn, incubate their eggs, and rear juveniles, processes that are dependent upon a seasonal hydrology of frozen rivers in the winter, the spring freshet, and fairly high and cool flows in the summer.¹¹⁹ AEA's current study of climate change on just the upper Susitna River cannot accurately predict the range and magnitude of impacts on documented fish populations both upstream and downstream of the dam.

b. Altered sedimentation rates

Climate-induced changes to sedimentation rates in the glaciers above the reservoir and in the downstream tributaries regulated by Project operations pose potential threats to fish habitat. Salmon are dependent on very particular river channel morphology and riverbed substrate

¹¹³ USFWS Study Request, at 7.

¹¹⁴ NMFS Study Dispute, at 19.

¹¹⁵ TNC, ECOLOGICAL RISK ASSESSMENT, at 21; M.D. Bryant, *Global Climate Change and the Potential Effects on Pacific Salmonids in Freshwater Ecosystems of Southeast Alaska*, 95 CLIMATE CHANGE 169, 181 (2009) [hereinafter *Climate Change Effects on Pacific Salmonids*].

¹¹⁶ *Id.*, at 181.

¹¹⁷ See Letter from Am. Fisheries Soc'y, at 3.

¹¹⁸ NMFS Request for Rehearing, at 19.

¹¹⁹ *Climate Change Effects on Pacific Salmonids*, at 181.

composition for successful spawning.¹²⁰ The effects of climate change will disrupt the natural sedimentation pattern and threaten physical habitat structure.¹²¹ Project operations are likely to exacerbate these adverse consequences as the dam captures sediment and organic matter, reducing transport of important habitat material to downstream aquatic communities while depleting their food webs of essential nutrients.¹²²

c. Reduced Project longevity

Climate change also presents direct structural threats to the proposed dam. The incidence of extreme weather events, such as floods and storms, which can compromise structural integrity, is predicted to increase in the future. Such climate-driven events are also associated with high rates of sediment transport, which could reduce the capacity of the reservoir while abrading turbines and other mechanical components.¹²³ Overall, recent modeling suggests that climate change will result in unstable winter conditions and increased frequency of freeze-thaw cycles and river breakup in the region, which leads to a more dynamic load on dam infrastructure.¹²⁴

NRDC's Requested Study is needed to determine how the Project will impact riverine processes and terrestrial, riparian, and aquatic ecosystems. Modeling climate-induced changes to the thermal, flow, and sedimentation regime throughout the entire basin is necessary to provide a realistic projection of the range of potential future climatic and hydrologic trends, and evaluate the vulnerabilities of fish, wildlife and habitat to altered conditions. Ultimately, this analysis will allow decision-makers to understand the nexus between Project operations and effects on the resource.

4.5.5 Section 5.9 (b)(6) NRDC's proposed study methodology is consistent with generally accepted scientific practice

GCMs, downscaled climate projections, and corresponding streamflow predictions are more accurate than ever, as discussed in Section 4.4. Climate modeling is now an accepted scientific practice that is increasingly relied upon to inform federal water management and (non-FERC) licensing decisions for hydropower projects. Since the SPD was issued in mid-2013, the following agencies responsible for managing the nation's water supplies have integrated climate modeling into their decision-making:

a. USACE

In May of 2014, USACE issued guidance for incorporating new science and information regarding climate change impacts into their hydrologic analysis studies, in accordance with Executive Order 13653.¹²⁵ The guidance suggests relying upon data from the Third National Climate Assessment (discussed in Section 3.4), NOAA's 2013 technical report *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment*, and Reclamation's climate risk

¹²⁰ Letter from Am. Fisheries Soc'y, at 3.

¹²¹ *Id.*

¹²² See Letter from Am. Fisheries Soc'y, at 3.

¹²³ See NMFS Request for Rehearing, at 19.

¹²⁴ See *Some Aspects*, at 1648.

¹²⁵ USACE Guidance, at 1.

assessments and basin-wide studies, described below.¹²⁶ Furthermore, USACE describes how to formulate “projections of specific climate changes and associated impacts to local-scale project hydrology that may occur far in the future due to changing baselines and ranges of variability reported in the recent literature.”¹²⁷ The agency recommends using hydrologic simulations, models, and projections using spatially downscaled data from the CMIP5, available through the Downscaled Climate and Hydrology Projections website, which is maintained in partnership with USACE, U.S. Geological Survey (“USGS”), Reclamation, and several research institutions.¹²⁸

b. Reclamation

In March of 2016, Reclamation issued a report to Congress on implementing climate change science in order to develop climate risk assessments for western water supplies and demands under the SECURE Water Act.¹²⁹ As mandated by this legislation, “Reclamation coordinates with [the Department of Energy] to compare climate modeling analyses that project climate conditions and impacts to hydropower into the future.”¹³⁰ Reclamation maintains that “advances in modeling efforts” and “tools currently available to support incorporation of climate information into resource management decisions,” now enable federal agencies to evaluate the impacts of climate change on hydropower projects and natural resources.¹³¹ For example, Reclamation is currently conducting the Upper Deschutes River Basin Study in Oregon, in which applies climate change scenarios through integrated models to evaluate the viability of future water resource management alternatives.¹³²

c. USFWS & NOAA

The National Fish, Wildlife, and Climate Adaptation Strategy, an initiative led by USFWS and NOAA to share best practices for climate modeling, issued “A Report on Implementation” in

¹²⁶ *Id.* at C-2.

¹²⁷ *Id.* at 1.

¹²⁸ *Id.* at C-3. This site, run by the Program for Climate Model Diagnosis and Intercomparison, not only serves as a data archive, but also issues reports evaluating local and regional projection data and techniques to promote effective use of the most reliable models to inform water resource science and management. *Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections*, PROGRAM FOR CLIMATE MODEL DIAGNOSIS AND INTERCOMPARISON, http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/ (last visited May 17, 2016).

¹²⁹ Section 9505 of the SECURE (Science and Engineering to Comprehensively Understand and Responsibly Enhance) Water Act directs federal agencies, including DOI, DOE, NOAA, USGS, and the National Weather Service; the Federal Power Marketing Administrations; and state water resource agencies to collectively examine “the potential effects of climate change on water available for hydropower generation at federal facilities and on the marketing of that power.” Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, tit. IX, subtit. F, § 9503(c); BOR, SECURE WATER ACT SECTION 9503(C) – RECLAMATION CLIMATE CHANGE AND WATER 1-40 (Mar. 2016), <http://www.usbr.gov/climate/secure/docs/2016secure/2016SECUREReport.pdf>.

¹³⁰ *Id.*

¹³¹ *Id.* at 1-12.

¹³² *Id.* at 4-21.

2015.¹³³ The document provides strategies for incorporating climate change science into natural resource management and outlines recent commitments from federal, state, and local agencies to develop, improve, and increase use of climate modeling.¹³⁴

d. EPA

In September of 2013, the EPA released a report describing how watershed modeling can be used to assess the sensitivity of stream flow—as well as nutrient and sediment loads—to the cumulative impacts of climate change and development.¹³⁵ The study investigated “the influence of downscaling approaches on watershed model simulations.”¹³⁶ EPA found that, with appropriate calibration and validation, these models could be used to “provide a range of plausible future hydrologic and water quality change scenarios that can be applied in various planning and scoping frameworks.”¹³⁷

e. USGS

USGS now routinely uses downscaled temperature and precipitation data to inform its risk assessments. Beginning in October of 2013, the agency published multiple scientific studies modeling the potential impacts of climate change on salmon habitat in Pacific Northwest watersheds.¹³⁸ In their 2015 report, the USGS National Climate Change and Wildlife Center touted how their Alaska Climate Science Center in particular has helped “the scientific modeling community make refinements to improve the understanding of” how sensitive arctic resources, such as glaciers and permafrost, will continue to be impacted by climate change.¹³⁹

¹³³ USFWS ET AL., NATIONAL FISH, WILDLIFE, AND PLANTS CLIMATE ADAPTATION STRATEGY: NEXT STEPS: A REPORT ON IMPLEMENTATION (Sept. 2015), <http://www.wildlifeadaptationstrategy.gov/next-steps-implementation-report.php>.

¹³⁴ *Id.* at App. 1, 27-66.

¹³⁵ U.S. EPA, NAT’L CTR FOR ENVTL. ASSESSMENT, WATERSHED MODELING TO ASSESS THE SENSITIVITY OF STREAMFLOW, NUTRIENT, AND SEDIMENT LOADS TO POTENTIAL CLIMATE CHANGE AND URBAN DEVELOPMENT IN 20 U.S. WATERSHEDS (Sept. 2013), <https://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=256912>.

¹³⁶ *Id.* at 5-2.

¹³⁷ *Id.* at 8-2.

¹³⁸ See, e.g., D. Graves & A. Maule, *A Stakeholder Project to Model Water Temperature under Future Climate Scenarios in the Satus and Toppenish Watersheds of the Yakima River Basin in Washington, USA*, 124 CLIMATIC CHANGE 399-411 (2014), <http://dx.doi.org/10.1007/s10584-012-0643-x>; James R. Hatten et al., *Modeling Effects of Climate Change on Yakima River Salmonid Habitats*, 124 CLIMATIC CHANGE 427-39 (2014), <http://dx.doi.org/10.1007/s10584-013-0980-4>; FRANK VOSS & ALEC MAULE, DEVELOPMENT OF A DATABASE-DRIVEN SYSTEM FOR SIMULATING WATER TEMPERATURE IN THE LOWER YAKIMA RIVER MAIN STEM, WASHINGTON, FOR VARIOUS CLIMATE SCENARIOS, USGS OPEN-FILE REPORT 2013-1010 (2013), <https://pubs.usgs.gov/of/2013/1010/pdf/ofr20131010.pdf>.

¹³⁹ ELDA VARELA MINDER & HOLLY A. PADGETT, U.S. DEPARTMENT OF THE INTERIOR CLIMATE SCIENCE CENTERS AND U.S. GEOLOGICAL SURVEY CLIMATE CHANGE AND WILDLIFE SCIENCE CENTER ANNUAL REPORT FOR 2015, USGS OPEN-FILE REPORT 2016-1043 (Apr. 2016), <http://pubs.usgs.gov/of/2016/1043/ofr20161043.pdf>, at 2.

The implementation of climate change models across federal water agencies has clearly become standard practice over the past few years, replacing the outdated practice of assuming relatively stationary baseline conditions. According to the 2014 USACE guidance, “the assumptions of stationary climatic baselines and a fixed range of natural variability” have ceased to “be appropriate for long-term projections of the climatologic parameters, which are important in hydrologic assessments for inland watersheds.”¹⁴⁰ This assertion demonstrates that federal agencies have already recognized the prudence of utilizing predictive modeling, given the reliability of current models and the known unreliability of considering future conditions to be static. The hydrologic and glacier mass balance models recommended by NMFS and employed in the voluntary study by AEA, have been recognized by IPCC as particularly reliable models and should be incorporated as required components of the study plan. The Appendix provides additional examples of recent proven methodologies (developed and tested since mid-2013) for creating climate modeling frameworks to assess future hydrologic change in glacial basins.

4.5.6 Section 5.9(b)(7) NRDC’s Requested Study is cost-effective and feasible and alternative studies are inadequate

The project is anticipated to cost \$250,000 to \$350,000 in order to hire a primary investigator (with doctoral or preferably post-doctoral experience in applied climate projections) and research assistants to develop a modeling framework and analyze the data over the course of a year.¹⁴¹ This level of cost is reasonable given that the Project cost is currently estimated at \$5.19 billion.¹⁴² This relatively small expense is justified by the importance of understanding the hydrologic and climatic changes that will impact the resources and the Project. AEA’s decision to conduct climate modeling on the upper basin, despite such modeling not being a required component of the Study Plan, demonstrates that modeling is not only worthwhile, but can and should be performed for the entire basin. Furthermore, it demonstrates that the information gathered in the alternative literature reviews of Section 7.7 and 6.5 failed to provide information of satisfactory precision, quality, and value, as discussed in Section 4.5.3. NRDC’s Requested Study is evidently worth the reasonable costs.

5. Conclusion

The vulnerability of the Susitna basin ecosystem to the combined adverse impacts of the Project and climate change, and the vulnerability of the Project’s water supplies, requires a more thorough climate change study. Narrowly assessing potential changes to sedimentation and inflow to the proposed dam overlooks critical, basin-wide alterations to surface water temperature and flow that will impact terrestrial, aquatic, and riparian resources, particularly downstream of the proposed dam. Furthermore, the existing literature review falls far short of predicting these changes and their environmental consequences with sufficient precision. Fortunately, relevant and robust climate modeling data and downscaling techniques are now available to achieve this objective. Recent studies provide AEA with modeling frameworks developed for glacially-fed subarctic basins that can assess the effects of climate change on

¹⁴⁰ USACE Guidance, at 1.

¹⁴¹ NMFS, 7.7 Glacier and Runoff Changes, ISR Review and Study Modifications, (June 22, 2016), at 31.

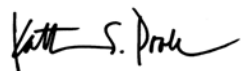
¹⁴² *Project Overview*, SUSITNA-WATANA HYDRO, <http://www.susitna-watanahydro.org/project/project-description/> (last visited May 17, 2016).

hydropower projects, as well as basin hydrology and ecology, with minimal uncertainty. Such improvements in climate modeling, as well as new federal law and policy clarifying how to incorporate climate science into environmental reviews, have allowed natural resource management agencies to more accurately characterize baseline conditions. We respectfully request that FERC approve NRDC's Study Request in order to accurately predict the impacts of climate change and the Project on the entire Susitna River watershed and ecosystem.

Respectfully submitted on this 23rd day of June, 2016,



Monty Schmitt
Senior Water Program Scientist
Natural Resources Defense Council



Kate Poole
Senior Water Program Attorney
Natural Resources Defense Council

APPENDIX

Executive Action on Climate Change

Exec. Order No. 13693, *Planning for Federal Sustainability in the Next Decade*, 80 Fed. Reg. 15872 (Mar. 25, 2015)

Council on Env'tl. Quality, *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, 79 Fed. Reg. 77801 (proposed Dec. 24, 2014)

Exec. Order No. 13677, *Climate-Resilient International Development*, 79 Fed. Reg. 58229 (Sept. 26, 2014)

Exec. Order No. 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, 80 Fed. Reg. 6425 (Feb. 4, 2014)

Exec. Order No. 13653, *Preparing the United States for the Impacts of Climate Change*, 78 Fed. Reg. 66817 (Nov. 6, 2013)

EXEC. OFFICE OF THE PRESIDENT, THE PRESIDENT'S CLIMATE ACTION PLAN (June 2013), <https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>

Exec. Order No. 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes*, 75 Fed. Reg. 43021 (July 22, 2010)

Exec. Order No. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 Fed. Reg. 52117 (Oct. 8, 2009)

Federal Agency Actions and Guidance

Federal Emergency Management Agency (FEMA)

FED. EMERGENCY MGMT AGENCY, STATE MITIGATION PLAN REVIEW GUIDE, FP 302-094-2 (revised March 2015), <https://www.fema.gov/media-library/assets/documents/101659>

National Marine Fisheries Service

NAT'L MARINE FISHERIES SERV., REVISED GUIDANCE FOR TREATMENT OF CLIMATE CHANGE IN NMFS ENDANGERED SPECIES ACT DECISIONS (2016)

U.S. Army Corps of Engineers (ACOE)

U.S. ARMY CORPS OF ENG'RS, GUIDANCE FOR INCORPORATING CLIMATE CHANGE IMPACTS TO INLAND HYDROLOGY IN CIVIL WORKS STUDIES, DESIGNS, AND PROJECTS, NO. 2014-10, ENG'G & CONSTRUCTION BULLETIN (2014)

U.S. ARMY CORPS OF ENG'RS, 2015 STRATEGIC SUSTAINABILITY PERFORMANCE PLAN (2015)

U.S. ARMY CORPS OF ENG'RS, CLIMATE CHANGE ADAPTATION PILOTS (2012),
http://www.corpsclimate.us/docs/RCC_Pilots_Sept%202012_lowres_2013.pdf

U.S. Bureau of Reclamation (BOR)

U.S. BUREAU OF RECLAMATION, SECURE WATER ACT SECTION 9503(C) – RECLAMATION CLIMATE CHANGE AND WATER (2016)

U.S. BUREAU OF RECLAMATION, WEST-WIDE CLIMATE RISK ASSESSMENT: SACRAMENTO AND SAN JOAQUIN BASINS CLIMATE IMPACT ASSESSMENT (2014)

U.S. BUREAU OF RECLAMATION, LITERATURE SYNTHESIS ON CLIMATE CHANGE IMPLICATIONS FOR WATER AND ENVIRONMENTAL RESOURCE, TECHNICAL MEMORANDUM 86-68210-2013-06 (2013)

U.S. Department of Agriculture (USDA)

U.S. DEP'T OF AGRIC., 2015 STRATEGIC SUSTAINABILITY PERFORMANCE PLAN (2015)

U.S. Department of Energy (DOE)

U.S. DEP'T OF ENERGY, EFFECTS OF CLIMATE CHANGE ON FEDERAL HYDROPOWER: REPORT TO CONGRESS (2013)

U.S. DEP'T OF ENERGY, US ENERGY SECTOR VULNERABILITIES TO CLIMATE CHANGE AND EXTREME WEATHER (2013)

U.S. Department of Transportation (DOT)

U.S. DEP'T OF TRANSP., CLIMATE ADAPTATION PLAN 2014: ENSURING TRANSPORTATION INFRASTRUCTURE AND SYSTEM RESILIENCE (2014)

U.S. Environmental Protection Agency (EPA)

U.S. ENVTL. PROTECTION AGENCY, WATERSHED MODELING TO ASSESS THE SENSITIVITY OF STREAMFLOW, NUTRIENT, AND SEDIMENT LOADS TO POTENTIAL CLIMATE CHANGE AND URBAN DEVELOPMENT IN 20 U.S. WATERSHEDS (Nat'l Ctr. for Env'tl. Assessment, 2013),
<https://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=256912>

U.S. ENVTL. PROTECTION AGENCY, 2015 STRATEGIC SUSTAINABILITY PERFORMANCE PLAN (2013)

U.S. Fish and Wildlife Service (USFWS)

U.S. FISH & WILDLIFE SERV. ET AL., NATIONAL FISH, WILDLIFE, AND PLANTS CLIMATE ADAPTATION STRATEGY: NEXT STEPS: A REPORT ON IMPLEMENTATION (2015), <http://www.wildlifeadaptationstrategy.gov/next-steps-implementation-report.php>

U.S. Forest Service (USFS)

U.S. FOREST SERV., FOREST SERVICE CLIMATE CHANGE ADAPTATION PLAN 2014 (2014)

U.S. Geological Survey (USGS)

ELDA VARELA MINDER & HOLLY A. PADGETT, U.S. DEPARTMENT OF THE INTERIOR CLIMATE SCIENCE CENTERS AND U.S. GEOLOGICAL SURVEY CLIMATE CHANGE AND WILDLIFE SCIENCE CENTER ANNUAL REPORT FOR 2015, USGS OPEN-FILE REPORT 2016-1043 (2016), <http://pubs.usgs.gov/of/2016/1043/ofr20161043.pdf>

FRANK VOSS & ALEC MAULE, DEVELOPMENT OF A DATABASE-DRIVEN SYSTEM FOR SIMULATING WATER TEMPERATURE IN THE LOWER YAKIMA RIVER MAIN STEM, WASHINGTON, FOR VARIOUS CLIMATE SCENARIOS, USGS OPEN-FILE REPORT 2013-1010 (2013), <https://pubs.usgs.gov/of/2013/1010/pdf/ofr20131010.pdf>

U.S. Government Accountability Office (GAO)

U.S. GOV'T ACCOUNTABILITY OFF., GAO-15-290, LIMITING THE FEDERAL GOVERNMENT'S FISCAL EXPOSURE BY BETTER MANAGING CLIMATE CHANGE RISKS (2015), http://www.gao.gov/highrisk/limiting_federal_government_fiscal_exposure/why_did_study

State and Local Agency Actions and Guidance

COMMONWEALTH OF MASS., DRAFT MEPA CLIMATE CHANGE ADAPTATION AND RESILIENCY POLICY (2014)

N.Y. DEP'T OF ENVTL. CONSERV., COMMISSIONER'S POLICY: CLIMATE CHANGE AND DEC ACTION (2010), <http://www.dec.ny.gov/regulations/65034.html>

WASH. DEP'T OF TRANSP., GUIDANCE FOR NEPA AND SEPA PROJECT LEVEL CLIMATE CHANGE EVALUATIONS (2014), http://www.wsdot.wa.gov/Nm/rdorJyres/BDF7C3DA-4F27-4CD5-8D02-6813027A928B/0/WSDOT_ClimateGuidance.pdf

Statutes

The Federal Power Act, 16 U.S.C. § 797(c)

Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, tit. IX, subtit. F, § 9503(c)

N.Y. State Environmental Quality Review Act (SEQRA), N.Y. ENVTL. CONSERV. LAW, art. 8

MASS. GEN. LAWS, ch. 30, § 61, *amended by* Massachusetts Global Warming Solutions Act (GWSA), ch. 298 of the Acts of 2008, §7

Cases

Massachusetts v. EPA, 549 U.S. 497 (2007)

Ctr. for Biological Diversity v. Salazar, 804 F. Supp. 2d 987 (D. Ariz. 2011)

Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172 (9th Cir. 2008)

Kunaknana v. Army Corps of Engineers, No. 3:13-cv-00044-SLG, 2015 WL 3397150 (May 26, 2015)

Kunaknana v. Army Corps of Engineers, 23 F. Supp. 3d 1063 (D. Alaska 2014)

Massachusetts v. EPA, 549 U.S. 497 (2007)

NRDC v. Kempthorne, 506 F. Supp. 2d 322 (E.D. Cal. 2007)

Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez, 606 F. Supp. 2d 1122 (E.D. Cal. 2008)

South Yuba River Citizens League v. Nat'l Marine Fisheries Serv., 723 F. Supp. 2d 1247 (E.D. Cal. 2010)

Udall v. Fed. Power Comm'n, 387 U.S. 428 (1967)

Federal Environmental Impact Statements

CAL. DEPT. OF WATER RES. & U.S. BUREAU OF RECLAMATION, BAY DELTA CONSERVATION PLAN/CALIFORNIA WATER FIX PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (2015)

NAT'L PARK SERV., MERCED WILD AND SCENIC RIVER FINAL COMPREHENSIVE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT (2014)

NAT'L PARK SERV., TUOLUMNE WILD AND SCIENCE RIVER FINAL COMPREHENSIVE MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT (2014)

U.S. BUREAU OF RECLAMATION & STATE OF WASHINGTON DEPT. OF ECOLOGY, CLE ELUM POOL RAISE PROJECT: A COMPONENT OF THE YAKIMA RIVER BASIN INTEGRATED WATER RESOURCE MANAGEMENT PLAN: FINAL ENVIRONMENTAL IMPACT STATEMENT (2015)

U.S. DEPT. OF AGRICULTURE, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE FLAGSTAFF WATERSHED PROTECTION PROJECT (2015)

U.S. DEPT. OF THE INTERIOR & U.S. BUREAU OF RECLAMATION, SHASTA LAKE WATER RESOURCE INVESTIGATION: ENVIRONMENTAL IMPACT STATEMENT (2014)

U.S. BUREAU OF RECLAMATION, ARKANSAS VALLEY CONDUIT LONG-TERM EXCESS CAPACITY MASTER CONTRACT FEDERAL ENVIRONMENTAL IMPACT STATEMENT (2013)

U.S. FISH & WILDLIFE SERV., MALHEUR NATIONAL WILDLIFE REFUGE FINAL COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT (2012)

U.S. FOREST SERV., R8-MB 143 A, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE GEORGE WASHINGTON NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN (2014)

Books, Institution Publications, and Technical Reports

ANCHOR QEA, PHASE 1 EXECUTIVE SUMMARY: PRELIMINARY FRAMEWORK FOR ECOLOGICAL RISK ASSESSMENT OF LARGE-SCALE HYDROPOWER ON BRAIDED RIVERS IN ALASKA, *prepared for* The Nature Conservancy (June 2015), https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/scak/Documents/TNC_AKHydropower_ERA_Ph1ExecSum_June15.pdf

A. J. Bawden, D.H. Burn & T.D. Prowse, *An Analysis of Spatial and Temporal Trends and Patterns in Western Canadian Runoff: A CROCWR Component*, Proceedings of the 19th International Northern Research Basins Symposium and Workshop (Aug. 11-17, 2013)

F.S. Chapin, III et al., *Ch. 22: Alaska, in* CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT (J. M. Melillo, Terese Richmond, and G. W. Yohe eds., 2014), <http://nca2014.globalchange.gov/downloads>

CLIMATE CHANGE IN THE NORTHWEST: IMPLICATIONS FOR OUR LANDSCAPES, WATERS, AND COMMUNITIES (M. M. Dalton, P.W. Mote, & A.K. Snover eds., 2103)

S.M. COHEN ET AL., MODELING CLIMATE-WATER IMPACTS ON ELECTRICITY SECTOR CAPACITY EXPANSION (Nat'l Renewable Energy Lab., 2014)

Michael B. Gerrard, *Reverse Environmental Impact Analysis: Effect of Climate Change on Projects*, 45 N.Y. LJ. 247 (2012)

CATHY LI, DISCUSSION OF CLIMATE CHANGE-RELOAD WATER IMPACTS IN FEDERAL ENVIRONMENTAL IMPACT STATEMENTS (EISs), JANUARY-SEPTEMBER 2012 (Sabin Ctr. for Climate Change Law, 2013)

H.C. Linton et al., *Spatiotemporal Trends in Climatic Variables Affecting Streamflow Across Western Canada from 1950-2010: A CROCWR Component*, Proceedings of the 19th International Northern Research Basins Symposium and Workshop (Aug. 11-17, 2013)

TERESA PAREJO NAVAJAS, REVERSE ENVIRONMENTAL ASSESSMENT ANALYSIS FOR THE ADAPTATION OF PROJECTS, PLANS, AND PROGRAMS TO THE EFFECTS OF CLIMATE CHANGE IN THE EU: EVALUATION OF THE PROPOSAL FOR AN EIA DIRECTIVE (Columbia Public Law Research Paper No. 14-445, 2015)

RAJENDRA K. PACHAURI ET AL., IPCC, CLIMATE CHANGE 2014: SYNTHESIS REPORT: CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2015), <http://www.ipcc.ch/report/ar5/syr/>

Balqis M. Rehan & Jim W. Hall, *Flood Risk Management Decision Analysis with Finite Historical Records and Highly Variable Climate Effects*, in VULNERABILITY, UNCERTAINTY, AND RISK 2867 (2014)

G. Wendler et al., *Strong Temperature Increase and Shrinking Sea Ice in Arctic Alaska*, 8 OPEN ATMOSPHERIC SCI. J. (2014)

JESSICA WENTZ, ASSESSING THE IMPACTS OF CLIMATE CHANGE ON THE BUILT ENVIRONMENT UNDER NEPA AND STATE EIA LAWS: A SURVEY OF CURRENT PRACTICES AND RECOMMENDATIONS FOR MODEL PROTOCOLS (Sabin Ctr. for Climate Change Law, 2015)

Jessica Wentz, *Assessing the Impacts of Climate Change on the Built Environment: A Framework for Environmental Reviews*, 45 ENVTL L. REP. 11015 (2015)

PATRICK WOOLSEY, CONSIDERATION OF CLIMATE CHANGE IN FEDERAL EISS 2009-2011 (Sabin Ctr. for Climate Change Law, 2012)

Peer-reviewed Publications

K. E. Bennett et al., *Historical Trends and Extremes in Boreal Alaska River Basins*, 527 J. HYDROL. 590 (2015)

Stefania Camici et al., *Impact of Climate Change on Flood Frequency Using Different Climate Models and Downscaling Approaches*, 19 J. HYDROL. ENG'G 1 (2014)

Linyin Cheng & Amir AghaKouchak, *Nonstationary Precipitation Intensity-duration-frequency Curves for Infrastructure Design in a Changing Climate*, 4 SCI. REPORTS 1 (2014)

Huicheng Chien et al., *Modeling the potential impacts of climate change on streamflow in agricultural watersheds of the Midwestern United States*, 491 J. HYDROL. 73 (2013)

Jill Crossman et al., *The Significance of Precipitation Patterns: Modelling the Impacts of Climate Change and Glacier Retreat on Extreme Flood Events in Denali National Park, Alaska*, 8 PLOS ONE 1 (2013), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0074054>

Solomon Gebre & K Alfredsen, *Contemporary Trends and Future Changes in Freshwater Ice Conditions: Inference from Temperature Indices*, 45 HYDROL. RESEARCH 455 (2014)

Solomon Gebre et al., *Sensitivity to Climate Change of the Thermal Structure and Ice Cover Regime of Three Hydropower Reservoirs*, 510 J. HYDROL. 208 (2014), <http://www.sciencedirect.com/science/article/pii/S0022169413009207>

Solomon Gebre et al., *Some Aspects of Ice-Hydropower Interaction in a Changing Climate*, 7 ENERGIES 1641 (2014), www.mdpi.com/1996-1073/7/3/1641/pdf

Solomon Gebre et al., *Review of Ice Effects on Hydropower Systems*, 27 J. COLD REG. ENG'G 196 (2013)

Adam K. Gobena et al., *The Role of Large-scale Climate Modes in Regional Streamflow Variability and Implications for Water Supply Forecasting: A Case Study of the Canadian Columbia River Basin*, 51 ATMOS.-OCEAN 380 (2013)

J.R. Goode et al., *Potential Effects of Climate Change on Streambed Scour and Risks to Salmonid Survival in Snow-dominated Mountain Basins*, 27 HYDROL. PROCESS. 750 (2013)

D. Graves & A. Maule, *A Stakeholder Project to Model Water Temperature under Future Climate Scenarios in the Satus and Toppenish Watersheds of the Yakima River Basin in Washington, USA*, 124 CLIMATIC CHANGE 399 (2014), <http://dx.doi.org/10.1007/s10584-012-0643-x>

Rabi Gyawali et al., *Regional Regression Models for Hydro-climate Change Impact Assessment*, 29 HYDROL. PROCESS. 1972 (2015), <http://onlinelibrary.wiley.com/doi/10.1002/hyp.10312/abstract>

Rabi Gyawali & D. Watkins, *Continuous Hydrologic Modeling of Snow-affected Watersheds in the Great Basin Using HEC-HMS*, 18 J. HYDROL. ENG'G 29 (2013)

S. Hagemann et al., *Climate change impact on available water resources obtained using multiple global climate and hydrology models*, 4 EARTH SYSTEM DYNAMICS 129 (2013)

James R. Hatten et al., *Modeling Effects of Climate Change on Yakima River Salmonid Habitats*, 124 CLIMATIC CHANGE 427 (2014), <http://dx.doi.org/10.1007/s10584-013-0980-4>

K.M. Jeffries et al., *Transcriptomic Responses to High Water Temperature in Two Species of Pacific Salmon*, 7 EVOL. APPL. 286 (2014)

J. C. Leppi et al., *Linking Climate Change Projections for an Alaskan Watershed to Future Coho Salmon Production*, 20 GLOBAL CHANGE BIOL. 1808 (2014)

M.C. Loinaz et al, *Integrated Flow and Temperature Modeling at the Catchment Scale*, 495 J. HYDROL. 238 (2013)

K. Madani et al., *Climate Change Impacts on High-elevation Hydroelectricity in California*, 510 J. HYDROL. 153 (2014)

N. J. Munoz et al., *Adaptive Potential of a Pacific Salmon Challenged by Climate Change*, 5 NATURE CLIMATE CHANGE 163 (2015)

Sarah E. Null, Scott T. Ligare, & Joshua H. Viers, *A Method to Consider Whether Dams Mitigate Climate Change Effects on Stream Temperatures*, 49 J. AM. WATER RES. ASS'N 1456 (2013)

Sarah E. Null & Joshua H. Viers, *In bad waters: Water Year Classification in Nonstationary Climates*, 49 WATER RES. RESEARCH 1137,
<http://onlinelibrary.wiley.com/doi/10.1002/wrcr.20097/pdf>

Jayantha Obeysekera and Jose D. Salas, *Quantifying the Uncertainty of Design Floods under Nonstationary Conditions*, 19 J. HYDROL. ENG'G (2014)

A. A. Oubeidillah et al., *A Large-scale, High-resolution Hydrological Model Parameter Data Set for Climate Change Impact Assessment for the Conterminous US*, 18 HYDROL. AND EARTH SYSTEM SCI. 67 (2014)

Kyle O'Neil et al., *Modeling the Impact of Climate Change on Hydropower Operations in the Connecticut River Basin*, WORLD ENVTL. & WATER RES. CONGRESS 1175 (2013)

James S. Risbey et al., *Well-estimated Global Surface Warming in Climate Projections Selected for ENSO Phase*, 4 NATURE CLIMATE CHANGE 835 (2014)

Ana Rosner et al., *A risk-based approach to flood management decisions in a nonstationary world*, 50 WATER RES. RESEARCH 1928 (2014)

Harinder Singh & A. Sankarasubramanian, *Systematic Uncertainty Reduction Strategies for Developing Streamflow Forecasts Utilizing Multiple Climate Models and Hydrologic Models*, 50 WATER RES. RESEARCH 1288 (2014),
<http://onlinelibrary.wiley.com/doi/10.1002/2013WR013855/full>

Markus Schnorbus & Alex Cannon, *Statistical Emulation of Streamflow Projections from a Distributed Hydrologic Model: Application of CMIP3 and CMIP5 Climate Projections for British Columbia, Canada*, 50 WATER RES. RESEARCH 8907 (2014),
<http://onlinelibrary.wiley.com/doi/10.1002/2014WR015279/full>

R. R. Shrestha, D.L. Peters, & M.A. Schnorbus, *Evaluating the Ability of a Hydrologic Model to Replicate Hydro-ecologically Relevant Indicators*, 28 HYDROL. PROCESS., 4294 (2014)

Steven A. Stratz & Faisal Hossain, *Probable Maximum Precipitation in a Changing Climate: Implications for Dam Design*, 19 J. HYDROL. ENG'G (2014)

Xuezhi Tan & Thian Yew Gan, *Nonstationary analysis of annual maximum streamflow of Canada*, 28 J. CLIMATE 1788 (2015)

Julie A. Vano et al., *Understanding Uncertainties in Future Colorado River Streamflow*, 95 BULL. AM. METEOR. SOC'Y 59 (2014)

Cameron Wobus et al., *Hydrologic Alterations from Climate Change Inform Assessment of Ecological Risk to Pacific Salmon in Bristol Bay, Alaska* 19 PLOS ONE (2015), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0143905>

Luo Yuzhou et al., *Assessment of climate change impacts on hydrology and water quality with a watershed modeling approach*, 450-451 SCI. TOTAL ENVIRON. 72 (2013), <http://www.ncbi.nlm.nih.gov/pubmed/23467178>

20160624-5024

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

June 23, 2016

Re: Comments on the Alaska Energy Authority's Initial Study Report and Supplemental Filings, Susitna-Watana Hydrologic Project No. 14241-000

On behalf of Susitna River Coalition, Talkeetna Community Council, Alaska Survival, Talkeetna Defense Fund, Alaska Center, Trout Unlimited, and Wild Salmon Center we offer comments and proposed modification to the Alaska Energy Authority's wildlife studies including Moose Distribution, Abundance, Movement, Productivity, and Survival (10.5), Caribou Distribution, Abundance, Movements, Productivity and Survival (10.6), Dall's Sheep Distribution and Abundance (10.7), Distribution and Abundance, and Habitat Use of Large Carnivores (10.8), and Wolverine Distribution and Abundance (10.9).

On June 4, 2014, the Alaska Energy Authority (AEA) filed its Initial Study Report (ISR). Pursuant to Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP) regulations, the ISR details AEA's "overall progress" in implementing the FERC approved study plan and reports on the data collected. 18 CFR §5.15(c)(1). For this particular project, in addition to the initial ISR filing, FERC also determined that AEA's 2014 Technical Memorandum and other supplemental study implementation reports and study completion reports filed later by AEA also "serve the intent of the ISR" and are reviewable during this comment period.¹

Under the ILP, the default study period for most projects is 1-2 years, however, FERC may require potential applicants to extend this study period if additional study time is necessary.² The required length of each study is "case specific."³ Licensing participants have the opportunity to review the ISR and file comments and proposed "modifications to ongoing studies or new studies" including additional seasons of study. 18 CFR §5.15(c)(4). A showing of good cause" is evaluated on a case-by-case basis, and FERC with broad discretion, may require a potential applicant to conduct additional studies, or extend the study season.⁴ Proposed modifications must be made with a showing of "good cause" and must include a "demonstration that (1)[a]pproved studies were not conducted as provided for in the approved study plan; or (2) [t]he study

¹ FERC Letter, ILP Process Plan and Schedule, Project No. 14241-000, December 2, 2015.

² A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria, Federal Energy Regulatory Commission, March 2012, Page 13.

³ Guide to Study Criteria, at 13.

⁴ See 16 U.S.C. § 797, 42 U.S.C. § 4321, 18 C.F.R. § 5

was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way.” 18 CFR §5.15(d).

Currently AEA is conducting 58 FERC approved studies to collect the information needed to support a license application. The studies are designed to collect baseline information on the Susitna River and the fish, wildlife, botanical resources and other recreational, aesthetic and cultural resources that may be impacted by the proposed project’s construction and operation. These studies are conducted in “preparation of quality environmental documents,” which “plays a critical role in the hydropower licensing process.”⁵ Notably, these studies must be adequate to evaluate the cumulative effects of the project on area resources over a “30-50 year licensing term” as well as robust enough to “evaluate the beneficial and adverse environmental effects of the proposed project” and any “impacts of continued operation of the project.”⁶

We offer comments on the wildlife studies conducted by AEA. The Initial Study Reports, Supplemental Study Reports, and Study Completion Reports filed by AEA illustrate many problematic variances, data collection under anomalous environmental conditions, and the omission of important studies. We do not believe that the studies as presented by AEA are adequate to predict the impacts of the proposed Susitna-Watana project to wildlife and habitat. For that reason, we propose FERC requires AEA to conduct additional wildlife studies, as is summarized in the comments contained in this letter and the more detailed comments of Sterling Miller, incorporated by reference herein, to obtain adequate baseline data for proper analysis of the project’s potential impacts.

Moose Distribution, Abundance, Movement, Productivity, and Survival (10.5)

The proposed Susitna dam has the potential to significantly impact moose and moose habitat. Potential impacts include a decrease in winter moose browsing habitat, increased hunting pressure due to the development of new access roads and transmission lines, and more vehicular collision fatalities.

The Moose Distribution, Abundance, Movement, Productivity, and Survival Study (10.5) seeks to document the “population and composition” of area moose and assess “the relative importance of the habitat in the inundation zone, proposed access/transmission corridors, and the riparian area below the Project.”⁷

⁵ Preparing Environmental Documents, Guidelines for Applicants, Contractors, and Staff, Federal Energy Regulatory Commission, September 2008, page v.

⁶ 18 C.F.R. § 5.18(b)(2)-(5)

⁷ Moose Distribution, Abundance, Movements, Productivity, and Survival Study, Final Study Plan, Susitna-Watana Hydroelectric Project, FERC No. 14241, July 2013, Page 10-2.

I. The Moose Study should be modified to require AEA to collect additional collared moose survey data during winter months when low-elevation moose use the inundation area.

A primary objective of the Moose Study (10.5) is to “document the level of late winter use of adults and calves in the proposed inundation area.”⁸ The approved study plan called for deploying VHF and GPS collars on moose in the project area with “monthly areal radio-tracking surveys.”⁹ However, during the 2014-2015 winter, AEA reported that “the study team ceased monthly radio-tracking flights of VHF-collared moose in the winter months of December, January, February, and April.”¹⁰ AEA justified the decision stating that winter monitoring was unnecessary “[b]ecause little movement typically occurs during those months.”¹¹ We do not believe that AEA can meet the FERC approved study objectives without collecting year round data on moose populations in the vicinity of the inundation zone.

We hired wildlife expert Sterling Miller to review the Moose Study and offer comments. *Please refer to the attached report for more detailed comments.* He specifically identified this variance to the FERC approved study plan as particularly problematic. Low elevation moose are most likely to use the inundation zone during the peak four winter months.

“While it is true that moose move less during winter, this modification will result in far fewer locations of the VHS-collared (sic) moose during the season when they are at lowest elevations and in closest proximity to the proposed impoundment. This modification, therefore, will result in a bias against locations of moose at a time when moose are most likely to occur in the area that will be most affected by the proposed impoundment. This is also at the time of year when moose are most stressed by browse availability and other winter stresses. Correspondingly, the locations of VHS (sic) collared moose cannot be used to evaluate habitat selectivity of moose during this critical period.”¹²

⁸ Initial Study Report (ISR), Moose Study (10.5), Part A at 2.

⁹ Moose Final Study Plan, at 10-4

¹⁰ Moose Distribution, Abundance, Movements, Productivity, and Survival 2014-2015 Study Implementation Report, Susitna-Watana Hydroelectric Project, FERC No. 14241, November 2015, Page 3

¹¹ *Id.*

¹² Miller, Sterling, Moose comments Su-Hydro ISR by Alaska TU, Wild Salmon Center, and Sterling Miller, page 2

Additionally, by eliminating winter surveys of VHF-collared moose, the sample size of comparative data is greatly reduced, eliminating 62% of the collared moose from the habitat selectivity data.¹³

“To avoid underestimation of impoundment use by VHF-collared animals, however, it will probably be necessary to restrict analysis of point location data to GPS-collared animals. This will greatly reduce the sample size of individuals that can be used to document late winter habitat use by moose in the proposed inundation area. It will also reduce the number of moose available to describe subherds as winter use of habitats by subherds tend to be distinct during winter.”¹⁴

This variance from the approved study plan decreases the sample size and fails to document the use of adults and calves in the inundation zone during winter months as required by the FERC approved study plan. For the foregoing reasons, FERC should modify the Moose Study and require AEA to conduct at least one additional year of year-round moose surveys that includes sampling during the winter months.

II. The Moose Study should be modified to require AEA to collect additional moose browse data on CIRWG lands in close proximity to the dam site.

FERC approved study plan directs AEA to “document moose browse utilization in and adjacent to the inundation zone and the riparian area below the Project.”¹⁵ During the 2013 study season, AEA reported an important variance that prevented access to some of the sample plots for moose browse because AEA had not secured access agreements to Cook Inlet Regional Working Group (CIRWG) lands.¹⁶ The CIRWG lands are in close proximity to the Susitna River and the dam site. These lands were also identified by AEA as “high” for browse.¹⁷ AEA attempted to work around the problem by replacing these sample plots with others in a different location that had the same moose density classification.¹⁸

Wildlife consultant Sterling Miller contends that this is problematic for the moose habitat data:

¹³Miller, Sterling, et. al., Moose comments at 2.

¹⁴ Miller, Sterling, et. al., Moose comments at 6

¹⁵ Moose Final Study Plan, at 10-2.

¹⁶ Moose, Initial Study Report, Part A – Page 5

¹⁷ *Id.* at 15.

¹⁸ Moose, Initial Study Report, Part A – Page 5

“Doing this assumes that all quadrats within the “high” stratum for browse are equivalent in terms of having more or less browse than the average quadrat within the high stratum. This is not a valid assumption.... [A]ll quadrats classified as “high” are not equal, and the lowest elevational quadrats likely have more moose browse and browse utilization than the higher elevational quadrats within the same stratum.”¹⁹

AEA’s study “work around” will likely “result in *over-sampling* of browse plots distant from the impact areas and *under-sampling* of plots where impacts of the project will be least and most significant.”²⁰ Any impact assessments based on the browse data collected “will likely be biased unless this is corrected.”²¹ To correct these biases and meet the objectives of the FERC approved study plan, FERC should require AEA to collect additional browse data and adopt plot selection and categorization methods that take into account elevation and proximity of the plots to the project area and the Susitna River.

III. The Moose Study should be modified to require AEA to collect additional survey data to replace the information that was collected under anomalous weather conditions in 2013 and better describe and identify subpopulations.

Data collected during the spring of 2013 were collected under anomalous environmental conditions. Some of the moose surveys were conducted during “the unusually late spring in 2013.”²² These abnormal conditions likely affected moose movements, calving area, and survival of the moose in the project area. Since very few years of moose telemetry surveys were planned, it is critical that baseline data is reliable. Samples taken during a very unusual year can dramatically skew the data. To establish a reliable baseline for moose populations in the project area, FERC should require AEA to conduct at least one additional year of data collection under normal environmental conditions.

¹⁹ Miller, Sterling, et. al., Moose comments at 2.

²⁰ Miller, Sterling, et. al., Moose comments at 6.

²¹ Miller, Sterling, et. al., Moose comments at 6.

²² Initial Study Report, Caribou Distribution, Abundance, Movements, Productivity, and Survival Study, Alaska Energy Authority, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, June 2014, Part A – Page 5.

In addition, additional surveys should be conducted to identify subpopulations of moose in the study area. “Ballard and Whitman (1988) identified 11 different subpopulations of moose, all of which had different patterns of movement and habitat use and would have been impacted by the then-proposed impoundment in different ways. In the ISR, all moose are treated as if they were part of one big subpopulation.”²³

Some subpopulations of moose are likely to be more impacted by the proposed project due to differences in behavior and habitat use patterns. It is critical to identify subpopulations to properly assess impacts on moose populations. For that reason, FERC should require AEA to conduct additional moose surveys to identify subpopulations, behavior and habitat use patterns.

Caribou Distribution, Abundance, Movements, Productivity and Survival (10.6)

Caribou heavily use the area in the vicinity of the proposed Susitna dam. Over time, different herds have used the area so the impacts to each herd can vary dramatically depending on the caribou range at the time of the study. Fundamentally, “[c]aribou need large landscapes in which to survive in large herds. When formerly large landscapes are infringed on or limited by developments, it limits the ability of caribou to shift their movements and centers of distribution in a pattern that have evolved over thousands of years. Large herds need large landscapes and without them caribou cannot survive in large herds.”²⁴ The proposed project will likely prevent the large established herds from remaining together, hinder caribou from accessing traditional calving grounds, disrupt migratory patterns and access to habitat.

The Caribou Study is designed to “obtain sufficient population information on caribou to evaluate project effects on important seasonal ranges, such as calving areas, rutting areas, wintering areas, and migration/movement corridors.”²⁵ For the following reasons, we believe that the Caribou Study needs to be modified to address identified variances and ensure that AEA collects adequate baseline data to assess impacts.

I. The Caribou Study should be modified to require AEA to collect additional years of radio collared data to achieve appropriate levels of resolution on all caribou herds using the study area.

²³ Miller, Sterling, Caribou comments Su-Hydro ISR by Alaska TU, Wild Salmon Center, and Sterling Miller, at 3.

²⁴ Miller, Sterling, Caribou comments Su-Hydro ISR by Alaska TU, Wild Salmon Center, and Sterling Miller, Page 2.

²⁵ Caribou Initial Study Report, at Part C - Page 1; *See also*, Final Study Plan, Alaska Energy Authority, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, July 2013, Page 10.6-1.

Two primary objectives of the Caribou Study are to “document seasonal use of and movement through the Project area by both females and males of the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH) and assess the relative importance of the Project area to both the NCH and DCH.”²⁶ To accomplish this task, AEA deployed radio collars on caribou from the NCH and DCH.

However, AEA reported one problematic variance in the caribou study. Due to the mixing of the herds within the study area, AEA did not deploy the collars on the individual caribou based on their associated herd.²⁷ Instead, after collar deployment and monitoring AEA grouped the collared caribou as the “Western Migratory Group” and the “Eastern Migratory Group” based on winter movements.²⁸ While wildlife expert Sterling Miller noted that the variance is reasonable because AEA’s plan to designate herds is sound, he does not believe that adequate herd designations and proper resolution can be accomplished without additional years of study and the recognition of additional caribou groups, specifically the Chulitna group and the Cantwell group. *(Please see the attached Caribou Study review for more detail.)*

“Because of the complicated nature of the herds and groups in the vicinity of the proposed Susitna-Watana Impoundment, many years of study will be necessary to sort out which groups or herds will be most impacted and how these impacts will occur; especially since there is significant year to year variation in movements and areas utilized. It is unlikely that these relations can be adequately sorted out with only 2-3 years of study of radio-marked individuals especially if resolution is lost by recognizing only two groups as is done in the current study (the WG and the NCH).”²⁹ “Appropriate levels of resolution on all the groups using the study area are unlikely to be obtained with only 2-3 years of study.”³⁰

AEA recognizes that “herd designations remain the best tool for understanding caribou population dynamics and quantifying the potential effects of development.”³¹ For that reason and given the fact that Caribou have extremely wide ranges, “to adequately study the range, grazing patterns, productivity, important breeding and calving areas, and other important areas to a caribou herd, it is important to conduct

²⁶ Caribou Initial Study Report, Part A at 1.

²⁷ Caribou Initial Study Report, at Part A - Page 3.

²⁸ Caribou Initial Study Report, at Part A - Page 3.

²⁹ Miller, Sterling, et. al., Caribou comments at 3.

³⁰ Miller, Sterling, et. al., Caribou comments at 4.

³¹ Caribou Initial Study Report, at Part A-Page 3.

studies for more than 2-3 years.”³² For the aforementioned reasons, FERC should modify the Caribou Study and require AEA to collect additional years of radio collared data to achieve appropriate levels of resolution on all caribou herds using the study area to fully understand and assess project impacts.

II. The Caribou Study should be modified to require AEA to collect additional years of information to address data gathered under anomalous environmental conditions during the 2013 study season.

The caribou surveys conducted during the spring of 2013 were preformed under anomalous environmental conditions. In the ISR, AEA acknowledges that “spring migration and peak calving were delayed during the *unusually* late spring in 2013 and very few collared cows were found on the traditional calving grounds... during the typical period of peak calving.”³³ “A very high proportion of parturient cows lost their calves in 2013 (66%). This is much higher than reported in previous studies for the NCH based on work conducted during 2008 (Schwanke 2011).”³⁴

“Caribou productivity and survival is variable between years and areas based on habitat quality and weather conditions.”³⁵ The heavy and late snows of 2013 as well as the colder weather in April and May of 2013 likely caused Caribou herds to dramatically alter normal migratory movements. It also significantly increased adult and calf mortality. To meet study objectives and assess potential impacts it is imperative that AEA collect accurate baseline data especially when conducting a short term study for a species that has long term trends. For these reasons, FERC should modify the Caribou Study and require AEA to collect additional years of information to address data collected under anomalous environmental conditions to ensure accurate and reliable baseline data.

Dall’s Sheep Distribution and Abundance (10.7)

Please see the attached review by Sterling Miller for comments on the Dall’s Sheep Study. These comments were prepared based on the June 3, 2014 Initial Study Report. The review has not been subsequently updated.

³² Miller, Sterling, et. al., Caribou comments at 4.

³³ Caribou Initial Study Report, at Part A – Page 5.

³⁴ Caribou Comments, Sterling Miller at 4.

³⁵ Miller, Sterling, et. al., Caribou comments at 5.

Study of Distribution, Abundance, and Habitat Use by Large Carnivores (Wolves and Bears) (10.8)

Bears (10.8)

I. The Bear Study should be modified to require AEA to collect additional survey information and samples in the vicinity of the Susitna project.

The goal of the Large Carnivore study is to “obtain sufficient information on three species of dominant predators and game animals in the region- brown bear, black bear, and wolf-to use in evaluating Project related effects and identifying any appropriate protection, mitigation, or enhancement measures.”³⁶ The Bear Study was designed to be a combination of a “desk analysis” with a field study component.³⁷ AEA identified the Study Area as all of Game Management subunit 13E plus subunits 13A, 16.A and 16B.³⁸ For purposes of the Bear Study, this is a very large study area and incorporates the analysis of study results that are very far from the proposed project.

We hired wildlife expert Sterling Miller to review the Large Carnivore Study (10.8) and provide detailed comments and recommendations. *Please see the attached Large Carnivore Study review for detailed comments.* The comments provided are based on the review of the Initial Study Report filed in June 2014. While AEA conducted additional field work in 2015 and updated its report by noting that field work is complete, we do not believe that AEA has sufficient information to meet the study objectives or evaluate project effects.³⁹

- a. AEA should continue to collect additional bear hair samples, expand the sample area north of Devils Creek and assess habitat use and movement of bears.

AEA identified two variances in the ISR regarding the hair-snag studies along the salmon spawning areas. These variances impact the ability of AEA to assess the “bear use of streams supporting spawning by anadromous fishes.”⁴⁰ Of particular concern,

³⁶ ISR, Large Carnivore Study (10.8), Part A at 2.

³⁷ *Id.* at 1.

³⁸ *Id.*

³⁹ AEA, Study Implement Report, Distribution, Abundance, and Habitat Use by Large Carnivores, Page 7

⁴⁰ AEA, Initial Study Report, Distribution, Abundance, and Habitat Use by Large Carnivores,, Part A – Page 1

AEA did not take hair-snag samples upstream of Devil's Canyon and collected samples at less than one third of the "documented salmon spawning sites" in during the 2013 study season.⁴¹ Due to these variances "[i]t is unlikely that salmon use by bears living in the vicinity of the proposed Susitna dam site will be documented."⁴²

Although AEA conducted additional bear hair samples in 2015, no samples were taken above Devils Canyon and data gaps from the 2013 study season still remain. The continuation of hair-snag studies is not only important to assess the use of salmon spawning areas by bears, but also to assess the relative density of bears in this area. In addition, an assessment of the impacts of the proposed project cannot be conducted without information on bear habitat use and movements. AEA conducted no habitat use or movement studies of either brown or black bears in the study area. Without such, a proper assessment of the importance of the project area to bears is not possible.

For these reasons, we request that FERC require AEA to preform additional years of hair-snag sampling, including sampling upstream from Devil's Canyon. The effort "should include sample collection times relative to timing of salmon use and bear molting."⁴³ Additionally, to better assess bear use of the project area AEA should redesign the Bear Study to include radio-tracking bears using GPS transmitters to permit determination of bear use of project impact areas, like the studies done for caribou and moose in the project area.⁴⁴

II. The Bear Study should be modified to address fundamental problems.

- a. AEA should reduce the size of the study area to properly evaluate project effects.

AEA reported in the ISR that the study area for both brown and black bears is the same as "ADF&G's Talkeetna study area" and "includes the entire area of Game Management Unity Subunit 13E plus parts of adjacent Subunits 13A, 16A, and 16B."⁴⁵ Sterling Miller raised concerns with the size of the study area:

- "The Large Carnivore Study Area used to estimate bear density and abundance is 26,490 km². This greatly exceeds the size of the area within which bears conceivably could be impacted by the proposed Susitna Dam

⁴¹ Large Carnivore, ISR, Part A – Page 9

⁴² Sterling Miller, Bear comments on Su-Hydro ISR by TU, Wild Salmon Center, and Sterling Miller at 6.

⁴³ Miller, Sterling Bear comments at 19

⁴⁴ Miller, Sterling Bear comments at 14

⁴⁵ Large Carnivore, ISR, Part A – Page 2

project. This study area was configured for an estimate based on data collected during 2000-2003 that was unrelated to Susitna Dam studies.”⁴⁶

- “The Large Carnivore Study Area is too large to accurately meet study objectives for Large Carnivores that would be impacted by the proposed project... The method currently being used does not provide an abundance or a density estimate for either species of bear in the area that will be impacted by the impoundment.”⁴⁷

We propose that the population and density study analysis follow the study area used for the Su-Hydro bear studies in 1987, which “was 1,317 km² centered on the proposed Watana-Susitna dam site”.⁴⁸

- b. Single season surveys were conducted during the spring only, due to decreased visibility in the summer and fall from flora growth, this created a bias in the density assessments, and additional studies in additional seasons need to be conducted to fix this bias.

AEA conducted bear density and population studies during the spring months when the likelihood of observing individual bears is higher due to limited foliage growth. However, this biases the density estimates, as bear activity, location, and density differ throughout the seasons based on food availability. Sterling Miller identified the biases this single-season sampling has on density maps and population estimates.

- Spring location of bears include avalanche tracts “where bears forage for newly emergent vegetation and tubers.” Spring locations may also “reflect the presence of a winter-killed or wolf-killed ungulate.”⁴⁹
- In the spring months bears are “searching for mating opportunities or avoiding predation on their newborn cubs. Many spring sightings, therefore, occur in places a bear is moving through rather than exploiting for food.”⁵⁰
- AEA density maps show the highest density of bears along the 5,000 foot contour, however the density of bears as abnormally high “only because bears emerging from dens occur here in the spring; the food resources available in this area are

⁴⁶ Miller, Sterling Bear comments at 2

⁴⁷ Miller, Sterling Bear comments at 6-16

⁴⁸ Miller, Sterling Bear comments at 6

⁴⁹ Miller, Sterling et. al. Large Carnivore comments, at 4

⁵⁰ Miller, Sterling Bear comments at 5

inadequate to support a high density of bears throughout the year”⁵¹ and “because during spring, many bears (especially females with newborn cubs [Miller 1987]) occur in the vicinity of their high elevation dens where there is no food in order to avoid infanticide of their cubs by other bears.”⁵²

- AEA reported that proximity to salmon streams was not a driving factor in brown bear abundance.⁵³ However, these surveys were conducted in the spring when salmon are not yet spawning in the rivers, therefore bears are not yet using these anadromous areas. “This does not mean that the driving force influencing and correlated with brown bear density in the Large Carnivore Study Area is not salmon.”⁵⁴
- The factor most influencing bear density is the abundance and spatial distribution of food (Schwartz et al. 2003). In the Large Carnivore Study Area and most other places with bears, brown bear density is more influenced by availability of salmon for food than by any other factor. However, bears are not on salmon streams during spring when the MRDS surveys were conducted because the salmon have not yet arrived.”⁵⁵

The single-season sampling methods employed by AEA influenced the density estimation maps of the study area, overestimating densities in high elevations at great distances from salmon spawning streams, and underestimating densities in close proximity to streams. The resulting biases in the density maps underestimate the importance and use of the salmon streams by bears in the project area, and prevent an accurate assessment of the impacts of the proposed project and changes in the project area to bears. Although AEA conducted an additional season of data collection in 2015, additional study seasons are necessary to fill data gaps from the 2013 study season and properly estimate bear distribution and abundance in the project area. To rectify these biases, we urge FERC to require AEA to conduct additional density studies during the summer and fall months, as well as incorporate density estimates from hair-snag studies to accurately estimate the density of bears in the project area.

⁵¹ Miller, Sterling Bear comments, “This problem was identified in the ISR (page 10): “[the modeling effort] left the concentrations of brown bears in the northeastern portion unexplained...[and] the study team surmised that brown bears were overestimated in the northeastern portion of the study area...” at 5.

⁵² Miller, Sterling Bear comments at 5

⁵³ Large Carnivore, ISR Part A-Page 10

⁵⁴ Miller, Sterling Bear comments at 8

⁵⁵ Miller, Sterling Bear comments at 4

III. The Bear Study should be redesigned to address fundamental problems related to the MRDS study method to properly estimate the density and abundance of bears in the study area and assess project impacts.

AEA reported in the Study Implementation Report that no additional data is needed for the Bear Study because “the objective to estimate the populations of brown and black bears has been completed.”⁵⁶ Due to AEA’s numerous modification request to the ILP, this is the first time licensing participants are able to fully comment on AEA’s study progress. The data results and analysis reported by AEA in the ISR contain glaring errors that suggest underlying biases and inaccuracies. We do not believe that AEA has sufficient information to meet the study objectives or assess project impacts as required by the FERC approved study plan. We recommend that the Large Carnivore studies be modified to require AEA to preform additional years of field work to fix errors in the study results.

a. Density surface maps created from MRDS results show inaccurate densities of bears

AEA employed a “mark recapture distance sampling” technique to estimate the density and population of bears within the study area.⁵⁷ Sterling Miller points out that, this technique has an “underestimation bias even with the correction added based on point independence.”⁵⁸ “This approach ... is under development for bears in Alaska... this technique, as currently envisioned for use in Susitna studies, has not been subjected to peer review⁵⁹ and does not meet the criteria established by AEA for Susitna Dam studies that techniques must be ‘consistent with generally accepted scientific practice.’”⁶⁰

Density maps generated from AEA’s MRDS studies present inaccuracies in the data collection and analysis compared to previous peer reviewed studies on brown and black bears, some in the same area. For instance, AEA reported estimated high density of brown bears in high elevation areas that cannot support those densities, and low density in areas near salmon streams that should show a high number of bears. The extremely

⁵⁶ Miller, Sterling Bear comments at 2

⁵⁷ Large Carnivore, FSP at Page 10.8-5

⁵⁸ Miller, Sterling Bear comments at 7

⁵⁹ Becker (ADF&G, personal communication) reports that publications on point independence reanalysis of MRDS data are in preparation. Similar techniques have been used for other species and are reported in the literature.

⁶⁰ Miller, Sterling Bear comments at 14

high densities of both bears in some areas and low density calculations in others point to underlying biases and errors in the study. In addition, AEA's density map "indicates **lower** densities in southern and western portions of the Large Carnivore Study Area where bears have access to multiple runs of salmon, than in interior areas where bears do not have access to salmon. All available studies indicate that where brown bears have access to multiple runs of Pacific salmon, densities are much higher than in interior areas."⁶¹

As concluded by Sterling Miller, "[t]he indicated densities appear much too high based on comparisons with densities reported in other studies. This indicates, at best, a calibration problem and makes the density surface maps useless for the purpose of determining how many bears use any portion of the Large Carnivore Study Area. Additionally, the ISR does not even attempt to provide estimates of the number of bears of either species that will be impacted by the proposed project (much less the level or mechanisms of such impacts). There is no indication that any additional effort will be forthcoming in subsequent reports to provide information pertinent to evaluating project impact on bears."⁶²

For those reasons, we propose AEA be required to conduct additional data analysis using available data from the current study to evaluate abundance and density estimates that can be compared to Su-hydro studies conducted in 1980s.

- b. Calculated detectability of bears in the surveys was overestimated in the report, which resulted in the underestimation of the total number of bears in the study area.

It is likely the observation of bear in the study area during surveys lacked independence, raising the detectability rate of the bears and resulting in the underestimation of bears in the study area. The mark recapture distance study relies heavily upon the independence of the two observers to calculate an accurate estimate of bear density and abundance in an area. AEA reported that the two observers (flight passenger and pilot) were separated by curtain to maintain independence. Sterling Miller indicates that this is key to the success of the model,

"The most critical assumption in this technique may be that the sightings by each observer are independently obtained; a sighting by one observer must not influence the likelihood that the other will also see the

⁶¹ Miller, Sterling Bear comments at 3

⁶² Miller, Sterling Bear comments at 5

bear. The importance of this assumption was evaluated by Benson (2010). Violations of this assumption will lead to a systematic underestimation bias.”⁶³

Review of the densities and estimated population size of brown bears in the study area reported by AEA, and previous studies in the area, indicates the model resulted in the underestimations. Sterling Miller suggests that this underestimation is likely due to the violation of the assumption of independence,

“We suspect that this underestimation bias most likely resulted from lack of independence between observers in the aircraft during MRDS surveys. Lack of independence between observers would lead to overestimation of detection probabilities which would cause underestimation of bear abundance.”⁶⁴

The possible lack of independence in the mark recapture distance surveys poses a major problem of the assumptions in the bear density and abundance estimations which need to be addressed. We propose AEA be required to conduct additional season of field work in the study area using the Capture-Mark Resight methods presented in the comments by Sterling Miller and summarized below.

Recommended Modification

Bear studies should be redesigned to permit direct estimation of the number of bears in the area likely to be impacted by the proposed impoundment, rather than the current study area which is approximately 20 times larger. The method currently being used does not provide an abundance or a density estimate for either species of bear in the area that will be impacted by the impoundment. CMR, hair-snaring DNA studies, and/or Resource Selection Function studies based on data from radio-marked bears are all appropriate techniques that should be considered to provide useful information for evaluating project impacts on bears. Depending on techniques used, this would require 2-4 years of study with the quickest result from DNA hair snaring studies (e.g., Kendall et al. 2009, Boulanger et al. 2002). This is particularly important for brown bears. The estimates derived by Miller (1987) for black bears are unlikely to have changed much in the Susitna Dam area.

⁶³ Miller, Sterling Bear comments at 25

⁶⁴ Miller, Sterling Bear comments at 3

- c. AEA should use different methods to survey bears in forested areas to accurately evaluate density and abundance.

AEA reported observations and estimated density for both brown and black bear within the study area in the ISR. Low density areas reported by AEA include large forested areas. The inability of AEA observers to see bears within this area likely contributed to the underestimation of density and population for both brown and black bear in this area.

“The reason there are no previous bear density or population estimates in the western and southern portion of the Large Carnivore Study Area is because much of the bear habitat in this area is forested. It is very difficult to use techniques based on observations in habitats where bears cannot be seen because of overstory vegetation... if any bears present in the study area cannot be detected, then any analytical technique based on observations will underestimate abundance.”⁶⁵

These non-observances of bears in the forested areas are particularly problematic for the estimation of black bear in the area, as ideal black bear habitat includes heavily forest areas. Sterling Miller expresses the impact this likely had on AEA’s reported estimations,

“We suspect this is because black bears living in these lightly forested or shrubby riparian habitats penetrating to the northeast in the middle of the study area are more likely to be seen than in the more heavily forested habitats further south and west where higher density black bear populations most likely occur. This is because these are the most forested habitats that are preferred by black bears. Black bears occur primarily in forested habitats and, in the project area, in the riparian

⁶⁵ Miller, Sterling Bear comments at 2, who notes In the key paper on mixed mark-recapture and line transect models, Laake et al. (2008:299) noted: *“In particular, it is much more difficult to cope with availability bias and it will typically require additional effort such as a known marked population [references], separating in time between surveys [references], or an independent estimation of the availability process [references]”*. Availability bias is when animals are not available for detection (e.g., hidden by vegetation). In the same paper (page 300) the authors acknowledge that for double-count methods (such as used in the current study): *“...these methods cannot account for animals that are unavailable to both observers.”* Further (page 301) these authors acknowledge that when some groups are hidden (unavailable to be seen), it represents a form of heterogeneity *“...that cannot be modelled with mark-recapture and, unfortunately, it is a fairly common form of heterogeneity”*.

habitats along the upper Susitna River and its tributaries like Watana Creek (Miller 1987).”⁶⁶

We propose FERC require AEA to conduct additional studies in the project area using the capture mark resight methods as described below in Section IV and in attached comments by Sterling Miller.

- d. AEA’s study methods limited the number of bears recorded by observers, which contributed to the underestimation of bear populations in the study area.

Limitations in AEA’s methods likely resulted in observers missing or not counting bears present in the study area, which contributed to the underestimation of the population and density of bears in the study area. Bears above 5,000 feet, those outside of the transect lines, and any which were “incidental” sightings were not counted in the abundance, density, or population calculations, and reduced the number of estimate bears in the study area. FERC should require AEA to conduct additional data collection consistent with the capture mark resight methods which use all bear sightings in calculating the population and density of bears in the study area.

IV. The Bear Study should be modified to require AEA to use the CRM method rather than the MRDS method to estimate the density and abundance of bear populations in the study area and assess impacts.

For the aforementioned reasons, we urge FERC to require AEA to conduct further studies of bears within the project area, using the capture-mark resight methods outlined by Sterling Miller below and supported by the attached Bear Study review. The capture-mark resight method is not only a peer-reviewed and accepted method for bear research, but also more accurate method of estimating bear abundance and density. This modification will ensure that AEA has sufficient information to assess project impacts and develop a mitigation plan to address adverse impacts consistent with the purpose of the Large Carnivore Study (10.8).

⁶⁶ For both black and brown bears the apparent incorrect depiction of bear densities in the density surface maps presented in the ISR can be roughly evaluated using bear harvest data. Our comments on the Analysis of Harvest Data Study (Study 10.20) include a recommendation on how this can be done and why it is pertinent to the bear studies.

Proposed Modifications and Other Recommendations Bear Study (10.8)⁶⁷

1. Bear studies should be redesigned to permit direct estimation of the number of bears in the area likely to be impacted by the proposed impoundment, rather than the current study area which is approximately 20 times larger. The method currently being used does not provide an abundance or a density estimate for either species of bear in the area that will be impacted by the impoundment. CMR, hair-snaring DNA studies, and/or Resource Selection Function studies based on data from radio-marked bears are all appropriate techniques that should be considered to provide useful information for evaluating project impacts on bears. Depending on techniques used, this would require 2-4 years of study with the quickest result from DNA hair snaring studies (e.g., Kendall et al. 2009, Boulanger et al. 2002). This is particularly important for brown bears. The estimates derived by Miller (1987) for black bears are unlikely to have changed much in the Susitna Dam area. In contrast, efforts have been ongoing for decades to reduce the number of brown bears in GMU 13 so earlier estimates may no longer apply to the current population (Miller et al. 2011).
2. Redesigned bear studies should include radio-tracking bears using GPS transmitters to permit determination of bear use of project impact areas more precisely than was possible during 1980s studies using VHF collars. This study requires more than three years.
3. Although we believe the density and abundance estimates generated by this project are not biologically credible (probably because of incorrect data inputs), the idea of generating a density surface map from observational data has merit at least for other species and perhaps, if done correctly, for bears as well. The spatial modeling for this project has apparently resulted in densities being assigned to all 1-km² cells in the Large Carnivore Study Area based on covariates where bears were seen. Smoothing software from this database was used to generate the density surface maps where shading indicated a purported gradient of bear density. A more valuable way to use these data than difficult-to-interpret shadings on a map, would be to build tables showing the number of 1-km² cells in different density categories (e.g., 0-4.9/1,000 km², 5-9.9, 10-14.9, 15-19.9, 20-24.9, etc.). This tabular data could be used to derive population and mean density estimates for a subportion of any study area (including a portion of the Large Carnivore Study Area surrounding the proposed impoundment or the 1,317 km² study area where abundance and density was estimated by Miller (1987)). We suggest that the midpoint of each density category could be used to derive these estimates. It may be possible to derive a variance for such estimates based on Coefficient of Variation surface maps such as are displayed in the ISP using

⁶⁷ Miller, Sterling, ISR Review of Brown and Black Bear Study 10.8, at 16-20.

the same 1-km² cell approach. We recommend that AEA contract to do something like this for the existing 1-km² data set for some portion of the Large Carnivore Study Area that is geographically pertinent to impact assessment studies for the proposed project. This will also be a useful test of the validity of the results generated by the MRDS approach used in this project and reported in the ISR.

4. Regardless of whether the above is done, we recommend that AEA acquire the databases used to generate the results shown in the ISR which generated the density surface and related maps so that they can be independently evaluated for problems that lead to apparent non-credible results. According to the FSP, AEA paid for the spatial analyses used to generate these products and therefore should have a right to have them. Available information presented in the ISR is inadequate to evaluate problems. We don't even know which covariates were found pertinent to the final model used to construct the density surface map and which covariates were determined to be non-significant. Neither do we know the Akaike's Information Criteria (AIC) scores for any of these covariates. This information is necessary to evaluate the results.
5. All maps in the ISR should be modified to show geographic features to permit viewers to orient themselves within the Large Carnivore Study area. The needed features include the proposed Susitna Dam impoundment and major rivers. For brown bears this includes Figures. 5.1-11 and 5.1-12 and the corresponding maps for black bears.
6. Regardless of the approach to future bear studies, the project on Wildlife Harvest Analysis (ISR Chapter 10.20) should include analysis of kill density by harvest reporting units (UCUs) in the entire Large Carnivore Study Area. This will facilitate interpretation of the logic of density surface area plots in the ISR. Recommendations for presentation of harvest data for brown and black bears are in our comments for Project 10.20.
7. The reports on bear and population density estimation techniques are too complex for those without current advanced training in biometrics. Our review of the ISR required consultation with several Alaskan biometricians, including some who have studied the techniques in question. That level of complexity is contrary to the intended purpose of the study reports. The purpose is to inform FERC, the concerned public (and professional wildlife biologists) of study progress so that the suitability of techniques to accomplish stated objectives can be evaluated. The one published paper cited as the authority for these techniques and results is also highly technical and complex (Becker and Quang 2009). If AEA is going to make a case that research

reports—and associated comment periods—are ultimately adequate to support a FERC license application, reports must be presented in a way the interested and reasonably well-educated public can understand. Other study reports for terrestrial species were adequately comprehensible, but this was not the case for the bear portion of the Large Carnivore ISR that involved estimating bear abundance, density and creating the final products based on spatial modeling.

8. If the experimental MRDS approach continues to be employed in Susitna Dam impact assessment studies, power analyses must also be conducted to determine what level of change would be detectable utilizing a subsequent application of the approach (e.g., post dam construction) in the same study area. Walsh et al. (2010) conducted a rigorous power analysis, without which, the management utility of any technique cannot be evaluated.
9. A sensitivity analysis should also be conducted. This will permit evaluating the impact on final results of not observing a subset of randomly selected bear groups on the estimate of bear population size. The same kind of sensitivity analysis should be done to evaluate the impacts of having seen additional groups on the final results.
10. ADF&G chose to use an experimental technique for these studies even though a more comprehensive model for impact assessment studies has long been available to ADF&G (e.g., Flynn et al. 2012, Miller 1987). Meaningful information on changes in bear abundance, population composition, and additional information on bear use of the potential impact area could have been obtained by replicating the studies of Miller (1987) using the same study area. This study area was used to conduct 2 density estimates using CMR techniques in 1985 and 1995 (Miller 1997b). Replicating this work would provide useful information on changes and trends in the bear population. More pertinent information on dam impacts could also have been attained using Resource Selection Function techniques (e.g., Boyce et al. 2002, Manley et al. 2008, Flynn et al. 2012), or DNA hair sampling techniques (e.g., Woods et al. 1999, Kendall et al. 2009, Proctor et al. 2012).
11. Authors must be explicit about the units with which they are estimating bear numbers and bear density. Although it is not explicitly stated, the ISR estimates actually represent bears of all ages. This was based on extrapolations from mean group size observed. Absent explicit description of the units for population or density estimates, they are of little value in making spatial or temporal comparisons with other study areas.

12. Results of the MRDS technique should include search intensity (minutes searched/km²) and associated variability based on covariates (e.g., vegetation type or elevation). This facilitates comparisons with results of other techniques such as the CMR approach. The search intensity for CMR studies in the Susitna study area (“MidSu”) was 1 min/km² (Miller et al. 1997a: Table 3).
13. Tables should be provided based on number of bears seen by group size (including groups of newborn, yearling and 2 year-old cubs) and mean and median group size. This is the only information on population composition the MRDS technique can provide. This information is also useful in evaluating the extrapolation for number of groups seen to total number of bears in the population. It is also potentially very useful to evaluate whether the MRDS technique systematically under-samples groups of females with newborn cubs which are the last to exit dens in the spring (Miller 1990) and stay at high elevations near their den sites for an extended period following emergence (Miller 1987).
14. Tabular data for the MRDS technique should show range and means for detectability based on important covariates, especially group size, distance, snow cover, and vegetation. This information is important to permit evaluation of suspected overestimation bias in detectability.
15. The authors should display the locations, elevations, and dates of their MRDS transects on a study area map and in tables so that readers can see where and when transects were flown. This is necessary to evaluate likely bias in the categories of bears likely to be seen such as females with newborn cubs who tend to remain at high elevation near dens during spring.
16. The analysis of isotopes in bear hair to detect salmon use by bears should include sample collection times relative to timing of salmon use and bear molting.
17. Neither the final study plan nor the ISR have any objective associated with evaluating the impacts of proposed roads and transmission lines that will be required to support the proposed project. Although bears can and will cross these corridors, the corridors will likely result in negative impacts on movements by avoidance reactions and increased access to currently remote areas of GMU 13 for hunters and other recreationists which will increase mortality from legal hunting, defense of life and property kills, and illegal kills. There is a huge body of literature on the adverse impacts of roads and access corridors on brown bears including: Simpson (1986), Mattson et al. (1987), McLellan and Shackleton (1988), Kaswork and Manley (1990), Gibeau et al. (2002), Chruzez et al. (2003), Waller and Servheen (2005),

Cook et al. (2006), Graves et al. (2006), Graves et al. (2007), Clevenger and Huijser (2011), Proctor et al. (2012). This impact was also observed by Schwanke (2011:145): “[Brown bears in Unit 13] *are wary of motorized vehicles.*”

Wolves (10.8)

I. The Large Carnivore Study should be modified to actually “study” wolf distribution and abundance in the project area to fill important data gaps and adequately assess adverse impacts.

The studies proposed and conducted by AEA regarding wolf abundance and habitat use of the project area are wholly inadequate. AEA proposed a “desk analysis” of wolf abundance and distribution from ongoing studies conducted by Alaska Department of Fish and Game (ADF&G). However, the studies routinely conducted by ADF&G, which AEA rely upon, do not measure the abundance, distribution, or habitat use of wolves within the proposed project area.

- a. AEA should conduct field work and study a smaller geographic area in the vicinity of the project.

AEA relies on studies conducted by ADF&G to provide information to support the desk analysis of wolf use of the project area to evaluate potential impacts. The data however is “collected for a geographic area (Game Management Unit or Subunit) that is too large to be of utility in evaluating project impacts on wolves.” “These routinely-collected data pertain to the number of wolves in various Subunits of Unit 13 (at best) and will not generate any estimates of the number of wolves in the study area for large carnivores...in the much smaller area of actual impact of the proposed Susitna-Watana Dam and associated corridors.” “A study on a smaller geographic area in the vicinity of the proposed project is needed to evaluate these impacts.”⁶⁸

Although AEA conducted some field surveys in 2015, the survey only included a very small portion of the project area. These studies do not provide the data parameters and data points necessary for AEA to meet the Large Carnivore study objectives and goals for the Large Carnivore Study (10.8).

For those reasons, we urge FERC to require AEA to designate an appropriately sized wolf study area in the vicinity of the project area, conduct additional aerial surveys and propose methods to determine project methods. These methods should also include

⁶⁸ Miller, Sterling, Wolves Comments on Su-Hydro ISR by Alaska TU, Wild Salmon Center, and Sterling Miller, Page 2-3

evaluating information on the number of wolves harvested in the geographic area that would be impacted by the proposed project and corresponding corridors and transmission lines.”⁶⁹

Study of Distribution and Abundance of Wolverines (10.9)

I. The Wolverine Study should be modified to require AEA to collect additional data to fill the data gap from the first study season.

Although AEA has filed a Study Completion Report for wolverine studies, FERC should require AEA to conduct at least one additional year of data collection to meet the study objectives. The goal of the wolverine study is to “collect pre-construction baseline population data on wolverines in the Project area (reservoir impoundment zone; facilities; laydown; and storage areas; access and transmission line routes) to enable assessment of the potential impact from development of the proposed Project.”⁷⁰

Under the FERC approved study plan, “the wolverine study is a multi-year project involving evaluation of existing information and field surveys.”⁷¹ This primarily includes the use of “snow-tracking and the SUPE technique... to estimate the number and density of wolverines in the Project Area.”⁷² “Occupancy modeling is a viable approach that can be used in conjunction with the SUPE.”⁷³ In the first year of wolverine studies, due to poor weather conditions, AEA was unable to conduct SUPE surveys, instead only conducting occupancy modeling surveys.⁷⁴ AEA recognized that, “OM was unlikely to preform adequately to provide a multi-season index to wolverine populations” and “the statistical power of OM to detect changes in wolverine abundance is very low.”⁷⁵

In the ISR, AEA reported the limitations of the OM surveys, and recommends that, “the objective of establishing a population index with OM as a reliable monitoring tool in lieu of regular and repeated SUPE surveys was not achieved and future efforts should focus on SUPE surveys.”⁷⁶ We concur with AEA on this point, and propose that

⁶⁹ Miller, Sterling, et. al., Wolves comments at 5-6

⁷⁰ Wolverine Distribution, Abundance, and Habitat Occupancy, Final Study Plan, Susitna-Watana Hydroelectric Project, FERC No. 14241, July 2013, Page 10.9-1.

⁷¹ Wolverine Final Study Plan, at 10.9-1.

⁷² Wolverine Final Study Plan, at 10.9-3.

⁷³ Wolverine Final Study Plan, at 10.9-3.

⁷⁴ Wolverine Distribution, Abundance, and Habitat Occupancy, Initial Study Report, Alaska Energy Authority, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, June 2014, Part A – Page 2.

⁷⁵ Wolverine Distribution, Abundance, and Habitat Occupancy, Study Completion Report, Alaska Energy Authority, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, November 2015, Page 4.

⁷⁶ Wolverine Study Completion Report, at 4.

an additional year of SUPE surveys for wolverine be conducted to accomplish these population objectives.

II. The Wolverine Studies should be modified to require additional data collection to fill important data gaps in wolverine population studies.

AEA reported two variances for the Wolverine Distribution, Abundance, and Habitat Occupancy studies in the Study Completion Report that limit the sample size of the study, and need to be addressed.

Although AEA filed a Study Completion Report for Wolverine Distribution, Abundance and Habitat Occupancy, we propose that FERC require AEA conduct an additional year of SUPE studies to reconcile these variances with the approved study plan and meet the study objectives.

III. The Wolverine Study should be modified to require additional data collection to address biases in the SUPE data collected in 2015 and use the proper model to assess the impacts of the proposed project on wolverine habitat.

AEA acknowledges the limitations of the SUPE data collected in 2015, and recognizes the potential biases of this data in regards to wolverine abundance and habitat use. AEA recognized two important variance ins the Study Completion Report. These variances include:

- “In 2015... A band of sample units on the southern end of the survey are were excluded” from the SUPE surveys.⁷⁷ These excluded sample plots are classified as “high strata” and are the only plots classified as such on the south side of the Susitna River and in close proximity to the proposed Project Area.⁷⁸
- AEA did not conduct SUPE surveys in 2013 or 2014, due to lack of ideal snow conditions.⁷⁹ Data from SUPE surveys conducted in 2015 remains the only data available for analysis. This data is insufficient and may hold many biases, as was recognized by AEA in the Study Completion Report.

⁷⁷ Wolverine Study Completion Report, at 4.

⁷⁸ Wolverine Study Completion Report, Figure 4.1, at 15.

⁷⁹ Wolverine Study Completion Report, at 4; Wolverine Initial Study Report, at Part A-Page2.

AEA delineates multiple potential biases within the SUPE data,

- “One potentially bias of track surveys is that they may over-represent habitats and elevations that animals use in transit and under-represent habitats and elevations in which animals are relatively stationary.”⁸⁰
- SUPE “sampling was stratified, in part, by elevation and by *a priori* assumptions about habitat quality. Therefore, the data are representative of wolverine occurrence among habitats in the sample units with high elevation, alpine habitats over-represented.”⁸¹
- “Late-winter avoidance of tundra or ‘open’ habitats may be confounded by the tendency for wolverines to shift elevation seasonally, driven by snow depth and food availability.”⁸²
- “Females use natal dens for parturition... some adult females and young of the year may be missed in surveys at that time. Likewise any individuals not moving during the survey period would not be represented in the observed group of tracks, again leading to and underestimation of abundance.”⁸³

These potential biases in the data from only one short (4 day) SUPE sampling of wolverine population and habitat use increases the variability and decreases the reliability of the impact analysis of the proposed project on wolverines. We propose that FERC require AEA to conduct additional SUPE surveys to obtain adequate population baseline data for proper impact analyses.

Additionally, because the SUPE and OM studies conducted by AEA offer little insight into the habitat use of wolverines outside of a limited number winter days we propose that FERC require AEA conduct additional wolverine habitat surveys. Sterling Miller suggests,

“A good model for impact assessment studies for wolverine by ADF&G biologists was available in the ADF&G studies of Lewis et al. (2012)⁸⁴ designed to evaluate impacts of a proposed road in southeastern Alaska.

⁸⁰ Wolverine Study Completion Report, at 8-9.

⁸¹ Wolverine Study Completion Report, at 9.

⁸² Wolverine Study Completion Report, at 9.

⁸³ Wolverine Study Completion Report, at 8.

⁸⁴ Lewis, S.B., R.W. Flynn, L.R. Beier, D.P. Gregovich, and N.L. Barten. 2012. Spatial Use, Habitat Selection, and Diets of Wolverines along the proposed Juneau Access Improvements Road Corridor, Southeast Alaska. Final Wildlife Research Report, ADF&G/DWC/WRR-2012-05. 48pp.,

This model is more appropriate to meet objectives of the current study on Susitna-Watana Dam impacts as it involved GPS-equipped wolverine to evaluate habitat use in the proposed impact area. The current study will add no new information on habitat use by wolverine in the project area although this is identified as an objective.”⁸⁵

Wolverine are an elusive and difficult to study species, but important to the Susitna-Watana area ecosystem. For the aforementioned reasons, AEA should collect at least two consecutive years of SUPE data to fill important data gaps to ensure reliable baseline data and to evaluate project impacts.

Wildlife Harvest Analysis Study (10.20)

AEA reported in both the filed Initial Study Report in June 2014 that “this study was rescheduled for implementation during 2015.”⁸⁶ No additional reports on progress or results from the study have been published by AEA at this time. We propose AEA conduct this study as approved by FERC in the Final Study Plan.

All Wildlife Studies (10.5 – 10.20)

I. All of AEA’s studies on wildlife should be modified to require AEA to conduct studies that evaluate the impacts of the proposed roads and transmission lines that will be built to support the proposed project.

To satisfy FPA and NEPA requirements, FERC requires “potential applicants” to identify and describe all wildlife resources including those in “the project’s transmission line corridor or right-of-way.”⁸⁷ AEA mentioned project impacts along transmission lines and access roads in some (i.e. wolverine, moose), but not all of the wildlife study plans, additionally, AEA provides no discussion of study results or analysis of data in the Initial Study Reports, Supplemental Study Reports, or Study Completion Reports for any of the wildlife studies. Sterling Miller expressed the need for additional data and analysis in the caribou, moose, wolverine, wolf, and Dall’s sheep studies,

- The transmission lines and access roads to the project area will increase hunter access to and increase pressure on wildlife species.

Comment on Moose Studies: “Roads have negative impacts because of increased human access to formerly remote areas for hunting and other

⁸⁵ Miller, Sterling, et. al. Wolverine comments, Page 2.

⁸⁶ Wildlife Harvest, Initial Study Report, Part C – Page ii

⁸⁷ 18 CFR§ 5.6(d)(3)(v)(A)-(B)

recreation, disturbance avoidance by moose and collisions with vehicles.”⁸⁸

Comment on Caribou: “The proposed corridors will provide increased access to hunters in a formerly roadless and relatively isolated area in the heart of the Nelchina Caribou range and the Unit 13 portion of the Delta Caribou herd range. Corridor impacts will be especially significant for the Denali highway access route which passes through a large portion of the Delta Caribou herd range in Unit 13; this herd is already declining and stressed (Seaton 2011) and the Denali Highway access corridor will increase hunting pressure especially on this small herd.”⁸⁹

Comments on Wolf Studies: “Because these corridors will provide improved human access to the impoundment area, they will exacerbate already heavy human harvests and cause displacement by avoidance reactions of wolves (Ballard et al. 1984).”⁹⁰

- The transmission lines and access roads to the proposed project area will cause displacement of herds, fragmentation of habitat, and generate stress and disturbance of individuals of wildlife species.

Comments on Dall’s Sheep: “Because these corridors will provide improved human access to the impoundment area, they will exacerbate impacts associated with human presence. This is especially the case for the Denali route which is the one through the sheep range. Every effort should be made to construct this road to minimize impacts on sheep.”⁹¹

Comment on Wolverine Studies: “Because these corridors will provide improved human access to the impoundment area, they will exacerbate impacts associated with human presence.”⁹²

Comments on Caribou Studies: “These corridors will likely result in negative impacts on movements and also likely slow succession of lichens and other plants important to caribou... Of the three routes under consideration, it is likely that the Gold Creek route would have the least

⁸⁸ Miller, Sterling, et. al., Moose Comments at 5.

⁸⁹ Miller, Sterling, et. al., Caribou Comments at 6.

⁹⁰ Miller, Sterling, et. al., Wolves Comments at 6.

⁹¹ Miller, Sterling, et. al., Dall’s Sheep Comments at 3

⁹² Miller, Sterling, et. al., Wolverine Comments at 4

impact and the Denali Highway route would have the most impact on caribou (and other terrestrial wildlife species). ”⁹³

The lack of evaluation of the project’s transmission lines and access road impacts on wildlife is of great concern. To meet FERC requirements, AEA must conduct studies and evaluate the cumulative effects of the project, which includes an assessment of impacts from transmission lines and access roads. For these reasons, we urge FERC to require AEA to develop, conduct, and report on impacts associated with project infrastructure development.

Thank you for the opportunity to comment. Please see the attached expert reviews for more detailed comments, recommendations and proposed modifications.

Sincerely,

Mike Wood
President
Susitna River Coalition

Whitney Wolff
Board President
Talkeetna Community Council

Judy Price
Board President
Alaska Survival

Ellen Wolf
Board Secretary
Talkeetna Defense Fund

Ryan Schryver
Deputy Director
Alaska Center

Sam Snyder
Alaska Engagement Director
Trout Unlimited

Emily Anderson
Alaska Sr. Program Manager
Wild Salmon Center

⁹³ Miller, Sterling, et. al., Caribou Comments at 6.

Attachments

Wildlife Study Reviews Sterling Miller

- 1. Review of Moose Distribution, Abundance, Movement, Productivity, and Survival (10.5)**
- 2. Review of Caribou Distribution, Abundance, Movements, Productivity and Survival (10.6)**
- 3. Review of Dall's Sheep Distribution and Abundance (10.7)**
- 4. Review of Distribution and Abundance, and Habitat Use of Large Carnivores (10.8)**
 - a. Bear Study**
 - b. Wolf Study**
- 5. Review of Wolverine Distribution and Abundance (10.9).**

MOOSE

Comments on: Moose Distribution, Abundance, Movements, Productivity, and Survival, Initial Study Report Section 10.5 (Parts A, B and C), and Prepared for AEA, Susitna-Watana Hydropower by Alaska Department of Fish and Game, Palmer, AK. 15 pp . June 2014. (No authors named), and

Final Study Plan (FSP), Study Plan Section 10.5. Moose Distribution, Abundance, Productivity, and Survival. Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, July 2013.

Purpose of these comments: The Initial Study Report (ISR) and Final Study Plan (FSP) for the Susitna-Watana project were reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the FSP;
2. Evaluate whether data collection and analysis techniques are adequate to achieve stated objectives;
3. Evaluate whether stated objectives and study plans are adequate to evaluate impacts on moose of the proposed project
4. Evaluate and contrast earlier studies on the same project by Ballard and Whitman (1988), Becker and Steigers (1987) and Becker (1988) to determine if these results are integrated into the current project; and
5. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts.

Objectives of the moose study (ISR page 2); (Analyses of progress toward these objectives are provided in a separate section, below, by objective):

1. Document the moose population and composition in the study area.
2. Assess the relative importance of the habitat in the inundation zone, proposed access/transmission corridors, and the riparian area below the Project.
3. Document the productivity and calf survival of moose using the study area.
4. Document the level of late winter use of adults and calves in the proposed inundation area.
5. Document moose browse utilization in and adjacent to the inundation zone and the riparian area below the Project.
6. Document the amount of potentially available habitat for improvement through crushing, prescribed burning, or other habitat enhancement.
7. Analyze and synthesize data from historical and current studies of moose as a continuation of the 2012 big-game distribution and movements study (AEA 2012).

General overview comments

The ISR does not present results on many of the stated objectives. It is not unreasonable to assume, however, that the final report will present results in a way that will permit evaluation of whether the stated objectives were accomplished. Assuming that these more detailed analyses

will be done in the final report, then some of the concerns raised below based on the results to date reported in the ISR may prove to have been adequately addressed.

A “modification” from the FSP was identified to eliminate monitoring of moose marked with VHS collars during 4 months of winter 2014 (December-March). This was justified on the basis that “little movement occurs during this period” (ISR Part C, page 1). While it is true that moose move less during winter, this modification will result in far fewer locations of the VHS-collared moose during the season when they are at lowest elevations and in closest proximity to the proposed impoundment. This modification, therefore, will result in a bias against locations of moose at a time when moose are most likely to occur in the area that will be most affected by the proposed impoundment. This is also at the time of year when moose are most stressed by browse availability and other winter stresses. Correspondingly, the locations of VHS collared moose cannot be used to evaluate habitat selectivity of moose during this critical period. There are 55 VHF-collared moose and 37 GPS-collared moose so this means that approximately 62% of the transmitter-equipped moose cannot be used to estimate habitat selectivity during the time they are closest to the proposed impoundment. GPS-collared moose generate many more point locations and habitat selectivity on an annual basis will depend on this much smaller sample of individuals. It would have been far better to continue to monitor the VHS-collared moose during winter, thereby increasing the number of individuals useful to evaluate habitat selectivity and capture the wide range of individual variability that exists between subpopulations of moose.

A “variance” from the FSP was identified for the browse survey that resulted from the inability to sample cells on Cook Inlet Regional Working Group (CIRWG) lands (ISR, part C). The assertion that “...the flexibility of the browse survey methods allowed the study team to work around these lands and still meet the study objectives” (ISR PART C Page ii) is not convincing. The pertinent study objective is: “Document moose browse utilization in and adjacent to the inundation zone and the riparian area below the Project.” Inspection of Figure 5.1-4 of the ISP (page 15) reveals that all of the CIRWG lands are in strata subjectively classified as “high” for browse and are in the areas in closest proximity to the Susitna River. These are the areas where Ballard and Whitman (1988) specifically identified that moose selected preferentially during winter. Although they do not specify, it appears that the way the study team “worked around” not being able to sample the quadrats on CIRWG lands was to select another “high” stratum quadrat to sample. Doing this assumes that all quadrats within the “high” stratum for browse are equivalent in terms of having more or less browse than the average quadrat within the high stratum. This is not a valid assumption. The studies by Ballard and Whitman (1988) concluded that the lowest elevation areas (near the Susitna River where the CIRWG lands occur) are preferred by moose during winter. Inspection of Figure 5.1-4 reveals that all of the quadrats in the stratum classified as “low” are at high elevations. This supports the conclusion that there is an elevational gradient in moose browse from high to lower elevations. Correspondingly, all quadrats classified as “high” are not equal, and the lowest elevational quadrats likely have more moose browse and browse utilization than the higher elevational quadrats within the same stratum. Subjective stratification of a study area only works if all quadrats within a stratum have equal opportunities of being sampled which land access issues prevented. Alternative methods of selecting quadrats to sample based on weighting by elevation and proximity to the Susitna River should have been utilized.

It is important to identify subpopulations of moose in the study area. Ballard and Whitman (1988) identified 11 different subpopulations of moose, all of which had different patterns of movement and habitat use and would have been impacted by the then-proposed impoundment in different ways. In the ISR, all moose are treated as if they were part of one big subpopulation; this should be remedied for the final report.

There are no results reported for Objective 6 and no study mechanisms identified to achieve Objective 6 (mitigation through habitat modification). In the current ISR, there is essentially no effort made toward Objective 7 which is to integrate the results of earlier Susitna Dam studies on moose (Ballard and Whitman 1988). It is essential that this be done in the final report.

Evaluations of reported progress by objective

Objective 1. Document the moose population and composition in the study area.

No data on this objective are presented in the ISR although the general techniques for data collection are described. The processes for data collection seem generally appropriate. The GeoSpatial Population Estimator Survey (GSPE) described on page 3 of the ISR is the appropriate technique to estimate moose numbers in the vicinity of the proposed impoundment. Data were apparently obtained for moose using this technique but the study area where these data were obtained is not identified, the density strata are not illustrated, and no results from this work are reported. Corresponding, it is not possible based on information presented in the ISR to evaluate the results. Hopefully, these deficiencies will be remedied in the final report.

Although it is not clear, it is possible that the GSPE estimator was applied to the entire “moose study area” illustrated in Figure 3.1 (page 11) of the ISR. If so, this estimate will apply to an area that is too large to provide a meaningful estimate of moose numbers in the smaller area that will be impacted by the proposed impoundment. A biologically-meaningful study area surrounding the proposed impoundment needs to be identified and moose numbers estimated for this area using appropriate techniques.

Generally, techniques for estimating moose population composition have been standardized by ADF&G for many decades and it is reasonable to continue to use these techniques, as proposed in this study, to determine population composition. These data are obtained for Count Areas (CAs) 7 and 14 illustrated in Figure 3-1 (page 11) of the ISR. However, these 2 CAs include areas far from the proposed impoundment and do not include a large portion of the area immediately adjacent to the proposed impoundment. Correspondingly, it is unclear what valid conclusions can be drawn from these 2 CAs with respect to anticipated impoundment impacts on moose. At a minimum, the basis for drawing conclusions from these CAs needs to be explained in the Final Report on these studies.

The earlier ADF&G report on this project (Ballard and Whitman 1988) identified 11 subpopulations of moose in the Susitna-Watana impoundment area. It is unclear whether or not this study has an objective of identifying subpopulations. If the current study assumes that the subpopulations identified in the 1980s have not changed in distribution, numbers or behavior, the analysis will be inadequate. Ballard and Whitman clearly identified differences in behavior

(migratory, non-migratory, partially migratory) that are pertinent to evaluation of impacts. Subpopulation identity studies require reporting of the results of radio-collar monitoring in order to identify differences between groups. The results reported in the ISR treat all individuals as if they are members of a single subpopulation which is incorrect as demonstrated by Ballard and Whitman (1988). Identification of subpopulations is important for impact assessment studies as some subpopulations are likely to be more impacted by the proposed project than others. The behavior and habitat use patterns of the subpopulations likely to be most affected by the project need to be documented to assess impacts. ADF&G is aware of this as shown by an excellent paper by 4 ADF&G biologists that described the benefits of migratory behavior in a southeastern moose population (White et al. 2014).

On page 11 of the ISR (Results), it is reported that surveys were conducted daily during May 15-June 4, 2013. However, calf survival (53%) was reported to July 1. More mortality likely occurred between June 4 and July 1. Survey information after June 4 should be reported, including methodology and results.

Objective 2. Assess the relative importance of the habitat in the inundation zone, proposed access/transmission corridors, and the riparian area below the Project.

The stated variance to not monitor VHF collars during winter (December, January, February, and March) (Part C) severely compromises subpopulation identification (see more discussion of this under discussion for Objective 4). Identification of subpopulations/subherds tends to be most distinguishable based on winter, rutting season, and calving area differences in areas occupied (Ballard and Whitman 1988). Timing of movements varied between years largely based on weather (especially snow) conditions (Ballard and Whitman 1988). Numbers of moose within the Susitna-Watana impoundment during winters of moderate severity ranged from 42-580 (0.2-2.3 moose/km²) (Ballard and Whitman 1988:v). Moose occurred at lowest elevations during April (Ballard and Whitman 1988).

Figure 5.1-2 is presented to show the area defined as the “inundation zone” or “Reservoir Inundation Zone Survey Area”. The area illustrated is much larger than the area actually flooded so it presumably reflects some standardized ‘inundation zone impact area’ that is common to all studies; however, this is not clear in the report. Correspondingly, impact area should be labeled/characterized as something other than “inundation zone”. The term “inundation zone” was used by Ballard and Whitman (1988) in reference to the actual zone flooded by the impoundments and this is the literal meaning of this term.

There is essentially nothing in the FSP to evaluate impact associated with access roads or transmission line corridors. Negative impacts of access corridors on moose are well documented (e.g., Harris et al. 2014 and studies cited in that report which included 2 ADF&G co-authors). During the October 21, 2014 AEA meetings on the ISRs for terrestrial mammals, AEA staff asserted that information obtained during these studies would be used to inform the decision on which route to use and that is why specific studies on the corridors are not included in the study plans for terrestrial mammals. Although there is some logic to this proposed sequence, it will inevitably result in inadequate studies of impacts on moose for whichever access route is ultimately chosen. Roads have negative impacts because of increased human access to formerly

remote areas for hunting and other recreation, disturbance avoidance by moose and collisions with vehicles. Transmission line corridors--if not heavily used as corridors for human--may have a positive impact on moose through improvement of browse as a result of setting back successional stage.

We believe that the process for evaluating the riparian habitat below Suitina-Watana Dam is probably appropriate if numbers of point locations are adequate, especially from GPS collars (currently, n=37: 24 cows, 13 bulls)¹. Monthly monitoring of VHF collars (currently n=55: 36 cows, 19 bulls) will generate few data except during spring when they monitor calf survival daily.

Maps of point locations for VHF-collared moose are presented in this report (e.g., Fig. 5.1-2). However, it is necessary to identify the initial capture sites for these individuals in order to determine that moose captured and monitored were captured in appropriate locations to adequately represent the moose that area likely to be impacted by the project. This information on initial capture locations is also important to permit evaluation of whether the moose were captured in areas where subpopulations were identified by Ballard and Whitman (1988). It is also important to differentiate between point locations of different individuals and types of moose (i.e., sex and reproductive status: with twins, singletons, no calves, etc.), and to display and analyze data in areas beyond the inundation zone. Without data presented in this way, the adequacy of planned studies is difficult to evaluate. This should be done in the final report on moose studies.

Objective 3. Document the productivity and calf survival of moose using the study area.

Techniques are generally appropriate but no data are presented to evaluate whether analysis will be appropriate and the techniques for data analysis are presented in only the most general way. As noted above, we recommend improving interpretability of the relevance of these data by identifying them with distinct symbols on plots (figures) indicating where cows were captured in different categories (with twins, singletons, no calves, etc.).

Objective 4. Document the level of late winter use of adults and calves in the proposed inundation area.

Reaching this objective is severely compromised by the variance (described in Part C) to stop monitoring VHF collars during the 4 peak winter months (see below). Part 4.2.1 (Variances for the moose movement studies) says no variances were necessary in 2013 but, apparently, a major variance is due for winter 2014 and subsequently. See comments under Objective 2 above. Not collecting location data for VHF collars during the 4 winter months when low-elevation moose use of the impoundment impact zone is likely highest for the subpopulations most likely to be adversely affected will bias results by underestimating annual use of impoundment impact zones. Furthermore, collection of information on “distribution of radio-collared moose in the study area” was identified as an objective for the deployment of the VHF collars (ISR Part A, page 2).

¹ The studies by Ballard and Whitman (1988) involved putting either VHF radio collars or visual collars on 184 adults. GPS collar technology generally was not available during these studies.

Good winter data on moose movements can be obtained from the large number of locations documented by GPS-collared animals. To avoid underestimation of impoundment use by VHF-collared animals, however, it will probably be necessary to restrict analysis of point location data to GPS-collared animals. This will greatly reduce the sample size of individuals that can be used to document late winter habitat use by moose in the proposed inundation area. It will also reduce the number of moose available to describe subherds as winter use of habitats by subherds tend to be distinct during winter (also during calving).

Objective 5. Document moose browse utilization in and adjacent to the inundation zone and the riparian area below the Project.

Reaching this objective with regard to browse sampling plots located in and adjacent to the inundation zone is compromised by the inability to sample on plots CIRWG lands (see variance identified in Section 4.3.1). This design change will apparently result in **over**-sampling of browse plots distant from the impact areas and **under**-sampling of plots where impacts of the project will be least and most significant. This bias is evident in Figure 5.1-4 of the ISR (Part A, page 15). Correspondingly, impact assessments likely will be biased unless this is corrected. The provided justification² of this problem is insufficient.

One way to avoid this apparent sampling bias for browse utilization plots would be to target-sample the BLM lands in the “high” strata just north and east of the CIRWG lands along Watana Creek, rather than stick to random selection of high strata plots throughout the study area. Plots available for selection can be weighted based on proximity to the impoundment and/or elevation. These are more equivalent high value moose winter areas to the CIRWG lands than, for example, the high strata areas in the upper Talkeetna River, upper Deadman Creek, or on the east side of the Browse Survey Study Area. It is evident from Fig. 5.1-4 (ISR, Part A, page 15) that no high density strata were sampled in the lowlands near Watana Creek which is highly important for moose based on the studies conducted by Ballard and Whitman (1988).

The importance of the unsampled quadrats in the impoundment zone (especially Watana Creek) was supported by browse data from Becker and Steigers (1987) and movement data from Ballard and Whitman (1988). Becker and Steigers (1987:24), stated:

The data on proportion of willow plants browsed, the results from analyzing observations of moose locations, and the fact that the higher elevation areas, outside the impoundment, have higher willow productivity than the lower elevation areas inside the Watana impoundment³ is consistent with the hypotheses that a large amount of the biomass found at higher elevations is not available to moose during winter...

² “...the flexibility of the established study method allowed the study team to move to alternative cells when CIRWG lands were encountered [e.g. selected by the random sampling procedure]...” (ISR, Part A, page 7). The ‘alternative cells’ available did not include CIRWG lands in the highest impact areas closest to the impoundment. It is incorrect to suggest that all alternative cells are equivalent in terms of impact based on proximity to the impoundment.”

³ There were 2 impoundments proposed in the 1980s; references to the “Watana impoundment” in those 1980s studies refer to the same dam and impoundment area as the current project under consideration. The second dam proposed in the 1980s was further downstream and referred to as the “Devils Canyon” impoundment.

The proportion of browsed willow plants found in the Watana impoundment was significantly greater than that found outside the impoundment. Browsing pressure on willows outside of the impoundments increased with decreasing elevation at a constant rate; starting at 3400 feet the expected odds a willow plant is browsed versus not browsed increases by 35.4% as elevation decreases by 200 feet. The odds that a willow plant is browsed versus not browsed appeared to be constant, over elevation, in the Watana impoundment. Ballard and Whitman (1986) hypothesized that moose were more likely to use the Watana impoundment in severe winters than in mild ones. Their data suggest that the highest use of the Watana impoundment occurs during the winter period (February 1 through April 30) and, in general, the moose population exhibits movements toward lower elevations during this period. Their analysis of habitat use by moose shows that strata in the Watana impoundment are selected for while almost all strata in the area outside this impoundment are avoided.

Ballard and Whitman (1988) focused most of their work in areas where moose were expected to be most impacted by the upstream (“Watana”) proposed project then under consideration. This “Watana” project is essentially the same project as the Susitna project currently under consideration. Ballard and Whitman (1988) conducted relatively little moose work in the vicinity of the then-proposed Devil’s Canyon impoundment further downstream on the Susitna River. However, Modafferi (1988) conducted extensive population identity and habitat use studies in Units 14A and 14B and 16A downstream of the proposed Devils Canyon project; much of this work was designed to identify potential habitat improvement areas for the purpose of mitigating for habitat losses upstream. There is no indication that current studies considered earlier work by Modafferi (1988) or incorporated it into the design of mitigation work for current studies.

Objective 6. Document the amount of potentially available habitat for improvement through crushing, prescribed burning, or other habitat enhancement.

No methods or results for documenting achieving this objective are presented. For mitigation purposes, this is an important objective. It is noteworthy that almost no habitat improvement techniques like those named in this objective have been conducted in Unit 13 for many years. Instead of habitat improvement, “predator control” efforts (liberalized bear hunting regulations and wolf control) have been favored by ADF&G in an effort to increase moose numbers.

Predator control efforts directed at wolves have been implemented for decades and are reported to have increased moose numbers. However, these efforts have been inadequate to meet moose harvest and population objectives (Tobey and Schwanke 2010). Bears potentially impact moose primarily through predation on neonatal moose (Ballard et al. 1991). In spite of dramatically liberalized bear hunting regulations and increased brown bear harvests however (Miller et al. 2011), there has been no increase in moose calf survival (Tobey and Schwanke 2010). This finding is consistent with earlier research (Miller and Ballard 1992).

Tobey and Schwanke (2010 and earlier reports), report no efforts at habitat improvement in the impoundment impact area through “crushing, prescribed burning, or other habitat enhancement.” This raises questions regarding the likelihood of implementation of these methods as project mitigation for moose impacts. These authors report a prescribed burn took place in 2004 in Unit

13B. Tobey and Schwanke (2010:159) acknowledge that “The lack of substantial fires over the past 50 years has resulted in lower browse quality” and “...productivity data suggests Unit 13 moose reproductive performance figures remain average for moose statewide”.

As a practical matter, prescribed (or natural) fires are likely the only way to improve moose browse across large areas. In limited areas such as along transmission line and road corridors, some improvements in browse quantity and quality from setback of vegetative successional stage are likely to occur.

Objective 7. Analyze and synthesize data from historical and current studies of moose as a continuation of the 2012 big-game distribution and movements study (AEA 2012).

Essentially no effort is made in the ISR to analyze and synthesize data from the earlier report by Ballard and Whitman (1988). Neither is there any indication that Ballard and Whitman (1988) formed a basis of any part of the study plan. There is very little in ISR reports for moose that suggests the pertinent earlier work from the 1980s was read, consulted, or informed the current study. This needs to be remedied in the final study report.

Ballard and Whitman (1988) list 13 “important” impacts (both positive and negative) of the proposed project and 7 “potentially important” impacts which are listed in the attached summary of their 1988 report. This 1988 report also enumerated the characteristics and main impacts on 11 subpopulations of moose in the then-proposed 2 dam project area.

Similarly, Becker and Steigers (1987) produced a detailed report on moose browse utilization in the then-proposed 2-impoundment study area that apparently did not inform the current study. Current studies should have been designed to reveal whether the current level of browse utilization (utilized or not) differs from that found by Becker and Steigers (1987). Becker and Steigers (1987) estimated total biomass lost as a result of project development, and the proportion of plants utilized. In contrast, the current study is designed only to estimate the proportion of plants utilized and does not propose to estimate biomass which is the most important parameter to estimate in terms of doing mitigation to compensate for habitat losses.

Some important conclusions from the Becker and Steigers (1987) and Becker (1988) reports with regard to losses of browse due to impacts of Watana dam⁴ construction (raising the Watana impoundment to its final height) were:

- **Stage 1** (Watana initial earthen dam): Loss of 74,430 kg of willow biomass 6,788 kg of paper birch biomass and 1,929,182 kg of mountain cranberry biomass (Table 43).
- **Stage 3** (Watana final full impoundment height): Additional loss (excluding Stage 1 losses) of 58,511 kg of willow biomass, 6,767 kg of paper birch biomass, and 1,941,003 kg of Mt. cranberry.
- Summing stages 1 and 3 resulted in total losses of 132,941 kg of willow biomass, 13,555 kg of paper birch biomass, and 3,870,185 kg of Mt. cranberry biomass. Table 43 also

⁴ In the earlier 2-impoundment studies the term “Watana impoundment” was used to distinguish the dam in the current proposal (Susitna-Watana dam) from the downstream proposed dam at Devils Canyon.

provides the upper limit of the 80% confidence interval (CI). No CI can be calculated for the lumped estimate for both stages.

- The amount of biomass above 50 cm in height lost was estimated at (Table 44, page 72):
 - Stage 1: 32,866 kg for willow and 5,000 for paper birch,
 - Stage 3: 27,593 kg for willow and 4,559 for paper birch,
 - Total: 60,459 kg for willow and 9,559 kg for paper birch (no CI for combined estimate).
- “Greatest browse utilization by moose occurred at lower elevations where less browse was produced...Utilization of browse within the impoundments (2,200 ft) during 1985 (a winter of moderate severity) was about 70%. Browsing intensity was greater within both impoundment zones than outside...The impoundment zones may be even more important to moose during severe or moderately severe winters.” (Figs. 45-46 of Ballard and Whitman 1988)
- “Winter use of the impoundment zones appeared partially dependent on snow depth...When snow accumulations made browse unavailable at high elevations, moose moved into the impoundment zones where browse was more available.” (Ballard and Whitman 1988:67)
- “The most sensitive parameter in the moose population submodel [part of the overall carrying capacity model] is the amount of browse that is available to moose as forage.” (Becker 1988:11)
- For the individual submodel, the most sensitive parameters are animal condition and diet digestibility. Overall, these parameters are the most sensitive to the whole model.

Recommendations

1. Retain winter monitoring of VHF collars as winter is a key period when dam impacts are likely to occur. Alternatively, increase numbers of GPS collars and rely on GPS collars exclusively to evaluate habitat selectivity.
2. It is extremely important to report the Winter Severity Index for each year of the study as done by Ballard and Whitman (1988). A comparable method would suffice so long as extreme conditions (or lack thereof) are associated with the results presented. Moose populations are primarily limited by browse availability which is most important in terms of moose movements and demography during extreme winters (Ballard and Whitman 1988, Becker 1988, Schwartz and Franzman 1993). There is a prevailing misconception that management of predation can overcome inadequate browse during severe winters.
3. The term “inundation zone” or “inundation survey area” is used frequently but never defined. This term is not used in the ISRs for the other terrestrial species reports we have reviewed so the biological rationale for it needs to be better explained. From the figures, it appears larger than the area flooded (as is appropriate) but it should be explicitly defined.
4. There is no direct mention of any objective to identify moose subpopulations in the study area where Ballard and Whitman (1988 pages 55-66) identified 11 subpopulations. Each subpopulation exhibits different patterns of movement including migratory, non-migratory, and some mixed migration. Impacts of the proposed project will impact some subpopulations much more than others (Ballard and Whitman 1988). Directly comparable techniques should be used in the current study to permit identification of subpopulations. Subpopulations of moose likely have changed since the studies of

Ballard and Whitman (1988) and it cannot be assumed that the same subpopulations and patterns of use still occur.

5. Design browse utilization studies so that at least some data will be directly comparable to the results reported by Becker and Steigers (1987). The earlier study focused more on utilization and availability by species whereas the current study focuses on obtaining percent utilization data using the approach of Seaton et al. (2011). Regardless, data on utilization and availability are readily obtainable at the same time percent utilization data are collected.
6. In the Susitna-Watana Dam impact area, Ballard and Whitman (1988) estimated moose abundance using the Gasaway et al. (1986) and related techniques. Results from directly comparable techniques proposed for use in this study need to be used to permit evaluation of any changes that have occurred.
7. Impact assessment studies should not be considered adequate unless study plans incorporate (including allocation of funds) post-project studies to determine actual impacts on moose movements, use of habitats, and changes in numbers and reproductive parameters. Post-project studies should be incorporated into the study plan and these studies should use GPS collars to permit statistically valid comparisons with pre-project studies currently underway.
8. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in the earlier ADF&G reports on Susitna dam studies conducted during 1980-1986 (e.g., Ballard and Whitman 1988). Anonymous reports do not have the credibility that comes with reports by people willing to identify themselves as responsible for the studies and conclusions.

References Cited

- Ballard, W. B., and J. S. Whitman. 1988. Susitna Hydroelectric Project, Final report, Big game studies, Vol. II—Moose Upstream. Alaska Department of Fish and Game. 150 pp.
- Ballard, W.B., J.S. Whitman, and D.J. Reed. 1991. Population dynamics of moose in Southcentral Alaska. *Wildlife Monographs* 114:1-49.
- Becker, E.F. 1988. Susitna Hydroelectric Project Final Report Big Game Studies Vol. V.—Moose Carrying Capacity Estimate. Alaska Department of Fish and Game, Anchorage. 113 pp.
- Becker, E.F., and W.D. Steigers Jr. 1987. Susitna Hydroelectric Project Final Report Big Game Studies Vol. III—Moose Forage biomass in the middle Susitna River Basin, Alaska. Alaska Department of Fish and Game, Anchorage. 113 pp.
- Harris, G., R.M. Nielson, T. Rinaldi, and T. Lohuis. 2014. Effects of winter recreation on northern ungulates with focus on moose (*Alces alces*) and snowmobiles. *Eur. J. Wildlife Res.* 60:45-58.
- Gasaway, W. C., S. D. DuBois, D. J. Reed, and S. J. Harbo. 1986. Estimating moose population parameters from aerial surveys. *Biological Papers of the University of Alaska*, No. 22, Fairbanks. 108 pp.
- Miller, S.D. and W.B. Ballard. 1992. Analysis of an effort to increase moose calf survivorship by increased hunting of brown bears in south-central Alaska. *Wildl. Soc. Bull.* 20(4):445-454.

- Miller, S.D., J. Schoen, J. Faro, and D. Klein. 2011. Trends in intensive management of Alaska's grizzly bears, 1980-2010. *Journal of Wildlife Management*: 1243-1252.
- Modafferi, R. D. 1987. Susitna Hydroelectric Project, Final report, Big game studies, Vol. I—Moose Downstream. Alaska Department of Fish and Game. 181 pp.
- Seaton, C.T., T. F. Paragi, R.D. Boertje, K. Kieland, S. Dubois, and C.L. Fleener. 2011. Browse biomass removal and nutritional condition of moose *Alces alces*. *Wildl. Biol.* 17:55-66.
- Tobey, R.W., and R.A. Schwanke. 2010. Unit 13 Moose management report. Pages 150-164 in P. Harper, ed. Moosemanagement report of survey and inventory activities 1 July 2007-30 June 2009. Alaska Dept. Fish and Game. Project 1.0. Juneau, AK.
- White, K.S., N.L. Barten, S. Crouse, and J. Crouse. 2014. Benefits of migration in relation to nutritional condition and predation risk in a partially migratory moose population. *Ecology* 95(1):225-237.

CARIBOU

Comments on: “Caribou Distribution, Abundance, Movements, Productivity, and Survival, Study plan Section 10.6, Initial Study Report, (Parts A, B and C), and Prepared for AEA, Susitna-Watana Hydro by Alaska Department of Fish and Game, Palmer, AK. 14 pp. (part A). June 2014. (No authors named), and

Revised Study Plan, Wildlife Resources, 10.6. Caribou Distribution, Abundance, Movements, Productivity, and Survival. Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, pages 10-16 to 10-24. December 2012. (Please note the Caribou Revised Study Plan was approved by FERC without modification and is thus equivalent to the Final Study Plan.)

Purpose of these comments: The Initial Study Report (ISR) and RSP for the Susitna-Watana project was reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the RSP;
2. Evaluate whether the data collection and analysis techniques are adequate to achieve the stated objectives;
3. Evaluate whether the stated objectives and study plans are adequate to evaluate the impacts on caribou of the proposed project with a view to assuring that adequate information is available to determine both impacts and appropriate kinds and levels of mitigation for impacts; and
4. Evaluate and contrast earlier studies on the same project by Pitcher (1987) to determine if these earlier studies are integrated into the current project; and
5. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts on caribou.

Objectives for Caribou Project (RSP pages 10-16). (Analyses of progress toward these objectives are provided in a separate section, below, by objective):

1. Document seasonal use of and movement through the Project area by both females and males of the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH).
2. Assess the relative importance of the Project area to both the NCH and DCH.
3. Document productivity and survival of caribou using the Project area.
4. Analyze data from historical caribou studies and synthesize with recent data for NCH and DCH, as a continuation of the caribou task of the 2012 study (AEA 2012).

General overview comments:

Caribou, far more than moose or most ungulates make wide-ranging movements and migrations. These commonly follow one pattern for a number of decades and then shifts may occur possibly because range conditions in different areas change or deteriorate. This is an important fact for impact assessment studies as impact assessments could vary dramatically decades later (or earlier), depending on the caribou range at the time of evaluation. The area near the impoundment and in the Chulitna Mountains north of the impoundment was more heavily

utilized by Nelchina caribou than during the studies by Pitcher (1987) (Skoog 1968 from Pitcher 1987). Skoog (1968 from Pitcher 1987) considered the Chulitna Mountains to be the most important for year-round use by Nelchina caribou. Pitcher (1987) recognized a subherd of caribou consisting of about 350 individuals in the Chulitna Mountains. He reported that about 1,500 animals occurred year-round in the upper drainages of the Susitna, Nenana, and Chulitna Rivers. In recent years, it appears that more Nelchina caribou herd (NCH) animals are using the area around the impoundment and north of the impoundment thereby increasing the frequency with which the impoundment, associated corridors and infrastructure would be encountered by Nelchina caribou.

The most general point about caribou and the proposed impoundment is that caribou need large landscapes in which to survive in large herds. When formerly large landscapes are infringed on or limited by developments, it limits the ability of caribou to shift their movements and centers of distribution in a pattern that have evolved over thousands of years. Large herds need large landscapes and without them caribou cannot survive in large herds.

Another general point is that NCH (and to a lesser extent the Delta herd and the Chulitna and Cantwell groups) is an extremely popular resource for Alaska hunters and subsistence users. The NCH herd is intensively managed by ADF&G for this reason (Schwanke 2011). There is nothing positive about proposed Watana hydroelectric project for the long term potential of the Nelchina caribou herd to continue as a large herd. All foreseeable impacts will be negative. The magnitude of these impacts will be difficult to predict and may not become evident for decades.

In terms of immediate impacts, Pitcher (1987:iv) observed:

The major concern with the Watana impoundment is that the female segment of the herd will try to cross the reservoir during spring migration to the calving grounds and that mortalities will result because of hazardous conditions.

Over the long term Pitcher (1987:iv) recognized that:

Most importantly, the Susitna hydroelectric project should be viewed as one of a number of developments which have or may occur on the Nelchina caribou range. While no single action may have catastrophic results, the cumulative impact will likely be a reduced ability of the Nelchina range to support large numbers of caribou.

Evaluations of reported progress by objective

The stated goals of the ISP as repeated in the ISR are "...to obtain sufficient population information on caribou to evaluate Project-related effects on important seasonal ranges, such as calving areas, rutting areas, wintering areas, and migration/movement corridors. Four specific objectives were identified and progress toward each of these is evaluated below based on the Initial Study Report (ISR).

Objective 1. Document seasonal use of, and movement through, the Project area, as defined in Section 8.6.3) by both females and males of the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH).

The study plan calls for deploying 30 VHF collars on bulls and 55-65 GPS collars on cows and bulls. The ISR reported that the collars were deployed as intended in the revised study plan (RSP) with an appropriate variance (discussed below) based on issues associated with admixture of NCH and DCH at the time collars were deployed.

Monitoring of these collars is done using both project funds and regularly scheduled management flights for collared caribou and counts of all caribou. This number of collars should be adequate to accomplish this objective if they are appropriately distributed geographically and the ISR reported an appropriate number of telemetry survey locations for these collars that is consistent with the study plan. However, only gross scale analyses of these data were presented in the ISR so it is not possible to evaluate how or whether these data will be appropriately analyzed. At present, there is no reason to believe that available data will not be analyzed appropriately.

The inclusion of GPS collars on caribou in this study represents a major advance over the technology available to Pitcher (1987) and should reveal new and meaningful results pertinent to this impact study and, more broadly, to caribou management in the study area.

To determine if both kinds of collars (GPS and VHF) were appropriately distributed, it will be necessary, in subsequent reports, to plot the distributions of initial capture locations by date collared, herd, type of collar, and sex of animal collared.

The variance reported in the ISR (page 6) with respect to the distribution of radio-transmitters appears reasonable. This variance is based on the admixture of Delta and Nelchina herd animals in the study area. It is probably an appropriate distribution of collars to distribute two-thirds of collars to Eastern Migratory Group (EMG) individuals (clearly NCH) and one-third to Western Group (WG) individuals (containing a larger number of DCH individuals that winter in the study area south of the Alaska Range). Once movements of collared animals is evaluated to determine their affiliation with the DCH or the NCH, analyses of project impacts based on these movements will have to be weighted based on the proportion of collars in each herd (this can't be known at the time collars are deployed) and the size of each herd to determine cumulative impacts on caribou (both herds). No doubt the investigators plan on doing this and will not assume that each herd had an equal percentage of its members collared.

There are additional categories of caribou in the Watana Dam impact area including a permanent Chulitna group. There is also a group of migratory caribou centered in the Cantwell area. Both of these groups will be heavily impacted if the northern (Denali) access route is developed and the Chulitna group is likely to be impacted by the dam as well. Because of the complicated nature of the herds and groups in the vicinity of the proposed Susitna-Watana Impoundment, many years of study will be necessary to sort out which groups or herds will be most impacted and how these impacts will occur; especially since there is significant year to year variation in movements and areas utilized. It is unlikely that these relations can be adequately sorted out

with only 2-3 years of study of radio-marked individuals especially if resolution is lost by recognizing only two groups as is done in the current study (the WG and the NCH). If there are reasons why these groups are lumped in with the EMG and WG individuals, this should be better explained.

Objective 2. Assess the relative importance of the Project area to both the NCH and DCH.

No results for this objective were reported. With multiple years of study, there is no reason to expect that the relationships between these herds cannot be sorted out appropriately but, as noted above, appropriate levels of resolution on all the groups using the study area is unlikely to be obtained with only 2-3 years of study. There are more than NCH and DCH individuals in the Susitna-Watana Dam area and this objective should be expanded to include impacts on individuals from the Cantwell area and in that overwinter in the Chulitna Hills but are not DCH individuals.

During the AEA ISR meetings on October 22, 2014, ADF&G researcher Kim Jones said that radio-marked caribou would be followed for a third year. This is an important and necessary change but it is unclear if addition of one additional year will be sufficient to permit identification of subherds and to evaluate impacts on the basis of subherds. In percentage terms, impacts on subherds can vary greatly because they currently vary greatly in size.

No data analysis of data collected in 2014 was presented at the October 22, 2014 meeting and only 2013 data presented in the ISR were available for analysis. No further meetings are scheduled to discuss data collected after 2013; these data will not be available for outside review until the final study report at which time planned studies will all have been concluded and scheduled opportunities for modifications of study plans based on review data collected after the first year of study (i.e. 2014-2015) will no longer exist.

Objective 3. Document productivity and calf survival of caribou using the Project area.

Few results for this objective were reported. It was mentioned that there was a late spring in 2013 which delayed spring migration and peak calving. A very high proportion of parturient cows lost their calves in 2013 (66%). This is much higher than reported in previous studies for the NCH based on work conducted during 2008 (Schwanke 2011). It is very important that anomalous conditions like this (and also winter conditions) continue to be reported in subsequent reports on these caribou studies.

Objective 4. Analyze data from historical caribou studies and synthesize with recent data for the NCH and DCH as a continuation of the caribou task of 2012 study W-S1 (AEA 2012).

This report appropriately included comparison data on number of VHF collars deployed and number of locations/collared caribou during the 1980-1985 by Susitna Hydro project studies on caribou conducted by Pitcher (1987). No comparison or synthesis of results with these earlier studies or with Survey and Inventory work (e.g. Schwanke 2011) are presented in the current ISR and this is reasonable at this point in the current studies. Subsequent reports should include

this analysis and synthesis. It was not known (or at least determined) by Pitcher (1987) that DCH animals occurred in Unit 13. This was apparently determined in 1993 based on studies by Valkenburg et al. (2002) that documented movements of DCH animals collared in 20A into Unit 13 (Seaton 2011).

The DCH is much smaller and less productive than the NCH and has a population estimate of about 2,520 in 2009 (Seaton 2011) compared to 44,985 in 2010 for the NCH (Swanke 2011). The 2010 fall estimate for the NCH was likely inflated by an unusually large number of calves (Swanke 2011).

Caribou productivity and survival is variable between years and areas based on habitat quality and weather conditions. Generally, the NCH has been increasing and the DCH has been declining in both numbers and productivity (Schwanke 2011, Seaton 2011). Condition and parturition studies indicate that both herds may periodically (at least) be nutritionally stressed compared to other herds (Pitcher 1991, Schwanke 2011, Seaton 2011). It is important that the current impact assessment studies ultimately incorporate the status and trends of both herds into an analysis of the proposed project's impacts as identified by this objective. Short term studies under perhaps anomalous conditions cannot adequately evaluate impacts absent the appropriate long term context for species like caribou.

Schwanke (2011:101) in her caribou Survey and Inventory report recognized the potential impact of the Susitna Hydroelectric project on caribou:

Large numbers of Nelchina caribou have spent a considerable amount of time between late summer and winter in the Watana Creek area in recent years. As this project [the Susitna-Watana dam], moves forward, it will again be necessary to fully evaluate the effects of a large hydroelectric dam on movements and habitat use by the NCH.

Recommendations:

1. As we recommended during the October 22, 2014 AEA meeting, in order to determine if both VHF and GPS collars were appropriately distributed, subsequent reports must plot distributions of initial capture locations for each individual by date (spring or fall), type of collar (VHF or GPS), and sex of animal. The Watana Dam project area includes a complex set of associations of caribou associated with 4 different groups or herds including the Nelchina herd (the largest group), the Delta herd, a group in the Chulitna Hills, and a Cantwell group. The ISR collapses these into two groups: the Eastern Migratory Group (largely migratory Nelchina Herd that currently calve in the foothills of the Talkeetna Range and overwinter farther east in Unit 13) and the Western Group (animals that winter in the study area supposedly composed of mixed Nelchina and Delta herd individuals). There is no specific identification in the study plan of the small Chulitna Hills group which is likely to be the most impacted by the project especially if the Denali access route is selected. We suggest that it would be helpful if future reports specifically address how collars were deployed by each of the herds/groups in the study area or clarify the justifications for collapsing these into only 2 categories.

2. Neither the RSP nor the ISR have any objective associated with evaluating impacts of roads and transmission lines that would be built to support the proposed project. Although caribou can cross these corridors during migrations and other movements, these corridors will likely result in negative impacts on movements and also likely slow succession of lichens and other plants important to caribou; this may benefit moose but have negative impacts on caribou. This kind of impact of the project was recognized by Pitcher (1987) and it is unfortunate and incorrect for the current analysis to ignore the impacts of corridors, especially since both herds increasingly occur in the area impacted by (especially) the Denali Highway corridor and the Chulitna corridor as illustrated in Fig. 4.1-1, page 12 and Figure 3-1 (page 11) of the ISR. Of the three routes under consideration, it is likely that the Gold Creek route would have the least impact and the Denali Highway route would have the most impact on caribou (and other terrestrial wildlife species). The comparison deserves documentation and discussion in this report.
3. In addition to impacts on caribou movements, the proposed corridors will provide increased access to hunters in a formerly roadless and relatively isolated area in the heart of the Nelchina Caribou range and the Unit 13 portion of the Delta Caribou herd range. Corridor impacts will be especially significant for the Denali highway access route which passes through a large portion of the Delta Caribou herd range in Unit 13; this herd is already declining and stressed (Seaton 2011) and the Denali Highway access corridor will increase hunting pressure especially on this small herd. The problems associated with road corridors was recognized by Pitcher (1987:iv):

The proposed Denali access road would cut through summer and winter range from about half of the upper Susitna-Nenana subherd and run through historical summer and winter range for the main Nelchina herd. Heavy human traffic could result in avoidance by caribou and perhaps mortality through caribou-vehicle collisions.
4. Pitcher (1987) provided a list of likely ways caribou would be impacted by the project. The current study shows no indication that it was designed to evaluate the relative importance of these impact mechanisms. A study of impacts should be based on a list of the impact mechanisms that will likely occur.
5. The study plan and the ISR fail to evaluate mitigation of project impacts on caribou. Mitigation for caribou is not straightforward as they are a species adapted to advanced successional stages of vegetation (e.g. climax) and almost all human interventions in such habitats move succession toward earlier stages which are less useful to caribou. Schwanke (2011:101) reported that there are more than 5 million acres of caribou habitat in Unit 13 that can be improved [implication is that burning would improve but this is far from certain as Joly et al. (2003) reports that the NCH routinely selects habitats older than 50 years after a burn. Unlike moose, caribou generally are adapted to habitats in late stages of vegetation succession.
6. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in for 1980s ADF&G reports (e.g. Ballard and Whitman

1988). Anonymous reports do not have the credibility that comes with those by people willing to identify themselves as responsible for the studies and conclusions.

7. Figures 5.1-1 and 5.1-p2 showing seasonal utilization of habitats based on kernel home range plotting techniques are useful but should be displayed separately, based on animals from the Eastern Migratory Group (primarily NCH) and the Western Group (mixed NCH and DCH animals). Individuals from other groups—e.g., Chulitna Hills and Cantwell groups—should also be identified as these are likely pertinent grouping categories for evaluating impacts. Mixing these 4 groups/herds together in single plots loses important resolution between groups as acknowledged variances to the Study plan based on the mixing of these herds and groups. VHF and GPS data must continue to be presented separately, as was done for the ISR. The ISR defines “low,” “medium,” and “high” density strata in Figures 5.1-1 ,5.1-2. Visually, these figures are hard to interpret because density shading obscures features (e.g., the summer and fall depictions of the impoundment for VHF collared caribou in Figure 5.1- pg. 13). Also, the scale of these Figures is too large to permit interpretation of how they overlap impoundment impact zones.
8. Impact assessment studies are inadequate until study plans incorporate (and fund) post-project impact analysis of caribou movements, habitat use, and population and reproductive changes. Post-project studies should be incorporated into the study plan and should use GPS collars to facilitate statistically valid comparisons with ongoing pre-project studies in the actual impoundment area. For documenting river and impoundment crossings and seasonal use of seasonal ranges, VHF collars are adequate to document project impacts during post project studies.

References Cited

- Joly, K., B.W. Dale, W.B. Collins., and L.G. Adams. 2003. Winter habitat use by female caribou in relation to wildland fires in interior Alaska. *Canadian J. Zoology* 81:1192-1201.
- Pitcher, K. W. 1987. Susitna Hydroelectric Project, Final report, Big game studies, Vol. IV—Caribou. Report prepared by Alaska Department of Fish and Game, Anchorage, for the Alaska Power Authority, Anchorage. 59 pp. [APA Doc. No. 3496]
- Pitcher, K.W. 1991. Nutritional status of the Southern Alaska Peninsula, Nelchina and other southcentral Alaska Caribou herds. Alaska Dept. of Fish and Game. Progress Report Project w-23-4. Study 3.36. Juneau. 42pp.
- Schwanke, R.A. . 2011. Units 13 and 14B Caribou management report. Pages 90-108 in P. Harper, ed. Caribou management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.

Seaton, C.T. 2011. Unit 20A Caribou management report. Pages 128-142 *in* P. Harper, ed.
Caribou management report of survey and inventory activities 1 July 2008-30 June 2010.
Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.

DALL'S SHEEP

Comments on: Dall's Sheep Distribution and Abundance, Study Plan Section 10.7, Initial Study Report (Part A Sections 1-6, 8-10), Prepared for AEA, Susitna-Watana Hydro by Alaska Department of Fish and Game and ABR, Inc. June 2014. (No authors named). 17 pp (part A); and

Revised Study Plan, Wildlife Resources, 10.6. Dall's Sheep Distribution and Abundance Study, Final Study Plan, Section 10.7, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, pages 10.7-1 to 10.7-7. July 2013.

Purpose of these comments: The Initial Study Report (ISR) and Final Study Plan (FSP) for the Dall's sheep portion of the Susitna-Watana project was reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the FSP;
2. Evaluate whether the data collection and analysis techniques are adequate to achieve the stated objectives;
3. Evaluate whether the stated objectives and study plans are adequate to evaluate the impacts on Dall's sheep of the proposed project with a view to assuring that adequate information is available to determine both impacts and appropriate kinds and levels of mitigation for impacts;
4. Evaluate and contrast earlier sheep studies on the same project by Tankersley (1984) to determine if these results are or will be integrated into the current project; and
5. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts.

Objectives for Dall's Sheep Project (FSP pp. 10.7-1 to 2); (Analyses of progress toward these objectives are provided in a separate section, below, by objective):

1. Estimate the current minimum population size of Dall's sheep in the study area.
2. Delineate the summer range of Dall's sheep in the study area.
3. Evaluate the current condition of mineral licks in and near the Project Area.
4. Analyze and synthesize data from historical and current studies of Dall's sheep in the study area as a continuation of the 2012 study (AEA 2012a).

General overview comments:

The variance described in section 4.2.1 of the ISR to deploy a time-lapse camera at the Jay Creek site to automatically record sheep presence is a valuable addition to the FSP. In spite of the camera being knocked over by a bear (probably), it provided valuable information to permit more direct comparisons with the direct observational data reported by Tankersley (1984). As stated in the FSP, techniques used in this project are consistent with generally accepted scientific practices.

Analysis of accomplishments by Objective:

Objective 1. Estimate the current minimum population size of Dall's sheep in the study area.

This objective was accomplished. Survey procedures documented a minimum of 512 sheep in the study area of which 277 (54%) were in the Chulitna Mountains, 194 in the West Kosina Hills south of the Susitna River, and 41 in the Watana Creek Hills closest to the proposed impoundment. Surveys to count sheep were more extensive in the Chulitna Mountains than they were in the 1980s. Overall, there are about 1,562 sheep in the populations ranging from the Talkeetna Mountains to the Chulitna Hills. Those numbers are down from approximately 2,500-3,000 sheep in 1999 (Petlier 2011).

Objective 2. Delineate the summer range of Dall's sheep in the study area.

This objective was accomplished. Sheep locations obtained during 2013 aerial surveys are adequately depicted in Fig. 5.1-1 (page 13) of the ISR and tabulated in Table 5.1-2 (page 8) of the ISR.

Objective 3. Evaluate the current condition of mineral licks in and near the Project Area.

It is unclear what "current condition" in the context of this objective is. Tankersley (1984) presented chemical analysis of the Jay Creek and Watana sheep licks and the current study does not add to this information. If "current condition" means whether there have been changes in the chemical or physical characteristic of the licks since the 1980s, there is no indication in the ISR or FSP that such changes have occurred, or how they would have been measured if they had occurred. Had gross changes occurred (e.g., the lick being covered by a mudslide), they would have been detected during this study. If "current conditions" refers to the numbers of sheep using the licks, this was also accomplished and showed a general decline in lick use consistent with the decline in sheep numbers in the entire study area and in adjacent herds. This decline is thought to result from severe winters (Petlier 2011).

Objective 4. Analyze and synthesize data from historical and current studies of Dall's sheep in the study area as a continuation of the 2012 study (ADA 2012a).

The ISR made appropriate use of the historical data from Tankersley (1984) and from routine ADF&G data collection sources. It appears that sheep use of the Jay Creek lick is declining in comparison to the 1980s. This follows a general population trend for sheep in this area.

Recommendations:

1. The study should include an evaluation of the composition of the three populations (% adult males, lambs/100 ewes, etc.), their use of mineral licks, and how those factors varied from 1980s observations.
2. At the AEA meeting on October 21, we recommended consideration of a new study proposal to evaluate whether the Kosina Hills population was isolated from the Jay Creek-Watana population by the intervening Susitna River. We suggested that this could be done via

genetic analysis of shed hair to see if genetic interchange is currently occurring between these populations. We suggested the Kosina Hills sheep might be attracted to the mineral licks on the north side of the river and that when the impoundment is built, such movements would be impossible, thereby increasing the isolation of both populations/herds. We believe this would be a valuable addition to the existing study plan, but acknowledge there is a high likelihood that these populations are currently isolated by the formidable barrier of the Susitna River. At a minimum, a literature review should be conducted to determine if there are data indicating that the distance between these herds or the presence of the Susitna River between them already prevents interchange between them.

3. Neither the ISP nor the FSP have any objective associated with evaluating the impacts on sheep of the proposed roads and transmission lines that will be built to support the proposed project. Because these corridors will provide improved human access to the impoundment area, they will exacerbate impacts associated with human presence. This is especially the case for the Denali route which is the one through the sheep range. Every effort should be made to construct this road to minimize impacts on sheep.
4. There is nothing in the FSP or ISR that is designed to identify appropriate kinds or levels of mitigation for adverse impacts of the project on Dall's sheep. The most likely source of adverse impacts identified by Tankersley (1984) is from disturbance and, possibly loss of connectivity between the Watana Hills and Kosina Hills and/or Chulitna Mountains populations caused by the large impoundment blocking sheep movements.
5. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in the earlier ADF&G reports on Susitna dam studies conducted during 1980-1986 (Tankersley 1984). Anonymous reports do not have the credibility that comes with reports by people willing to identify themselves as responsible for the studies and conclusions.
6. Impact assessment studies should not be considered adequate unless study plans incorporate (including allocation of funds) post-project studies to determine actual impacts on Dall's sheep movements, use of habitats such as the sheep licks, and changes in numbers and reproductive parameters. It is likely that the proposed impoundment will block movements between the Watana Hills sheep population and the Kosina Creek population. Such movements have not been documented or evaluated. Post-project studies should be incorporated into the study plan.

References Cited

- Peltier, T.C. 2011. Units 13A, 13E, 14A (north) and 14B Dall sheep management report. Pages 72-79 in P. Harper, ed., Dall sheep management report of survey-inventory activities 1 July 2007-20 June 2010. Alaska Department of Fish and Game. Project 6.0. Juneau, Alaska.
- Tankersley, N. 1984. Susitna Hydroelectric Project, Big Game Studies, Vol. VIII Dall Sheep. Alaska Dept. of Fish and Game, Anchorage. 44pp.

BROWN AND BLACK BEARS, portion of Study Plan Section 10.8 (Large Carnivores)

Comments on: Part A: Initial Study Report, “Distribution, Abundance, and Habitat Use by Large Carnivores, Study Plan Section 10.8, and Prepared for AEA, Susitna-Watana Hydro by Alaska Department of Fish and Game, Palmer, AK. June 2014. (No authors named) 38 pp (part A) (available at: http://www.susitna-watanahydro.org/wp-content/uploads/2014/05/10.08_LGCAR_ISR_PartA.pdf); and Part B: Supplemental Information (and Errata) to Part A (February 3, 2014 Draft Initial Study Report Study Plan Section 10.8, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, 3pp. June 2014; and

Revised Study Plan, Wildlife Resources, 10.8. Distribution, Abundance, and Habitat Use by Large Carnivores Study, Final Study Plan, Section 10.8, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, pages 10.8-1 to 10.8-13 . July 2013. (Please note the Large Carnivore Revised Study Plan was approved by FERC without modification and is thus equivalent to the Final Study Plan.)

Purpose of these comments: The Initial Study Report (ISR) and Revised Study Plan (RSP) for the Susitna-Watana (hereafter referred to as Susitna) project was reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the RSP;
2. Evaluate whether the data collection and analytical techniques are adequate to achieve the stated objectives;
3. Evaluate whether the stated objectives and study plans are adequate to evaluate the impacts on brown (grizzly) and black bears of the proposed project with a view to assuring that adequate information is available to determine both impacts and appropriate kinds and levels of mitigation for impacts;
4. Evaluate and contrast earlier studies on the same project by Miller (1987) to determine if these results are integrated into the current project;
5. Identify factual errors in the ISR and RSP;
6. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts;
7. Provide an intelligible description of what these studies consisted of (see Appendix A).

Objectives for the Large Carnivores Project (RSP pages 10.8-1 to 2).

1. Estimate the current populations of brown bears, black bears, and wolves in the study area, using existing data from ADF&G.
2. Evaluate bear use of streams supporting spawning by anadromous fishes in habitats downstream of the proposed dam that may be altered by the Project.
3. Describe the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G.

4. Synthesize historic and current data on bear movements and seasonal habitat use in the study area, including the substantial body of data gathered by radio-tracking during the 1980s, as a continuation of the 2012 wildlife studies (AEA 2012).

General overview comments

It is our belief that the investigative methods used in this study will not provide information of value in evaluating the impacts of the proposed Susitna Dam on brown bears or black bears. The Large Carnivore Study Area used to estimate bear density and abundance is 26,490 km². This greatly exceeds the size of the area within which bears conceivably could be impacted by the proposed Susitna Dam project. This study area was configured for an estimate based on data collected during 2000-2003 that was unrelated to Susitna Dam studies. The ISR asserts that the objective to estimate the populations of brown and black bears has been completed, suggesting no additional data or analyses are forthcoming.

Density surface maps (ISR 10.8 Figures 5.1-5 and 5.1-11) are based on the incorrect premise that where bears happen to be documented during spring surveys is related to the carrying capacity of the habitat (expressed as density). In addition, the technique used to generate estimates of bear abundance and density in the entire Large Carnivore Study Area (hereafter termed the Mark-Recapture Distance Sampling or MRDS technique) has not been described or proved accurate for black or brown bears in any existing publications or reports in Alaska or elsewhere. The data collection and analytical methods used for bears in this study have not been peer reviewed and are correspondingly not “consistent with generally accepted scientific practice” as required for AEA Susitna studies. For some other species, the person involved in the spatial modeling, Miller et al. (2013:23) described “Density surface modelling from survey data [as] an active area of research” and noted that “we look forward to further improvements and extensions in the near future.” Distance sampling techniques have been used to estimate abundance of polar bears in the Barents Sea subpopulation (Aars et al. 2009), but this work did not involve the capture-recapture component of the MRDS technique used for the current Susitna bear studies. Unlike the Susitna area bear studies, the habitat variables for the polar bear studies were very limited because there were no elevation or vegetation variables (covariates) that required consideration.

The reason there are no previous bear density or population estimates in the western and southern portion of the Large Carnivore Study Area is because much of the bear habitat in this area is forested. It is very difficult to use techniques based on observations in habitats where bears cannot be seen because of overstory vegetation. Regardless of efforts to correct for this problem by covariate analysis in the MRDS method, if any bears present in the study area cannot be detected, then any analytical technique based on observations will underestimate abundance.¹

¹ In the key paper on mixed mark-recapture and line transect models, Laake et al. (2008:299) noted: “In particular, it is much more difficult to cope with availability bias and it will typically require additional effort such as a known marked population [references], separating in time between surveys [references], or an independent estimation of the availability process [references]”. Availability bias is when animals are not available for detection (e.g., hidden by vegetation). In the same paper (page 300) the authors acknowledge that for double-count methods (such as used in the current study): “...these methods cannot account for animals that are unavailable to both observers.” Further (page 301) these authors acknowledge that when some groups are hidden (unavailable to be seen), it

Although the ISR and Becker and Quang (2009) do not provide location data upon which their analysis is based, we suspect very few bears were seen in forested portions of the study area, openings in the forest, or sedge flats. This means that their abundance estimates and corresponding density surface maps reflect primarily the segment of the population available for observation. This segment is largely between timberline and 5,000 feet for brown bears.

There is no possibility of calculating a detection probability based on bears observed by only one of two observers if no bears are observed because of overstory vegetation. The brown bear population estimate derived for the Large Carnivore Study Area and published by Becker and Quang (2009) is implicitly acknowledged in the ISR as an **underestimate**. The ISR reported a brown bear population estimate that was 46% higher than reported (based on exactly the same data for the same study area) by Becker and Quang (2009). This increase resulted from use of new mathematical techniques involving point independence.² The estimate increased from 575.9 brown bears to 841 brown bears, and density from 26.3 bears/1000 km² to approximately 35.8 bears/1000 km². We suspect that even when point independence is included in the math used to calculate population size, there remains an underestimation bias. Our suspicion is based on the fact that the density surface map for brown bears presented in the ISR (Fig. 5.1-11, page 30) is contrary to expectations. This map indicates **lower** densities in southern and western portions of the Large Carnivore Study Area where bears have access to multiple runs of salmon, than in interior areas where bears do not have access to salmon. All available studies indicate that where brown bears have access to multiple runs of Pacific salmon, densities are much higher than in interior areas (Miller et al. 1997, Hildebrand et al. 1998, Table 1 in this document).

We suspect that this underestimation bias most likely resulted from lack of independence between observers in the aircraft during MRDS surveys. Lack of independence between observers would lead to overestimation of detection probabilities which would cause underestimation of bear abundance. We present evidence that is consistent with overestimation bias in the MRDS data. This evidence is based on comparisons of detection probabilities calculated using the MRDS technique with other studies (Capture-Mark-Resight or CMR) where sightability of bears was directly estimated based on number of marked bears known to be present in an area that were observed. The CMR studies used equivalent aircraft and observers but more intensive search techniques. Correspondingly, sightability of bears would be expected to be higher in the CMR estimates than for the detection probabilities calculated using the MRDS technique. This should occur for each set of the MRDS covariates associated with a bear sighting. Based on examination of Figure 5.1-7 (page 26 of the ISR), however, the calculated MRDS detection probabilities were higher than found in the more intensive CRM surveys.

represents a form of heterogeneity "...that cannot be modelled with mark-recapture and, unfortunately, it is a fairly common form of heterogeneity".

² Point independence involves the assumption that somewhere on the curve describing probability of detection as a function of distance from the airplane and associated covariates (slope, aspect, vegetation, group size, etc.), the probability of detection is 100% for both observers. Laake et al. (2008:305) observed: "To use point independence, it is essential to meet the assumptions for distance sampling. The assumption of locally uniform density around the line or point is the key assumption. For line transects, this means that within a specified strip, the expected distribution of perpendicular distances to all objects (observed and unobserved) is uniform."

It is likely too, that the MRDS application in the current study may not have appropriately identified the correct covariates that influence the likelihood of seeing a bear. Laake et al. (2008:307) noted that:

Even if every horse [read object or animal] had a measurable probability of detection, the use of covariates relies on the investigator's ability to identify all covariates and properly measure the covariates...All of the important covariates will have to be identified before the survey unless they can be adequately obtained from a GIS layer or some other means....Even if the uniformity assumption holds and you can use MRDS, there are limits to how much visibility bias [reason animals are not detected by observers] can be accommodated when it results from availability bias [animals not available to be seen because, for example, they are hidden under a forest canopy or in dens].

Based on available information in the ISR, we do not know which covariates were investigated during the current study or used in the final model. The ISR (page 3) mentions explanatory variables (e.g., covariates) such as “elevation, aspect, habitat, and east-west and north-south gradients,” and it is clear that some of these were covariates considered. However, it is also clear some of these covariates are not directly correlated with bear abundance including north-south and east-west gradients. These gradients do not directly reflect food availability. The most important factor that influence bear abundance is food availability (Schwartz et al. 2003 and many others). Elevation, aspect, and slope are likely proxy variables for things that affect food availability for bears which, in spring, might be avalanche tracts where bears forage for newly emergent vegetation and tubers. Where a bear is seen in spring might also reflect the presence of a carcass of a winter-killed or wolf-killed ungulate or availability of ungulate calves. A springtime southwest-northeast gradient in the Large Carnivore Study area might reflect salmon availability during summer and fall. The most important covariate affecting detection probability for bears (and most other wildlife) is vegetation/canopy coverage.

We recommend that bear population estimates—at least for brown bear—be made exclusively for the area where project impacts are expected on bears.³ Instead, the current study reported in the ISR makes a population estimate for a huge study area (26,490 km² of which 23,515 km² was below 5,000 feet elevation and classified as bear habitat on that basis). Earlier Susitna-Watana Dam impact assessment studies conducted in the 1980s directly estimated the number of bears in a study area of 1,317 km² that was considered a reasonable size for estimating the number of bears that would be impacted by the then-proposed project (Miller 1987). The size of study areas and population estimates for the current and earlier study are contrasted in Table 1.

We are also concerned that basic assumptions behind the density surface maps presented in the ISR based on spatial modeling may be biologically inappropriate for bears. The characteristics of places where bears are seen, especially during spring surveys, are likely to be largely irrelevant to the carrying capacity (expressed as density) of any study area. The factor most influencing bear density is the abundance and spatial distribution of food (Schwartz et al. 2003).

³ A new estimate for black bears may not be necessary if AEA is willing to accept the estimate of 47 bears made by Miller (1987) during earlier Susitna Dam studies. Unlike brown bears which have been subject to intensive harvest management in Unit 13, it is unlikely there have been significant changes in black bear abundance in the limited area of black bear habitat in the Susitna River riparian habitat in the proposed Watana impoundment area.

In the Large Carnivore Study Area and most other places with bears, brown bear density is more influenced by availability of salmon for food than by any other factor. However, bears are not on salmon streams during spring when the MRDS surveys were conducted because the salmon have not yet arrived. Additionally, bears constantly move between non-contiguous patches of food or for other reasons such as, during spring, searching for mating opportunities or avoiding predation on their newborn cubs. Many spring sightings, therefore, occur in places a bear is moving through rather than exploiting for food. Analyses based on multiple relocations of the same bear and throughout seasons, therefore, are necessary to identify habitats bears use disproportionately to availability. This kind of distinction is frequently conducted based on resource selection function (RSF) analyses (e.g., Flynn et al. 2012) that are based on many relocations of the same radio-marked individuals during all seasons.

Techniques based on observing bears including the MRDS and CMR techniques must be conducted in the spring before leaves come out, but the characteristics of the spot where a bear happens to occur during spring is likely to be irrelevant to carrying capacity (density). This problem with creating a density surface map based on spring observations of brown bears is evident in Fig. 5.1-11 (page 30) of the ISR. The darkest shaded areas intended to represent the highest densities are at high elevations and are mostly adjacent to the 5,000 foot contour. This is because during spring, many bears (especially females with newborn cubs [Miller 1987]) occur in the vicinity of their high elevation dens where there is no food in order to avoid infanticide of their cubs by other bears (Miller 1987, Steyaert et al. 2013). The darkest area in Figure 5.1-11 indicating the most densely populated area is in the extreme northeastern corner of the study area at high elevations in the Alaska Range near the Susitna River headwaters. This area, in fact, is dark only because bears emerging from dens occur here in the spring; the food resources available in this area are inadequate to support a high density of bears throughout the year.⁴ The color shading in this area on Figure 5.1-11 suggests it has a density >300 bears/1000 km². Densities this high occur only in areas with abundant salmon (Miller et al. 1997). Similarly, relatively low brown bear densities are indicated in the southern portion of the density surface map along the lower Susitna and Yentna Rivers (Figure 5.1-11). These areas are where salmon occur during summer and fall, thus are most likely important to bear populations in this area, and would be expected to exhibit the highest densities.

Problems are apparent with the spatial modeling used to construct density surface maps for both bear species. The indicated densities appear much too high based on comparisons with densities reported in other studies (this is discussed in more detail below). This indicates, at best, a calibration problem and makes the density surface maps useless for the purpose of determining how many bears use any portion of the Large Carnivore Study Area. Additionally, the ISR does not even attempt to provide estimates of the number of bears of either species that will be impacted by the proposed project (much less the level or mechanisms of such impacts). There is no indication that any additional effort will be forthcoming in subsequent reports to provide information pertinent to evaluating project impact on bears.

⁴ This problem was identified in the ISR (page 10): “[the modeling effort] left the concentrations of brown bears in the northeastern portion unexplained...[and] the study team surmised that brown bears were overestimated in the northeastern portion of the study area...”

Application of the MRDS technique in this study will, at best, produce only estimates of abundance and density. Nothing in the proposed 10.8 study design will provide necessary information on bear movements or habitat use. Such information is essential to evaluate Susitna Dam project impacts on bears. Flynn et al. (2012) produced such an analysis for brown bears in southeastern Alaska. In this study, the ADF&G researchers used GPS collared bears and Resource Selection Functions analyses (e.g., Boyce et al. 2002, Manley et al. 2002) to evaluate bear use of habitats near a proposed new road. Similar techniques would provide highly pertinent information needed to augment studies using VHF-collared bears that were conducted in the 1980s for the proposed Watana dam (Miller 1987). Similar studies using GPS transmitters on bears would significantly advance knowledge of proposed Susitna-Watana Dam impacts on black and brown bears. Repeating the Capture Mark Recapture (CMR) density and population composition estimates in the same area surrounding the Susitna dam, where density was measured in 1985 and 1995 (Miller 1997b) would also provide useful and directly comparable information on trends in bear numbers and population composition.

The isotope studies identified to address Objective 2 will provide new information on the importance of salmon in bear diets in the Susitna River. None of the sites sampled for bear hair during 2013 (Fig. 5.1-14, page 33 of ISR, Part A), however, were upstream of Devils Canyon. Therefore, it is unlikely that salmon use by bears living in the vicinity of the proposed Susitna dam site will be documented. It is also likely that any salmon use based on hair analysis that is documented by bears upstream from Devils Canyon would be complicated by an inability to distinguish between salmon from the Susitna River and salmon from Prairie Creek (a tributary of the Talkeetna River where Miller 1987 documented use of salmon by some study area brown bears).

Analysis of accomplishments by Objective

Objective 1. Estimate the current populations of brown bears, black bears, and wolves in the study area, using existing data from ADF&G. [See separate comments for our analysis of wolf studies]

The MRDS technique used in this study to estimate bear abundance and density are mathematically very complex and difficult to understand. We have provided a broad overview of this technique, as best we can understand it, in Appendix A. We provide this in hope that it will facilitate ease of understanding the material presented in the ISR.

The Large Carnivore Study Area is too large to accurately meet study objectives for Large Carnivores that would be impacted by the proposed project. This study area was based on an earlier study unrelated to Susitna Dam impact assessment studies. This earlier study generated a population estimate in what was called the “Talkeetna Study Area” (Becker and Quang 2009). This study area is identical to the Large Carnivore Study Area in the ISR (Figure 3-1, page 19). The size of this area is 26,490 km², of which 23,515 km² is below 5,000 feet elevation and was classified on this basis as being “bear habitat” in both Becker and Quang (2009) and the ISR. In contrast, 1980s Su-hydro bear studies (Miller 1987) estimated bear numbers and density in a more appropriately-sized area for predicting project impacts on bears. This earlier study area was 1,317 km² centered on the proposed Watana-Susitna dam site (Table 1).

Table 1. Comparison of bear population estimates and study area size for current AEA Susitna Dam impact assessment studies (AEA 2014) and the 1980s studies (Miller 1987).

Source	Brown bear population estimate	Black bear population estimate	Size of study area used to estimate density
AEA ISR (2014)	841		23,515 km ² portion (<5,000' elevation) of 26,490 km ² total study area
AEA ISR (2014)	--	1,262	Unspecified area lower than 4,600 feet contour.
Miller (1987)	35.7	--	1,317 km ²
Miller (1987)	--	47.0	532 km ² portion of brown bear study area classified as suitable black bear habitat

Miller (1987) estimated black bear numbers in the same 1,317 km² study area used for the brown bear estimate, but classified only 532 km² as black bear habitat suitable for making density calculations. The ISR used the elevational upper limit of black bear observations (4,600 feet) as the upper limit of bear habitat and therefore pertinent to black bear density calculations. However, the ISR does not report what this area was. A large part of the Large Carnivore Study Area is not forested and therefore not suitable black bear habitat; some of this is correctly depicted in Figure 5.1-5. However, it is anomalous that the riparian figures of habitat are more darkly shaded (indicating higher densities) than the forest lowlands on the southern and eastern portions of the study area in the density surface map. We suspect this is because black bears living in these lightly forested or shrubby riparian habitats penetrating to the northeast in the middle of the study area are more likely to be seen than in the more heavily forested habitats further south and west where higher density black bear populations most likely occur. This is because these are the most forested habitats that are preferred by black bears. Black bears occur primarily in forested habitats and, in the project area, in the riparian habitats along the upper Susitna River and its tributaries like Watana Creek (Miller 1987).⁵

The population estimates made by Miller (1987) included brown bears seen above 5,000 feet elevation. Furthermore bears were actively searched for at all elevations. The MRDS surveys, in contrast, were truncated at the 5,000 foot contour and any bears occurring above 5,000 feet could not be counted. Both studies appropriately used only the area below 5,000 feet to estimate density. However, excluding bears above 5,000 feet from density calculations contributes to an underestimation bias.⁶

It appears probable that the MRDS technique has an underestimation bias even with the correction added based on point independence. Becker and Quang (2009:13) reported on the line

⁵ For both black and brown bears the apparent incorrect depiction of bear densities in the density surface maps presented in the ISR can be roughly evaluated using bear harvest data. Our comments on the Analysis of Harvest Data Study (Study 10.20) include a recommendation on how this can be done and why it is pertinent to the bear studies.

⁶ High elevations are used by brown bears primarily as denning habitat and not as foraging areas in the study area (Miller 1987).

transect technique in the only peer-reviewed paper published on this method, and mistakenly said, “*Our model produced an estimate within the range of mark-resight density estimates (10-41 bears/1,000 km²) of bears in interior Alaska (Schwartz, Miller and Haroldson 2003).*” In fact, the ISR density estimate as we calculated it (this number was not reported in the ISR) was 35.7 brown bears/1,000 km²). Although this estimate is within the range for populations of interior bears that do not have access to salmon, it appears to be significantly lower than populations of bears that do have access to salmon. In much of the Large Carnivore Study Area (Table 2) the bears do have access to salmon, so comparisons with “interior” bear densities are inappropriate. Areas with abundant salmon typically have much higher densities (>100 bears/1,000 km²) than interior areas without salmon where brown bears subsist on moose and caribou calves in the spring, berries, roots and vegetation (Miller et al. 1987, Hildebrand et al. 1998, Schwartz et al 2003). Brown bears in the immediate Susitna Dam impact area have interior diets without access to abundant salmon.⁷

In discussion at the AEA meetings on October 21, 2014, E. Becker from ADF&G asserted that he was unable to identify proximity to salmon streams as a covariate influencing brown bear abundance during his surveys (also reported in the ISR 10.8, Part A Page 10). No doubt this is because during the spring, when his surveys were conducted, bears are not on salmon streams. This does not mean that the driving force influencing and correlated with brown bear density in the Large Carnivore Study Area is not salmon. In the spring, bears are focusing on finding the foods that are available at that time which are more likely maintenance foods that suffice only to sustain high bear densities until salmon arrive. Many bears in spring are also at or near den sites. The issue with salmon is illustrative of a general problem with the spatial modeling using the MRDS technique. This assumption is that the characteristics of the habitat where a bear group is seen in the spring are relevant to the overall population density in the area. The single factor most correlated with bear density is the abundance and distribution of food (Schwartz et al. 2003; Hildebrand et al. 1998, Miller et al. 1997, and many others). Bears move long distances between food patches which vary seasonally in distribution and amount of available food to obtain breeding opportunities, or to move to or from den sites for example. Their location during any one time may not reflect habitat characteristics that are important relative to the carrying capacity (expressed as density) of the habitat overall. This explains why habitat utilization/selection patterns are more accurately based on multiple data points for numerous individual bears rather than just one point where a bear happens to be when a survey observation is made.

Estimates of bear density using the MRDS method for salmon-rich habitats of the Alaska Peninsula (Subunits 9A, northern 9B, 9C, and 9D) are also lower than estimates obtained using CMR techniques (Miller et al. 1997a). This suggests the same kind of underestimation bias in analyses (without adjustments for point independence) as in Becker and Quang (2009). Riley and Butler (2011:110) reported an estimate of approximately 110 bears/1,000 km² in these Alaska Peninsula subunits. Comparison of this with other areas where salmon are available (Table 2) suggests that these Alaska Peninsula MRDS estimates are too low (i.e., have an underestimation bias).

⁷ Miller (1987) reported that some brown bears in the Susitna Dam area made seasonal trips to Prairie Creek to exploit a run of king Salmon; other than this, they existed on an interior brown bear diet of vegetation and ungulate calves (moose and caribou).

Table 2. Brown/grizzly bear densities in North America based on presence/absence of salmon as a significant source of food. The ISR estimates considered disparate are indicated in bold; these were obtained using Mark-Recapture Distance Sampling (MRDS) technique initially reported by Becker and Quang (2009).

Area	Significant salmon available?	Reported density (bears of all ages)/1,000 km ²	Reference
Northern Yukon, Canada	no	3-4	Schwartz et al. 2003*
Arctic coastal plain, Alaska	no	4	Schwartz et al. 2003*
Alberta, Canada	no	4-5	Schwartz et al. 2003*
Cabinet-Yaak Ecosystem, NW Montana	no	4.3-4.8	Kendall et al. in press
Eastern Brooks Range, Ak	no	7	Schwartz et al. 2003*
Jasper NP, Alberta, Canada	no	10-12	Schwartz et al. 2003*
Northern GMU 13, Alaska	no	10-13	Schwartz et al. 2003*
GMU 13E and 13A Alaska	no	11-41	Schwartz et al. 2003*
MacKensie Mts., Canada	no	12	Schwartz et al. 2003*
Yellowstone Ecosystem, Wyoming	no	14-18	Schwartz et al. 2003*
Waterton Lakes, Alberta, Canada	no	15	Schwartz et al. 2003*
Arctic NWR, AK	no	16	Schwartz et al. 2003*
East-central Alaska Range	no	16	Schwartz et al. 2003*
Seward Peninsula, AK	no	18	Schwartz et al. 2003*
Northern BC, Canada	no	21	Schwartz et al. 2003*
Northern Continental Divide Ecosystem, MT 2009	no	24**	Kendall et al. 2009, JWM 73:3-17
SE BC, Canada (Selkirks)	no	27	Schwartz et al. 2003*
Western Brooks Range, AK	no	30	Schwartz et al. 2003*
Glacier NP, Montana (2005)	no	30	Kendall et al 2008, JWM 72:1693-1705
Denali NP, AK	no	34	Schwartz et al. 2003*
Kluane NP, Yukon, Canada	no	37	Schwartz et al. 2003*
Glacier NP, MT	no	47	Schwartz et al. 2003*
Flathead River, MT	no	80**	Schwartz et al. 2003*
Susitna-Watana (“Talkeetna”) Study area, Alaska, 2000-2003	yes[#]	26.3 (based on population estimate of 576)	Becker and Quang (2009)
Susitna-Watana Large Carnivore (“Talkeetna”) Study area, Alaska	yes[#]	35.8^{###} (based on population estimate of 841)	AEA 2014 (ISR 10.8)
Alaska Peninsula, Black Lake	yes	191	Schwartz et al. 2003*
Chichagof Island, SE AK	yes	318	Schwartz et al. 2003*
Kodiak Island, AK	yes	323-342	Schwartz et al. 2003*
Admiralty Island, AK	yes	399-440	Schwartz et al. 2003*
Katmai NP, AK	yes	551	Schwartz et al. 2003*

*C. Schwartz, S. Miller and M. Haroldson, 2003. Grizzly Bear. Chapter 26 in Feldhamer, Thompson and Chapman (Eds.), Wild Mammals of North America: Biology, Management, and Conservation, 2nd Ed., Johns Hopkins, Univ. Press. (see Table 26.9, page 574 for references to primary sources for density estimates)

** Calculated by S. Miller based on Kendall's estimate of 765 bears in a 31,401 km² study area

*** Estimate likely reflects area of concentration rather than wide area density

[#] Study Area was a mixture of habitats where salmon were available along the Susitna River below Devils Canyon and Upper Cook Inlet (an estimated 50-75% of study area) and interior habitats with little to no salmon along the Susitna River above Devils Canyon (25-50%)

^{###} This density estimate was calculated by S. Miller based on the estimate of 841 bears in the Large Carnivore Study Area (26,490 km²) reported in the ISR divided by the area of the study area considered to be bear habitat because it is below 5,000 feet elevation (23,515 km²). The ISR population estimate is a 46% increase in the estimate of 576 bears that was reported by Becker and Quang (2009) but was based on the same data that were collected during 2000-2003. Although based on the same data, the ISR estimate was a 46% higher because a different mathematical technique was used to estimate population size.

The brown bear density surface map (ISR 10.8 Fig. 5.1-11) appears to overestimate density even though the MRDS approach appears to underestimate bear abundance as discussed above. The darkest areas on this figure represent the highest densities and according to the color index scale,⁸ a significant portion of the study area is indicated as having densities near 0.2 bears/km² (or 200/1,000 km²) even in areas where no salmon are present such as in the big bend portion of

⁸ This shading scale is incorrectly labeled “Estimated abundance” when it should be “estimated density”.

the Susitna River on the east end of the study area. As displayed in Table 2, all Alaska study areas where brown bear density has been estimated where salmon are not present have densities <50 bears/1,000 km². This suggests a serious calibration problem with the spatial modeling used to derive the density surface map. At best, the density surface map may be characterized as depicting relative (not absolute) densities. A similar calibration problem was found with the density surface map for black bears as discussed below. We believe this kind of problem results when species experts are not involved with the development and calibration of mathematical models such as those producing the results reported in the ISR.

The ISR acknowledges that brown bears in the Study Area downstream of Devils Canyon eat a significant amount of salmon. This is evident in the stable isotope signatures from bear hairs collected in this area and reported in ISR 10.8 Part B: Supplemental Information (and Errata) to Part A (February 3, 2014 Draft Initial Study Report) by ABR Inc. (June 2014). Although these data have not been fully analyzed, they appear to indicate that brown bears, at least, eat significant amounts of salmon in this area. Correspondingly, this should be reflected as higher bear densities in areas where hair samples were collected, as densities should be similar to those reported for coastal areas rather than interior areas (Table 2).

All techniques for **estimating** abundance and density may include bias. However, it appears that the detection probabilities calculated for the Mark-Recapture Distance sampling (MRDS) technique are unreasonably high. If detection probabilities are biased high, the resulting estimate of bear numbers will be biased low.

An underestimation bias in the MRDS technique is indicated by the calculated detection probabilities in comparison with sightability data obtained during Capture Mark Resight (CMR) techniques (Miller et al. 1997a). Detection probabilities in MRDS surveys are calculated based on bear groups seen by only one observer in the plane and bear groups seen by both observers. This is the mark-resight component of the MRDS technique and is based on the assumption that observations of the two observers are independent (i.e., the sighting of a bear by one observer does not increase the likelihood that the bear will be seen by the other observer). If this critical assumption is incorrect, then the estimates will be biased low and minor violations of this assumption can result in significant underestimation bias (Benson 2010).⁹ Sightability of bear groups during CMR surveys, in contrast, does not require any assumptions and is empirically calculated based on the percentage of marked bears (known to be present) that are seen during CMR survey flights. Identical to the MRDS surveys, the CMR flights have both a pilot and an observer in a fixed wing aircraft. During the survey, however, everything is done to maximize the likelihood of seeing bears. This means that the pilot and observer cooperate: they fly in a spiraling pattern allowing views of the ground from many angles; they can fly tighter circles in habitats where bears are likely to occur and where visibility is restricted by vegetation; they can

⁹ Based on simulation studies, Benson (2010:2) reported: "... the [Becker and Quang] estimator had substantial bias if even 10% of observations were dependent. Incorporation of an "ideal" covariate, i.e., the scale parameter for each transect, decreased the bias of the estimator, but there was substantial bias for most simulated scenarios, regardless of the covariate. Precision of the estimator increased (i.e., standard error decreased) as the level of dependency was increased, likely because dependent data caused an overestimate of the h_{max} [maximum probability of detection]. These results suggest that Gamma MRDS [mark-recapture distance sampling] methods should be used with caution when detection probabilities are not independent."

follow bear tracks in the snow; and they are not constrained by any elevation contours or time. This means any bear that is present is much more likely to be detected during CMR surveys than during MRDS surveys regardless of the characteristics of the habitat (these characteristics are called covariates in the MRDS analysis).

The calculated brown bear Horowitz-Thompson (H-T) detection probabilities for the MRDS surveys are shown in Figure 1. A red line displays the average sightability (24%) for a CMR study that was conducted in 1985 in the 1,317 km² study area used to estimate bear density (Miller 1987, sightability data in Miller et al. 1997a). Average sightabilities for many CMR studies in Alaska were presented by Miller (1997a:Table 3), and almost all of them are lower than the median detection probability for brown bears reported by AEA (0.485, ISR 10.8 Part A Page 8) (Figure 1). This comparison supports our suspicion that detection probabilities were overestimated in the MRDS technique reported by AEA (2014). This would have led to an underestimation of bear abundance.

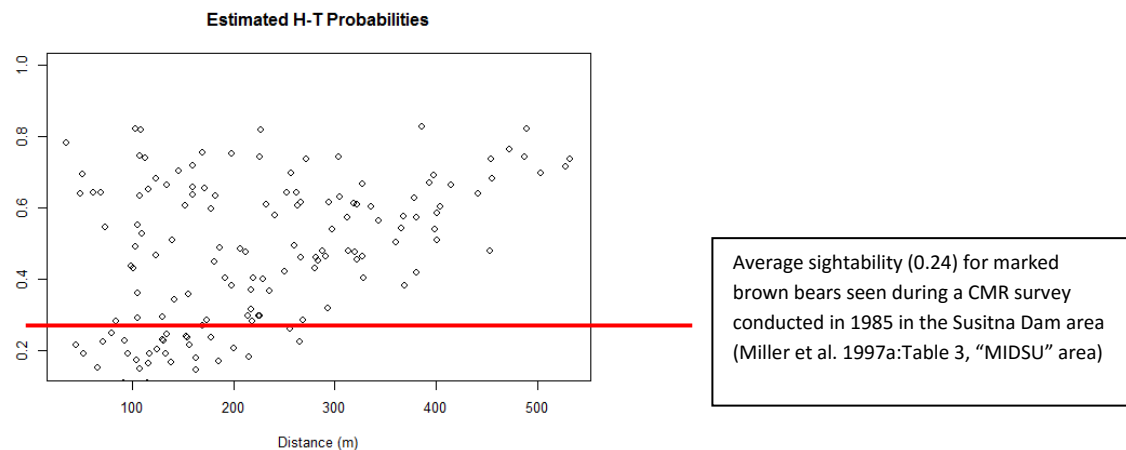


Figure 1. Estimated Horowitz-Thompson (H-T) detection probabilities for brown bears in the Large Carnivore Study area (extracted from Figure 5.1-7 of the Large Carnivore ISR, page 26, red line and text box added).

E. Becker of ADF&G said that this comparison was invalid because detection probabilities for the MRDS technique were calculated differently than sightabilities for the CMR studies. Although calculated differently, for each of the detection probability points in Fig. 1, the likelihood that a particular bear would have been seen during a CMR survey flight would be higher. This is because of the higher search effort during CMR surveys. Additionally, the likelihood of any bear being seen in forested habitats that composed >50% of the Large Carnivore Study Area would be even lower than in the predominantly shrub habitats where the 24% sightability value was obtained during earlier Susitna studies (Miller 1987). Bears in these forested habitats would not only have detection probabilities less than the median of 0.48 reported in the ISR and illustrated in Fig. 1, the likelihood of observing these bears would be much less than the 24% found in the shrubby habitats of the 1985 Susitna study area.

Black bear estimates in the ISR suffer from similar problems to those described above for brown bears. The ISR reports that the median detection probability for black bear groups was 0.4930 (ISR 10.8 Page 7 and Figure 5.1-1). In the Susitna Dam studies conducted by Miller (1987),

the CMR sightability for black bears was 34% (Miller et al. 1998:Table 3). Most of the H-T detection probabilities illustrated for black bears in Fig. 5.1.1 of the ISR were >0.34 in spite of the fact that CMR techniques, as described above for brown bears, were more intensive so all black bear groups should have higher detection probabilities in CMR surveys than during MRDS techniques. Additionally, the forest overstory in a large portion of the Large Carnivore Study area (downstream of Devils Canyon) would be expected to reduce observability of black bears compared to the riparian habitats where black bears primarily occur in the vicinity of the proposed impoundment where earlier studies occurred. The fact that the mean detection probability for black bears in the MRDS studies (0.493, page 7 of ISR 10.8 Part A) was higher than the average sightability for black bears during CMR surveys in the 1980s (0.34) suggests the H-T detection probabilities were overestimated for black bears. This may be because few of the black bears that were present in the forested habitats in the western and southern portions of the Study Area, were seen during MRDS surveys.

The MRDS density and population estimates for the Large Carnivore Study Area appear to be even less appropriate for estimating proposed project impacts on black bears than brown bears. We do not understand how the black bear density surface map (Figure 5.1-5) can be used to determine black bear density in the project area or how many bears there are in the project impact area. The darker areas on this density surface map are claimed to represent higher black bear densities and, based on the incorrectly labeled scale,¹⁰ the darkest areas appear to match densities >1 bear/km². A population density of 1/km² would match the highest density ever reported for black bears (in Virginia, see Pelton 2003: 548). Earlier black bear studies in the area of the proposed Susitna Dam reported densities of 0.09 bears/km² or 88.5/1,000 km² (Miller 1987, Miller et al. 1997a). Two black bear studies on the Kenai Peninsula in Alaska reported densities of 0.20-0.29 black bears/km² (reported in Miller et al. 1997a: Table 4). The Kenai Peninsula represents good black bear habitat (even by Alaska standards), while the darkest areas on the density surface map (Fig. 5.1-5) occur in areas that any knowledgeable bear biologist would classify as marginal habitat. We conclude that the density surface map incorrectly depicts black bear density in the Large Carnivore Study area. In contrast, the ISR (Part A Page 7) reported “*The study team used the model to predict the number of black bears in 1-km cells (Fig 5.1-5). Model fit diagnostics indicated a good fit. The deviance explained by the model was high (38.1 percent), indicating a good predictive model.*” We believe if a bear expert had been involved in this research project rather than only biometricians, it would have been recognized that a model predicting black bear densities of >1/km² in any part of Alaska was not a credible model.

The FSP (page 10.8-6) states that “*Distance sampling using line transects surveyed from small airplanes (Becker and Quang 2009) is the primary method currently employed by ADF&G to obtain regional estimates of bear population density in southern Alaska.*” We question this statement. The most recent Bear Survey and Inventory reports for Game Management Units 13, 14, and 16, (Petlier 2011 a,b; Schwanke 2011) make no mention of Becker and Quang (2009) or the brown bear density estimates reported by AEA. The ISR (Part A, Page 3) reports that Becker and Quang’s MRDS transect approach was used during 2003 and 2004 in a combined 13A and

¹⁰ The scale for both species on the density surface maps is incorrectly labeled “Estimated abundance” when it should be “estimated density” since it is a density surface map.

13B study area, yet this decade-old study was not cited by Schwanke (2011) in her report on brown bear management in Unit 13 and no results from this work are reported in the ISR. ADF&G management biologists may not be using results obtained from MRDS applications because the study area is too large and variable to be useful in a management context. The “Talkeetna Study Area” which is the same as the ISR Large Carnivore Study Area, integrates results across multiple GMUs and Subunits (13E, 16A, 16B), each with different habitat conditions (e.g., no/low to high salmon availability). Concentrated food sources like salmon dramatically influence bear densities (Miller et al. 1997a, Hildebrand et al. 1998, Schwartz et al. 2003). Consequently, a density estimate incorporating large portions of both Unit 13 and Unit 16 is of little or no value to a management biologist for either area. Furthermore, management biologists in Units 13, 16, and 9 likely recognize that the population and density estimates are too low to be credible.

Objective 2. Evaluate bear use of streams supporting spawning by anadromous fishes in habitats downstream of the proposed dam that may be altered by the Project.

This objective would be more precisely stated if it was made clear that bear “use” was not going to be examined during this study but rather the ratio of salmon consumption to consumption of terrestrial plant and animal foods. Results of carbon and nitrogen isotope analyses are not reported in the ISR, but preliminary results for both bear species are reported in Part B of the ISR (June 2014). These preliminary results are consistent with previous studies in Alaska where black and brown bears are sympatric (e.g., Fortin et al. 2007) and suggest much higher use of salmon by brown bears than black bears which exhibit higher use of plants.

No bear hair was collected in 2013 on the Susitna River above Devils Canyon because of access issues. This is unfortunate as 1980s data collection efforts were based on the invalid assumption that Chinook salmon did not migrate above Devils Canyon. It is unclear if hair above Devil’s canyon will be collected in 2014.

Objective 3. Describe the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G. (See separate wolf comments for evaluation of this objective.)

Objective 4. Synthesize historical and current data on bear movements and seasonal habitat use in the study area, including the substantial body of data gathered by radio-tracking during the 1980s, as a continuation of the 2012 wildlife studies (AEA 2012).

It is not clear what the phrase “...current data on bear movements and seasonal habitat use in the study area” refers to. To our knowledge, there are no ongoing studies on these issues for either bear species in any portion of the Large Carnivore Study Area or adjacent to this area. A brown bear study was initiated by management staff in GMU 13A but was terminated and no report is available. Even if a report on this 13A study were available, it is unlikely that it would provide insights on movements and seasonal habitat use in the area of the proposed impoundment. We conclude that the ISR will not provide any new information on bear movements and seasonal habitat use in the study area so this objective will not be achieved.

More sophisticated analysis of movement and habitat use data is now possible with new software and GPS technology that did not exist during the earlier studies conducted in the 1980s (Miller 1987). It is unfortunate that GPS collars were not employed in the current bear studies. Insights gained from GPS collar technology play an important new role in the current AEA-funded Susitna Dam impact assessment studies for moose and caribou. The same should have been done for bears.

The ISR for bears correctly captures many of the main conclusions from earlier Su-Hydro studies (Miller 1987) with the exception of the denning comments mentioned below in the section on errors.

Errors in ISP and ISR and related documents

We believe that the Final Study Plan in Section 10.8.5 (Consistency with Generally Accepted Scientific Practice) incorrectly asserts “*Distance sampling using line transect surveys from small airplanes (Becker and Quang 2009) is the primary method currently employed by ADF&G to obtain regional estimates of bear population density in southern Alaska*” (Page 6). It would be more accurate to state that this approach (termed here Mark-Recapture Density Sampling or MRDS technique) is under development for bears in Alaska. There is no publication or report that correctly uses the technique to report bear density in Alaska or anywhere else because the two publications that employed MRDS did not use the point independence reanalysis (Becker and Quang 2009, Walsh et al. 2010). Point independence reanalysis is used for the first time for bear data in the ISR. Therefore this technique, as currently envisioned for use in Susitna studies, has not been subjected to peer review¹¹ and does not meet the criteria established by AEA for Susitna Dam studies that techniques must be “consistent with generally accepted scientific practice.”

ADF&G has deployed the MRDS technique in high density populations in parts of GMU 9 (the Alaska Peninsula) during 1999-2005, but we are unaware of any publication or report describing the methods for obtaining these estimates. Consequently, they are impossible to evaluate. There is a brief mention of the density estimation results derived from these surveys in the biannual brown bear Survey and Inventory report for GMU 9 (Riley and Butler, 2011). The density estimate using the MRDS technique in Unit 9 was 110 bears/1,000 km² (Riley and Butler 2011). This estimate is significantly lower than previously reported density estimates for similar habitats on the Alaska Peninsula and Kodiak Island (Miller et al. 1997a, Van Daele 2011, see Table 1 above).

The conclusion that the MRDS technique is better described as “under development,” rather than established science, is also supported by new analyses of old data collected using this technique. Data collected during 2000-2003 in the 26,490 km² Large Carnivore Study Area (also called the Talkeetna Study area) resulted in a population estimate of 575.9 brown bears (SE = 78.7) (Becker and Quang 2009:219). Recent re-analysis of these same data resulted in an increase in

¹¹ Becker (ADF&G, personal communication) reports that publications on point independence reanalysis of MRDS data are in preparation. Similar techniques have been used for other species and are reported in the literature.

the population estimate to 841 brown bears (SE = 161.7) with a 95% CI of from 578.7 to 1,221.5) (ISR Part A, page 8). The initial population estimate made by Becker and Quang (2009) is not within the 95% CI of the most recent population estimate reported in the ISR using exactly the same data but different analytical techniques.¹² Although the new analysis resulting in higher density estimates appears more in line with previous studies for interior GMU 13, these estimates still appear low based on the amount of salmon-rich habitat in eastern GMU 13E, 16A, and 16B (Susitna River downstream from Devils Canyon representing about half of the Large Carnivore Study Area). This problem is discussed above and illustrated in Table 1.

The only adequately documented use of the MRDS technique to estimate brown bear numbers was a study by federal biologists in Bristol Bay on the Togiak National Wildlife Refuge in GMU 18 (Walsh et al. 2010). This published study is not mentioned in the ISR or the RSP. It is briefly mentioned in the Survey and Inventory report for GMU 18 where the Togiak Refuge estimate was extrapolated to all of GMU 18 to obtain a Unit-wide population estimate (Perry 2011). The density estimate reported was 40.4 bears (all ages)/1,000 km² (Walsh et al. 2010), which is consistent with previous non-quantitative estimates for this area. However, the new analytical techniques which resulted in a 40% increase in estimates reported by Becker and Quang (2009) probably would, if recalculated to include point independence, result in a corresponding dramatic increase in the number of bears estimated in the Togiak Refuge in GMU 18. Walsh et al. (2011:56) concluded:

...the [Becker and Quang 2009] method can only detect total population change between two surveys of 38% or larger (Table 7). This level of power is less than needed to address current management needs for the Togiak NWR (i.e. changes of ~20% or less over 5 y). Thus, while the method currently has limited value for monitoring bear populations similar to that of the study area, it shows promise for populations of greater density with equal or greater detectability. Based on density estimates (Miller 1993), this potentially includes all nonforested habitat in the coastal regions up to ~ 100 km inland from the Alaska Peninsula to the panhandle regions in southeastern Alaska.

The ISR also erroneously states, “ADF&G does not consider bear dens to be “sensitive locations,” (ISR section 10.8.4.1.2 Downstream surveys [for bear]), citing a letter from M. Burch, ADF&G, to AEA, dated December 10, 2011). With reference to black bears, at least, both the statement that bear dens are seldom reused and that they are not sensitive areas are incorrect. Schwartz et al. (1987:288) noted “Reuse of dens [by black bears] was common in all 3 study areas.” The areas studied by Schwartz et al. (1987) included the Susitna Dam area and the lower Susitna River (below Devils Canyon), Prince William Sound, and the Kenai Peninsula. Schwartz et al. 1987:289) also noted that “*The high reuse of natural cavity dens [by black bears] in SRB [Susitna River Study Area] was unexpected considering the characteristics of these dens, many of which appeared drafty and cold and frequently incompletely sealed by the snowpack.*” Dismissing the importance of denning habitat is also inconsistent with observations made in earlier Su-hydro studies. Miller (1987:44) observed:

¹² The new analytical techniques uses a DSM (detailed Density Surface Model) developed by Miller et al. (2013) and Generalized Additive Models (GAMs) (Wood 2006).

Most [brown] bears showed a tendency to den in the same general location year after year but considerable variation was observed. Den sites used in different years by the same individual were separated by a mean distance of 3.8 miles (Table 42).

With respect to black bear dens, Miller (1987:67) reported:

These data demonstrate a high rate of reuse of individual dens by bears in the upstream Su-Hydro area compared with other study areas (Schwartz et al., in press) and suggest that good den sites may be limited in the upstream study area.

And Miller (1987:62) reported:

Forty-four different dens were found in the vicinity of the Watana Impoundment: 55% of these were dug, 41% were in natural cavities, and 2% were of unknown cavity type (Table 75). Of these dens, 55% would be flooded by the proposed impoundment and 46% would not be flooded (Table 75).

Miller (1987:63) concluded:

These data suggest that the Watana Impoundment would probably result in a reduction of acceptable denning sites for black bears resident in this area. This factor might become limiting for black bear populations in this area if populations remained at pre-impoundment levels.

Another error in the ISR occurs in Part A (page 10), where it states: “*Black and brown bears are highly territorial and tend to use the same high-quality foraging areas throughout a season (Barnes 1990)*” (emphasis added). Bears were also mistakenly identified as territorial on page 10 of the ISR with regard to the hair snaring studies. In fact, neither black or brown bears are “territorial.” Territoriality is defined when a species defends the area it occupies (a territory) from encroachment by others of the same species. Both bear species have large and overlapping home ranges and both species tend to reuse high quality foraging areas within their home ranges during a season. Although not territorial, bears may defend a personal space against crowding by other bears. It is also incorrect to say that bears use the same area throughout a season unless a “season” is atypically defined as the period when a certain food source is available (such as berries in a particular spot or a temporally short run of a single species of salmon as occurs in Prairie Creek near the proposed Susitna impoundment [Miller 1987]).

Recommendations

1. Bear studies should be redesigned to permit direct estimation of the number of bears in the area likely to be impacted by the proposed impoundment, rather than the current study area which is approximately 20 times larger. The method currently being used does not provide an abundance or a density estimate for either species of bear in the area that will be impacted by the impoundment. CMR, hair-snaring DNA studies, and/or Resource Selection Function studies based on data from radio-marked bears are all appropriate techniques that should be considered to provide useful information for evaluating project impacts on bears. Depending on techniques used, this would require 2-4 years of study with the quickest result from DNA

hair snaring studies (e.g., Kendall et al. 2009, Boulanger et al. 2002). This is particularly important for brown bears. The estimates derived by Miller (1987) for black bears are unlikely to have changed much in the Susitna Dam area. In contrast, efforts have been ongoing for decades to reduce the number of brown bears in GMU 13 so earlier estimates may no longer apply to the current population (Miller et al. 2011).

2. Redesigned bear studies should include radio-tracking bears using GPS transmitters to permit determination of bear use of project impact areas more precisely than was possible during 1980s studies using VHF collars. This study requires more than three years.
3. If AEA chooses not to redesign bear studies as recommended above, then it is essential that available data from the current study be evaluated in such a way that abundance and density estimates can be directly compared to earlier Susitna Dam studies (Miller 1987). To do that, existing spatial analysis results for density must be used to generate population and density estimates for an area that makes sense in terms of where the proposed project will impact bears. Most appropriately, this will involve estimating abundance and density not just for the entire 26,490 km² Large Carnivore Study Area, but also for the same 1,317 km² study area used to estimate bear abundance and density estimates in 1985 (Miller 1987) and in 1995 (Miller 1997b). For the 1,317 km² study area, bear estimates (all ages) were 35.6 (95% CI =33.0-40.1) in 1985 and 53.7 (95% CI=47.4-63.1) in 1995 (Miller 1997b). For “independent bears” estimates were 24.7 (95% CI=20.9-31.3) in 1985 and 30.7 (95% CI=25.4-39.7) in 1995 (Miller 1997b).
4. Although we believe the density and abundance estimates generated by this project are not biologically credible (probably because of incorrect data inputs), the idea of generating a density surface map from observational data has merit at least for other species and perhaps, if done correctly, for bears as well. The spatial modeling for this project has apparently resulted in densities being assigned to all 1-km² cells in the Large Carnivore Study Area based on covariates where bears were seen. Smoothing software from this database was used to generate the density surface maps where shading indicated a purported gradient of bear density. A more valuable way to use these data than difficult-to-interpret shadings on a map, would be to build tables showing the number of 1-km² cells in different density categories (e.g., 0-4.9/1,000 km², 5-9.9, 10-14.9, 15-19.9, 20-24.9, etc.). This tabular data could be used to derive population and mean density estimates for a subportion of any study area (including a portion of the Large Carnivore Study Area surrounding the proposed impoundment or the 1,317 km² study area where abundance and density was estimated by Miller (1987)). We suggest that the midpoint of each density category could be used to derive these estimates. It may be possible to derive a variance for such estimates based on Coefficient of Variation surface maps such as are displayed in the ISP using the same 1-km² cell approach. We recommend that AEA contract to do something like this for the existing 1-km² data set for some portion of the Large Carnivore Study Area that is geographically pertinent to impact assessment studies for the proposed project. This will also be a useful test of the validity of the results generated by the MRDS approach used in this project and reported in the ISR.
5. Regardless of whether the above is done, we recommend that AEA acquire the databases used to generate the results shown in the ISR which generated the density surface and related maps so that they can be independently evaluated for problems that lead to apparent non-credible results. According to the FSP, AEA paid for the spatial analyses used to generate these products and therefore should have a right to have them. Available information

presented in the ISR is inadequate to evaluate problems. We don't even know which covariates were found pertinent to the final model used to construct the density surface map and which covariates were determined to be non-significant. Neither do we know the Akaike's Information Criteria (AIC) scores for any of these covariates. This information is necessary to evaluate the results.

6. All maps in the ISR should be modified to show geographic features to permit viewers to orient themselves within the Large Carnivore Study area. The needed features include the proposed Susitna Dam impoundment and major rivers. For brown bears this includes Figures. 5.1-11 and 5.1-12 and the corresponding maps for black bears.
7. Regardless of the approach to future bear studies, the project on Wildlife Harvest Analysis (ISR Chapter 10.20) should include analysis of kill density by harvest reporting units (UCUs) in the entire Large Carnivore Study Area. This will facilitate interpretation of the logic of density surface area plots in the ISR. Recommendations for presentation of harvest data for brown and black bears are in our comments for Project 10.20.
8. The reports on bear and population density estimation techniques are too complex for those without current advanced training in biometrics. Our review of the ISR required consultation with several Alaskan biometricians, including some who have studied the techniques in question. That level of complexity is contrary to the intended purpose of the study reports. The purpose is to inform FERC, the concerned public (and professional wildlife biologists) of study progress so that the suitability of techniques to accomplish stated objectives can be evaluated. The one published paper cited as the authority for these techniques and results is also highly technical and complex (Becker and Quang 2009). If AEA is going to make a case that research reports—and associated comment periods—are ultimately adequate to support a FERC license application, reports must be presented in a way the interested and reasonably well-educated public can understand. Other study reports for terrestrial species were adequately comprehensible, but this was not the case for the bear portion of the Large Carnivore ISR that involved estimating bear abundance, density and creating the final products based on spatial modeling.
9. If the experimental MRDS approach continues to be employed in Susitna Dam impact assessment studies, power analyses must also be conducted to determine what level of change would be detectable utilizing a subsequent application of the approach (e.g., post dam construction) in the same study area. Walsh et al. (2010) conducted a rigorous power analysis, without which, the management utility of any technique cannot be evaluated.
10. A sensitivity analysis should also be conducted. This will permit evaluating the impact on final results of not observing a subset of randomly selected bear groups on the estimate of bear population size. The same kind of sensitivity analysis should be done to evaluate the impacts of having seen additional groups on the final results.
11. ADF&G chose to use an experimental technique for these studies even though a more comprehensive model for impact assessment studies has long been available to ADF&G (e.g., Flynn et al. 2012, Miller 1987). Meaningful information on changes in bear abundance, population composition, and additional information on bear use of the potential impact area could have been obtained by replicating the studies of Miller (1987) using the same study area. This study area was used to conduct 2 density estimates using CMR techniques in 1985 and 1995 (Miller 1997b). Replicating this work would provide useful information on changes and trends in the bear population. More pertinent information on dam impacts could also have been attained using Resource Selection Function techniques

- (e.g., Boyce et al. 2002, Manley et al. 2008, Flynn et al. 2012), or DNA hair sampling techniques (e.g., Woods et al. 1999, Kendall et al. 2009, Proctor et al. 2012).
12. Authors must be explicit about the units with which they are estimating bear numbers and bear density. Although it is not explicitly stated, the ISR estimates actually represent bears of all ages. This was based on extrapolations from mean group size observed. Absent explicit description of the units for population or density estimates, they are of little value in making spatial or temporal comparisons with other study areas.
 13. Results of the MRDS technique should include search intensity (minutes searched/km²) and associated variability based on covariates (e.g., vegetation type or elevation). This facilitates comparisons with results of other techniques such as the CMR approach. The search intensity for CMR studies in the Susitna study area ("MidSu") was 1 min/km² (Miller et al. 1997a: Table 3).
 14. Publications on the MRDS technique to estimate bear abundance should be submitted to wildlife journals and not just statistical journals that are not typically read by non-quantitative wildlife biologists. Bear biologists, for example, would be more likely to recognize that the density estimates in the density surface maps are way too high for Alaska and to question the high detectability probabilities values reported in the ISR. In contrast, referees for statistical/mathematical journals are likely to be unfamiliar with important aspects of bear biology and to focus on the math involved.
 15. Tables should be provided based on number of bears seen by group size (including groups of newborn, yearling and 2 year-old cubs) and mean and median group size. This is the only information on population composition the MRDS technique can provide. This information is also useful in evaluating the extrapolation for number of groups seen to total number of bears in the population. It is also potentially very useful to evaluate whether the MRDS technique systematically under-samples groups of females with newborn cubs which are the last to exit dens in the spring (Miller 1990) and stay at high elevations near their den sites for an extended period following emergence (Miller 1987).
 16. Tabular data for the MRDS technique should show range and means for detectability based on important covariates, especially group size, distance, snow cover, and vegetation. This information is important to permit evaluation of suspected overestimation bias in detectability.
 17. The authors should display the locations, elevations, and dates of their MRDS transects on a study area map and in tables so that readers can see where and when transects were flown. This is necessary to evaluate likely bias in the categories of bears likely to be seen such as females with newborn cubs who tend to remain at high elevation near dens during spring.
 18. The analysis of isotopes in bear hair to detect salmon use by bears should include sample collection times relative to timing of salmon use and bear molting.
 19. Neither the final study plan nor the ISR have any objective associated with evaluating the impacts of proposed roads and transmission lines that will be required to support the proposed project. Although bears can and will cross these corridors, the corridors will likely result in negative impacts on movements by avoidance reactions and increased access to currently remote areas of GMU 13 for hunters and other recreationists which will increase mortality from legal hunting, defense of life and property kills, and illegal kills. There is a huge body of literature on the adverse impacts of roads and access corridors on brown bears including: Simpson (1986), Mattson et al. (1987), McLellan and Shackleton (1988), Kaswork and Manley (1990), Gibeau et al. (2002), Chruzez et al. (2003), Waller and

Servheen (2005), Cook et al. (2006), Graves et al. (2006), Graves et al. (2007), Clevenger and Huijser (2011), Proctor et al. (2012). This impact was also observed by Schwanke (2011:145): “[Brown bears in Unit 13] *are wary of motorized vehicles.*”

20. There is nothing in the study plan or ISR that is designed to identify appropriate kinds or levels of mitigation for adverse impacts of the project on bears. Although current ADF&G management objectives for brown bears are to reduce their abundance in the hope this will increase moose availability for hunters (Schwanke 2011), the objective for FERC and federal land managers may not and should not correspond.
21. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in the earlier ADF&G reports on Susitna dam studies conducted during 1980-1986 (e.g., Miller 1987). At least a “prepared by” statement should be included in these reports. Anonymous reports do not have the credibility that comes with reports by people willing to identify themselves as responsible for the studies and conclusions.
22. Impact assessment studies should not be considered adequate unless study plans incorporate post-project studies to determine actual impacts on bear movements, use of habitats, and changes in numbers and reproductive parameters, and should include allocation of funds for that work. Post-project studies should use GPS collars to permit statistically valid comparisons with data from currently ongoing pre-project studies.

References Cited

- Aars, J., T.A. Marques, S.T. Buckland, M. Anderson, S. Belikov, A. Boltunov, and O. Wiig. 2009. Estimating the Barents Sea polar bear subpopulation size. *Marine Mammal Science* 25:35-52.
- Ballard, W.B., and S.D. Miller. 1990. Effects of reducing brown bear density on moose calf survival in southcentral Alaska. *Alces* 26:9-13.
- Becker, E. 2003. Brown bear line transect development. Federal Aid Final Research Report, Wildlife Restoration, Grants W-27-2, W-27-3, W-27-4, W-27-5, W-33-1, Project number 4.30. 5pp. [just a report that double count studies were conducted in GMUs 9, 13 A,B,E, and northern GMU 16A and B; no results reported].
- Becker, E.F., and P.X. Quang. 2009. A gamma-shaped detection function for line-transect surveys with mark-recapture and covariate data. *Journal of Agricultural, Biological, and Environmental Statistics*, 14(2):207-223.
- Benson, Anna-Marie. 2010. Use of a gamma-shaped detection function for estimating abundance of animals: The importance of independent data. MS. Thesis, Univ. of Alaska Fairbanks. 22pp.
- Borchers, D.L., J.L. Laake, C. Southwell, and C.G.M. Paxton. 2006. Accommodating unmodeled heterogeneity in double-observer distance sampling surveys. *Biometrics* 62:372-378.
- Boulanger, J., K.C. Kendall, J.B. Stetz, D.A. Roon, L.P. Waits, and D. Paetkau. 2008. Multiple data sources improve DNA-based mark recapture populations of grizzly bears. *Ecological Applications* 18:577-589.
- Boulanger, J., G.C. White, B.N. McLellan, J. Woods, M. Proctor, and S. Immer. 2002. A meta-analysis of grizzly bear DNA mark-recapture projects in British Columbia, Canada. *Ursus* 13:137-152.
- Boyce, M.S., P.R. Vernier, S.E. Nielsen, and F.K.A. Schmieglelow. 2002. Evaluating resource selection functions. *Ecological Modelling*, 157:281-300.
- Buckland, S.T., D.R. Anderson, K.P. Burnham, J.L. Laake, D.L. Borchers, and L. Thomas. 2001. *Introduction to Distance Sampling*. Oxford University Press, New York, NY.
- Chruszez, B., A.P. Clevenger, K. Gunson, and M.L. Gibeau. 2003. Relationship among grizzly bears, highways and habitat in the Banff-Bow Valley, Alberta, Canada. *Canadian J. Zoology*, 81:1378-1391.
- Clevenger, A.P., and M.P. Huijser. 2011. *Wildlife Crossing Structure Handbook, Design and Evaluation in North America*. FHWA-CFL/TD-11-003. Federal Highway Administration, Planning, Environment and Reality. Washington DC, USA.
- Cook, J.A., N.G. Dawson, S.O. MacDonald. 2006. Conservation of highly fragmented systems: The north temperate Alexander Archipelago. *Biol. Conservation*, 133:1-15.
- Flynn, R.W., S.B. Lewis, L.R. Beir, G.W. Pendleton, A.P. Crupi, and D.P. Gregovich. 2012. Spatial use, habitat selection, and population ecology of brown bears along the proposed Juneau access improvements road corridor, Southeast Alaska. Final Wildlife Research Report, ADF&G/DWC/WRR-2012-04. 106pp.
- Fortin, J.K., S.D. Farley, K.D. Rode, and C.T. Robbins. 2007. Dietary and spatial overlap between sympatric ursids relative to salmon use. *Ursus* 18:19-29.
- Gibeau, M.L., A.P. Clevenger, S.H.J. Wierzchowski. 2002. Grizzly bear response to human development and activities in the Bow River Watershed, Alberta, Canada. *Biological Conservation* 103:227-236.

- Golden, H. and T. Rinaldi. 2008. Population ecology and spatial dynamics of wolves relative to prey availability and human activity in the Nelchina Basis, Alaska. Research Final Performance Report 1 July 2006-30 June 2008, Federal Aid in Wildlife Restoration W-33-6, Study 14.24. 13pp.
- Graves, T.A., S. Farley, and C. Servheen. 2006. Frequency and distribution of highway crossings by Kenai Peninsula brown bears. *Wildlife Soc. Bulletin*, 34:800-808.
- Graves, T.A., S. Farley, M.I. Goldstein, and C. Servheen. 2007. Identification of functional corridors with movement characteristics of brown bears on the Kenai Peninsula, Alaska. *Landscape Ecology* 22:765-772.
- Hildebrand, G.V., C.C. Schwartz, C.T. Robbins, M.E. Jacoby, T.A. Hanley, S.M. Arthur, and S. Servheen. 1999. The importance of meat, particularly salmon, to body size, population productivity, and conservation of North American brown bears. *Canadian Journal of Zoology* 77:132-138.
- Kasworm, W.F., and T.L. Manley. 1990. Road and trail influences on grizzly bears and black bears in northwest Montana. *International Conf. on Bear Research and Management* 8:79-84.
- Kendall, K.C., J.B. Stetz, J. Boulanger, A. C. Macleod, D. Paetkau, and G.C. White. 2009. Demography and genetic structure of a recovering grizzly bear population. *Journal Wildlife Management*, 73:3-17.
- Laake, J., M.J. Dawson, and J. Hone. 2008. Visibility bias in aerial survey: mark-recapture, line-transect or both? *Wildlife Research*, 35:299-309.
- Manly, B.F.J., L.L. McDonald, D.L. Thomas, T.L. McDonald, and W.P. Erickson. 2002. Resource selection by animals. Kluwer Academic Publishers, Dordrecht, Netherlands.
- Mattson, D.J., R.R. Knight, and B.M. Blanchard. 1987. The effects of developments and primary roads on grizzly bear habitat use in Yellowstone National Park, Wyoming. *International Conf. on Bear Research and Management* 7:259-273.
- McLellan, B.N., and D.M. Shackleton. 1988. Grizzly bears and resource-extraction industries: Effects of roads on behavior, habitat use and demography. *J. Applied Ecology*, 25:451-460.
- Miller, D.L., M.L. Burt, E.A. Rexstad, and L. Thomas. 2013. Spatial models for distance-sampling data: recent developments and future directions. *Methods in Ecology and Evolution* 4:1001-1010. Available at: <http://dill.github.io/papers/dsm-paper.pdf>
- Miller, S.D. 1987. Big Game Studies, Brown and Black Bear. Vol. VI. Black bear and Brown Bear. Final 1986 Report, Susitna Hydroelectric Project Final Report. Alaska Dept. of Fish and Game, Juneau. 276pp.
- Miller, S.D. 1990. Denning ecology of brown bears in southcentral Alaska and comparison with a sympatric black bear population. *Int. Conf. Bear Res. And Management* 8:279-288.
- Miller, S.D., and W.B. Ballard. 1992. Analysis of an effort to increase moose calf survivorship by increased hunting of brown bears in south-central Alaska. *Wildlife Soc. Bulletin* 20:445-454.
- Miller, S.D., G.C. White, R.A. Sellers, H.V. Reynolds, J.W. Schoen, K. Titus, V.G. Barnes, Jr., R.B. Smith, R.R. Nelson, W.B. Ballard, C.C. Schwartz. 1997a. Brown and black bear density estimation in Alaska using radiotelemetry and replicated mark-resight techniques. *Wildlife Monographs* 111:1-55.

- Miller, S.D. 1997b. Impacts of heavy hunting pressure on the density and demographics of brown bear populations in Southcentral Alaska. Federal Aid in Wildlife Restoration, Research Final report, 1 July 1993-30 June 1996. 97 pp.
- Miller, S.D., R.A. Sellers, and J.A. Keay. 2003. Effects of hunting on brown bear cub survival and litter size in Alaska. *Ursus* 14:130-152.
- Miller, S.D., J.W. Schoen, F. Faro, and D.K. Klein. 2011. Trends in intensive management of Alaska's grizzly bears, 1980-2010. *Journal Wildlife Management* 75:1243-1252.
- Peltier, T.C. 2011. Unit 16 brown bear management report. Pages 166-176 in P. Harper, ed. Brown bear management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.
- Pelton, M. 2003. Black Bear. Pages 547-555 in G.A. Feldhamer, B.C. Thompson, and J.A. Chapman, eds. *Wild Mammals of North America: Biology, Management, and Conservation*, 2nd Ed. Johns Hopkins Univ. Press. Baltimore, Maryland, USA.
- Perry, P. 2011. Unit 18 brown bear management report. Pages 189-186 in P. Harper, ed. Brown bear management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.
- Proctor, M.B., D. Paetkau, B.N. McLellan, G. Stenhouse, K.C. Kendall, R.D. Mace, W.F. Kasworm, C. Servheen, C.L. Lausen, M.L. Gibeau, W.L. Wakkinen, M.A. Haroldson, G. Mowat, C.D. Apps, L.M. Cianiello, R.M.R. Barclay, M.S. Boyce, C.C. Schwartz, and C. Strobeck. 2012. Population fragmentation and inter-ecosystem movements of grizzly bears in western Canada and the northern United States. *Wildlife Monographs* 180:1-46.
- Riley, M.D. and L. Butler. 2011. Unit 9 brown bear management report. Pages 109-117 in P. Harper, ed. Brown bear management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.
- Schwanke, B., and R. Tobey. 2011. Nelchina Brown Bear Demographics. Federal Aid Research Annual Performance report, Alaska Department Fish and Game State Wildlife Grant W-33-8, project 4.41. 4 pp.
- Schwanke, R.A. . 2011. Units 13 and 14B brown bear management report. Pages 141-150 in P. Harper, ed. Brown bear management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.
- Schwartz, C. C., S.D. Miller, and A. W. Franzmann. 1987. A comparison of denning ecology of three black bear populations in Alaska. *Intl. Conf. Bear Res. and Manage.* 7:281-292.
- Schwartz, C.C., S.D. Miller, and M.A. Haroldson. 2003. Grizzly bear. Pages 556-586 in G.A. Feldhamer, B.C. Thompson, and J.A. Chapman, eds. *Wild Mammals of North America: Biology, Management, and Conservation*, 2nd Ed. Johns Hopkins Univ. Press. Baltimore, Maryland, USA.
- Schoen, J. W., L. R. Beier, and J. W. Lentfer. 1987. Denning ecology of coastal brown bears on Admiralty and Chichagof Islands, Southeast Alaska. *Int. Conf. Bear Res. and Manage.* 7: 293-304.
- Simpson, K. 1986. Impacts of a hydro-electric reservoir on populations of caribou and grizzly bear in southern British Columbia. *Keystone Bio-Research Report for the B.C. Ministry of Environment*. Mimeo. 40pp.
- Steyaert, S.M.J.G., J. Kindberg, J.E. Swenson, and A. Zedrosser. 2013. Male reproductive strategy explains spatiotemporal segregation in brown bears. *J. of Animal Ecology* 82:836-845.

- Testa, W.J., W.P. Taylor, and S.D. Miller. 1998. Impacts of heavy hunting pressure on the density and demographics of brown bear populations in Southcentral Alaska. Alaska Dept. Fish and Game. Federal Aid in Wildlife Restoration Progress report. Project W-24-5, Study 4.26. Juneau, AK.
- Van Daele. 2011. Unit 8 brown bear management report. Pages 79-108 in P. Harper, ed. Brown bear management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Project 3.0. Juneau, AK.
- Waller, J.S., and C. Servheen. 2005. Effects of transportation infrastructure on grizzly bears in northwestern Montana. J. Wildlife Management, 69:985-1000.
- Walsh, P., J. Reynolds, G. Collins, B. Russell, M. Winfree, and J. Denton. 2010. Application of a double-observer aerial line transect method to estimate brown bear population density in southwestern Alaska. J. of Fish and Wildlife Management 1:47-58.
- Woods, J.G., D. Paetkau, D. Lewis, B.N. McLellan, M. Proctor, and C. Strobeck. 1999. Genetic tagging free ranging black and brown bears. Wildlife Soc. Bulletin, 27:616-627.
- Wood, S.N. 2006. Generalized Additive Models: An Introduction with R. Chapman & Hall/CRC Press, New York, NY.

APPENDIX A. The Mark-Recapture Distance Sampling (MRDS) technique: General principles and commentary.

Using line transects (distance sampling) techniques to estimate the abundance of objects, including wildlife, is a well-established technique with an extensive and growing literature. It is a sampling technique designed to provide information on abundance in a small area that can be extrapolated to a larger area of interest to estimate abundance in the larger area. At its most basic level, a line along a transect or elevational contour is established in an area of interest and the perpendicular distance of objects of interest from this line are obtained. These distances are summed in various ways to determine the effective area that has been sampled or, in some cases, an effective transect width is set and assumptions are made about the visibility of the objects within this width. Visibility may be affected by things that make it more or less easy to see the object, such as vegetation or object size, and these are termed covariates that affect visibility.

The MRDS technique combines the line-transect concept with mark-recapture-techniques (Laake et al. 2008). Mark-recapture techniques also have a long history supported by extensive literature. Mark-recapture techniques are a way of estimating the number of the animals that are not directly observed through analysis of the ratio of marked to unmarked animals observed. Mark-recapture is conducted by putting a known number of marked objects in an area and subsequently determining the ratio of marked to unmarked objects that are recaptured in some way (such as visual sightings). As long as the number of marks available for recapture is known (termed population closure), then the total number of objects in the population can be calculated from the ratio of marked to unmarked individuals obtained during recapture efforts. Establishing population closure for objects that can move around (like animals) is something that must be addressed by persons using capture recapture methods; Miller et al. (1997a) did this in the Susitna study area using radio telemetry.

The MRDS technique as described for bears by Becker and Quang (2009) uses line intercept techniques to establish the distance from the transect line at which bears are seen from an aircraft. It combines this with capture-recapture techniques using two observers in an aircraft who are isolated from each other (looking for bears without communicating between themselves). Only one observer may see a bear, both observers may see a bear, or both observers may miss a bear. When one observer sees a bear, it is treated as a “marked” bear. If the other observer also sees the bear, it is treated as a recapture (resighting) of a marked bear, and if the other doesn’t see it that is the same as a marked bear not having been “resighted.” The most critical assumption in this technique may be that the sightings by each observer are independently obtained; a sighting by one observer must not influence the likelihood that the other will also see the bear. The importance of this assumption was evaluated by Benson (2010). Violations of this assumption will lead to a systematic underestimation bias.

The MRDS technique uses the capture-recapture data from the observers to calculate a detection probability for each observation. Data on the physical characteristics where the sighting occurred (slope, aspect, vegetation cover, etc.) are also obtained and subjected to an analysis to determine which are important to include in detectability models. Spatial Modeling (Miller et al. 2013) may be used to construct a density surface map based on bear observations obtained.

There are numerous potential advantages to the MRDS technique. One is that it eliminates the need to make assumptions about population closure. Another is that it allows a series of randomly distributed transects in a large study area to be evaluated to determine animal abundance in the entire study area. In contrast, results from more traditional mark-resight techniques (e.g., Miller et al. 1997a) are valid only for the study area for which population closure is established which, typically, is small compared to areas that are of management significance (such as a Game Management Unit). In cases where the area of interest is already relatively small, such as for the Susitna Dam impact area, the CMR or other techniques such as DNA hair sampling techniques may be more appropriate as they directly estimate bear numbers and density in the specific area of interest such as around the proposed Susitna Dam project (e.g., Miller 1987, 1997b). Techniques to downscale bear estimates obtained from large areas like the Large Carnivore Study Area to smaller areas such as the Susitna Dam impact area, in contrast, have not yet been developed to our knowledge.

The independent dual observer approach technique can calculate a Horvitz-Thompson (H-T) detection probability (hereafter detectability). Typically, detectability declines with increasing distance from the transect, and also can be low near the transect (such as under the aircraft). Becker and Quang (2009) plotted this detectability for one category of bears (single walking bear) and it followed this pattern. The most single walking bears were seen about 150 m from the transect line (Becker and Quang 2009:Figure 1). The median distance for a single walking bear seen from the transect line was 444 m and the differences between the two observers in the probability of seeing this bear can be plotted (Becker and Quang 2009: Figure 3). The maximum detectability is the peak of this curve and (for the single walking bear) was 85.3% for the pilot and 77.0% for the observer. These values as well as peak detection distance will vary for different covariates (e.g., group sizes, vegetative cover, snow cover, distance from the transect, bear activity type, etc.). Well-established mathematical techniques are used to determine which covariates contribute significantly to the overall model used to estimate bear abundance and Becker and Quang reported that those listed were the most important.

The value for overall detectability is lower than the reported value for maximum detectability. Becker and Quang (2009) and ADF&G in the ISR determined a detectability for each group of bears seen based on covariates and plotted these values ("Estimated H-T Probabilities") in Figure 5.1-1 (page 20 of the ISR for black bears) and Figure 5.1-7 (page 26 for brown bears). It is not straightforward to compare detectability using MRDS directly to other ways of calculating sightability. Sightability in most studies involving physically marked animals is calculated based on the number of marks seen divided by the number of known marks present (e.g., Miller 1997a:Table 3 for many CMR studies around Alaska). The ISR reports that a total of 145 brown bear groups and 351 black bear groups were used in the multiple-covariate distance-sampling model to calculate a population estimate of 841 brown bears (SE = 161.7) and 1,262 black bears (SE = 169) in the Large Carnivore Study Area based on data obtained during 2000-2003. The ISR estimated the median probability that a brown bear group was observed as 0.485 (range 0.109-0.829) (page 8) and for black bear groups as 0.493 (range 0.0976-0.9097) (page 6).

Because we are concerned that detectability may be systematically overestimated by the MRDS technique when applied to bears, we have made some comparisons to our calculated sightability for groups reported in the ISR with other estimates of sightability in Alaskan studies using CMR techniques. Sightability will be overestimated if the observations of one observer increase the

likelihood of the other observer seeing the bear (Benson 2010). If sightability is overestimated, population size will be underestimated.

Earl Becker (ADF&G personal communication, 25 August 2014) asserted that the detection probabilities reported for the MRDS technique are not directly comparable to those obtained by capture-mark-resight (CMR) techniques such as those reported by Miller et al. (1997a). However even if not directly comparable, it is safe to say that in all cases and for any distance from the aircraft that the CMR sightability values should be **higher** than the detection probabilities reported using MRDS as described for bears by Becker and Quang (2009). This is because both techniques use identical aircraft and 2 observers but the sightability of a bear at whatever distance it occurs from the airplane (e.g., at whatever point in the detectability curve) should be higher for CMR techniques because:

1. With CMR techniques the pilot and observer are not and need not be independent; they are free to communicate with each other and cooperate in finding as many bears as possible including following tracks and counting bears discovered incidental to the initial bear seen;¹³
2. More intensive search techniques should always result in higher sightability values than less intensive ones. With CMR techniques the flight patch is not a straight line but is typically a circulating pattern designed specifically to maximize the likelihood of seeing a bear from one of many angles in the circle and includes circulating in tighter circles in likely areas where bears could occur, including areas where bear tracks are seen. With CMR techniques the design of searches need only assure that there is no bias in the likelihood of seeing marked or unmarked individuals. This search pattern implicitly accounts for the covariates mentioned in the Becker email above and would result in **CMR methods under any circumstance documenting more bear sightings—not less—than** when flying a straight line transect. In other words, although the detectability and sightability values are based on different kinds of data, the detectability from the strip technique (apples) should always be lower than the sightability from the CMR techniques (oranges), regardless of covariates or distance from the aircraft. The CMR techniques are not limited to a strip of a set width; a bear is counted regardless of how far it is from the aircraft when originally sighted.
3. With CMR techniques there is not an elevational limit for searches allowing teams to search at or above 5,000 feet elevation in mountainous areas where females with newborn cubs are likely to occur in spring (Miller 1987). These CMR search teams actively look in the vicinity of dens (typically conspicuous in snow banks) and find females with new born cubs in the spring (females with newborn cubs are the last to exit dens in the spring [Miller 1990]). In contrast, for the MRDS techniques used in the ISR, flight lines are along randomly established elevational contours limited to <5,000 feet elevation in mountainous areas so these transects are likely to undersample the segment of the population composed of females with newborn cubs. Females with newborn cubs may be 15-30% of the population. Miller (1990: Table 3) reported the mean exit date for females

¹³ In a personal conversation with Becker on 10/23/14 about how sightability is increased by following tracks, sometimes for miles, he said that the aircraft pilots who are big game guides frequently do find bears from his transects by observing tracks and following them visually. If this is the case than tracks should be examined as a covariate influencing detectability during his surveys.

with newborn cubs as May 15 with a range from April 23 to June 2. Becker and Quang (2009) report only that their surveys were done during “mid-May to early June” but do not report the actual dates of their surveys so it is impossible to know the significance of a potential bias against females with newborn cubs.

4. With CMR techniques, when a bear is seen at any distance from the aircraft, it is counted along with any bears seen incidental to flying to see the first spotted bear. It appears that bears seen incidental to the first bear using the Becker and Quang (2009) approach cannot be counted because counting them they would confuse calculation of the detectability curves which are critical to this technique.
5. Neither the ISR or Becker and Quang (2009) provide data on their search intensity (effort). However, for CMR techniques in the 1985 Susitna Hydro study, search effort was reported as 1 minute/km² per replication with a sightability of marked bears in the study area of 24% (Miller et al. 1997a:Table 3). This was typical for other studies in generally similar habitats such as on the north side of the Alaska Range (AKR-1 and AKR-2 in Miller et al. 1997). We suspect that bear surveys as part of the ISR were conducted at a lower intensity than those for the CMR techniques.

Although the above points indicated that CMR should produce sightabilities higher than the detectabilities reported using the MRDS approach, in almost all of the Horvitz-Thompson (H-T) detection probabilities in Figure 5.1-7 of the ISR are greater than the overall sightability of 24% reported for Su-Hydro CMR studies in 1985 (Miller et al. 1997a:Table 3). This is consistent with the conclusion that the MRDS technique currently in use by AEA and reported in the ISR overestimates detectability, leading to underestimates of population size and density. An explanation is not clear, but it most likely involves lack of independence between observers which would lead to underestimation bias (Benson 2010).

WOLVES

Comments on: Distribution, Abundance, and Habitat Use by Large Carnivores, Study Plan Section 10.8, Initial Study Report, (Parts A, B and C), and Prepared for AEA, Susitna-Watana Hydro by Alaska Department of Fish and Game, Palmer, AK. June 2014. (No authors named) 38 pp (part A); and

Revised Study Plan, Wildlife Resources, 10.8. Distribution, Abundance, and Habitat Use by Large Carnivores Study, Final Study Plan, Section 10.8, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA, pages 10.8-1 to 10.8-13. July 2013. (Please note the Large Carnivore Revised Study Plan was approved by FERC without modification and is thus equivalent to the Final Study Plan.)

Purpose of these comments: The Initial Study Report (ISR) and Revised Study Plan (RSP) for the wolf portion of the Large Carnivore portion of the Susitna-Watana project was reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the RSP;
2. Evaluate whether the data collection and analysis techniques are adequate to achieve the stated objectives;
3. Evaluate whether the stated objectives and study plans are adequate to evaluate the impacts on wolves of the proposed project with a view to assuring that adequate information is available to determine both impacts and appropriate kinds and levels of mitigation for impacts;
4. Evaluate and contrast earlier wolf studies on the same project by Ballard et al. (1984) to determine if these results are or will be integrated into the current project; and
5. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts.

Objectives for Large Carnivores Project—Wolf portion only considered here (RSP pages 10.8-1 to 2). (Analyses of progress toward these objectives is provided in a separate section, below, by objective):

1. Estimate the current populations of [~~brown bears, black bears, and~~] wolves in the study area, using existing data from ADF&G.
2. [~~pertains to bears~~]
3. Describe the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G.
4. ~~Synthesize historical and current data on bear movements and seasonal habitat use in the study area, including the substantial body of data gathered by radio tracking during the 1980s, as a continuation of the 2012 wildlife studies (AEA 2012).~~ [Note: There is no mention made here of using historic information on wolves collected as part of earlier Su-Hydro studies—see recommendation #2 below. The reference to AEA 2012 is to a report that also does not mention wolves. Analysis of the historical information on wolves should be an objective for Large Carnivore Studies.]

General overview comments:

The RSP/FSP proposes to use existing routinely-collected data to evaluate the impacts of the proposed project on wolves. However, there are no existing data or routinely collected data on wolves for the area that would be impacted by the project on either the number of wolves (Objective 1) or on the seasonal distribution of, and habitat use by wolves (Objective 3). Available data for these objectives are 30 years old and no longer valid because management emphasis for wolves has changed dramatically in this area. Completion of this study plan will not result in information that will inform AEA or FERC on the project's impacts on wolves. The ISR states (page 2) that for wolves, the "...study involves office-based analysis of existing ADF&G data on wolves from GMU Subunits 13E and 13A, and from adjacent Subunits 14B, 16A, and 20A, as available" (emphasis added). The ISR (page 5) asserts that historical data will be "synthesized" "...with data from other recent and current monitoring by ADF&G of wolves in GMU Subunits 13, 13b, 13e, 14b, 16, NS 20, as a continuation of AEA's wildlife studies that were begun in 2012 (AEA 2012a)." However, no data are "available" on project impacts on wolves and there are no data from other recent and current wolf monitoring in any of these subunits. We conclude that these statements in the ISR and RSP/FSP are meaningless and misleading insofar as it implies that such data might be "available" or be in process of being collected.

There are routinely collected data on numbers of wolves in Unit 13 and other units. However, these data are collected for a geographic area (Game Management Unit or Subunit) that is too large to be of utility in evaluating project impacts on wolves. A study on a smaller geographic area in the vicinity of the proposed project is needed to evaluate these impacts. Such a study was conducted by Ballard et al. (1984) but to our knowledge there are no new studies of wolves in the project area since then. We are not aware of any new studies involving radio-marked wolves in Unit 13 or the other subunits mentioned since the aborted effort in Units 13A and 13B described by Golden and Rinaldi (1008). Given the extremely heavy hunting pressure on wolves throughout GMU 13 (Schwanke 2012), we acknowledge that it would be extremely difficult to conduct a movement or habitat use study for wolves at the appropriate scale to determine project impacts using conventional techniques (radio telemetry) (Golden and Rinaldi 2008).

There are no methods being proposed or used for AEA's current wolf studies that will accomplish Objective 3 ("Describe the seasonal distribution and habitat use by wolves in the study area using existing data"). Unit 13 is now a wolf intensive management area and the objective is to "...maintain a post-hunting and trapping season population of 135-165 wolves (3.2-3.9 wolves/1,000 km²) in the available habitat unitwide." (Schwanke 2012:93). This objective is about half the estimated number of wolves during the 1970s (275-300) (Schwanke 2012:92 from Ballard et al. 1987). In the late 1990s, there were approximately 520 wolves in Unit 13 (Schwanke 2012).

No estimates of wolf numbers in the project area were presented in the ISR and we believe it is highly unlikely that the ongoing routine monitoring work in Unit 13 will result in accomplishment of Objective 1 (Estimate the current number of wolves in the project area using existing data).

Analysis of accomplishments by Objective:

Objective 1. Estimate the current populations of ~~brown bears, black bears, and~~ wolves in the study area, using existing data from ADF&G.

ADF&G proposes to use existing data collection procedures to estimate current populations of wolves “in the study area”. However, these routinely-collected data pertain to the number of wolves in various Subunits of Unit 13 (at best) and will not generate any estimates of the number of wolves in the study area for large carnivores illustrated in Figure 3-1 (page 19 of the ISR, Part A) or--as impact assessment studies should do-- in the much smaller area of actual impact of the proposed Susitna-Watana Dam and associated corridors.

Correspondingly, the ISR provides no estimates of numbers either for the illustrated Large Carnivore Study Area or for a more pertinently drawn and smaller impact study area for the Susitna-Watana Dam project and associated transportation and transmission corridors. The ISR reports that it has “made progress” in summarizing trends in wolf populations (ISR Part A, page 11) but the only progress reported is on a scale much larger than the dam impact area (either in Figure 3.1 or in a more pertinently-drawn study area). There is no indication that future reports will present data at a pertinent scale for project impacts. The progress reported in the ISR is taken directly from the Survey and Inventory Report for the whole of GMU 13 (e.g. Schwanke 2009, 2012).

Ballard et al. (1984: 21) reported (for both Watana and the then-proposed Devils Canyon impoundments):

The number of wolves inhabiting areas which could be impacted by the proposed project has fluctuated from 25 in spring 1983 to 47 in fall 1983 (Table 3). Both hunting and trapping have regulated the number of wolves occupying the area. Mostly wolf mortality occurred during the months of January through April primarily from aircraft assisted ground shooting (Table 2, Fig. 3). Territory sizes of 9 wolf packs in the Susitna River Basin ranged from 124 mi² to 803 mi² (322 km² to 2081 km²) and averaged 452 mi² (1171 km²) (Table 4). Some territory sizes may not be adequately described because some packs have only been located a few times... and

Generally, wolves restrict their movements to elevations less than 4,000 ft/1300 m. For example, the Watana Pack had only 2 of 56 (3.6%) observations at elevations greater than 4,000 ft/1300 m elevation in 1982.

By far the largest pack documented by Ballard et al. (1984) was the Watana Pack. This pack, if it still exists, is the pack that would be most impacted by the currently proposed project. The current Study Plan will not be able to document if this pack (or any other pack described by Ballard et al. 1984) still exists or its current size.

Since the studies by Ballard et al. (1984), there have been intensive and successful efforts to reduce the numbers of wolves in GMU 13 by increasing harvests (Schwanke 2012). This kind of disruption makes it impossible to assume that the packs, territories or wolf numbers described in earlier studies bear any resemblance to what currently exists in the project impact area. Since there are no ongoing studies to determine this, it appears that Objective 1 for wolves will not be achieved.

Objective 3. Describe the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G.

No results are reported for this objective. The existing study plan is to use routinely collected wolf management data but these data are not specific to the Large Carnivore Study area illustrated in Figure 3-1 (page 19 of the ISR, Part A) or, as they should be, to the smaller area within which wolves will be impacted by the proposed project.

It is true that currently it is extremely difficult to conduct radio-tracking studies of wolves in GMU 13 because of very heavy hunting pressure caused by the designation of GMU 13 as an intensive management zone for wolves. The rapid elimination of radio collared wolves led to the cancelation of wolf studies in Subunits 13A and 13B designed to evaluate impacts of vehicles on wolves (Golden and Rinaldi 2008). This problem existed to a lesser extent during the earlier Su-hydro studies which is the reason Ballard et al. (1984) did not include illustrations of the pack territories they studied. It may be the case that there is no way Objective 3 could be achieved under the current regulatory system for wolves in GMU 13 and it is puzzling why this objective was included if no effort was going to be made to achieve it.

Since the studies by Ballard et al. (1984), there have been intensive and successful efforts to reduce the numbers of wolves in GMU 13 by increasing harvests (Schwanke 2012). This kind of disruption makes it impossible to assume that the distribution, abundance, movements, or territories for wolves that were described in earlier studies still exist. Since there are no ongoing studies to “describe seasonal distribution of, and habitat use by wolves”, it appears that Objective 3 for wolves will not be achieved.

Objective 4. Synthesize historical and current data on bear movements and seasonal habitat use in the study area, including the substantial body of data gathered by radio-tracking during the 1980s, as a continuation of the 2012 wildlife studies(AEA 2012).
[underscore added]

This objective refers to bears and includes no reference to use of the historical data for wolves in the Susitna Dam impact area reported by Ballard et al. (1984) as part of earlier impact assessment studies. There are no analyses of historical wolf data in AEA 2012. Although the historical data is of reduced pertinence given the history of intensive wolf harvest in GMU 13 (Schwanke 2012), some effort to extrapolate from these data to impacts of the current study is potentially pertinent and should be included as an objective.

Errors in RSP and ISR and related documents

The FSP refers to ADF&G memorandum to AEA dated November 22, 2011, in support of the contention that “...ongoing monitoring work will be sufficient, ...so no additional field surveys [of wolves] are deemed necessary for the Project. Hence, desktop analyses of existing ADF&G data will be used to meet the study objectives for wolves.” (RSP page 10.8-6) However, these objectives include estimating the numbers of wolves in the Study Area (Objective 1) and determining the seasonal movements of, and habitat use by wolves of the study area (Objective 3). Ongoing routine monitoring work conducted by ADF&G is not sufficient to accomplish

either of these objectives at a scale that is necessary to evaluate project impacts on wolves. At best, this monitoring will suffice to estimate the numbers of wolves in a Subunit; current estimates by Schwanke (2012) provide estimates only for all of Unit 13 and not even harvests are reported by subunit. In fact, the ISR does not report on either Objective 1 or 3, but instead reports on trends in wolf numbers at much larger geographic scales (GMU or GMU Subunit). Further, the ISR makes no effort to evaluate current use by wolves of the impoundment impact area or the number of wolves in this area.

Recommendations:

1. Objectives 1 and 3 for wolves should not have been stated in the RSP/FSP if there was going to be no effort made to achieve them. Listing these objectives is deceptive to the licensing process for the proposed project. We acknowledge that for wolves these objectives would be difficult to achieve given the current heavy hunting pressure on wolves throughout GMU 13. This hunting pressure resulted in the need to cancel an earlier project (Golden and Rinaldi 2008) based on radio-collared wolves because radio marked animals were so quickly killed that no data of value could be obtained. We recommend that the AEA acknowledge that Objectives 1 and 3 for wolves as currently stated are unattainable for the area within which wolves will be impacted by the proposed project, or for the Large Carnivore study area delineated in the RSP/FSP and ISR. We further recommend that an appropriately-sized wolf study area centered on the project area be identified and methods proposed to identify ways to determine project impacts on wolves in this area, or to propose some other way to mitigate for adverse project impacts on wolves. This should be identified as a significant variance from the Final Study Plan. Wolves are species of concern to federal authorities who must consider the license application regardless of what the State of Alaska's management objectives. As apex predators in the ecosystem, wolves play a vital role in regulating not only potential overabundance of large carnivores that frequently results in habitat damage, but also positively affects many other species of plants and animals through what is known as a trophic cascade effect (Hebblewhite et al. 2005, Hebblewhite and Smith 2010, Ripple and Beschta 2011).
2. The wolf studies should have included an objective to synthesize the historical and current data on wolf movements and seasonal habitat and prey use in the Suitna-Watana project study area, including the substantial body of radio-tracking data gathered during the 1980s. The moose, caribou and bear studies included such an objective and the wolf studies should too, given the importance of wolves as apex predators in ecosystems (see above references). Ballard et al. (1984) conducted extensive studies on wolves in the Susitna-Watana Dam area and made impact assessments. Although the situation has changed substantially for wolves

in the project area since these earlier studies, these data should be utilized for this project¹. Perhaps AEA might choose to accept, for the purposes of mitigation, the impacts assessed in the earlier studies. Additional pertinent information on Susitna-Watana Dam area wolves also was presented in Ballard et al. (1987). Although not specifically stated in AEA documents, we speculate that the decision to exclude historical data for wolves may result from the fact that GMU 13 is now designated by the State of Alaska as an Intensive Management Area. This means that the state's objective for wolves is to significantly reduce them. The Alaska Energy Authority, FERC, the Bureau of Land Management (BLM) and Cook Inlet Region, Incorporated should all have a vested interest in project impacts to wolves given their important role in the ecosystem and in wildlife management in Alaska's most popular hunting district.

3. The Large Carnivore Study area illustrated in Fig 3-1 (page 19 of the ISR, Part A) is misleading both as an area within which wolves will be impacted by the proposed project, and as an area within which routinely-collected wolf data are obtained. This figure includes parts of 3 different subunits in 2 different units, covering an order of magnitude more area than would be relevant to project impacts. Ballard et al. (1984) reported that in 1984, just the Watana pack ranged over an area of 1,246 km². An area five times this large would still be only approximately 25% of the Large Carnivore Study Area identified in the ISR and RSP/FSP. Future study reports should be more precise about what constitutes a realistic study area for wolf impacts.
4. At a minimum, future reports should include information on the number of wolves harvested in the geographic area that would be impacted by the proposed project and corresponding corridors and transmission lines. These data are already available.
5. Neither the RSP nor the ISR have any objective associated with evaluating the impacts on wolves of the proposed roads and transmission lines that will be built to support the proposed project. Because these corridors will provide improved human access to the impoundment area, they will exacerbate already heavy human harvests and cause displacement by avoidance reactions of wolves (Ballard et al. 1984).
6. Nothing in the RSP or ISR identifies appropriate kinds or levels of mitigation for adverse impacts of the project on wolves. These impacts are pertinent to the FERC, BLM, and CIRI given their important role in the ecosystem and wildlife management decisions.

¹ Ballard et al. (1984) analyzed the results of studies of 42 radio-collared wolves in 13 different packs during 1981-1983 in the Devils Canyon and Watana impoundment zones and presented pack histories of their movements based on 649 radio-locations plus more sightings. Moose represented 61% of documentable wolf diet and caribou 30%. This report concluded that wolves would be impacted by lower wintering densities of moose and caribou in the impoundment zone and by disturbance from inundation and facilities development affecting wolves far from the impoundment zone.

7. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in the earlier ADF&G reports on Susitna dam studies conducted during 1980-1986 (e.g. Ballard and Whitman 1987). Anonymous reports do not have the credibility that comes with reports by people willing to identify themselves as responsible for studies and conclusions.
8. Impact assessment studies should not be considered adequate unless study plans incorporate (including allocation of funds) post-project studies to determine actual impacts on wolf movements, habitat use, and changes in numbers and reproductive parameters. Post-project studies should be incorporated into the study plan.

References Cited

- Ballard, W. B., J. S. Whitman, L. D. Aumiller, and P. Hessing. 1984. Susitna Hydroelectric Project, Big Game Studies. 1983 Annual Report. Vol. V - Wolf. Alaska Dept. of Fish and Game. 44pp.
- Ballard, W.B., J.S. Whitman, and C.L. Gardner. 1987. Ecology of an exploited wolf population in southcentral Alaska. Wildlife Monographs 98. 54pp.
- Golden, H. and T. Rinaldi. 2008. Population ecology and spatial dynamics of wolves relative to prey availability and human activity in the Nelchina Basis, Alaska. Research Final Performance Report 1 July 2006-30 June 2008, Federal Aid in Wildlife Restoration W-33-6, Study 14.24. 13pp.
- Hebblewhite, M., D. Smith. 2010. Wolf community ecology: ecosystem effects of recovering wolves in Banff and Yellowstone National Park. Pages 69-120 in M.P.C. Muslani and P. Paquet (eds.), The Wolves of the World: New Perspectives on Ecology, Behavior, and Policy. Univ. of Calgary Press, Calgary Alberta.
- Hebblewhite, M., C.A. White, C.G. Nietvelt., J.A. Hund, T.E. Frywell., J.M. Bayley, and S.E. Paquet, 2005. Human activity mediates a trophic cascade caused by wolves. Ecology 86:2135-2144.
- Ripple, W.J., and R.L. Beschta. 2011. Trophic cascades in Yellowstone: The first 15 years after wolf reintroduction. Biological Conservation, doi:10.1016/j.biocon.2011.11.005.
- Schwanke, R.A. 2012. Unit 13 Wolf management report. Pages 92-100 in P. Harper, ed. Wolf management report of survey and inventory activities 1 July 2008-30 June 2010. Alaska Dept. Fish and Game. Species Management Report ADF&G/DWC/SMR-2012-4. Juneau, AK.

Schwanke, R.A. 2009. Unit 13 Wolf management report. Pages 93-103 in P. Harper, ed. Wolf management report of survey and inventory activities 1 July 2005-30 June 2008. Alaska Dept. Fish and Game. Project 14.0. Juneau, AK.

WOLVERINE

Comments on: Wolverine Distribution, Abundance and Habitat Occupancy. Study Plan Section 10.9, Initial Study Report (Part A Sections 1-6, 8-9), Prepared for AEA, Susitna-Watana Hydro by Alaska Department of Fish and Game and ABR, Inc. June 2014. (No authors named). 10 pp (Part A); and

Final Study Plan, Wildlife Resources, 10.9. Wolverine Distribution, Abundance and Habitat Occupancy, Section 10.9, Susitna-Watana Hydroelectric Project, FERC Project No. 14241, AEA. 10 pp. July 2013.

Purpose of these comments: The Initial Study Report (ISR) and Final Study Plan (FSP) for the wolverine portion of the Susitna-Watana project was reviewed to:

1. Evaluate progress toward the study objectives identified in the ISR and in the FSP;
2. Evaluate whether the data collection and analysis techniques are adequate to achieve stated objectives;
3. Evaluate whether stated objectives and study plans are adequate to evaluate the impacts on wolverine of the proposed project with a view to assuring that adequate information is available to determine both impacts and appropriate kinds and levels of mitigation for impacts;
4. Evaluate and contrast earlier wolverine studies on the same project by Whitman and Ballard (1984) to determine if these results are or will be integrated into the current project; and
5. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts.

Objectives for Wolverine Project (FSP pages 10.-1). (Analyses of progress toward these objectives are provided in a separate section, below, by objective):

1. Estimate the current population size of wolverines.
2. Establish a population index for wolverines.
3. Describe the distribution of wolverines in late winter.
4. Describe habitat use by wolverine in late winter.

These objectives are inadequate to achieve the goal of the wolverine project as stated in the ISR (AEA 2012: 4) inserted below:

The overall goal of this study is to collect pre-construction baseline population data on wolverines in the Project area (reservoir impoundment zone; facilities, laydown, and storage areas; access and transmission line routes) to enable assessment of the potential impacts from development of the proposed Project. This information will be used to estimate impacts on habitats used seasonally by wolverines.

The objectives are not specific to a study area, whereas the goal is correctly specific to the "Project area". It appears that the study design is to estimate population size in (Objective 1) and establish a population index for (Objective 2) the Wolverine Study Area (WSA) depicted in Figure 3.1 (page 7) of the ISR. No basis is offered for the location of the WSA depicted in

Figure 3.1 and it appears to include far too much area to the west and north of the proposed project and far too little area to the east and south of the project area. This may be because the goal is to include all 3 access routes under consideration but since only one of these will be selected, it is more appropriate to center the WSA on the proposed project area. We note that none of the other terrestrial mammal studies configured their study areas to encompass all access routes under consideration.

General overview comments

Wolverine are elusive animals occurring at very low densities, making them difficult to study. In southern parts of their range, at least, they are threatened by climate change that reduces the amount of snow and ice they depend on for transportation and denning (Ruggiero et al. 2007, Copeland et al. 2007).

The only thing that will certainly be accomplished during this project are occupancy modeling (OM) surveys which determine whether established quadrats are occupied based on tracks observed during winter surveys. Two iterations of OM surveys were accomplished in winter 2012-2013 and comprise the entirety of data reported in the ISR. No progress is reported on the application of the Sample Unit Probability Estimator (SUPE) beyond development of the sampling grid (25 km² blocks) and description of the vegetation in each block. The SUPE application, if completed, will provide an estimate of abundance and density of wolverine in the WSA.

A good model for impact assessment studies for wolverine by ADF&G biologists was available in the ADF&G studies of Lewis et al. (2012) designed to evaluate impacts of a proposed road in southeastern Alaska. This model is more appropriate to meet objectives of the current study on Susinta-Watana Dam impacts as it involved GPS-equipped wolverine to evaluate habitat use in the proposed impact area. The current study will add no new information on habitat use by wolverine in the project area although this is identified as an objective.

Analysis of accomplishments by Objective

Objective 1. Estimate the current population size of wolverines.

The ISR suggests that the OM results may “potentially” result in a minimum estimate of wolverine population size. It is unclear how this can be accomplished with OM modeling. OM is based on the number of quadrats in which wolverine tracks are observed, and generates presence/absence data based on whether tracks are seen. However, this fails to quantify wolverine as one individual may leave tracks in many quadrats. Similarly, two or more wolverine may leave tracks in one quadrat. The ISR reported that OM surveys detected wolverine tracks in 23 of 25 sample units but provided no illustration of which sample units these were. In order to evaluate project impacts on wolverine, it is necessary to show where wolverine are found relative to the proposed project.

If snow conditions permit application of the SUPE technique, it will likely result in an estimate of the “current” population size of wolverine in the WSA and address Objective 1 (Becker et al.

2004, Golden et al. 2007). The SUPE technique involves following the tracks in the snow until the individuals leaving the tracks are seen thereby allowing corrections on numbers of individuals involved in leaving tracks that are not possible with just OM data.

The WSA, however, is inappropriately sized and situated for the proposed project. The current study should focus on deriving an estimate of the numbers of wolverine in the project area using a biologically meaningful definition of the area of impact of the proposed project. A biologically meaningful definition of impact area would likely encompass some distance from the proposed project where the distance was a function of the mean home range size of wolverine in the study area.

Objective 2. Establish a population index for wolverines.

The intention of this objective is unclear. Based on the ongoing studies, a population index using OM (presence/absence) data collected during winter may be developed. The ISR does not describe any efforts to establish the relationship of this index to actual population size. Neither does the ISR indicate that power analysis will be used. Power analysis is necessary for any index to be useful in a management context because it determines the amount of change that can be detected. In illustration, the ISR reported that OM surveys detected wolverine tracks in 23 of 25 sample units. If, in the future, similar OM surveys detected tracks in 20 or 25 sample units, would that indicate a declining or increasing trend that could be attributed to the proposed project? If not, then it is unclear how establishment of a population index is pertinent to evaluating the project's impact on wolverine. A power analysis is essential to determine whether an observed change represents a statistically significant trend and would allow for calculation of confidence intervals around that conclusion.

We understand why ADF&G is interested in development of a large-area population index for wolverine given its utility for management purposes. It is difficult, however, to determine how development of an index will inform AEA or FERC on the proposed project's impacts on wolverine. At a minimum, the pertinence of this index to the licensing of the project needs to be explained.

Objective 3. Describe the distribution of wolverines in late winter.

The ISR provides no indication of how this objective will be accomplished. The OM modeling describes presence/absence of tracks in a 25 km² quadrat but such information at the scale of the illustrated WSA (Figure 3.1) provides no information of value about wolverine distribution in late winter that is pertinent at the scale of the proposed project. Absent an explanation of how this objective will be accomplished with the OM and SUPE techniques described for this project, we conclude that this objective most likely will not be accomplished at a level of resolution that is pertinent to evaluation of impacts on wolverine of the proposed project.

Objective 4. Describe habitat use by wolverine in late winter.

There is no indication of any techniques that will accomplish this objective in the FSP or ISR. Habitat use can best be described by radio telemetry studies and it is unfortunate that this study did not add to the habitat use data obtained using VHF collars by Whitman and Ballard (1984) by putting out some GPS collars on wolverine in the study area. The goal of the study as described is based on a habitat use evaluation so we conclude that the goal cannot be reached except to the degree that data obtained by Whitman and Ballard (1984) can be used. It is a failure of study design that the stated objectives for the wolverine study did not include integration of the earlier Whitman and Ballard (1984) results.

Recommendations

1. Perform a power analysis on any trend index developed as part of these studies.
2. Abundance estimates should be derived for a study area that is appropriately sized and situated for the area of likely impact of the proposed project on wolverine. The same area should be used for whatever technique is used to accomplish objectives 3 and 4 if any effort is made to accomplish these objectives. As noted above, we do not believe that Objectives 3 and 4 can be accomplished using the identified techniques at a scale that is pertinent to evaluate project impacts on wolverine. All objectives should be focused on a study area that is biologically meaningful for wolverine in terms of the proposed project. A biologically meaningful definition of impact area would likely encompass some distance from the proposed project where the distance was a function of the mean home range size of wolverine derived from another study since pertinent data are not proposed to be collected on this parameter in the current study.
3. It is essential that previous Su-Hydro wolverine studies (e.g., Whitman and Ballard 1984) be incorporated into the current study for the final report. It was overlooked to state this as an objective but it needs to be done regardless. The 1980s Susitna-Watana Hydro studies obtained data from 22 radio-collared wolverine which were periodically re-located to determine habitat use, movements, seasonal shifts in elevation and home ranges. No information of this type is being collected as part of the current Susitna-Watana Dam project studies for wolverine.
4. Neither the ISP nor the FSP have any objective associated with evaluating the impacts on wolverines of the proposed roads and transmission lines that will be built to support the proposed project (this is, however, identified as a “goal”). Because these corridors will provide improved human access to the impoundment area, they will exacerbate impacts associated with human presence.
5. There is nothing in the ISR or FSP designed to identify appropriate kinds or levels of mitigation for adverse impacts of the project on wolverine. The most likely sources of adverse impacts identified by Whitman and Ballard (1984) result from loss of scavenging opportunities on moose carcasses caused by impoundment-induced declines in moose populations near the proposed impoundment, and from increased human-caused mortality resulting from improved access.
6. Persons conducting the investigations and author(s) of the study reports should be identified by name as was done in the earlier ADF&G reports on Susitna dam studies conducted during 1980-1984 (Whitman and Ballard 1984). Anonymous reports do not have the credibility that

comes with reports by people willing to identify themselves as responsible for the studies and conclusions.

7. Impact assessment studies should not be considered adequate unless study plans incorporate (including allocation of funds) post-project studies to determine actual impacts on wolverine numbers and movements.
8. The bioclimatic envelope for wolverine was described by Copeland et al. (2010). It involves factors such as temperature, snow persistence, linkage of snow corridors, snow cover in denning areas, etc. The existing bioclimatic envelope for wolverine in the dam impact area should be described and contrasted with this.

References Cited

- Becker, E.F., H.F. Golden, and C.L. Gardner. 2004. Using probability sampling of animal tracks in snow to estimate population size. Pages 248-270 in W.L. Thompson, ed. *Sampling Rare or Elusive Species: Concepts and Techniques for Estimating Population Parameters*. Island Press, Washington, D.C.
- Copeland, J.P., J.M. Peek, C.R. Groves, W.E. Melquist, K.S. McKelvey, D.W. McDaniel, C.D. Long, and C.E. Harris. 2007. Seasonal habitat associations of the wolverine in central Idaho. *J. Wildlife Management* 71:2201-2212.
- Copeland, et al. 2010. The bioclimatic envelope of the wolverine (*Gulo gulo*): do climatic constraints limit its distribution? *Canadian J. of Zoology* 88:233-246.
- Golden, H.N., J.D. Henry, E.F. Becker, M.I. Goldsten, J.M. Morton, D. Frost, Sr. and A.J. Poe. 2007. Estimating wolverine *Gulo gulo* population size using quadrat sampling of tracks in snow. *Wildlife Biology* 13:52-61.
- Lewis, S.B., R.W. Flynn, L.R. Beier, D.P. Gregovich, and N.L. Barten. 2012. Spatial Use, Habitat Selection, and Diets of Wolverines along the proposed Juneau Access Improvements Road Corridor, Southeast Alaska. Final Wildlife Research Report, ADF&G/DWC/WRR-2012-05. 48pp.,
- Ruggiero, L.F., K.S. McKelvey, K.B. Aubry, J.P. Copeland, D.H. Pletscher, and M.G. Hornocer. 2007. Wolverine conservation and Management. *J. Wildlife Management* 71:2145-2146.
- Whitman, J.S., and W. Ballard 1984. Big Game Studies, Vol. VII. Wolverine. Susitna Hydroelectric Project, 1983 annual report, Alaska Department of Fish and Game, Juneau.

WILDLIFE HARVEST ANALYSIS Study Plan Section 10.20

Comments on: “Wildlife Harvest Analysis, Study Plan Section 10.20, Initial Study Report, (Part A Sections 1-6, 8-9), Prepared for AEA, Susitna-Watana Hydro by ABR, Inc. June 2014. (No authors named).

Purpose of these comments: Initial Study Report (ISR) and Final Study Plan (FSP) for the Wildlife Harvest Analysis Study portion of the Susitna-Watana project was reviewed to:

1. Make recommendations for improving data collection or analysis to permit more meaningful evaluations of project impacts and the accuracy of other reports especially 10.8 (Large Carnivores).

Objectives for Wildlife Harvest Analysis Study (ISR, page 1):

2. Identify past and current harvest effort for large and small game including furbearers, harvest locations, access modes and routes.
3. Compare current harvest locations of large and small game, including furbearers, with data on the seasonal distribution, abundance, and movements of harvested species, using the results of other, concurrent Project studies on big game and furbearers (Sections 10.5-10.11).
4. Provide harvest data for use in the analyses to be conducted for the recreation and subsistence resource studies (Sections 12.5 and 14.5, respectively).

General overview comments

No results for this project were reported in the ISR. At the AEA meetings to discuss the ISRs held on October 21, 2014, we made a recommendation on how to present harvest information for bears. This comment is designed to further explain that recommendation.

Recommendation

The ISR for bears in the Large Carnivore report (Study Plan Section 10.8) illustrates a large carnivore study area (Fig. 3.1 in that report) that we assert in our comments is inappropriate and too large for Watana-Susitna large carnivore studies. We also assert that the density surface maps illustrated for brown bears in Figure 5.1-11 (page 30 of that report) incorrectly depicts the density range for brown bears in the illustrated density surface map. Among other reasons, this challenge was based on disbelief that the bear density in salmon rich habitats in the southern-most portion of the large carnivore study area (depicted as low density in the large carnivore report) was correctly depicted. Areas with available salmon should have higher, not lower, densities than interior areas. Our assertion was challenged by the authors of that portion of the Large Carnivore Study during the October 21 meeting on the basis that: 1) no data were available showing lower densities in this portion of the study area, and 2) perhaps bear densities were lower even though these areas were rich in salmon. This challenge contradicted published reports that areas where brown bears have access to salmon have much higher densities than areas where they do not (Miller 1993, Miller et al. 1997, Hildebrand 1998, Schwartz 2003).

Correspondingly, at that meeting we recommended that the Wildlife Harvest Analysis Study include an analysis of the number brown of bears killed by hunters in the Large Carnivore Study Area. This should be done in the following way:

1. For a number of years treated collectively (e.g., 5 or more years), determine the number of brown bears killed by hunters in each Uniform Coding Unit (UCU) in the Large Carnivore Study area. All bears killed by hunters are assigned to a UCU during sealing, so reports of number of bears killed by UCU for the period selected can easily be generated (this was done by Miller 1993).
2. If desired, this can be done separately for spring and fall seasons but it is our belief that it would be most informative to compile harvest data for both spring and fall seasons combined. The survey data illustrated in Figure 5.1-11 of the ISR for bears were collected during spring but the bears seen during these surveys inhabit and are killed in UCUs throughout the study area.
3. Plot or report kill densities for UCUs or groups of adjacent UCUs from these bear harvest data that can be compared to the density surface map in Figure 5.1-11 in the Large Carnivore ISR. Although we acknowledge that bear harvest density is an imperfect metric to population density, it should reflect population density if bear population density differences are largest throughout the Large Carnivore Study Area. This plot should inform the disagreement about whether bear density in the southern portions of the large carnivore study area are indeed lower than in interior areas.
4. If UCUs for brown bear kills are grouped for this analysis, the groups of UCUs should be based on whether or not salmon are present in the groupings.
5. Do the same thing for black bears as a way of evaluating the accuracy of the black bear density surface map presented in Figure 5.1-6 of the Large Carnivore ISR. If groups of UCUs are used for analysis of black bear kill density, the groups should be based on whether the habitat is forested.

We note that the Study Area for the Wildlife Harvest Analysis (Figure 3-1, page 4) does not include portions of GMU 16B (Skwentna and Yentna Rivers). Correspondingly, for the above recommendations to be accomplished, the study area for wildlife harvest analysis will have to be expanded to the south and west to include all of the Large Carnivore Study Area (especially the northern part of GMU 16B). Although not as pertinent, it is worth noting as well that the depicted Harvest Analysis Study Area includes all of GMUs 13A and 13B and that large portions of these subunits are not included in the Large Carnivore Study Area described in Study 10.8. This is because the Large Carnivore study area was based on an earlier study reported by Becker and Quang (2009) that was conducted prior to the initiation of Su-hydro studies, and therefore does not correctly describe the area within which Susitna-Watana project impacts will affect large carnivores.

References Cited

Hildebrand, G.V., C.C. Schwartz, C.T. Robbins, M.E. Jacoby, T.A. Hanley, S.M. Arthur, and S. Servheen. 1999. The importance of meat, particularly salmon, to body size, population productivity, and conservation of North American brown bears. *Canadian Journal of Zoology* 77:132-138.

- Miller, S.D. 1993. Brown bears in Alaska: A statewide management overview. Alaska Dept. of Fish and Game Wildlife Technical Bulletin #11. Juneau, AK. 40pp.
- Schwartz, C.C., S.D. Miller, and M.A. Haroldson. 2003. Grizzly bear. Pages 556-586 in G.A. Feldhamer, B.C. Thompson, and J.A. Chapman, eds. Wild Mammals of North America: Biology, Management, and Conservation, 2nd Ed. Johns Hopkins Univ. Press. Baltimore, Maryland, USA.

20160721-3038



Federal Energy Regulatory Commission



Office of the Assistant Secretary of the Army

July 21, 2016

Contacts: Celeste M. Miller, FERC (202) 502-8680
Moira Kelley, ASSA (703) 614-3992

FERC, U.S. Army Corps of Engineers Sign MOU on Hydropower Development

The Federal Energy Regulatory Commission (FERC) and the U.S. Army Corps of Engineers (Corps) have signed a Memorandum of Understanding (MOU) to facilitate the development of hydropower at the Corps' federal facilities by synchronizing each agency's permitting process.

The MOU, which updates a previous MOU signed by the agencies in 2011, offers project developers an approach designed to improve efficiency with the FERC and Corps processes, reduce permitting times, provide a single environmental document and ensure more certainty and less risk.

"The potential for hydropower development in this country is significant, particularly at existing Corps facilities," FERC Chairman Norman Bay said. "Today's MOU is a positive step toward the development of these resources. Thank you to the Corps for their commitment to working with us to streamline our processes."

"This strengthened collaboration between FERC and the Army Corps of Engineers advances the Obama Administration's work to transition to a clean energy economy, and reduce carbon pollution," Jo-Ellen Darcy, Assistant Secretary of the Army for Civil Works, said. "This synchronized approach will shorten the time it takes the private sector to develop and construct new hydropower, and will help us more efficiently use our existing infrastructure. It is also advancing our efforts to find alternative ways to finance new infrastructure."

The synchronized approach includes two phases - an environmental review phase followed by a detailed technical, engineering, and safety review phase.

During Phase 1, the developer, FERC staff, and Corps staff will coordinate early to discuss the developer's proposal and the need for information to support the agencies' permitting decisions. The environmental effects of the proposed project will be evaluated up front through a single, joint environmental document, and a FERC license will be issued.

During Phase 2, the developer coordinates with FERC and Corp staff to prepare a final project design and submits the design to the Commission and the Corps. Once all of the Corps' preconstruction requirements have been completed and the Commission receives the Corps' written construction approval, the Commission will authorize construction of the project.

FERC issues preliminary permits and licenses to non-federal entities for the development of hydropower projects, including projects utilizing federal dams or other federal facilities. The Corps operates water resources projects throughout the Nation where potential exists for the development of hydropower and can allow the development of hydropower at suitable projects.

20160804-5014



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau Alaska 99802-1668

August 3, 2016

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

Subject: Susitna-Watana Hydropower Project,
FERC Project No. 14241-000;
Project Shut Down

Dear Ms. Bose:

The National Marine Fisheries Service (NMFS) requests the Federal Energy Regulatory Commission (FERC) clarify the schedule for the Susitna-Watana Hydropower Project and develop a study determination taking into consideration Alaska's Governor Bill Walker's June 29, 2016 announcement that the state is shutting down work on the project. The Alaska Energy Authority (AEA) has not formally notified NMFS or other stakeholders of the project shutdown nor requested FERC to modify the project's schedule.

The Integrated Licensing Process (ILP) was selected by FERC and AEA for this project. The ILP is rigorous and time-constrained. NMFS appreciates FERC staff's considerable involvement in the licensing process for this important project.

FERC's current ILP schedule includes the opportunity for review by all licensing participants of the comments, study modifications and new study requests of all other licensing participants which were provided to FERC on June 23, 2016. These reviews are due by August 22, a date which is fast-approaching. Shutting down work on the project requires modification to NMFS comments and especially to our study modification recommendations in consideration of the resulting indeterminate gap in conducting studies.

NMFS June 23rd comments included many recommendations to modify studies, our recommendation for a new study of model integration, and our recommendation for significant changes to a climate change study based on recent advances in climate science. Recent finalized guidance from the President's Council on Environmental Quality that federal agencies consider climate change under the National Environmental Protection Act when conducting project reviews further supports this recommendation.¹

¹ https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf



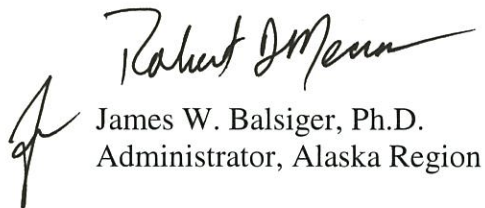
NMFS submitted these recommendations on June 22 in compliance with FERC's current schedule. At that time we were unaware that the project would be shut down one week later, and our recommendations do not include this important consideration. FERC's current, but now obsolete schedule continues through to the submission of a draft license application by AEA in 2018, which will not occur since the state is shutting down work on the project.

NMFS has diligently participated in the licensing process for this project for the past 5 years. We have committed significant resources, staff time, and both state and federal funds to review the project and its resource impacts. We have done this in compliance with FERC's ILP regulations, with the goal of conserving fish and wildlife resources of national and global importance. These Susitna River resources include five species of wild Pacific salmon and their over 300 miles of affected pristine, productive riverine habitat, the endangered Cook Inlet beluga whale and other marine mammals and their habitats.

The project has a large potential to impact these important fish and wildlife resources. NMFS advises FERC that it is in the best interest of conserving these resources that FERC's study determination (due by October 21, 2016 under the current schedule) be completed with full consideration of the reviews and recommendation provided on the Initial Study Report, and of comments due under the current schedule by August 22 - including our ability to consider the effects that work has been stopped on this project have for our study modifications and study requests. This will preserve the expensive and time consuming work done on the project to date and will develop a clear point of reference for restarting the project in the future.

If you have any questions, please contact NMFS Hydropower Coordinator, Susan Walker (907-586-7646; susan.walker@noaa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "James W. Balsiger".

James W. Balsiger, Ph.D.
Administrator, Alaska Region

20160804-5016



IN REPLY REFER TO:
FWS/AFES/AFWCO

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Anchorage Fish and Wildlife Field Office
4700 BLM Road
Anchorage, Alaska 99507-2546



August 3, 2016

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

Subject: Susitna-Watana Hydropower Project, FERC Project No. 14241-000; Project shut-down

Dear Ms. Bose:

The U.S. Fish and Wildlife Service (Service) is writing to express concerns regarding the Susitna-Watana hydroelectric project (Project) license schedule and the status of the upcoming deadline (October 21, 2016) for the Federal Energy Regulatory Commission (FERC) to make a determination on the Initial Study Reports (ISR). We are particularly concerned that, in light of the decision made by the Alaska State Governor, announced on June 29, 2016, to shut-down the Susitna-Watana hydro-electric project, there may be delays in the licensing schedule. Therefore, the Service requests clarification from FERC on the Project's licensing schedule. The Service submits this filing to FERC Project record in accordance with provisions of the National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Clean Water Act, Fish and Wildlife Coordination Act, and authorities under the Federal Power Act (FPA).

The Service has participated in the applicant's (Alaska Energy Authority) Integrated License Process (ILP) for the past five years. We have committed significant staff time and fiscal resources to review the Project's pre- and post-Project resource impacts under the rigorous ILP steps and timelines in an effort toward conserving fish and wildlife resources of national and global importance. These Susitna River resources include five species of wild Pacific salmon, numerous migratory bird species, bald and golden eagles, and the calving and summer range of the Nelchina caribou herd across State, Federal, and Native owned lands. Because the Project has a large potential to impact these important fish and wildlife resources and their habitats, the Service believes it in the best interest of these resources that a timely study determination be

Ms. Kimberly D. Bose

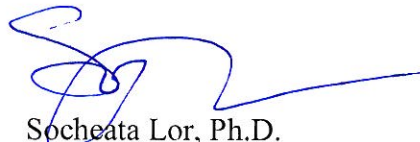
2

made. The deadline for the study determination under the current FERC license schedule (enclosed) is October 21, 2016.

The Service appreciates FERC's regulatory involvement in the applicant's licensing process and requests that FERC reach a study determination with full consideration of the Service's June 23, 2016, filing of the Initial Study Report recommendations, requests for study modifications, and new studies. The Service believes that a significant schedule delay or failure to reach the determination would compromise our agency's substantive resource recommendations under the ILP. In addition, the Service believes that the FERC study determination will provide a clear process reference should the Project be paused and proposed for reactivation in the future.

If you have any questions, please contact project biologist Betsy McCracken at (907) 271-2783 or via email at betsy_mccracken@fws.gov and include Project No. P-14241-000.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Socheata Lor', with a long horizontal flourish extending to the right.

Socheata Lor, Ph.D.
Field Supervisor

Enclosure

Enclosure**REVISED SUSITNA PROJECT PROCESS PLAN AND SCHEDULE**

If a due date falls on a weekend, holiday, or other day on which the Commission is not open for business, the due date is the following business day.

Responsible Party	Pre-Filing Milestone	Date
AEA	Hold Initial Study Report Meetings	March 21-25, 2016
AEA	File Initial Study Report Meeting Summary (October 2014 and January 2015 Meetings, combined)	April 24, 2016
All Stakeholders	File disagreements with Meeting Summary and recommendations for modified or new studies	June 23, 2016
All Stakeholders	File responses to meeting summary disagreements and recommendations for modified or new studies	August 22, 2016
FERC	Issue Director Determination on meeting summary disagreements and recommendations for modified or new studies	October 21, 2016
AEA	Second Study Season	2017
AEA	File Updated Study Report	October 21, 2017
AEA	Hold Updated Study Report Meeting	November 5, 2017
AEA	File Updated Study Report Meeting Summary	November 20, 2017
All Stakeholders	File disagreements with Meeting Summary and recommendations for modified or new studies	December 20, 2017
All Stakeholders	File responses to meeting summary disagreements and recommendations for modified or new studies	January 19, 2018

20160804-5031

STATE CAPITOL
P.O. Box 110001
Juneau, AK 99811-0001
907-465-3500
fax: 907-465-3532



Governor Bill Walker
STATE OF ALASKA

550 West Seventh Avenue, Suite 1700
Anchorage, AK 99501
907-269-7450
fax 907-269-7461
www.Gov.Alaska.Gov
Governor@Alaska.Gov

August 4, 2016

The Honorable Norman C. Bay
Chairman
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Alaska Energy Authority, Susitna-Watana Hydroelectric Project No. 14241

Dear Chairman Bay:

The purpose of this letter is to update you regarding the State of Alaska's interest in seeking an abeyance of the Federal Energy Regulatory Commission (FERC or Commission) license for the Susitna-Watana Hydroelectric Project (Susitna-Watana or Project) after the completion of the study plan determination.

As you may be aware, I recently announced that due to the State's fiscal situation, the State would be closing down certain major infrastructure projects, including Susitna-Watana. In doing so, I made clear that the Project would be shut down in such a way that the extensive work done to date would be preserved. This was consistent with my previous directive to the Alaska Energy Authority (AEA) to utilize existing appropriations to advance the Project to the stage of an updated Commission Study Plan Determination (SPD), in order to complete and preserve the value of the FERC-required studies to this point.¹ In accordance with these directives, AEA's focus for the past 18 months has been to protect the State's nearly \$200 million investment in this Project by finalizing the open FERC-required studies and preparing for the Commission's next milestone in the licensing process: its determination as to whether the previously approved study plans would support a hydropower license application.

The Commission's December 2, 2015 scheduling order² granted AEA's request to continue the Integrated Licensing Process (ILP) and set a schedule for: Initial Study Report (ISR) public meetings; comments on the ISR by State and federal resource agencies, members of the public, and other stakeholders; AEA's and other stakeholders' response to comments; and the Commission's updated SPD. AEA held the public meetings in March, and commenters recently filed literally

¹ See Letter from Wayne Dyok, Alaska Energy Authority, to Kimberly D. Bose (August 26, 2015) (requesting the Commission to lift the Integrated Licensing Process abeyance).

² Letter from Ann Miles to Wayne Dyok (December 2, 2015).

The Honorable Norman C. Bay
Susitna-Watana Hydroelectric Project
August 4, 2016
Page 2

hundreds of pages of detailed comments on the studies. AEA currently is in the process of reviewing those comments and preparing responses.

To assure the past investment is preserved, it is important to the State of Alaska that the Commission proceed with the ILP to the point of issuing its updated SPD, for the following reasons:

- FERC's updated SPD is a pivotal point in the licensing process, as it can require modification of existing study work or impose entirely new studies—all of which can significantly add to Project timing and cost. Alternatively, the updated SPD can affirm that Project studies are essentially on track to support a license application. Either way, the updated SPD is a necessary milestone.
- Many of the comments on the ISR question the integrity or usefulness of AEA's studies conducted to date. In order to preserve the value of the substantial amount of work that has been done, AEA needs to have the opportunity to respond to these comments and obtain the Commission's determination on the issues that have been raised.

The updated SPD protects existing information by obtaining FERC's position on the adequacy of methods implemented and data gathered to date. Following the Commission's updated SPD, I am requesting that the Commission issue an order holding the ILP in abeyance.

I understand that certain ILP participants have been raising questions about the schedule, in particular the August 22 deadline for responses to comments. AEA is currently hard at work preparing its responses. However, in light of the extensive comments, the recent schedule uncertainty, and the importance of the updated SPD to the State, I believe a 20 day extension of time to September 11, 2016 for all participants to file their responses would be appropriate. Please advise me as soon as possible if you are in agreement with this extension request.

The State greatly appreciates the significant commitment of time and resources of Commission Staff, federal and State resource agencies, Alaska Native entities, and other licensing participants in the ILP to date.

If you have any questions related to this matter, please do not hesitate to contact my office or Michael Lamb, AEA's Interim Executive Director, at mlamb@aidea.org or 907-771-3009

Sincerely,



Bill Walker
Governor

The Honorable Norman C. Bay
Susitna-Watana Hydroelectric Project
August 4, 2016
Page 3

cc: The Honorable Lisa Murkowski, United States Senate
The Honorable Dan Sullivan, United States Senate
The Honorable Don Young, United States House of Representatives
The Honorable Cheryl A. LaFleur, Commissioner, Federal Energy Regulatory Commission
The Honorable Tony Clark, Commissioner, Federal Energy Regulatory Commission
The Honorable Colette D. Honorable, Commissioner, Federal Regulatory Commission
Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission

20160808-5088

August 7, 2016

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

Ref: *Susitna Watana Hydropower Project No. 14241-000 — Response of Jan Konigsberg, Alaska Hydro Project, to meeting summary disagreements and recommendations for modified or new studies*

Dear Secretary Bose:

Below I argue the FERC-recommended study plan for the proposed Susitna dam will not develop sufficient information to prepare an adequate EIS — the various pending requests for study modifications and new studies notwithstanding.

1. *FERC-recommended study plan must provide sufficient information to ascertain potential environmental and ecologic Impacts to the Susitna River Basin, not just the Susitna River watershed:*

More than 2,000 miles of salmon-bearing streams and rivers are tributaries of the Susitna River.¹

Regulation of the Susitna River by a dam is likely to affect some, if not all, the tributaries downstream of the dam. Potential impacts to the tributaries must be identified, described, and analyzed in the EIS.

FERC's recommended studies of hydrology, geomorphology, fish, and ice-processes are necessary to develop information with which to prepare an assessment of the potential effect of Susitna River regulation on the tributaries.

The information on hydrology and geomorphology is necessary to assess whether Susitna River regulation will result in change to tributary morphology.

Information about fish distribution and abundance is necessary to assess whether Susitna River regulation will result in change to salmon populations and/or production in the tributaries.

¹ See Anadromous Waters Catalog for the State of Alaska (interactive mapping) for extent of salmon populations in Susitna River Basin tributaries.

Information about ice-processes is necessary to assess whether Susitna River regulation will result in change to tributary ice-processes.

FERC-recommended studies of Susitna River hydrology and geomorphology (assuming FERC agrees to the requested study modifications) should provide information sufficient to ascertain potential hydrologic and geomorphologic effects to tributaries from Susitna River regulation.

However, information from the salmon (proposed study modifications and new studies notwithstanding) is necessary but not sufficient to enable FERC to describe and analyze the impacts from the proposed project on salmon distribution and abundance in the tributaries. Similarly, information from the ice-processes study (proposed study modifications and new studies) is necessary but not sufficient to enable FERC to describe and analyze the impacts from the proposed project on tributary ice-processes.

2. The study plan does not provide sufficient information about salmon distribution and abundance in tributaries downstream of dam site:

FERC's objectives for the study of fish distribution and abundance include salmon escapement and juvenile salmon distribution and abundance.

The fish study provides information about escapement into various tributaries, but does not comprehensively document distribution and abundance of spawning aggregates within the tributaries.

The fish study provides information about distribution and abundance of juvenile salmon in the river downstream of the dam site in mainstem, side-channels, and sloughs within so-called "Focus Areas" and only in a few tributaries near their confluence with the Susitna River.

FERC did not require a comprehensive study of distribution and abundance of juvenile salmon in basin tributaries downstream of the dam site, because FERC assumed – incorrectly – the project would have no effect on the tributary environment in general and no particular effect on juvenile salmon in the tributaries.

This is an incorrect assumption because all smolts leaving the tributaries transit the Susitna River to Cook Inlet and because some juveniles hatched in the tributaries rear in the Susitna River mainstem, side-channels, and sloughs. Therefore, project effects on the mainstem, side channels, and sloughs could affect tributary-hatched salmon rearing in the Susitna River. About 90% of the total annual salmon run (all salmon species) into the basin spawns in tributaries

to the Susitna River.² Consequently, depending upon project effects on smolts and on pre-smolt juveniles from tributaries rearing in the mainstem, side channels and sloughs, the impact on basin-wide salmon distribution and abundance from project operations could be significant, as explained below.

Despite some trapping and tagging of juvenile salmon in a few tributaries (Montana Creek, Indian River, Whiskers Creek), the study does not provide needed information about the seasonal distribution and relative abundance of juvenile salmon by species in the tributaries, including the proportion of the juvenile population 1) rearing entirely in the tributary watershed, 2) rearing in both the tributary watershed and the Susitna River watershed, and 3) rearing only in the Susitna River.

Without this information, determining the impact of the proposed hydropower project on the basin's salmon population will not be feasible.

Therefore, a study is necessary to document distribution and abundance of juveniles throughout the Susitna River Basin's tributaries and to document the migration of pre-smolt juveniles from each tributary to rear in the Susitna River. This information will delineate the juvenile salmon populations that could be affected by the dam's regulation of the Susitna River.

If the effect of the proposed project on juvenile salmon were to be detrimental — namely an increase in juvenile mortality with a concomitant reduction in adult salmon returns — the loss of salmon biomass could depress primary productivity in the tributaries due to a decrease in carcass-derived nutrients in the tributary watersheds. In turn, this decrease in primary productivity could initiate a feedback-loop where the reduction in primary productivity decreases the tributary's carrying-capacity, further depressing the productivity of the tributary's salmon population. In addition, the loss of carcass-derived nutrients could alter riparian habitats (e.g., due to reduction in marine-derived nitrogen) and change watershed ecology (e.g., reduction in food for other animals).

To assess the potential effect of a reduction of carcass-derived nutrients in a tributary watershed requires a study of the watershed's dependence/response to nutrients derived from salmon carcasses (presumably, the objectives of such a study would include documenting the spawning aggregates within the tributary).³

² LGL Alaska Research Associates, Inc., Alaska Department of Fish and Game, Division of Sport Fish, "Salmon Escapement Study Plan Section 9.7, Initial Study Report Part A: Sections 1-6, 8-10," June 2014.

³ Watersheds vary considerably in their response to carcass-derived nutrients. Some watersheds are highly dependent on carcass-derived nutrients with respect to primary productivity, some are not. Further, owing to differences in the hydrologic regime, density of salmon, the abundance and types of predators and scavengers (which affects the extent of salmon carcass-derived nutrient movement within the watershed) the effect of carcass-derived nutrients may vary considerably among tributary watersheds. Additionally, the magnitude of nutrient contributions to

3. *The study plan does not provide sufficient information about tributary ice-processes:*

The ice-processes study does not provide sufficient information to know whether tributary ice-processes — mainly, ice formation (freeze-up) and ice break-up — is influenced/dependent on Susitna River ice-processes.

According to the ice-processes study, Susitna River ice-cover forms at the mouth as the frazil ice accumulates and conglomerates into bank-to-bank ice cover, which progresses upstream.

It stands to reason those tributaries that freeze-up in the same manner as the Susitna would not begin to freeze over until the Susitna River ice-cover passes the tributary mouth, thereby blocking tributary frazil-ice flow. Depending on the tributary, it may be the case an ice-bridge forms upstream of the tributary confluence, which would mean formation of ice-cover upstream of the ice-bridge is independent of Susitna River freeze-up. Nonetheless, if freeze-up were to occur in two different stages, ice-out in the reaches above and below the ice bridge would probably both depend upon ice-out of the Susitna River (assuming ice-cover does not simply melt prior to Susitna River ice-out).

Consequently, it is essential to document ice-processes of all salmon-bearing tributaries in order to determine if the effect of the project on the Susitna River ice-processes would affect tributary ice-processes, which in turn could impact 1) distribution and abundance of juvenile salmon in the tributary, 2) tributary morphology, and 3) aquatic-habitat characteristics.

Hence, the Services have requested a study of ice processes in the lower ten miles of the Chulitna, Talkeetna and Yenta rivers.⁴

Yet, as should be clear from the preceding discussion, it would not be sufficient to limit the study to only the lower ten miles of the three tributaries, nor to limit study to just these three tributaries. Other major salmon-producing tributaries below the dam site include Indian River, Portage Creek, Deshka River, and Willow, Montana and Sheep creeks.

the watershed ecosystem is influenced by the species of salmon present in the watershed. For instance, see: Piorkowski, B. S., "Ecological effects of spawning salmon on several southcentral Alaskan streams," Doctoral dissertation, University of Alaska, Fairbanks, 1995.

⁴ National Marine Fisheries Service, "Review of Initial Study Reports," June 22, 2016, 7.6 Ice Processes, Modification 3-2, p.5.

U.S. Fish and Wildlife Service, Susitna Watana Hydropower Project, FERC Project No. 14241-000; Review of Initial Study Reports, June 21, 2016, Section 7.6, p.3.

4. Conclusion

Distribution and abundance of juvenile salmon in the tributaries, tributary ecology with respect to salmon carcass-derived nutrients, and tributary ice-processes must be studied if there is to be an adequate analysis of the impacts from the project on the affected environment — the affected environment being the Susitna River Basin, not just the Susitna River watershed as the FERC study plan seems to presume.

Even if sufficient information is developed to document the current condition of the basin's salmon-bearing tributaries, the ability to analyze potential project impacts to the basin's tributaries with sufficient accuracy and precision is exceedingly problematic — if the inability thus far to model ice-processes is any indication.

20160809-0007

STATE CAPITOL
P.O. Box 110001
Juneau, AK 99811-0001
907-465-3500
fax: 907-465-3532



Governor Bill Walker
STATE OF ALASKA

550 West Seventh Avenue, Suite 1700
Anchorage, AK 99501
907-269-7450
fax 907-269-7461
www.Gov.Alaska.Gov
Governor@Alaska.Gov

August 4, 2016

The Honorable Norman C. Bay
Chairman
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Alaska Energy Authority, Susitna-Watana Hydroelectric Project No. 14291

Dear Chairman Bay:

The purpose of this letter is to update you regarding the State of Alaska's interest in seeking an abeyance of the Federal Energy Regulatory Commission (FERC or Commission) license for the Susitna-Watana Hydroelectric Project (Susitna-Watana or Project) after the completion of the study plan determination.

As you may be aware, I recently announced that due to the State's fiscal situation, the State would be closing down certain major infrastructure projects, including Susitna-Watana. In doing so, I made clear that the Project would be shut down in such a way that the extensive work done to date would be preserved. This was consistent with my previous directive to the Alaska Energy Authority (AEA) to utilize existing appropriations to advance the Project to the stage of an updated Commission Study Plan Determination (SPD), in order to complete and preserve the value of the FERC-required studies to this point.¹ In accordance with these directives, AEA's focus for the past 18 months has been to protect the State's nearly \$200 million investment in this Project by finalizing the open FERC-required studies and preparing for the Commission's next milestone in the licensing process: its determination as to whether the previously approved study plans would support a hydropower license application.

The Commission's December 2, 2015 scheduling order² granted AEA's request to continue the Integrated Licensing Process (ILP) and set a schedule for: Initial Study Report (ISR) public meetings; comments on the ISR by State and federal resource agencies, members of the public, and other stakeholders; AEA's and other stakeholders' response to comments; and the Commission's updated SPD. AEA held the public meetings in March, and commenters recently filed literally

¹ See Letter from Wayne Dyok, Alaska Energy Authority, to Kimberly D. Bose (August 26, 2015) (requesting the Commission to lift the Integrated Licensing Process abeyance).

² Letter from Ann Miles to Wayne Dyok (December 2, 2015).

OFFICE OF
EXTERNAL AFFAIRS
2016 AUG - 4 P 50
FEDERAL ENERGY
REGULATORY COMMISSION

The Honorable Norman C. Bay
Susitna-Watana Hydroelectric Project
August 4, 2016
Page 2

hundreds of pages of detailed comments on the studies. AEA currently is in the process of reviewing those comments and preparing responses.

To assure the past investment is preserved, it is important to the State of Alaska that the Commission proceed with the ILP to the point of issuing its updated SPD, for the following reasons:

- FERC's updated SPD is a pivotal point in the licensing process, as it can require modification of existing study work or impose entirely new studies—all of which can significantly add to Project timing and cost. Alternatively, the updated SPD can affirm that Project studies are essentially on track to support a license application. Either way, the updated SPD is a necessary milestone.
- Many of the comments on the ISR question the integrity or usefulness of AEA's studies conducted to date. In order to preserve the value of the substantial amount of work that has been done, AEA needs to have the opportunity to respond to these comments and obtain the Commission's determination on the issues that have been raised.

The updated SPD protects existing information by obtaining FERC's position on the adequacy of methods implemented and data gathered to date. Following the Commission's updated SPD, I am requesting that the Commission issue an order holding the ILP in abeyance.

I understand that certain ILP participants have been raising questions about the schedule, in particular the August 22 deadline for responses to comments. AEA is currently hard at work preparing its responses. However, in light of the extensive comments, the recent schedule uncertainty, and the importance of the updated SPD to the State, I believe a 20 day extension of time to September 11, 2016 for all participants to file their responses would be appropriate. Please advise me as soon as possible if you are in agreement with this extension request.

The State greatly appreciates the significant commitment of time and resources of Commission Staff, federal and State resource agencies, Alaska Native entities, and other licensing participants in the ILP to date.

If you have any questions related to this matter, please do not hesitate to contact my office or Michael Lamb, AEA's Interim Executive Director, at mlamb@aidea.org or 907-771-3009

Sincerely,



Bill Walker
Governor

The Honorable Norman C. Bay
Susitna-Watana Hydroelectric Project
August 4, 2016
Page 3

cc: The Honorable Lisa Murkowski, United States Senate
The Honorable Dan Sullivan, United States Senate
The Honorable Don Young, United States House of Representatives
The Honorable Cheryl A. LaFleur, Commissioner, Federal Energy Regulatory Commission
The Honorable Tony Clark, Commissioner, Federal Energy Regulatory Commission
The Honorable Colette D. Honorable, Commissioner, Federal Regulatory Commission
Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission

20160810-5205

R. Long Comments on the Talkeetna, Chulitna, and Susitna River Confluence Studies

Rebecca Long
Talkeetna AK

August 8, 2016

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

Subject: Docket P-14241, Proposed Susitna Dam
Stakeholder Comments in Support of Talkeetna Community Council,
Inc. (TCCI) Modification Requests for Confluence Area of Talkeetna,
Susitna, Chulitna Rivers in Studies 6.6 and 7.6

Dear Secretary Bose:

Summary of Comments

1. History and Background
2. 6.6 Fluvial Geomorphology Modeling below Watana Dam Study and 7.7 Ice Processes in the Susitna River Study should do 2 D modeling of Confluence.
3. The Confluence area classified for study as a Focus Area or Sub-Study

These comments are by a Talkeetna River watershed and general Talkeetna-area resident, a pre-filing intervener, and active in the stakeholder process since 2011. References will be made from my 6/9/16 comments to FERC and TCCI comments to FERC on 6/20/16 and on 6/5/13 to applicant Alaska Energy Authority (AEA).

Brief History/Stakeholder Perspective

- The Focus Areas (FAs) did NOT include the critical confluence area in the Integrated Licensing Studies November 2012 Revised Study Plans.
- TCCI requested this significant area be included in the 6.6 and 7.7 Revised Study Plans in November 2012 and January 2013.
- FERC's 4/1/13 Study Plan Determination agreed with TCCI request. FERC recommendation:
..."the study plan be modified to include a defined approach to evaluating geomorphic changes at the confluence of the Chulitna, Talkeetna, and Susitna rivers. The evaluation should extend from the mouth of both the Chulitna and Talkeetna rivers to the potentially

R. Long Comments on the Talkeetna, Chulitna, and Susitna River Confluence Studies

affected upstream reaches of these tributaries.” And FERC mandated the preparation of a Technical Memorandum (TM).

- On 6/5/13, the Susitna Dam Committee of the TCCI commented to AEA with information on the multi-million dollar Talkeetna Revetment that might be pertinent to the TM document.
- AEA’s 7/1/13 TM detailed the proposed study approach for geomorphic changes in Confluence area: objectives, technical approach overview, model and data components. Part 2 of the TM “Overall Modeling Approach” detailed the need for both reach-scale and local scale modeling. The benefits of 2 D modeling over 1 D modeling were discussed extensively.
- But the ISR review in 2014-2016 has shown that the applicant has only done 1 D modeling. And even the 1 D modeling is based on minimal data for the Chulitna and Talkeetna Rivers. And the ISR states there would be no more data collecting for the Confluence.

The Importance of Socio-Economic-Environmental Project Effects on Confluence Area

The community residents, the public users, and the economic stakeholders see this study data as crucial pre- and post-project information. Infrastructure management for the future needs this data along with the cumulative impacts of climate change projections.

The 3 Rivers affect the Trapper Creek, Sunshine and Talkeetna communities in the Confluence area and abutting it. In Talkeetna, the 3 rivers interaction affects the southern shore of the Talkeetna River which is at the end of Main Street, Talkeetna.

The Multi-million dollar revetment is located there. The jurisdiction of the Talkeetna revetment is by the Army Corp of Engineers, Mat Su Borough Flood Coordinator and Emergency Services Department. The revetment, built in 1978-79 is not a flood dyke or levee. It is designed to assist with Talkeetna River flow routing.

The Talkeetna town area had to be evacuated in the September 24, 2012 flooding. The revetment was damaged. Amongst the plethora of federal, state, and borough agencies, the funding for the mitigation of flood impacts came through in 2016, four years later. Much resources and time were invested to get to this point. There will be \$1.3 million dollars in federal disaster funds for repair work in 2017.

In their 6/15/13 comments to AEA, TCCI mentioned the calculations that members of the public have done. Concerned citizens analyzed LIDAR data

R. Long Comments on the Talkeetna, Chulitna, and Susitna River Confluence Studies

(available from the Mat Su Borough) and Google Earth photos and archives. They believe that changes in the mainstem Susitna River have the potential for the river to flow perpendicular toward the Talkeetna Revetment.

1. Modification-Fluvial Geomorphology Confluence Concerns Warrants 2-D modeling

- Post Project Winter Flow Impacts

According to the ISR, the winter flow elevated impacts could potentially be 10,000 cubic feet per second under ice conditions in the load following operations. These are not low flows.

The applicant is assuming that the Middle Susitna River bed post-project will be stable due to low flows and ice cover. This seems inaccurate.

The ice transport capacity of the Susitna River in winter is strong. For example, during the winter of 2013, the Susitna River left 6 to 8 feet ice sheets far into lateral brush habitat and close to the end of Main Street, Talkeetna. Winter ice jamming and sediment transport are significant.

- Current minimal data set of 2 winter samples at the Chulitna (only 1 usable) and 2 on the Talkeetna River shows that the complex relationship between the 3 rivers is not being analyzed. A static snapshot of the 2 tributary reaches from 1 D modeling doesn't fulfill the data requirements for accurate geomorphic change data. They are merely 2 additional isolated tributary reach 1 D modeling with no connectivity to the combined geographic feature or cumulative importance.

- 1 D versus 2 D Modeling (from AEA 7/1/13 TM)

Local scale analysis and 2 D modeling can simulate altered hydraulics and ice conditions on local erosion, scouring, mobilization, and sediment transport. It is the only method to simulate riparian vegetation changes that would alter lateral habitats. It will assess channel width and pattern post project changes.

1 D can't simulate lateral flows or complex hydraulics such as: point bar and pool riffle formations or planform changes such as river meandering or local bank erosion.

According to research that the National Marine Fisheries Service quotes in their 6/23/16 comments, 1 D models underestimate sediment transport in gravel bed rivers which could lead to underestimation of post project impacts.

- The Ice Process Study lead person stated in ISR 2014 meeting that they can't really model beyond the ice thickening at the confluence. Models won't show potential ice collapse and transport scenarios. Knowing that, the 2 D Ice Process Model should be extended to the confluence using the available 1 D data.

R. Long Comments on the Talkeetna, Chulitna, and Susitna River Confluence Studies

Study Modification Request to Classify Confluence Focus Area or Sub-Study

The current 10 Focus Areas were selected for 2 D modeling because they are representative of important habitat types, geomorphic reaches channel classification types and relation to other relevant studies. The Confluence is an important habitat/channel type. It represents a unique geomorphic, hydraulic, riparian system not found in the 10 FAs. And it affects human communities significantly.

Respectfully submitted,

Rebecca Long

20160822-5007

Cathy Teich, Talkeetna, AK.
P. O. Box 155
Talkeetna, AK 99676
8-18-16

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

Dear Secretary Bose:

RE: Docket P-14241, Proposed Susitna-Watana Dam
Comments in Support of the Talkeetna Community Council,
Inc.(TCCI)request for modifications of the study concerning
the Confluence of the Talkeetna, Susitna and Chulitna Rivers

In the April 1, 2013 Study Plan Determination, FERC agreed with TCCI that the study plan be modified to include a defined approach to evaluating geomorphic changes at the above mentioned confluence and that this evaluation should extend to the mouth of the Talkeetna and Chulitna Rivers and to the potentially affected upstream reaches. FERC had mandated the preparation of a Technical Memorandum.

AEA did a 1D study, based on minimal data and indicated in the ISR that there would be no more data collection for the Confluence. A more rigorous scientific study is needed in order to obtain more reliable data. This could be achieved with a 2 D study.

Accurate data from the Confluence is needed, as problems with River flows could impact the following:

- A revetment, that was designed to assist with Talkeetna River flow routing, which was damaged in 2012. It is slated to be repaired in 2017 with \$1.3 million dollars in federal disaster funds.

- The Railroad Bridge across the Talkeetna River. Also a resident trail beside it. This trail is the only trail route to peoples' homes in the Chase area. This is a well maintained trail for Chase Area taxpayers. Residents volunteer work to supplement its maintenance. The Chase Trail is a borough sanctioned trail for the Chase Community area. The portion of the trail that runs by the railroad is sanctioned by the Alaska Railroad.

- Billion Slough. There is a Railroad Bridge across it as well as the resident trail mentioned above.

- The communities of Chase, Trapper Creek and Sunshine.

It appears that AEA has been doing an inadequate job studying the confluence, which I fear would underestimate post project impacts to the confluence area. Yes, Alaska is in an economic downturn. The state doesn't have a lot of money. With a project of this magnitude, we cannot be sloppy. Too much is at stake.

It is imperative that a 2 D study be done for the above mentioned Confluence area.

Respectfully,

Cathy Teich
907-733-2155
cathyt@mtaonline.net

20160822-5035

Denis Ransy, Talkeetna, AK.

Dear Ms. Kimberly Bose, Secretary of the Federal Energy Regulatory Commission,

This regards Initial Study Review comments regarding the proposed Susitna Dam, P-14241.

I support the Talkeetna Community Council Inc. in their 6/20/16 ISR Modification Requests to studies 6.6 and 6.7 for the 3 Rivers Confluence.

The Alaska Energy Authority must place more importance on the 3 Rivers confluence area of the Talkeetna, Chulitna, and the Susitna Rivers. This has been sorely de-emphasized by AEA studies. It must become a focus area to highlight the potential project problems with this one of a kind area.

With the deterioration of the Talkeetna River revetment, post-project changes in Susitna River flow could very adversely affect the entire confluence area including the Talkeetna townsite itself.

The intensive study must focus more closely on changes of river current, erosion, sedimentation and vegetation. Studies to date have not adequately simulated these critical post-project changes. These inadequacies have been pointed out by the National Marine Fisheries Service in their June, 2016 ISR comments. AEA is ignoring these comments of the federal agency most qualifies to analyze these critical points.

Sincerely,
Denis Ransy

20160822-5088

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

August 21, 2016

RE: Response to the State of Alaska's request for extension of time to file comments and request for abeyance of the Integrated Licensing Process, Susitna-Watana Hydrologic Project No. 14241-000.

Dear Secretary Bose,

On behalf of Susitna River Coalition, Alaska Hydro Project, Cook Inletkeeper, The Alaska Center, Trout Unlimited, Wild Salmon Center and Natural Resources Defense Council (collectively "NGO Participants") we request that the Federal Energy Regulatory Commission (FERC) proceed with the Integrated Licensing Process (ILP) schedule through the Director's Determination before considering whether the State's request for an abeyance of the ILP schedule is the most appropriate way to close down the project.

On August 4, 2016, the State of Alaska provided FERC with an update on the Governor's directive to close down the Susitna-Watana Hydropower project due to the state's fiscal situation. The state requested that: 1) FERC allow the state to proceed with the ILP schedule through the Director's Determination, 2) FERC approve a 20 day extension of time to prepare its response to licensing participants' modification and new study requests, and 3) FERC approve the state's request for an order holding the ILP in abeyance following the Director's Determination. NGO participants address each request below and urge FERC to consider our position.

NGO Participants urge FERC to honor the state's request to proceed with the ILP schedule through the Director's Determination. We have expended a substantial amount of time and resources to engage in the review of the Initial Study Report (ISR). Our proposed modification and new study requests are extensive as are those submitted by the Fish and Wildlife Service and National Marine Fisheries Service. It is in the best interest of all licensing participants, including the Alaska Energy Authority (AEA) as applicant, to reach a determination for this stage of the ILP process. In addition, we have no objections to FERC approving the state's request for a 20 day extension of time to file its response to licensing participants' recommendations for modified or new studies.

However, NGO Participants feel it is premature for FERC to approve the State's request to hold the ILP in abeyance. We believe that FERC's decision about how to handle the ILP schedule moving forward would benefit greatly from additional information including AEA's upcoming response to licensing participants' recommendations for modified or new studies and the Director's Determination. Both filings will provide licensing participants, AEA and FERC with a better idea of the status of the project and the amount of work needed to complete the

scientific studies and to file a license application. Ultimately, it will allow all entities to assess next steps and make informed decisions.

Thank you for considering our requests.

Sincerely,

Mike Wood
President
Susitna River Coalition

Jan Konigsberg
Director
Alaska Hydro Project

Ryan Schryver
Deputy Director
The Alaska Center

Emily Anderson
Alaska Sr. Program Manager
Wild Salmon Center

Bob Shavelson
Executive Director
Cook Inletkeeper

Sam Snyder
Alaska Engagement Director
Trout Unlimited

Kate Poole
Sr. Water Program Attorney
Natural Resources Defense Council

20160826-3015

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, DC 20426

August 26, 2016

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
 Susitna-Watana Hydroelectric Project
 Alaska Energy Authority

Betsy McGregor
 Environmental Manager
 Alaska Energy Authority
 813 West Northern Lights Boulevard
 Anchorage, AK 99503

Subject: ILP Process Plan and Schedule

Dear Ms. McGregor:

On August 4, 2016, Governor Walker filed a request that the Commission proceed to the Integrated Licensing Process's (ILP) next milestone for the Susitna Project, which is issuance of a Commission staff determination on requests to modify or add to the list of approved studies for the project, and, thereafter, place the ILP in abeyance. The Governor has also requested that the process plan be modified to give the Alaska Energy Authority (AEA) an additional 20 days to respond to comments and study requests filed on its study report. The Governor states that he has also directed AEA to advance the project to this stage. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service (Services) have also filed requests for clarification of the ILP schedule in light of Governor Walker's announcement that the Susitna-Watana Project would be shut down due to the State's fiscal situation, and have asked that the Commission complete the study plan modification determination.

As requested, we intend to continue the ILP to the completion of the study plan modification determination. However, because no development application is expected to be filed in the foreseeable future, and to provide flexibility in completing work on other cases, we are modifying the process plan and schedule as follows:

All Stakeholders	File responses to meeting summary disagreements and recommendations for modified or new studies	September 11, 2016
FERC	Issue Director Determination on recommendations for study modifications or new studies	March 10, 2017

Once the study plan modification determination has been issued, the ILP will be in abeyance until further notice. If you have any questions, please contact David Turner at (202) 502-6091 or David.Turner@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

cc: Mailing List
Public Files