

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

**Health Impact Assessment Study
Study Plan Section 15.8**

2014-2015 Study Implementation Report

Prepared for

Alaska Energy Authority



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

NewFields and

Alaska Department of Health and Social Services

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TABLE OF CONTENTS

1.	Introduction	1
2.	Study Objectives	1
3.	Study Area	2
4.	Methods and Variances	3
4.1.	Modifications Identified in ISR	3
4.2.	Modifications Identified since the June 2014 ISR	3
5.	Results	4
6.	Discussion	4
6.1.	Data Gaps and Needs	5
7.	Conclusion	7
8.	Literature Cited	8
9.	Tables	9

LIST OF TABLES

Table 6-1 Project Description Elements Needed for the HIA 9

Table 6-2 Subsistence Survey Communities 10

LIST OF ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

Abbreviation	Definition
ADF&G	State of Alaska, Department of Fish and Game
ADHSS	Alaska Department of Health and Social Services
AEA	Alaska Energy Authority
ATR	Alaska Trauma Registry
CFR	Code of Federal Regulations
CHA	Community Health Aide
CRNA	Copper River Native Association
FERC	Federal Energy Regulatory Commission
HHS	Household harvest survey
HIA	Health Impact Assessment
ILP	Integrated Licensing Process
ISR	Initial Study Report
PAC	Potentially affected communities
REMI	Regional Economics Models Inc.
RMB	Robert Marshall Building
RSP	Revised Study Plan
SMI	Subsistence Mapping Interviews
SPD	Study plan determination
TLK	Traditional and local knowledge
USR	Updated Study Report

1. INTRODUCTION

This Health Impact Assessment (HIA), Section 15.8 of the Revised Study Plan (RSP) approved by the Federal Energy Regulatory Commission (FERC) for the Susitna-Watana Hydroelectric Project, FERC Project No. 14241, focuses on developing an HIA in support of the license application for the proposed Project. HIA is a structured planning and decision-making process for analyzing the potential positive and negative impacts of programs, projects, and policies on the health of residents in impacted communities. This Study Plan uses the methods and guidelines in the Alaska Department of Health and Human Service's (ADHSS's) "Technical Guidance for HIA in Alaska" (ADHSS HIA 2011).

A summary of the development of this study, together with the Alaska Energy Authority's (AEA) implementation of it through the 2013 study season, appears in Part A, Section 1 of the Initial Study Report (ISR) filed with FERC in June 2014 (AEA 2014a). As required under FERC's regulations for the Integrated Licensing Process (ILP), the ISR describes AEA's "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." (18 CFR 5.15(c)(1)).

Since filing the ISR in June 2014, AEA has continued to implement the FERC-approved plan for the HIA Study. Progress included:

- As described in detail below, AEA continued Phase 2 of the study, which involved the collection of baseline data in 2014. This baseline data collection effort consisted of fieldwork conducted in the Middle Copper River Basin potentially affected communities (PACs) of Tazlina, Gakona, and Gulkana in February 2014.
- On October 15, 2014, AEA held an ISR meeting for HIA Study.

In furtherance of the next round of ISR meetings and FERC's Study Plan Determination (SPD) expected in 2016, this report describes AEA's overall progress in implementing the HIA at Watana Dam Study during calendar year 2014. Rather than a comprehensive reporting of all field work, data collection, and data analysis since the beginning of AEA's study program, this report is intended to supplement and update the information presented in Part A of the ISR for the HIA Study through the end of calendar year 2014. It describes the methods and results of the 2014 effort, and includes a discussion of the results achieved.

2. STUDY OBJECTIVES

As set forth in the Study Plan (RSP Section 15.8.1.1), the goals and objectives of the HIA include the following activities:

- Identify potentially affected communities (PACs) and establish a community engagement plan (where relevant).

- Through a review of the FERC scoping meetings and ongoing community engagement, identify public issues and concerns about how community health might be affected during construction and operation of the Project.
- Collect baseline health data at the state level, borough, or census area level, tribal level, and at the potentially affected community level, as possible.
- Identify data gaps and determine the most efficient method to fill those gaps, through community consultation and coordination with other studies, such as the Subsistence Resources Study (Study 14.5), Regional Economic Evaluation Study (Study 15.5), Social Conditions and Public Goods and Services Study (Study 15.6), and Recreation Resources Study (Study 12.5).

Evaluate the baseline data against the Project description to initially determine the nature and extent of potential impact pathways, both positive and negative.

3. STUDY AREA

The HIA study area, established by the Study Plan (RSP Section 15.8.3) includes those communities potentially affected by construction and operation of the Project, such as Cantwell and communities along the Alaska Railroad corridor, as well as those communities further away but potentially affected by the movement of workers, materials, and supplies by using the criteria available in the Technical Guidance for HIA in Alaska (ADHSS HIA 2011). The study would also include communities identified in the Regional Economic Evaluation Study (Study 15.5) and Air Quality Study (Study 15.9) that would experience changes in emissions resulting from reductions in fossil-fuel utility plant outputs as a result of the Project. In addition to the communities along transportation corridors and those identified in these other studies, the HIA study will initially consider all the communities being studied in the Subsistence Resources Study (Study 14.5). Together, all these communities have been initially identified as PACs for the Project analysis to help facilitate collecting baseline information that could be used in the analysis of Project effects. Some sample analysis factors that could be used to evaluate a community's possible nexus to the Project effects include the following:

- Close geographic proximity to the Project,
- High likelihood for worker influx,
- Intense work force recruitment potential,
- High likelihood for change in key subsistence resources,
- High likelihood for change in transportation infrastructure,
- Potential for economic change including regional staging centers, and
- Existing high level of exposure to an environmental hazard that would be potentially exacerbated or improved by Project development.

4. METHODS AND VARIANCES

In 2013, the study team developed the Project overview and issues summary as provided in Phase 1 of the HIA Study Plan (RSP Section 15.8.4.1) with no variances. During Phase 2, the study team initiated baseline data collection as provided in the Study Plan (RSP Section 15.8.4.1) with no variances. As planned for Phase 2, the HIA team accompanied the Alaska Department of Fish and Game (ADF&G) harvest survey group in administering household harvest surveys (HHS) and performed health related community facilities and services observations in the Middle Copper River Basin communities of Tazlina, Gakona, and Gulkana. This occurred in February 2014, while the HIA team was preparing the ISR document.

Since the filing of the June 2014 ISR, a complete data gap review has been conducted in order to determine steps needed to complete this study. This included a review of the interdependent studies to determine which gaps still remain for these studies. A review of the Engineering Feasibility Study (AEA 2014c) was also performed to determine which project description elements are still needed to complete the HIA. These gaps are detailed in Section 6.1 below.

4.1. Modifications Identified in ISR

There was a single modification to the original study plan identified Section 15.8.4.7 of the ISR (Part C). This modification described that HIA analysis to be included in the Updated Study Report (USR) would not serve as the final HIA for the Project. The analysis included in the USR would serve as a template that could be updated and included in the FERC License Application once the AEA Project proposal is finalized. The USR, therefore, would not describe specific impacts or include a ranking and rating, but would instead include a “high level” overview of potential impact mechanisms and effects.

4.2. Modifications Identified since the June 2014 ISR

As the Project was put on hold, a data gap assessment was performed for the Project to determine which data would require updating in the continuation of the assessment. In order for the HIA to be performed most effectively, the most up-to-date data sources should be utilized, as community health profiles can be dynamic. This is especially true for smaller communities where relatively small changes in key performance indicators can have a greater impact on the overall health profile.

Statistics regarding public health, census, labor, etc. are updated on a periodic basis. The HIA team has evaluated data resources utilized in preparing section 15.8.5.2 Baseline Health Conditions of the ISR, to determine where newer data is available and compiled a list (with locations) of resources that can be used to update the baseline data reported in the ISR. Available updates are as follows:

- Alaska Native Tribal Health Consortium (2011-2014):
<http://www.anthctoday.org/epicenter/data/>
- Alaska Bureau of Vital Statistics (2012-2013):
<http://dhss.alaska.gov/dph/VitalStats/Pages/data/default.aspx>

- Alaska Behavioral Risk Factor Surveillance System (2013):
<http://dhss.alaska.gov/dph/InfoCenter/Pages/ia/brfss/maps.aspx>
- Alaska Trauma Registry (2007-2011)
- Alaska Wildfire Emissions Inventory (2014):
http://fire.ak.blm.gov/content/admin/awfcg_committees/Air%20Quality%20and%20Smoke%20Management/Final%202014%20Wildfire%20Inventory%20Report.pdf
- The University of Alaska Fairbanks, Cooperative Extension Service Food Cost Survey is updated quarterly: updated data can be requested from Bret Luick:
<http://www.uaf.edu/ces/hhfd/fcs/>
- Vaccination rates: Updated epidemiology bulletins available for 2015:
<http://www.epi.hss.state.ak.us/bulletins/catlist.jsp?cattype=Immunizations>
- Tuberculosis rates: Updated epidemiology bulletins available for 2015:
<http://www.epi.hss.state.ak.us/bulletins/catlist.jsp?cattype=Tuberculosis>
- Sexually Transmitted Infection rates: Updated epidemiology bulletins available for 2015:
<http://www.epi.hss.state.ak.us/bulletins/catlist.jsp?cattype=Sexually+Transmitted+Diseases>
- Alaska Department of Labor and Workforce Development (2015):
<http://labor.state.ak.us/trends/>

5. RESULTS

The output of the baseline data review to date, data gaps analysis, and field studies appear in Section 15.8.5.2 Baseline Health Conditions in the ISR: Part A (AEA 2014a). The data contained within the ISR have not been updated since the filing of the report in June 2014, however updates that are now available are described above in Section 4.2.

Results of facilities and services field observations performed in Tazlina, Gakona, and Gulkana will be presented in final study reporting according to the recently updated ADHSS Department of Epidemiology Confidentiality and Data Release Protocols (ADHSS SOE 2014.). To meet these protocols, all results of key informant interviews related to the project will be aggregated geographically and analyzed as input into potential impact mechanisms. A discussion of the types of data that are collected by the HIA team for this exercise is described in Section 6.0 of this report.

6. DISCUSSION

Assistance in the administration of HHS was provided for the village of Tazlina, and community observations were performed in Tazlina, Gakona, and Gulkana. Community facilities and services field observations consist of ground truthing information regarding:

- Presence of a grocery store, types of items available for sale and costs;

- Presence of water and sanitation facilities;
- Presence or absence of piped water and flush toilets in homes (based on interview);
- Presence of medical/health facilities, staffing levels, hours of operation capacities, available services, emergency capacity;
- Presence or absence of public safety officers (village safety officer, state troopers, firefighters, etc.);

Key informant interviews were conducted with personnel employed at the Copper River Native Association (CRNA) Robert Marshall Building. The Robert Marshall Building (RMB) is the clinical and administrative headquarters for CRNA, a non-profit health organization serving the Ahtna region including the Copper River Basin and outlying villages including Cantwell. The RMB houses CRNA's administrative, tribal services, primary care, dental, pharmacy, health education, and a wellness program for beneficiaries. At the time of the interviews, clinics in Gulkana, Gakona, and Copper Center were still in operation and service coverage was split between two Community Health Aides (CHAs) who rotated among the facilities. The clinic in Gakona was closed at the time the surveys took place, however, the HIA team interviewed the CHA at the clinic in Gulkana. The HIA team also interviewed the itinerant public health nurse that covers the Middle Copper River Basin. Results of these data would be aggregated to meet the ADHSS data release protocols within the Completed Study Report for the HIA.

6.1. Data Gaps and Needs

As discussed in Section 4.0, the HIA requires a complete project description along with inputs from interdependent studies in order to assess potential health impacts. The important elements relative to the project description listed in **Error! Reference source not found.** are needed for review.

A list of documents reviewed since the ISR can be found in Section 4.0 of Part D: Supplemental Information to June 2014 ISR. Gaps relevant to the HIA were noted so that they may be addressed when the information is available. The following gaps were noted based on the review of documents available for interdependent studies:

- Social Conditions and Public Goods and Services Study Plan Section 15.6 ISR (AEA 2014a).
 - The Regional Economics Model Inc. (REMI) model assumptions for comparing future socioeconomic conditions with and without the Project were still under development at the time of the HIA ISR development.
- Air Quality Study Plan Section 15.9 ISR (AEA 2014a)
 - Much of the information needed to complete this study is in the process of being developed through other licensing studies, including the Geology and Soils Characterization (Study 4.5), Transportation Resources (Study 15.7), as well as Project engineering investigations. As these other studies and investigations are

completed, the information developed in this report should be refined and updated.

- Groundwater Study Plan Section 7.5 ISR (AEA 2014a)
 - Groundwater flow models, including model input and calibration datasets, files, and model documentation were not yet complete at the time of the HIA ISR development
- Transportation Resources Study Plan Section 15.7 ISR (AEA 2014a)
 - This study completed the documentation of existing conditions and forecasted future conditions were completed for all modes but river transportation. The addition of Seward and Whittier port and rail postponed river travel-related interviews, and overall evaluation of Project effects on the transportation system. Complete analysis of transportation and port facilities and services from a health perspective is necessary.
- Baseline Water Quality Study Plan Section 5.5 ISR (AEA 2014a)
 - Water quality data collection was not yet complete at the time of the writing of the HIA ISR. For example, a complete set of the sediment monitoring data required for assessment of potential effects from mercury bioaccumulation is needed.
- Mercury Assessment and Potential for Bioaccumulation Study Plan Section 5.7 ISR (AEA 2014a)
 - According to the draft “Technical Memorandum Evaluation Of Continued Mercury Monitoring Beyond 2014” (AEA 2014b), there were data quality concerns regarding some of the data collected in 2013, which warranted the need for additional sampling in 2014. As a result, the modeling has not yet been completed. HIA study efforts would require evaluating the following key questions identified by the study:
 1. Whether conditions within the reservoir will cause mercury methylation from this source.
 2. The concentrations of methylmercury that might occur.
 3. Whether a mechanism exists (fish and small invertebrates living in the methylation zone) to transfer that methylmercury to wildlife.
- Subsistence Resources Study Plan Section 14.5 ISR (AEA 2014a)
 - The subsistence resource study team has completed HHS for all ADF&G Identified Study Communities (Table 3.1 in Subsistence Resources Study Plan Section 14.5 ISR). Harvest survey data is currently available in ADF&G technical reports (Holen et al., 2014 and 2015) for all subsistence study communities with the exception of Healy, which was surveyed in December 2014 and McKinley Park, to be surveyed in 2016 (**Error! Reference source not found.**).

- TLK workshops had not yet been held in Chickaloon or Knik at the time of the writing of the HIA ISR report, and thus remain as gaps for the HIA.
- The last column in **Error! Reference source not found.** below denotes which communities that Study 15.8 has received the results of the HIA questions from the ADF&G HHS team. At the time of the writing of this report, raw data had been received for two of the three HIA questions included in the HHS, thus analysis could not be completed for these or any of the communities listed in the table below.
- During the February 2014 community facilities and services field assessment, none of the key informants identified by the subsistence resources team (via the traditional and local knowledge workshops) were available for interview.

7. CONCLUSION

Work completed since the filing of the June 2014 ISR includes the following:

- Community health related facilities and services field observations in the Middle Copper River Basin communities of Tazlina, Gakona, and Gulkana;
- Data gap review of interdependent studies ISRs;
- Data gap review of Engineering Feasibility Study (AEA 2014c);
- Review of Section 5.1 Baseline Health Conditions of Health Impact Assessment Study Plan Section 15.8 to determine which data could be updated since the filing of the report; and
- Delineation of study completion needs in Section 8.0 of Health Impact Assessment Study Plan Section 15.8 Part D: Supplemental Information to June 2014 ISR.

The remaining plans to complete the study include completing reporting for additional health interviews during scheduled ADF&G household harvest subsistence surveys. The remainder of the study effort to be undertaken includes the final updated Phase 2 baseline data collection and Phase 3 identification of potential impact mechanisms and effects.

8. LITERATURE CITED

- ADHSS HIA. 2011. Health Impact Assessment Guidance Manual, the HIA Toolkit. Alaska Department of Health and Human Services, Health Impact Assessment Program. <http://www.epi.alaska.gov/hia/toolkit.htm>.
- ADHSS SOE. 2014. Alaska Section of Epidemiology Confidentiality Policies and Procedures and Data Release Protocols: Updated December 1, 2014 http://dhss.alaska.gov/dph/Epi/Documents/confidentiality/SOE_ConfidentialityPPData.pdf
- AEA. 2014a. Initial Study Report: Susitna-Watana Hydroelectric Project FERC Project No. 14241. Filed June 3, 2014 with the Federal Energy Regulatory Commission. <http://www.susitna-watanahydro.org/type/documents/>.
- AEA. 2014b. Technical Memorandum for Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7) - Evaluation of Continued Mercury Monitoring Beyond 2014. Filed September 30, 2014 with the Federal Energy Regulatory Commission. <http://www.susitna-watanahydro.org/type/documents/>
- AEA. 2014c. Susitna-Watana Hydroelectric Project Engineering Feasibility Report AEA11-022: <http://www.susitna-watanahydro.org/type/documents/>
- Holen DS, Hazell SM, Van Lanen JM, Ream JT, Desjardins SPA, Jones B, Zimpelman G. 2014. The Harvest and Use of Wild Resources in Cantwell, Chase, Talkeetna, Trapper Creek, Alexander/Susitna, and Skwentna, Alaska, 2012. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 385. Anchorage
- Holen DS, Hazell SM, Zimpelman G. editors. 2015. The Harvest and Use of Wild Resources in Selected Communities of the Copper River Basin and East Glenn Highway, Alaska, 2013. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 405. Anchorage

9. TABLES

Table 6-1 Project Description Elements Needed for the HIA

Project Description Information
Percentage of local hires – from what communities
Construction workforce countries/locations of origin
Worker scheduling and transportation methods
Social impact management strategies
Open or closed work camps?
Permanent work camp locations
Temporary work camp locations – what size and for what period of time?
Camp catering facility & service plans/protocols
Camp laundry services & service plans/protocols
Camp living area space & ventilation plans
Infrastructure description & locations
Transportation routes
Transportation hubs
Construction Equipment types/level of usage (size of engine (kw, HP), hours per day, area disturbed per day)
Type of fuel burning equipment used/usage
Air emissions inventory & projections
Water emission inventory & projections
Hazardous wastes to be utilized, generated
Hazardous waste management plans
Non-hazardous waste management plans
Water and sanitation management plans
Medical emergency response plans, including project related emergencies in the community
Spill/inadvertent emissions response plans, including those that may occur in communities
Workforce Occupational Health Plan; particularly pre-placement requirements
Employee health education plans

Table 6-2 Subsistence Survey Communities

Potential Communities	Traditional and Local Knowledge Workshops (TLK)	Household Harvest Surveys (HHS)	Subsistence Mapping Interviews (SMI)	Health Impact Assessment Activities	Date Partial Raw Data Received from ADF&G
Beluga		2013		TBD ¹	
Cantwell	2013 ¹⁰	2012 ⁷	2015	2013 ^{5, 10}	15 Sept 2015
Chase		2012 ⁷	2015	2013 ²	15 Sept 2015
Chickaloon	-- ¹¹	--		TBD ¹	
Chistochina		2013		2013 ³	
Chitina	2013	2013		2013 ³	
Copper Center	2013	2013		2013	
Copperville		2014		2014	
Denali Hwy Households		--		TBD ¹	
Eklutna	2013 ¹⁰	--		TBD ¹	
Gakona	2013	2013		2013 ⁵	
Glennallen		2013 ⁸		2014 ³	15 Sept 2015
Gulkana	2013	2013 ⁸		2013, 2014 ¹	15 Sept 2015
Healy		2014	2014	1-limited ⁹ , TBD ¹	
Kenny Lake		2013 ⁴		2013 ³	
Knik (added 2013)	-- ¹¹	--		TBD ¹	
Lake Louise		2013 ⁸	2015	2014	15 Sept 2015
McCarthy		2013		2013 ¹	
McKinley Park		2016	2016	TBD ¹	
Mendeltna		2013 ⁸		2014	15 Sept 2015
Mentasta Lake		2013		2013	
Mentasta Pass		2013		2013	
Nabesna		2013 ³		TBD ¹	
Nelchina		2013 ⁸		2014	15 Sept 2015
Parks Hwy Households		--		TBD ¹	
Paxson		2013 ⁸		2014	15 Sept 2015

Potential Communities	Traditional and Local Knowledge Workshops (TLK)	Household Harvest Surveys (HHS)	Subsistence Mapping Interviews (SMI)	Health Impact Assessment Activities	Date Partial Raw Data Received from ADF&G
Petersville		--	N/A ²	2013 ⁵	
Skwentna		2012 ⁷		2013	15 Sept 2015
Slana		2013		2013	
Susitna/Alexander		2012 ⁷		2013	15 Sept 2015
Talkeetna		2012 ⁷	N/A ²	2013 ²	15 Sept 2015
Tazlina		2013 ⁸		2014 ⁴	15 Sept 2015
Tolsona		2013 ⁸		2014	15 Sept 2015
Tonsina		2013 ⁸		2014	15 Sept 2015
Trapper Creek		2012 ⁷	2015	2013 ²	15 Sept 2015
Tyonek	2013 ¹⁰	2013 ¹⁰		2013 ¹⁰	
Wasilla		--			
Western Susitna Basin		--		TBD ¹	
Willow		--		-- ⁶	

¹ TBD Subsistence Study results will be reviewed to determine if additional food consumption surveys and/or key informant interviews are needed.

² Subsistence use data not available.

³ Included as part of Slana.

⁴ Also included Willow Creek.

⁵ Census Area covered during Trapper Creek HHS.

⁶ Community misidentified in the ISR (AEA 2014a) as gap community

⁷ ADF&G Technical Paper No. 385 (Holen et. al. 2014)

⁸ ADF&G Technical Paper No 405 (Holen et. al. 2015)

⁹ Limited interview conducted due to staff absence, not sufficient for data needs; requires KIIs with emergency providers & Community Leaders

¹⁰ ISR Sections 14.5 and 15.8 (AEA 2014a)

¹¹ Pending finalization of the Coordination Agreement (AEA 2014a, Section 14.5)