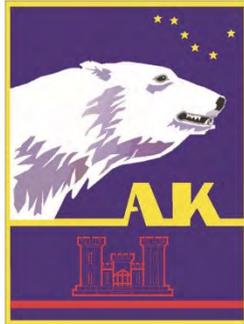


**U.S. Army Corps of Engineers
Alaska District**



**SECOND PERIODIC REVIEW REPORT
SITE 7 CARGO BEACH ROAD LANDFILL**

**NORTHEAST CAPE FUDS
ST. LAWRENCE ISLAND, ALASKA**

FUDS No. F10AK0969-05

**FINAL
AUGUST 2020**

F10AK096905_07.11_0509_a
1200C PERM

SECOND PERIODIC REVIEW REPORT

NORTHEAST CAPE FUDS ST. LAWRENCE ISLAND, ALASKA

FUDS No. F10AK0969-05

**FINAL
AUGUST 2020**

APPROVED BY:

DATE:

David R. Hibner
Colonel, Corps of Engineers
District Commander

F10AK096905_07.11_0509_a
1200C PERM

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
ACRONYMS AND ABBREVIATIONS	v
EXECUTIVE SUMMARY	ES-1
PERIODIC REVIEW SUMMARY FORM.....	S-1
1.0 INTRODUCTION	1-1
1.1 PURPOSE OF THIS REVIEW.....	1-1
1.2 RESPONSIBILITIES.....	1-1
1.3 OVERVIEW	1-2
2.0 SITE CHRONOLOGY	2-1
3.0 BACKGROUND	3-1
3.1 NORTHEAST CAPE.....	3-1
3.1.1 Physical Characteristics	3-1
3.1.2 Geology.....	3-2
3.1.3 Land and Resource Use.....	3-2
3.2 NEC SITE HISTORY	3-3
3.2.1 History of Contamination.....	3-4
3.2.2 Initial Response.....	3-6
3.2.3 Basis for Taking Action	3-7
4.0 SITE 7 REMEDIAL ACTIONS	4-1
4.1 REMEDY SELECTION	4-1
4.1.1 Removal Action Objectives	4-1
4.1.2 Selected Remedy.....	4-2
4.2 REMEDY IMPLEMENTATION	4-4
4.2.1 Remedy Implementation and Status	4-4
4.2.2 Operations and Maintenance.....	4-6
5.0 PROGRESS SINCE THE LAST REVIEW.....	5-1
6.0 PERIODIC REVIEW PROCESS	6-1
6.1 ADMINISTRATIVE COMPONENTS OF THE PERIODIC REVIEW PROCESS	6-1
6.2 COMMUNITY NOTIFICATION AND INVOLVEMENT.....	6-1

TABLE OF CONTENTS (Continued)

<u>SECTION</u>	<u>PAGE</u>
6.3 PUBLIC COMMENTS	6-2
6.4 DOCUMENT REVIEW	6-4
6.5 DATA REVIEW	6-4
6.5.1 Recovered Product Waste Characterization.....	6-5
6.5.2 Excavated Soil.....	6-5
6.5.3 Groundwater.....	6-6
6.5.4 Surface Water.....	6-7
6.6 SITE INSPECTION	6-8
7.0 TECHNICAL ASSESSMENT	7-1
7.1 QUESTION A.....	7-1
7.2 QUESTION B.....	7-2
7.3 QUESTION C.....	7-5
7.4 TECHNICAL ASSESSMENT SUMMARY	7-6
8.0 ISSUES	8-1
8.1 COMMUNITY ISSUES	8-1
9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS.....	9-1
10.0 PROTECTIVENESS STATEMENT(S).....	10-1
11.0 NEXT REVIEW	11-1
12.0 REFERENCES.....	12-1

TABLES

Table 2-1 Chronology of Site Events	2-1
Table 4-1 NEC Cleanup Levels.....	4-2
Table 4-2 Site 7 Selected Remedies and Current Status	4-3
Table 6-1 Site 7 Maximum Detected Concentrations in Excavated Soil	6-6
Table 8-1 Issues Identified	8-1
Table 9-1 Recommendations and Follow-up Actions	9-1

TABLE OF CONTENTS (Continued)

SECTION

PAGE

APPENDICES

Appendix A	Figures
Appendix B	Cleanup Levels, Toxicity, and Risk Evaluation
Appendix C	Site Inspection Checklists and Logbook
Appendix D	Photograph Log
Appendix E	Community Involvement
Appendix F	Survey Report
Appendix G	Response to Comments

(intentionally blank)

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AAC	Alaska Administrative Code
AC&WS	Aircraft Control and Warning Station
ADEC	Alaska Department of Environmental Conservation
ANCSA	Alaska Native Claims Settlement Act
ARAR	applicable or relevant and appropriate requirements
ATSDR	Agency for Toxic Substances and Disease Registry
Bristol	Bristol Environmental Remediation Services, LLC
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CON/HTRW	containerized hazardous, toxic, or radioactive waste
COPC	contaminant of potential concern
DD	Decision Document
DRO	diesel-range organics
ECC	Environmental Compliance Consultants, Inc.
ESD	Explanation of Significant Differences
EPA	U.S. Environmental Protection Agency
FRMD	FUDS Records Management Database
FS	feasibility study
FUDS	Formerly Used Defense Site
GRO	gasoline-range organics
HWAP	hazardous waste accumulation point
IRIS	Integrated Risk Information System
J	The analyte was positively identified; the quantitation is an estimation
Jacobs	Jacobs Engineering Group Inc.
LUC	land use controls
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOC	Main Operations Complex
NEC	Northeast Cape
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
PAH	polycyclic aromatic hydrocarbon

ACRONYMS AND ABBREVIATIONS (Continued)

PCB	polychlorinated biphenyl
POA	Pacific Ocean Alaska
POL	petroleum, oil, and lubricants
RAB	Restoration Advisory Board
RAO	removal action objective
RI	remedial investigation
ROD	Record of Decision
RRO	residual-range organics
Site 7	Site 7 Cargo Beach Road Landfill
TAH	total aromatic hydrocarbon
TAqH	total aqueous hydrocarbon
UECA	Uniform Environmental Covenants Act
USACE	U.S. Army Corps of Engineers
WACS	White Alice Communications System

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) completed the Second Periodic Review of the selected remedy for Site 7 Cargo Beach Road Landfill at the Northeast Cape Formerly Used Defense Site on St. Lawrence Island, Alaska. The purpose of this review is to ensure the remedy selected in *Decision Document: Site 7 Cargo Beach Road Landfill, Containerized Hazardous, Toxic, and Radioactive Waste (CON/HTRW) Project #F10AK0969-05* (USACE 2009b), signed 19 June 2009, is performing effectively and continues to be protective of human health and the environment. The Summary Form on the following pages presents the issues identified during the review that affect protectiveness, associated recommendations, follow-up actions, and the protectiveness statement.

A site inspection occurred in August 2018 followed by a review of available site data. The results of this Periodic Review identified issues that affect the short-term and long-term protectiveness of the remedy, which will be addressed by fully implementing the remedy, specifically the land use controls.

(intentionally blank)

PERIODIC REVIEW SUMMARY FORM

The summary form below provides a brief synopsis of the issues, recommendations, and protectiveness statements developed during this review period. Remedial actions that have occurred since the publication of the Decision Document for these sites (USACE 2009b) are presented in Section 4.0. The historical documents, data, and community concerns reviewed prior to the development of these items are included in Section 6.0.

SITE IDENTIFICATION		
Site Name: Site 7 Cargo Beach Road Landfill, Northeast Cape (St. Lawrence Island)		
FUDS ID: F10AK0969-05		
EPA ID: AK9799F2999		
Region: 10	State: Alaska	City/County: St. Lawrence Island
SITE STATUS		
NPL Status: Non-NPL Site		
Multiple Operable Units? No	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: Other Federal Agency If “Other Federal Agency” was selected above, enter Agency name: USACE		
Author name (Federal or State Project Manager): Environmental Compliance Consultants, Inc/Jacobs Engineering Group Inc. on behalf of USACE, Alaska District. Federal Project Manager – Robert Glascott		
Author affiliation: Contractor		
Review period: April 2014 – October 2018		
Date of site inspection: 2 August 2018 – 6 August 2018		
Type of review: Periodic Review		
Review number: 2		
Triggering action date: 24 February 2015		
Due date (five years after triggering action date): Approximately 24 February 2020		

ISSUES/RECOMMENDATIONS

Site: 7	Issue Category: Remedy Completion			
	Issue: LUCs in the form of deed notices regarding environmental contamination have not been implemented.			
	Recommendation: Record the deed notice and implement the LUCs as described in the DD.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Regulatory Party	Milestone Date
Yes	Yes	USACE	ADEC	2021
Site: 7	Issue Category: Remedy Implementation			
	Issue: The 2018 site inspection identified areas where the landfill cap has settled.			
	Recommendation: Conduct maintenance of the landfill cap by adding fill to areas which have settled.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Regulatory Party	Milestone Date
No	Yes	USACE	ADEC	2025
Site: 7	Issue Category: Remedy Implementation			
	Issue: Clarification for components of the Site 7 remedy is needed due to a newly promulgated ADEC regulation and site conditions (areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth).			
	Recommendation: The change from LUC and deed notices to UECA and Environmental Covenants, as well as documentation that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth should be addressed in an ESD document.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Regulatory Party	Milestone Date
No	No	USACE	ADEC	2025

PROTECTIVENESS STATEMENT

<i>Site:</i> Site 7 Cargo Beach Road Landfill	<i>Protectiveness Determination:</i> Will be protective	<i>Addendum Due Date (if applicable):</i>
---	--	---

Protectiveness Statement: The remedy at Site 7 is expected to be protective of human health and the environment upon completion. In the interim, no exposure pathways that could result in unacceptable risks have been noted. Full implementation of the remedy currently affecting protectiveness, which includes the filing of a deed notice, is anticipated to occur by 2021.

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE) contracted Environmental Compliance Consultants, Inc. (ECC)/Jacobs Engineering Group Inc. (Jacobs) to conduct the Second Periodic Review of the selected remedy at Site 7 Cargo Beach Road Landfill (Site 7) at Northeast Cape (NEC) on St. Lawrence Island, Alaska (Figure A-1), in August 2018. The Periodic Review process for Site 7 began by the signing of *Decision Document (DD): Site 7 Cargo Beach Road Landfill, Containerized Hazardous, Toxic, and Radioactive Waste (CON/HTRW) Project #F10AK0969-05* (USACE 2009b) and continues because all elements of the selected remedy, specifically land use controls (LUCs), were not fully implemented at the time of the First Periodic Review.

1.1 PURPOSE OF THIS REVIEW

The purpose of this review is twofold: to evaluate the implementation and performance of the remedial action that was selected for Site 7 and to determine if this action is protective of human health and the environment. The methods, findings, and conclusions of this Periodic Review are based on issues found through an examination of the available site data and a site inspection.

1.2 RESPONSIBILITIES

USACE, Alaska District, is the lead agency for remedial actions at Site 7, located within the NEC Formerly Used Defense Site (FUDS). USACE contracted ECC/Jacobs to conduct and prepare this Periodic Review Report. The selected final remedial actions for Site 7 were chosen in accordance with the Defense Environmental Restoration Program, United States Code, Title 10, Section 2701, et seq.

Per FUDS Program Policy (ER 200-3-1), CON/HTRW projects involving tanks, transformers, and other containers generally are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. However, this project, as is documented within the Site 7 Cargo Beach Road Landfill DD, has followed the CERCLA process as a matter of administrative consistency (USACE 2009b).

The remaining primary concerns at Site 7 are drums and other containers containing petroleum, oil, and lubricants (POL). If an actual or threatened release of a CERCLA hazardous substance, pollutant, and/or contaminant is identified during future remedy performance, an evaluation will be made in accordance with CERCLA and the National Contingency Plan to determine what action is warranted, if any, to protect human health and the environment.

1.3 OVERVIEW

This effort included community outreach as well as reviews of the DD requirements and work that has been done to satisfy those requirements. This Second Periodic Review was conducted using information repositories available as of December 2018, such as the First Periodic Review report, public comments, current and past monitoring data, and the physical condition of the site. The project team consisted of the USACE project manager, technical representatives, and contracted environmental engineering support.

2.0 SITE CHRONOLOGY

Important events, the associated document reference for each event, and relevant dates for the NEC FUDS are shown in Table 2-1. Sample locations and other important Site 7 features are presented on Figure A-4.

**Table 2-1
Chronology of Site Events**

Event	Date
NEC site acquired by the U.S. Air Force	1952
AC&WS constructed	1951-1952
WACS constructed	1954
Solid waste disposal activities at Site 7 commence	1965
AC&WS operations terminated	1969
WACS operations terminated	1972
Solid waste disposal activities at Site 7 conclude	1974
Bureau of Land Management obtained ownership of NEC	August 1975
ANCSA transferred land ownership to Sivuqaq, Inc. and Kukulget, Inc (ANCSA 1979).	June 1979
Environmental Assessment conducted (URS Corporation 1985)	1985
Site Assessment conducted (Ecology and Environment 1992)	1991 and 1992
Phase I RI conducted (Montgomery Watson 1995)	1994
All electrical transformers removed (Northwest EnviroService, Inc. 1995)	1994
Phase II RI/FS and Human Health and Ecological Risk Assessment drafted (Montgomery Watson 1996)	1996
Remedial Action conducted to remove communications wire and cable on the tundra (Montgomery Watson 1997)	1997
Phase II RI and FS finalized (Montgomery Watson 1999)	1999
Site Assessment conducted	1999
Restoration Advisory Board (RAB) comprised of community members and other interested parties formed	2000
Debris, hazardous waste, above-ground storage tanks, and fuel pipeline removed	2000
Underground storage tanks and PCB- and POL-contaminated soil removed, buildings demolished	2001

**Table 2-1
Chronology of Site Events (Continued)**

Event	Date
Phase III RI conducted (Montgomery Watson 2003)	2001 – 2002
30 buildings and a utilidor demolished; drums, communication poles, and wire removed	2003
Human Health and Environmental Risk Assessment finalized (USACE 2004)	2004
Phase IV RI conducted (Shannon and Wilson 2005)	
FS prepared (USACE 2007a)	2007
Groundwater Use Determination (18 AAC 350) submitted to ADEC (USACE 2007b)	April 2007
ADEC comments on the NEC 350 Determination received (ADEC 2007)	May 2007
DD selecting remedy for Site 7 approved by USACE-POA (USACE 2009b)	June 2009
Remedial Action begun to implement remedy for Site 7 (Bristol 2006)	June 2009
Bristol requested landfill closure by ADEC for Site 7 (Bristol 2009)	November 2009
Site 7 Landfill Cap Construction Report prepared (USACE 2010)	May 2010
State agronomist evaluation of Site 7 landfill recommended maintenance fertilization program to meet vegetation cover requirements (USACE 2011)	August 2010
Visual monitoring inspection conducted (Craner 2011)	September 2011
Site 7 reseeded and fertilized to assist vegetation growth; stabilization analysis conducted on borrow material used to cap the landfills (USACE 2012)	September 2011
Visual monitoring inspection conducted (Shewman 2012)	July 2012
EPA evaluated USACE Cleanup of FUDS at NEC and Gambell (EPA 2012b)	November 2012
Visual monitoring inspection conducted (Geist 2013)	August 2013
First Periodic Review site evaluation conducted (USACE 2015a)	September 2013
Final RAB Meeting	January 2014
11 tons of debris removed from Site 7 and across the NEC FUDS (USACE 2015c)	July 2014
Visual inspection conducted at Site 7 (USACE 2015a)	August 2014
Additional fill material added to Site 7 landfill cap in an area of settlement (USACE 2016a)	2014
First Site 7 Periodic Review Report signed (USACE 2015a)	February 2015
Visual inspection conducted at Site 7 (USACE 2016a)	August 2015
Long-term management plan prepared (USACE 2016b)	August 2016

**Table 2-1
Chronology of Site Events (Continued)**

Event	Date
Public Comment release and Summary Publication of the ATSDR Health Consultation (ATSDR 2017a, 2017b)	July 2017
Site inspection and visual monitoring conducted at Site 7	August 2018
Signage installed along Cargo Beach Road and at the north end of the runway to inform site visitors against using groundwater as drinking water in the vicinity of select NEC sites and identify areas where ground disturbing activities are not recommended	August 2018

Note:
For definitions, refer to the Acronyms and Abbreviations section.

(intentionally blank)

3.0 BACKGROUND

The section below is intended to describe the general conditions of the NEC Site in its entirety; the individual Site 7 history, physical characteristics, and land uses are discussed in detail in Section 3.2.1.

3.1 NORTHEAST CAPE

The project number for Site 7, located within the NEC FUDS, is F10AK0969-05. The Alaska Department of Environmental Conservation (ADEC) contaminated sites record key number for the entire NEC Site is 198532X917901. Site 7 is tracked with a separate record key (198532X917907) and file number (475.38.013). The ADEC Hazard ID number for Site 7 is 213. The U.S. Environmental Protection Agency (EPA) site identification number for NEC is AK9799F2999. The NEC FUDS is not listed on the National Priorities List (NPL).

3.1.1 Physical Characteristics

The NEC FUDS is located on St. Lawrence Island, Alaska, in the western portion of the Bering Sea, approximately 135 air-miles southwest of Nome (Figure A-1). It is 9 miles west of the northeastern cape of St. Lawrence Island at 63°19' north, 168°58' west. The NEC property originally encompassed approximately 4,800 acres (7.5 square miles) and is bounded by Kitnagak Bay to the northeast, Kangighsak Point to the northwest, and the Kinipaghulghat Mountains to the south.

The NEC FUDS consists mainly of rolling tundra, which rises from the Bering Sea toward the base of the Kinipaghulghat Mountains. These mountains rise abruptly to an elevation of approximately 1,800 feet above sea level roughly 3 miles from the coastline. The NEC FUDS is not connected to other permanent communities on the island by road and is only accessible by air, water, or all-terrain vehicle trails. The Village of Savoonga, the closest community, is located approximately 60 miles to the northwest (Figure A-1). Savoonga has a subarctic maritime climate with some continental influences during the winter. Summer temperatures average between 40 to 51 degrees Fahrenheit (°F) and winter temperatures average between -7 and 11°F. Temperature extremes have been recorded between -34 and 67°F. Average annual

precipitation is 10 inches, with 58 inches of snowfall. The island is subject to prevailing winds, averaging 18 miles per hour.

3.1.2 Geology

As presented in the DDs (USACE 2009a, 2009b), St. Lawrence Island consists of isolated bedrock highlands of igneous, metamorphic, and older sedimentary rocks surrounded by unconsolidated surficial deposits overlying a relatively shallow erosional bedrock surface. The main area of operation, known as the Main Operations Complex (MOC), is located at an elevation of approximately 100 feet. At the MOC, shallow, unconsolidated surficial materials overlie quartz monzonitic rocks of the Kinipaghulghat Pluton (Patton and Csejtey 1980). The pluton forms the mountainous area south of the NEC FUDS, which includes Kangukhsam Mountain. The Suqitughneq River drainage in the Kinipaghulghat Pluton has created an erosional valley and alluvial fan of unconsolidated sediment. The NEC FUDS is located on this alluvial fan, which protrudes north from the mountain front toward the Bering Sea. Granitic bedrock materials are exposed at the coast north of the site at Kitnagak Bay, which suggests the quartz monzonitic bedrock underlies the unconsolidated materials at a relatively shallow depth on a wave-cut erosional platform.

In general, the native soil stratigraphy at NEC is characterized by silts near the surface, overlying more sand-dominated soil at depth. The silt contains varying quantities of clay/sand/gravel and varies from 0 to 10 feet in thickness. The silt is dark brown to dark green and sometimes exhibits a mottled texture. In some areas, the silt exhibits an aqua-green or blue color. Dark brown silts are observed in outcrops. The sand at depth contains varying degrees of silt/gravel/cobbles that range from 2 feet to greater than 20 feet in thickness. These deeper, coarse-grained materials generally are unsorted and likely to be of glaciofluvial origin. The depth to bedrock at the NEC FUDS is unknown (USACE 2009a, 2009b).

3.1.3 Land and Resource Use

St. Lawrence Island residents from the villages of Gambell and Savoonga engage in subsistence fishing, hunting, and gathering in the NEC FUDS area year-round. Currently, there are no

permanent residents of the NEC area; however, representatives of the Native Village of Savoonga have indicated a desire to re-establish a permanent residential community at the site in the future.

St. Lawrence Island supports habitats for the following endangered or threatened species: the polar bear (threatened); spectacled eider (endangered); Steller's eider (threatened); and the Western Distinct Population Segment of Steller sea lion (endangered). Walrus are protected under the Marine Mammal Protection Act. The area of the NEC FUDS is used for the collection of berries and subsistence hunting of reindeer. The Suqitughneq River, which is located within the NEC FUDS, is used for subsistence fishing. The ocean surrounding the NEC FUDS is used extensively for subsistence activities, including fishing and hunting of whales, walrus, seals, and sea birds.

3.2 NEC SITE HISTORY

The NEC FUDS was constructed as an Aircraft Control and Warning Station (AC&WS) during 1950 and 1951 to provide radar coverage and surveillance for the Alaskan Air Command, and later for the North American Air Defense Command, as part of the Alaska Early Warning System. The site was activated in 1952 and a White Alice Communications System (WACS) station was added to the site in 1954. The AC&WS and WACS operations supported 212 personnel and were terminated in 1969 and 1972, respectively. Most military personnel were removed from the site by the end of 1969.

The NEC site totaled 4,880 acres and included areas for housing site personnel, power plant facilities, fuel storage tanks, distribution lines, maintenance shops, waste water treatment facilities, and landfills. The buildings and majority of furnishings and equipment related to the AC&WS were abandoned in place initially due to the high cost of off-island transport.

In 1971, the villages of Gambell and Savoonga opted out of the Alaska Native Claims Settlement Act (ANCSA), which allowed for title to 1.136 million acres of land in the former St. Lawrence Island Reindeer Reserve established in 1903. The Gambell Native Corporation and Savoonga Native Corporation (now known as Sivuqaq, Inc. and Kukulget, Inc.,

respectively) received titles to all of St. Lawrence Island (except U.S. Surveys 4235, 4237, 4340, 4369, 3728) by Interim Conveyance No. 203 dated 21 June 1979 (ANCSA 1979). In 1982, the Navy obtained approximately 26 acres of land containing the former WACS. The land transfer later was deemed invalid and property ownership was reverted to Sivuqaq, Inc., and Kukulget, Inc.

3.2.1 History of Contamination

Environmental investigations at the NEC FUDS began in the mid-1980s, and subsequent phased remedial investigations (RIs) were conducted between 1994 and 2004. The studies divided the concerns at NEC among 34 separate sites (USACE 2009a, 2009b). One of these sites, Site 7, is an unpermitted landfill that was used as the installation's primary solid waste disposal area from 1965 until closure in 1974. Site 7 is located 0.8 miles south of Cargo Beach, midway between the MOC and the beach at Kitnagak Bay. At the time of Site 7 DD development (USACE 2009b), the dump contained a variety of unknown materials. Since the development of the Site 7 DD, a substantial volume of waste has been removed, and subsequent sampling has provided additional characterization of the area surrounding the landfill. The landfill appears to have been created by dumping debris off the sides of a topographic mound. The debris then was covered by grading soil out from the top of the mound.

Environmental sampling activities at Site 7 have included the collection of soil, sediment, and surface and shallow groundwater samples, primarily around the perimeter of the landfill, and in a limited amount of soil within the landfill boundary, to determine if landfill contents were migrating. Detected analytes were compared to background concentration and the most conservative ADEC Method Two cleanup levels to determine the contaminants of concern (COCs) (USACE 2009b). Chemical analyses were conducted for petroleum-related compounds, volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls (PCBs), pesticides, and metals. Based on the results of the phased RIs, contaminants exceeding action levels in soil were identified in a limited amount of soil and included diesel-range organics (DRO), residual-range organics (RRO), PCBs, arsenic, chromium, and lead. The Site 7 COCs identified in the DD include DRO, RRO, PCBs, and arsenic in soil along with total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), and sheen in surface water.

In soil, the maximum DRO concentration was detected approximately 75 feet east of Cargo Beach Road at a concentration of 32,000 milligrams per kilogram (mg/kg) (Montgomery Watson 1995). At all other sampling locations, DRO concentrations ranged from nondetect to 2,300 mg/kg, which is below the site-specific cleanup level of 9,200 mg/kg (USACE 2009b). PCBs were detected in soil along the southeastern edge of the landfill at concentrations ranging from nondetect to 50.8 mg/kg (Shannon and Wilson 2005). In 2005, six locations with PCBs concentrations greater than 1 mg/kg were excavated and disposed offsite. Confirmation sampling results from 2005 demonstrated that PCBs were successfully removed to concentrations below 1 mg/kg at four of the six locations where PCB-contaminated soil was excavated and disposed offsite. Areas on the southeastern slope of the landfill may still contain PCB concentrations greater than 1 mg/kg in soil beneath the landfill cap (USACE 2007a).

In sediment, chromium and PCBs were detected above cleanup levels at one location (SD103) with concentrations of 100 mg/kg and 1.78 mg/kg, respectively (USACE 2009b). As shown on Figure A-4, the surveyed location of the landfill cap extends beyond all soil and sediment sample locations that exhibited COCs at concentrations greater than DD cleanup levels. DRO was detected at location SD301 at a maximum concentration of 4,900 mg/kg (USACE 2009b). Severely stained soil was selected for excavation and removal prior to capping the landfill. In surface water, DRO was detected in one sample (SW101) northeast of the landfill in 1994, with an average triplicate concentration of 8.9 milligrams per liter (mg/L). No other exceedances were detected in surface water in 1994. Surface water has been addressed through subsequent sampling at the site, which has not replicated the exceedances.

Multiple attempts to characterize groundwater conditions at Site 7 have been performed but many have been unsuccessful, with characterization of groundwater at the site limited by poor shallow groundwater availability. During the Phase I RI in 1994, four boreholes were placed around the landfill to locate groundwater and characterize migration of contaminants around the landfill. Boreholes were drilled to a maximum depth of 31 feet and one borehole was terminated at 15 feet below ground surface (bgs) and converted to monitoring well MW7-4 located east of the landfill and adjacent to a pond (USACE 2009b). Groundwater was not encountered at the other three boreholes. The lack of groundwater in these boreholes was

attributed to frozen soil conditions. A thin layer of perched groundwater may be present immediately above the frozen soil during the warmer summer months (USACE 2009b). In 2001, several temporary well points were advanced in the areas surrounding the landfill. These well points generally confirmed the lack of groundwater. One location (WP7-1), located west of the landfill, contained anomalous levels of several metals, including arsenic, chromium, and lead, as well as low levels of DRO and RRO. The water samples were not filtered and turbid, suggesting the metals detected were likely originating from the suspended sediments in the water column and are not representative of dissolved phase shallow groundwater conditions at the site. Groundwater also was collected from temporary well point WP7-3, which did not identify contaminants greater than cleanup levels (USACE 2009b). Groundwater migration from the site likely is limited because of the low permeability of the shallow, partially frozen soil. Groundwater probably remains in a relatively localized area with any migration occurring in a northeasterly direction, corresponding to surface topography.

Sampling of shallow groundwater is problematic at Site 7 due to the tundra/wetland environment, and sample collection is difficult because water is intermittent, slow to recharge, and is highly turbid. The groundwater exposure pathway at Site 7 is incomplete because there is not a sufficient quantity of water produced to be considered a reasonable potential future source for drinking water. The surface water at Site 7 is also not considered a potential drinking water source (ADEC 2007). A mitigation measure, in the form of signage recommending water at Site 7 not be used as a drinking water source, is in place to prevent the referenced exposure pathway.

3.2.2 Initial Response

Several non-time-critical interim removal actions were performed throughout NEC to address the removal of containerized hazardous/toxic waste items, buildings and miscellaneous debris, and hotspots of contaminated soil (USACE 2009b). Remedial actions specific to Site 7 include:

- In 2000, more than 6,000 55-gallon drums were removed from the surrounding area.
- In 2003, 15 tons of scrap metal were removed from the area east of Cargo Beach Road.

- In 2005, approximately 14 tons of PCB-contaminated soil from six areas along the southeastern edge of the landfill, as well as exposed drums and miscellaneous debris from the landfill perimeter edges were removed (USACE 2009b).
- In 2007, a geophysical survey (USACE 2007c) was conducted to map the extent of buried metallic anomalies. The geophysical data were consistent with side-cast debris around the edges of a natural topographic mound. Most of the remaining debris identified was located at the northwest and southeast edges of the topographic mound. Buried debris was not identified to extend beneath Cargo Beach Road.
- In 2014, maintenance of the cap occurred when fill material was added to a small area where settling was noted. The 2014 cap maintenance was documented on the USACE 2014 Site 7 landfill cap inspection form. Unfortunately, this form was erroneously omitted from Appendix E of the *2015 Landfill Periodic Visual Inspection Report* (USACE 2016a). A pdf of the cap inspection form is available and is included in Appendix C.

3.2.3 Basis for Taking Action

The response actions selected in the DD are necessary to protect the public health and welfare or the environment from actual or threatened releases of hazardous substances into the environment, including unknown liquid contents of buried and partially exposed drums (USACE 2009b).

(intentionally blank)

4.0 SITE 7 REMEDIAL ACTIONS

Removal action objectives (RAOs) and the selected remedy are presented in this section. Details regarding the initial plans, remedy implementation, and status of the remedy are provided.

4.1 REMEDY SELECTION

The DD addressing Site 7 was approved on 19 June 2009 (USACE 2009b). The goal of the Defense Environmental Restoration FUDS Program is to reduce any risk resulting from past military activities to safe levels in a timely and cost-effective manner.

4.1.1 Removal Action Objectives

Specific response action alternatives were developed and evaluated for Site 7. The RAOs, as specified in the Site 7 DD (USACE 2009b), include:

- Reduce threats to human health, safety, and the environment.
- Remove drums containing POL, hazardous substances, pollutants, or contaminants, as necessary, to reduce the likelihood of future spillage, leakage, and exposure to humans, animals, and the food chain.
- Prevent current and future exposure to humans by ingestion, inhalation, and dermal contact with contaminated soil at levels above risk-based cleanup levels.
- Prevent exposure to ecological receptors by direct contact with contaminated soil/sediment above risk-based cleanup levels.

Cleanup levels for identified COCs in various media at Site 7 established in the DD are presented in Table 4-1. Soil cleanup levels were developed based on the human health and ecological risk assessment (USACE 2004) to be protective of future permanent residents, with an assumed lifetime exposure to contaminated soil through incidental ingestion, inhalation, or dermal contact. Sediments that are intermittently submerged (e.g., ephemeral ponds, wet tundra) are considered soil, including all areas adjacent to Site 7. Surface water must meet water quality standards promulgated by the State of Alaska under Title 18 of the Alaska Administrative Code (AAC), Section 70 (ADEC 2018a). The water quality criteria for petroleum hydrocarbons, oil, and grease are described in 18 AAC 70.020(b) and stipulate these

compounds may not cause a visible sheen upon the surface of the water. In addition, the regulations provide acceptable levels for TAH and TAqH. The described surface water criteria are applicable to Site 7, as surface water is not considered a potential drinking water source.

**Table 4-1
NEC Cleanup Levels**

COC	Soil (mg/kg)	Surface Water (mg/L)
Arsenic	11 ^a	--
PCBs	1 ^b	--
DRO	9,200 ^c	no sheen
GRO	--	no sheen
RRO	9,200 ^c	no sheen
TAH ¹	--	0.010
TAqH ²	--	0.015

Notes:

-- Cleanup level not specified in the DD (USACE 2009a).

¹ TAH is the sum of BTEX.

² TAqH is the sum of BTEX and PAHs.

^a Site-specific background value

^b 18 AAC 75, Table B1, over 40-inch zone, direct contact pathway (as updated 9 October 2008).

^c Risk-based cleanup level derived from site-specific risk assessment, ingestion/inhalation pathways, future residential use (USACE 2009a).

For definitions, refer to the Acronyms and Abbreviations section.

4.1.2 Selected Remedy

Response action alternatives considered for Site 7 included: no further action, LUCs, natural attenuation, long-term monitoring, capping, and excavation and offsite disposal (USACE 2009b). Alternatives were evaluated for their ability to provide overall protection of human health and the environment; compliance with risk-based standards; short- and long-term effectiveness and performance; reduction in toxicity, mobility, and volume; implementability; and cost (USACE 2009b). The selected remedy for Site 7 contains several components and includes capping with intrusive removal action and incidental removal of contaminated soil associated with identified drums. The selected remedial components for Site 7 and their status are presented in Table 4-2.

**Table 4-2
Site 7 Selected Remedies and Current Status**

Remedial Component	Status
Expose underlying drums/debris by disturbing the upper approximately 1 foot of fill across the areas with mapped metallic anomalies (estimated 150,000 square feet) to determine if near-surface drums are present.	Completed in 2009. Ten test pits (10 feet by 10 feet by 4 feet) and 72 shallow pot holes were advanced at Site 7 (USACE 2010).
Excavate test pits or trenches distributed across the areas of known metallic anomalies to determine if large caches of drums are present.	Completed in 2009. Excavation during limited drum removal overlapped the areas with magnetic anomalies (129,000 square feet). Final excavation depth was not reported (USACE 2010).
Remove or drain identified drums with liquid content; characterize the waste contents; transport offsite for proper disposal.	Completed in 2009. A total of 182 drums located in the test pits and pot holes were drained, cleaned and crushed before disposal offsite or burial under the Landfill Cap. Drum contents were comingled and sent to an offsite disposal facility (USACE 2010).
Remove incidental contaminated soil associated with identified drums to the extent grossly-stained soil is determined by the contractor and USACE Quality Assurance Representative; characterize the soil for disposal; transport offsite for proper disposal.	Completed in 2009. A total of 100 tons of soil was removed from 1 to 2 feet below the drums during excavation and sent to an offsite disposal facility (USACE 2010).
Cap the debris with a minimum 2 feet of fill.	Completed in 2009. Landfill cap material (28,994 cubic yards) was transported to the site from a local borrow source and spread across the site (USACE 2010).
Revegetate the site.	Initiated in 2009 (USACE 2010). Additional seed and fertilizer were spread in 2011 (USACE 2012). Areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth. Despite the lack of vegetation on areas of the cap, the cap is stable and not eroding.
Survey the landfill boundary with map and text description.	Completed in 2009 (USACE 2010).
Deed notation ¹	Not yet completed.
Implement LUCs to limit groundwater use and prevent construction of buildings on top of the landfill. ¹	Not yet completed. Signage installed September 2018.

¹ Changes to the Deed Notation requirements as a result of the 2018 State of Alaska promulgated UECA are recommended to be addressed in a separate ESD document.

**Table 4-2 (Continued)
Site 7 Selected Remedies and Current Status**

Remedial Component	Status
Visual monitoring of the cap for settlement and erosion over a period of five years, with visual monitoring included in Periodic Reviews for up to 30 years, if deemed necessary.	Periodic Reviews ongoing. Annual visual monitoring completed between 2011 and 2015 (Craner 2011; Shewman 2012; Geist 2013; and USACE 2016a) (see also the 2018 cap inspection form in Appendix C). First Periodic Review conducted in 2013 (USACE 2015b). Visual monitoring for the Second Periodic Review was performed during 2018, the results of which are included in this Second Periodic Review Report.

Note:

For definitions, refer to the Acronyms and Abbreviations section.

4.2 REMEDY IMPLEMENTATION

This section presents a brief description of the selected remedy, its implementation history, status, and operations and maintenance plan.

4.2.1 Remedy Implementation and Status

The DD-selected remedy for Site 7 was to excavate test pits across the areas of known metallic anomalies to expose underlying drums and debris, remove or drain near-surface drums, remove incidental contaminated soil associated with identified drums, install a landfill cap, conduct periodic visual monitoring for settlement and erosion over a period of five years and additional visual monitoring up to 30 years if deemed necessary based on the results of the site inspections, survey the landfill boundary, and implement LUCs to limit groundwater use and prevent construction of buildings on top of the landfill.

Remedy implementation was initiated in 2009. Metallic anomalies identified by geophysical investigation in 2007 were located by survey and investigated. The top 1 foot of soil was uncovered to locate drums within the shallow subsurface. Excavations included 73 shallow “potholes” across the surface of the landfill, 10 test pits (at least an area of 100 square feet and a depth of 4 feet), and previously delineated magnetic anomaly areas covering approximately 129,000 square feet (USACE 2010). Excavation efforts encountered and disposed of

approximately 201 pounds of PCB light ballasts, 350 pounds of lead batteries, 4,100 pounds of lead debris, and approximately 10 gallons of antifreeze.

At the end of the 2009 field season, approximately 136 tons of nonhazardous waste, 2.7 tons of hazardous waste, and 182 waste-containing drums were removed from the landfill (USACE 2010). The total quantity of liquid waste found in the 182 waste-containing drums was recorded as approximately 2,150 gallons worth of liquid contents (USACE 2010). Contents from these drums were containerized, characterized, and disposed of offsite. After being emptied, cleaned, and crushed, 50 of the drums were transported offsite and 132 of the waste-containing drums were returned to the landfill. More than 1,000 empty drums that were encountered during the excavation were cleaned, crushed, and returned to the landfill. Approximately 100 tons of petroleum-stained soil encountered during excavation efforts were excavated, characterized, and containerized for offsite disposal.

Waste encountered at Site 7 was consolidated and cleaned at a Hazardous Waste Accumulation Point (HWAP) on the gravel pad at Site 6. Drums containing liquid product were transported to the HWAP, cut open, and pumped of their contents. Drums then were washed with a high-pressure hot water rinse within an open-top container express unit. Waste streams processed at the HWAP included DRO-contaminated soil, oil waste, PCB light ballasts, batteries, lead debris, antifreeze, and wash-water (USACE 2010). A 2-foot minimum landfill cap was constructed using material from an on-island borrow source south of Site 31. The cap was graded to promote surface runoff and prevent erosion. The landfill cap boundaries are shown on Figure A-2. Locations where debris was not encountered are noted as potentially having less than a 2-foot cap to maintain grade (USACE 2010). On 20 November 2009, site closure was requested (Bristol Environmental Remediation Services, LLC [Bristol] 2009). On 7 December 2009, request for site closure was deemed premature and denied by ADEC (USACE 2010).

In 2011, Site 7 was re-seeded and fertilized to assist vegetation growing on the surface of the landfill cap. A stabilization analysis was conducted by Bristol and determined the landfill cap met non-vegetative permanent stabilization requirements established in the 2011 Alaska Construction General Permit (USACE 2012).

In August 2018, both a site inspection and visual monitoring were performed and signs were installed to inform site visitors about Site 7 LUCs. Findings of the site inspection and visual monitoring identified that two areas of the landfill cap had experienced settlement and vegetation on the landfill cap was sparse. Along Cargo Beach Road and at the north end of the runway, signs were installed to inform site visitors against using groundwater as drinking water in the vicinity of Site 7 and identify landfill areas where ground disturbing activities or construction are not recommended. The installation of signage was not a required element of the selected remedy but was completed by the USACE based on community requests.

4.2.2 Operations and Maintenance

The estimated cost for the response action at Site 7 is \$4.6 million (USACE 2009b). Periodic Reviews, which include additional visual monitoring up to 30 years, constitute \$300,000 of the estimated amount. The number of Periodic Reviews within the 30-year period specified in the remedy is not defined but reviews are to be performed as necessary.

Visual monitoring inspections of the landfill cap by a USACE quality assurance representative occurred each year between 2011 and 2015; observations were noted in the 2011, 2012, and 2013 site inspection checklists (Craner 2011; Shewman 2012; Geist 2013) and in the *2015 Landfill Periodic Visual Inspection Report* (USACE 2016a). There was also a 2014 inspection checklist form that was erroneously omitted from the *2015 Landfill Periodic Visual Inspection Report* (USACE 2016a). A pdf of this form is available and is included in Appendix C. Please note that the percent vegetative cover values noted in the inspection form were determined through qualitative visual inspection of the cap and were not quantitatively measured. A separate visual inspection of the landfill cap was also conducted in 2013 as part of the First Periodic Review (USACE 2015b). Fertilizer and grass seed were added on 13 September 2011 to encourage vegetative regrowth in areas noted as bare (USACE 2011, 2012).

Visual monitoring inspection in 2014 indicated a low spot had developed near the top of the landfill. Additional fill was added to this low spot and the area was seeded and fertilized during field activities in 2014. Additionally, a small amount of metallic debris which protruded through the cap was removed.

Visual monitoring inspection in 2015 described the landfill cap as stable, and no areas of settlement were noted (USACE 2016a).

(intentionally blank)

5.0 PROGRESS SINCE THE LAST REVIEW

This is the Second Periodic Review for Site 7. Progress since the last period review included the 2014 maintenance of the landfill cap and removal of small metallic debris protruding from the cap. No progress was made during this review period for the implementation of DD specified LUCs.

A site inspection and visual monitoring were performed in 2018. Areas of settlement were identified in two locations on the landfill cap. Additionally, vegetation regrowth on the landfill cap was sparse.

Signs were installed along Cargo Beach Road and at the north end of the runway to inform site visitors against using groundwater as drinking water in vicinity of Site 7 and identify landfill areas where ground disturbing activities or construction are not recommended. The installation of signage was not a required element of the selected remedy, but was completed by the USACE based on community requests.

(intentionally blank)

6.0 PERIODIC REVIEW PROCESS

As previously stated, this site is not regulated under CERCLA; however, to maintain administrative consistency, this Periodic Review was conducted using the following guidelines:

- *EPA Five-Year Review Guidance* (EPA 2001)
- *Clarifying the Use of Protectiveness Determinations for CERCLA Five-Year Reviews* (EPA 2012a)
- *EPA Five-Year Review Recommended Template* (EPA 2016)

6.1 ADMINISTRATIVE COMPONENTS OF THE PERIODIC REVIEW PROCESS

USACE notified potentially interested parties of the occurrence of the review through community meetings, newspaper notices, emails, and distribution of a fact sheet (described in Section 6.2) in the spring of 2018. This notification was in conjunction with the notification of the concurrent Five-Year Review and Periodic Review for other NEC sites. The Periodic Review team consisted of individuals from USACE with technical support provided by Jacobs. The Periodic Review included the following components: community notification and involvement; document reviews; site inspection; interviews with the state regulatory agency and community members; an assessment of protectiveness of the remedies; and development of this Periodic Review Report. Documentation of the site inspection is available in Appendices C and D. Documentation of community involvement is included in Appendix E.

6.2 COMMUNITY NOTIFICATION AND INVOLVEMENT

A Restoration Advisory Board (RAB), comprised of community members and other interested parties, was established January 2000 as part of the remedial action construction phase of the NEC FUDS project. RAB meetings were held to keep the public informed of ongoing project activities at the NEC FUDS. Under the Technical Assistance for Public Participation program, the RAB was served by a technical advisor to provide technical guidance and comments on work plans, reports, proposed remedies, and potential environmental and human health impacts.

The community was notified and given opportunity to provide comments to this periodic review. A notice was placed in the newspaper *Nome Nugget* during the week of 29 March 2018. In addition, an informational flyer was mailed to select community members and ADEC on 21 March 2018. The public notices and flyer included information regarding the simultaneous Five-Year Reviews and Periodic Reviews occurring at the NEC FUDS (Appendix E).

Community interviews for this Periodic Review (and concurrent Five-Year Review and Periodic Review for other NEC sites) were conducted during a community meeting held by USACE and ECC/Jacobs personnel in Savoonga on 11 April 2018. Site 7 specific and related sitewide concerns are summarized in Section 6.3. The complete interview record and a copy of public notices are provided in Appendix E.

Following USACE signature of the final review and distribution of the final report, a second public notice will be placed in the *Nome Nugget* announcing the availability of this review and the second NEC Five-Year Review. A copy of this Periodic Review Report will be added to the information repositories.

Project related documents and reports are available at two information repositories: the Sivuqaq Corporation Building (Lodge) in Gambell and the Savoonga City Hall in Savoonga. Although the DD identifies two additional information repositories, the University of Alaska Fairbanks Northwest Campus Library in Nome and the Alaska Resource Library and Information Services in Anchorage, they are no longer maintained.

6.3 PUBLIC COMMENTS

Detailed interview responses and public comments are provided in the 2015 First Periodic Review Report (USACE 2015b). A summary of public comments, concerns, and requests relating to Site 7 received during the First Periodic Review is included below:

- Concern over adequacy of the landfill cap fill material and suitability for growing vegetation
- Comment that excavation and debris removal efforts were limited to the surface; concern over possibility of significant quantities of potentially hazardous debris remaining

- Request to install signs around the perimeter to notify site visitors of the presence of a landfill
- Concern over potential for leachate from landfills to affect the Suqitughneq River
- Request to install monitoring wells at landfills

Public notices printed in the *Nome Nugget* and on flyers posted in Savoonga identified that public comments for Periodic Review and concurrent Five-Year Review and Periodic Review for other NEC sites could be submitted by responding to a written questionnaire or following a planned public meeting in Savoonga. Public comments for the Second Periodic Review were solicited at a public meeting held by USACE in Savoonga on 11 April 2018.

Detailed meeting notes, including questions and USACE responses, are provided in the meeting minutes located in Appendix E. A summary of the questions, comments, and concerns received during the community meeting related to all NEC sites are listed below:

- Comments and questions regarding uncertainty in site status and closure:
 - Which sites have/have not received closure?
 - Once sites are closed, how often is the site monitored?
 - Is there a way to re-open a site once it is closed?
 - The process is inadequate (too lengthy) for reopening sites.
- Comment that a summary of the draft Five-Year Review report findings in the form of a public meeting would help provide an opportunity for comments during the draft period
- Question whether global warming/climate change will have an effect on the contaminated sites
- Request for clarity regarding which sites contain PCB contamination
- Comment that only installing one or two signs to describe land use restrictions is inadequate
- Concerns over consumption of fish from the Suqitughneq River
- Concern that additional unidentified landfills may exist at NEC
- Concerns over adequacy of 2018 sampling plan

6.4 DOCUMENT REVIEW

The primary document used during this Periodic Review is the DD for Site 7 to provide site history and to identify RAOs, contaminants of potential concern (COPC), COCs, and cleanup levels. Other site-specific documents were reviewed to assess the protectiveness of the remedy:

- RI/feasibility study (FS) reports (when necessary to clarify information in the DD)
- The human health and ecological risk assessment (USACE 2004)
- Removal action report
- The *First Periodic Review Report, Site 7 Cargo Beach Road Landfill* (USACE 2015b)
- Monitoring reports

References to the key documents are listed in Section 12.0 of this report.

The potential for changes to standards identified as applicable requirements in the DD and/or newly promulgated standards that may affect the protectiveness of the remedies are evaluated in Appendix B and discussed in Section 7.0. The following documents were reviewed for updates to applicable requirements and new toxicity information:

- ADEC 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control* (ADEC 2018b)
- *ADEC Cleanup Levels Guidance* (ADEC 2017)
- EPA Integrated Risk Information System (IRIS) retrieved from <http://www.epa.gov/iris/> (EPA 2018)

6.5 DATA REVIEW

The remedy at Site 7 is to expose underlying drums/debris by disturbing the upper approximately 1 foot of fill across the areas with mapped metallic anomalies to determine if near-surface drums are present, remove identified drums and the associated incidental contaminated soil, cap the landfill, conduct periodic visual monitoring of the cap for settlement and erosion for five years, and implement LUCs. The remedy was initiated in 2009 (USACE 2010). During limited drum removal efforts, several waste streams were encountered. Waste characterization samples were collected from excavated soil and drums containing drilling cuttings and recovered product. Soil, surface water, and groundwater samples were

primarily collected to characterize the perimeter of the landfill to determine if landfill COCs were migrating. Sample results were reviewed to identify any previously unidentified contaminants and/or changes in maximum detected concentrations of known COCs. This section provides a summary of that information.

6.5.1 Recovered Product Waste Characterization

A total of 24 liquid-containing accumulation drums resulted from the limited drum removal and emptying activities at Site 7 (USACE 2010). Each liquid-containing accumulation drum was field screened for chlorinated compounds using CHLOR-D-TECT test kits; results greater than 1,000 parts per million required fixed laboratory analysis. Three drums had CHLOR-D-TECT results greater than 1,000 parts per million, and one primary and one duplicate sample were composited from the three drums for laboratory analysis. Sample results identified lead at 200 mg/kg. The three drums were classified as hazardous waste due to lead results and the presence of chlorinated paraffins in excess of 1,000 mg/kg. An additional drum encountered was verified to contain nearly 100 percent ethylene glycol antifreeze.

In addition to liquid waste, oil sludge and absorbents contaminated with oil were managed at the HWAP. Three primary samples and one duplicate sample were collected from a combination of two oil sludge drums and 17 drums of kitty litter contaminated with oil. These samples indicated the presence of Aroclor 1248 up to 2.4 mg/kg and Aroclor 1254 at 1.1 mg/kg.

6.5.2 Excavated Soil

COPCs in soil at Site 7 identified in the DD include DRO, PCBs, arsenic, chromium, and lead. Several interim removal actions excavating contaminated soil were performed between 1994 and 2005. At the time of the DD (USACE 2009b), remaining soil contamination was believed to be limited and was planned to be capped or removed as grossly contaminated soil. Grossly contaminated soil encountered during limited drum removal efforts was excavated in 2009. Approximately 127 tons of petroleum-contaminated soil was removed during the 2009 field season. Confirmation samples were not collected following removal of grossly-stained soil

(USACE 2010). Table 6-1 presents maximum known concentrations at the time of the DD and the maximum concentrations detected in excavated soil waste accumulated at the HWAP.

**Table 6-1
Site 7 Maximum Detected Concentrations in Excavated Soil**

Analyte	Cleanup Level ^a	Unit	DD Maximum Concentration	Maximum Concentration in Excavated Soil ^f
DRO	9,200	mg/kg	32,000^b	11,000
Arsenic	11	mg/kg	17.3^c	0.0052 J
Chromium	50	mg/kg	75^c	0.0053 J
Lead	400	mg/kg	460^c	1.4
PCBs	1	mg/kg	> 0.5^{d,e}	1 J

Notes:

^a Cleanup level reported in the DD (USACE 2009b).

^b DD maximum concentration found in 1994.

^c DD maximum concentration found in 2001.

^d DD maximum concentration found in 2005.

^e Results collected using EnSys PCB field-screening kits (calibrated to 0.5 mg/kg of Aroclor 1260) indicated the PCB concentrations in soil remained above 0.5 mg/kg.

^f Maximum concentration in excavated soil is from samples collected from bulk soil containers in 2009 prior to offsite transportation and disposal.

BOLD = result exceeds cleanup level

J - The analyte was positively identified; however, the associated result was less than the limit of quantitation but greater than or equal to the detection limit.

For definitions, refer to the Acronyms and Abbreviations section.

6.5.3 Groundwater

RRO, chromium, lead, and nickel previously have been detected in shallow groundwater above ADEC drinking water standards at Site 7 (USACE 2009b). The DD did not include a remedy for groundwater contamination at Site 7 because shallow groundwater at Site 7 was not a current or reasonably expected potential future source for drinking water (ADEC 2007).

Historically, sampling groundwater at Site 7 has been difficult and largely unsuccessful. Previous efforts to install temporary well points were successful at location WP 7-1 in 2001 but required approximately three days before sampling could take place due to a low groundwater production rate. In some cases, the sampling points purged dry after 48 hours without producing the required sampling volume (USACE 2007a). Two groundwater grab samples (WP7-2 and WP7-3) collected in 2001 were obtained by digging “pits” 36 to 40 inches bgs and allowing them to fill with water prior to sampling.

In 2013, groundwater sampling was attempted northeast of the landfill cap (USACE 2014). Drive point refusal was encountered at depths ranging from 6 to 30 inches bgs due to large rocks. Groundwater was not encountered during the attempts, and it is not clear whether groundwater was present on site. As such, the potential for the migration of contaminants from the Site 7 landfill has been assessed through the sampling of surface water adjacent to the landfill cap.

6.5.4 Surface Water

COCs in surface water include DRO. In 1994, DRO was detected in a collocated surface water and sediment sample at concentrations of 8.9 mg/L (average of triplicate samples) and 4,900 mg/kg, respectively (USACE 2007a). Groundwater grab samples collected in 2001, approximately 200 feet downgradient of the surface water exceedance, did not contain DRO greater than cleanup levels.

In 2013, additional surface water sampling was conducted to evaluate existing surface water conditions at Site 7 (USACE 2014). The 1994 surface water sampling location was not available for resampling in 2013 because the area previously had been covered by the landfill cap in 2009. As an alternative, site surface water was collected from three ponds located near the base of the landfill cap. Surface water sampling locations are shown on Figure A-3. Surface water samples were analyzed for gasoline-range organics (GRO), DRO, RRO, benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), PCBs, Resource Conservation and Recovery Act metals, nickel, and zinc. Analytical results did not exceed the surface water criteria for TAH/TAqH and no sheen was identified during 2013 surface water sampling. The criteria described (TAH/TAqH and no sheen) are the applicable cleanup levels for surface water for a non-drinking water source. Local residents who utilize the subsistence fishing and hunting camp adjacent to Cargo Beach typically gather water from the surface waters of the Suqitughneq River, upstream of the intersection of the Airport and Cargo Beach Road (USACE 2009b). However, the surface water sample results for BTEX, PAHs, PCBs, and metals did not exceed any screening criteria for groundwater (USACE 2014).

6.6 SITE INSPECTION

Site inspection for this Periodic Review was conducted on 2 August 2018. The site inspection team consisted of USACE consultants from ECC/Jacobs. The team did not identify any existing monitoring wells, signs of disturbance (such as excavations), or changes in land use from those described in the DD. The 2018 site inspection checklist is provided in Appendix C.

The landfill cap at Site 7 was observed in good condition with no apparent signs of erosion. One minor crack was observed near the northern perimeter (Photo No. 7 [Appendix D]). The soil used for vegetative cover was observed to be very coarse, making vegetative growth sparse (Photo Nos. 3, 7, 11, and 12 [Appendix D]). Consistent with the 2013 Periodic Review, debris was noted adjacent to the landfill along the northwestern perimeter. Debris appeared to be wood fragments, pipes, sheet metal, rubber matting, wire, and a film reel (Photo Nos. 8, 9, 10, 11 and [Appendix D]). Limited wood debris was noted along the toe of the armored rock to the southeast (Photo Nos. 17 and 18 [Appendix D]). The ponded surface water areas adjacent to the landfill were nearly dry at the time of the 2018 site inspection, and water levels were much lower than those observed in 2013 (Photo Nos. 8 and 15 [Appendix D]).

Two areas of settlement on the cap were observed near the top of the landfill (Photo Nos. 12, 13, and 14 [Appendix D]). Depressions were approximately 2-feet below surrounding grade. Topography across these areas was surveyed and included on Figure A-4. Three topographic cross sections are presented on Figure A-5.

The Figure A-7 conceptual cross-section includes tundra vegetative mat, tundra soil, permafrost, landfill material, landfill cap, and a surface water pond adjacent to the cap; this figure is a supplement to the conceptual site model provided in the DD. The thicknesses of lithologic units as displayed on the figure are estimated and the conceptual cross-section is not to scale. The sloping upward topography on each side of the mounded feature is assumed, as the area is a topographic high and the features are likely to follow the same slope as the bedrock feature.

Based on consistent findings between the 2013 Periodic Review and the 2018 site inspection, the capping remedy and periodic visual monitoring described within the DD are still protective of human health and the environment.

(intentionally blank)

7.0 TECHNICAL ASSESSMENT

The protectiveness of the selected remedy is analyzed in this technical assessment, which was completed by answering three questions, as described below.

7.1 QUESTION A

Question A: Is the remedy functioning as intended by the DD?

Answer: Yes.

This question was answered by considering the remedy's implementation status (outlined in Section 4.0), available information (reviewed in Section 6.0), and comparing the remedy to the requirements specified in the DD. Remedial action performance, monitoring, LUCs, and indicators of potential problems were assessed, as applicable.

Remedial Action Performance

The selected remedy for Site 7 had several components, including limited drum removal and installation of a 24-inch minimum soil cap. The Second Periodic Review site inspection, conducted on 2 August 2018, verified the construction of a landfill cap and identified areas where the landfill cap had settled, but without evidence of erosion.

System Operations and Maintenance

Additional fill is needed in the areas of settling near the top of the landfill cap to re-establish positive drainage. An additional Periodic Review is also recommended to monitor the area of settling that occurred near the top of the landfill cap.

A small amount of debris was at the southeastern edge of the landfill. The site inspection also identified wood and metal debris in several surface water bodies adjacent to the landfill cap. However, this debris did not appear to be associated with contamination which would pose a risk to human health or the environment.

Implementation of Institutional Controls and Other Measures

The selected remedy for Site 7 included the implementation of LUCs to limit groundwater use and prevent construction of buildings on top of the landfill. At the time of this review, LUCs had not been implemented as required in the DD. Signage had been installed along Cargo Beach Road and at the north end of the runway to inform site visitors against using groundwater as drinking water in the vicinity of Site 7 and identified landfill areas where ground disturbing activities are not recommended.

A deed notice to specify LUCs have not been recorded have not been implemented. It is recommended that LUC and deed notices are changed to Uniform Environmental Covenants Act (UECA) and Environmental Covenants, as well as documentation that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth, should be addressed in an Explanation of Significant Differences (ESD) document.

Opportunities for Optimization

Clean fill should be placed in the areas of settling near the top of the landfill cap to re-establish positive drainage.

Early Indicators of Potential Issues

None.

7.2 QUESTION B

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Answer: Yes.

Question B was answered by evaluating the effects of cleanup level or action limit changes in applicable requirements and exposure assumptions that were used at the time of remedy selection that may affect its protectiveness. In addition, COCs listed in the applicable DD were evaluated to determine whether there were new or updated standards or if new data was obtained after the applicable DD was signed which identified additional COPCs (Appendix B). Toxicity

and contaminant characteristics were evaluated using the questions provided in Exhibit 4-2 of the CERCLA Five-Year Review guidance (EPA 2001).

The evaluation of new or changed standards was accomplished by first identifying the applicable standard and then comparing it to the current standard. Potential cleanup levels for COPCs not identified in the DD were compared to current applicable state cleanup standards. Table B-1 in Appendix B summarizes the evaluation of COCs and COPCs.

Changes in Standards and To Be Considered Standards

Are there changes in the standards identified as applicable or relevant and appropriate requirements (ARARs) in the Record of Decision (ROD) that bear protectiveness of the remedy?

The DD listed 18 AAC 75.341 as the applicable requirement for soil and 18 AAC 75.345 and 18 AAC 70.020(b) for surface water. The COCs for Site 7 are DRO, RRO, PCBs, and arsenic in soil and TAH/TAqH in surface water. Although ethylene glycol and chlorinated paraffins were identified in product accumulated from liquid-containing drums during the remedial actions that included offsite disposal of these liquids (see Section 6.5.1 and 6.5.2), these analytes have not been added to the list of Site 7 COCs. These analytes do not present current risk at the site because the liquid was removed and disposed of offsite and any potentially affected soil not removed as part of the previous remedial action exists beneath the landfill cap.

The ADEC cleanup levels in soil for DRO, RRO, and PCBs have not changed. The ADEC cleanup level for DRO and RRO, 10,250 mg/kg and 10,000 mg/kg, respectively, are less conservative than the site-specific cleanup levels of 9,200 mg/kg for DRO and RRO. Since the time of the risk assessment, the arsenic human health cleanup level has increased from 4.5 mg/kg to 8.8 mg/kg (USACE 2004). A background level of 11 mg/kg is being applied as the cleanup level for this site. TAH and TAqH parameters have not changed under 18 AAC 70.

Are there newly promulgated standards that might apply or be relevant and appropriate to the site and that bear on the protectiveness of the remedy?

No, the newly promulgated ADEC standards were changed to align more closely with the toxicity information published in the IRIS (EPA 2018). The toxicity information in IRIS for PCBs and arsenic have not been revised since the publication of the DD. There are no toxicity data in IRIS for either DRO or RRO.

What is the basis for each cleanup level identified in the ROD? Have there been changes to the basis of the cleanup levels?

Soil cleanup level changes for DRO, RRO, and PCBs have not occurred under 18 AAC 75 (ADEC 2018b). TAH and TAqH parameters have not changed under 18 AAC 70 (2018a). The arsenic human health cleanup level has increased from 4.5 mg/kg to 8.8 mg/kg.

Changes in Exposure Pathways

Has land use or expected land use on or near the site changed?

No, the current land use and expected land use on or near the site have not changed.

Have any human health or ecological routes of exposure or receptors changed or been newly identified?

No, human health or ecological routes of exposures or receptors have not changed or been newly identified.

Changes in Toxicity and Other Contaminant Characteristics

Are there newly identified contaminants or contaminant sources?

No, there were no new identified contaminants or contaminant sources.

Changes in Risk Assessment Methods

Are there unanticipated toxic byproducts of the remedy not previously addressed by the DD?

No, there were no unanticipated toxic byproducts of the remedy not previously addressed by the DD.

Have physical site conditions changed such that protectiveness may be affected? Has understanding of physical site conditions changed?

Yes, site conditions have changed minimally. These changes (minor crack, limited debris, and settlement of the cap) may affect the future protectiveness. There have been no changes in the understanding of physical site conditions.

Have toxicity factors for COCs at the site changed? Have other contaminant characteristics changed? Have ecological toxicity reference values and/or No Observed Adverse Effect Levels/Lowest Observed Adverse Effect Levels changed?

No, toxicity factors and contaminant characteristics for PCBs and arsenic have not changed.

Expected Progress Toward Meeting RAOs

RAOs are expected to be met following the implementation of LUCs to limit groundwater use and prevent construction of buildings on top of the landfill.

7.3 QUESTION C

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Answer: No.

This question was answered by considering whether ecological risks have been addressed adequately at the site, if the site is subject to natural disasters, and any plans for potential land use or land use changes.

7.4 TECHNICAL ASSESSMENT SUMMARY

While minor maintenance is recommended, the remedy selected for Site 7 is functioning as intended by the DD. However, implementation is not yet complete. The remedy selected for Site 7 is expected to be protective upon completion.

8.0 ISSUES

This section summarizes issues and concerns related to current site operations, conditions, or activities that were identified during this Periodic Review. Issues were evaluated to determine whether they affected the current or future protectiveness of the associated remedy. Table 8-1 summarizes issues identified that affect the protectiveness of the remedy. Unresolved concerns raised by the community are summarized and discussed in Section 8.1.

**Table 8-1
Issues Identified**

Issue No:	Issue	Reference	Affects Current Protectiveness? (Yes/No)	Affects Future Protectiveness? (Yes/No)
1	LUCs in the form of deed notices regarding environmental contamination have not been implemented.	USACE 2009b	Yes	Yes
2	The 2018 site inspection identified areas where the landfill cap has settled.	2018 Site Inspection Checklist (Appendix C)	No	Yes
3	Clarification for components of the Site 7 Remedy is needed due to a newly promulgated ADEC regulation and site conditions (areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth).	Not applicable	No	No

Note:
For definitions, refer to the Acronyms and Abbreviations section.

8.1 COMMUNITY ISSUES

Issues raised by the community regarding cleanup activities at the NEC FUDS were identified through community interviews, RAB meeting minutes, public meeting minutes, and letters to the EPA. Issues related specifically to Site 7 or describing sitewide concerns have been summarized in Appendix E with a response to their status.

(intentionally blank)

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Recommendations and follow-up actions have been identified to address the issues presented in Section 8.0. Table 9-1 presents these recommendations and identifies Issues 1 and 2 as affecting protectiveness.

**Table 9-1
Recommendations and Follow-up Actions**

Issue No.	Recommendations/ Follow-up Actions	Party Responsible	Regulatory Party	Milestone Date	Affects Protectiveness? (Yes/No)	
					Current	Future
1	Record the deed notice and implement the LUCs as described in the DD.	USACE	ADEC	2021	Yes	Yes
2	Conduct maintenance of the landfill cap by adding fill to areas which have settled.	USACE	ADEC	2025	No	Yes
3	The change from LUC and deed notices to UECA and Environmental Covenants, as well as documentation that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth, should be addressed in an ESD document.	USACE	ADEC	2025	No	No

Note:
For definitions, refer to the Acronyms and Abbreviations section.

(intentionally blank)

10.0 PROTECTIVENESS STATEMENT(S)

The remedy at Site 7 is expected to be protective of human health and the environment upon its completion. In the interim, no exposure pathways that could result in unacceptable risks are noted. Full implementation of the remedy currently affecting protectiveness, which includes the filing of a deed notice, is anticipated to occur by 2021.

(intentionally blank)

11.0 NEXT REVIEW

Future Periodic Reviews for Site 7, including visual monitoring of the capped area for settlement and erosion, are necessary to evaluate remedy protectiveness and completion. These reviews should be completed under one cover on a five-year periodic basis. The triggering action date of the next Periodic Review is the completion date of this Periodic Review. The due date of the next Periodic Review is five years following the triggering action (i.e. completion) date of this Periodic Review.

(intentionally blank)

12.0 REFERENCES

- ADEC (Alaska Department of Environmental Conservation). 2007 (24 May). *ADEC Comments on the Northeast Cape 350 Determination*. Letter from Jeff Brownlee (ADEC) to Carey Cossaboom of USACE. May 24, 2007. FUDS Records Management Database (FRMD) No. F10AK096903_05.07_0501_a.
- ADEC. 2017 (April). *Cleanup Levels Guidance for Methods Two and Three*. Draft.
- ADEC. 2018a (6 April). *Water Quality Standards*. 18 AAC 70.
- ADEC. 2018b (29 September). *Oil and Other Hazardous Substances Pollution Control*. 18 AAC 75.
- ANCSA (Alaska Native Claims Settlement Act). 1979 (27 June). *Interim Conveyance 203*. Gambell Native Corporation and Savoonga Native Corporation.
- ATSDR (Agency for Toxic Substances and Disease Registry). 2017a (24 July). *Health Consultation, Public Comment Version, Northeast Cape Formerly Used Defense Site (FUDS), St. Lawrence Island, Alaska*.
- ATSDR. 2017b (July). *Health Consultation Summary, Northeast Cape, St. Lawrence Island, Alaska*.
- Bristol (Bristol Environmental Remediation Services, LLC). 2006 (September). *Removal Action Report, Final, Northeast Cape Tram and Debris Removal Report*.
- Bristol 2009 (20 November). *Request for Site 7 Landfill Closure at Northeast Cape, St. Lawrence Island, Alaska*. Technical Memorandum. St. Lawrence Island, Alaska. FRMD No. F10AK096905_07.08_0501_a.
- Craner, Jeremy. 2011 (17 September). *Visual Inspection Checklist (Post-Closure) Site 7 Landfill and Site 9 Landfill*. FRMD Nos. F10AK096903_07.11_0500_p and F10AK096905_07.11_0500_p.
- Ecology and Environment. 1992 (December). *Site Inventory, Northeast Cape, St. Lawrence Island, Alaska*.
- EPA (U.S. Environmental Protection Agency). 2001 (June). *Comprehensive Five-Year Review Guidance*. EPA. 540-R-01-0007. OSWER No. 9355.7-03B-P. Office of Emergency and Remedial Response. Washington, D.C.
- EPA. 2012a (13 September). *Memorandum Clarifying the Use of Protectiveness Determination for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews*. OSWER No. 9200.2-111.

- EPA. 2012b (November). *Environmental Protection Agency (EPA) Region 10's Evaluation of Army Corps of Engineers Cleanup of FUDS at N.E. Cape and Gambell, St. Lawrence Island, Alaska*. FRMD Nos. F10AK0969603_01.07_0011_a and F10AK069603_01.07_0500_a.
- EPA. 2016 (January). *Transmittal of the Five-Year Review Recommended Template*. Office of Solid Waste and Emergency Response. OLEM-9200.0-89.
- EPA. 2018. Integrated Risk Information System (IRIS). Retrieved from <http://www.epa.gov/IRIS/>.
- Geist, Lisa. 2013 (7 August). *Visual Inspection Checklist (Post-Closure) Site 7 Landfill and Visual Inspection Checklist (Post-Closure) Site 9 Landfill*. FRMD Nos. F10AK096903_07.11_0503_p and F10AK096905_07.11_0502_p.
- Montgomery Watson. 1995 (January). *Remedial Investigation, Northeast Cape, St. Lawrence Island, Alaska*.
- Montgomery Watson. 1996 (December). *Draft Phase II Remedial Investigation/Feasibility Study, Northeast Cape, Alaska*.
- Montgomery Watson. 1997 (October). *Letter Report to Alaska District summarizing wire removal*.
- Montgomery Watson. 1999 (August). *Phase II Remedial Investigation, Northeast Cape, St. Lawrence Island, Alaska*.
- Montgomery Watson. 2003 (March). *Phase III Remedial Investigation, Northeast Cape, St. Lawrence Island, Alaska*. FRMD No. F10AK096903_03.10_0007_a.
- Northwest EnviroService, Inc. 1995 (June) *Removal at Northeast Cape, St. Lawrence, Alaska*.
- Patton, W. and B. Csejtey. 1980. Geologic map of St. Lawrence Island, Alaska: U.S. Geological Survey Miscellaneous Investigation Series. Map I-1203. 1 sheet, scale 1:250,000.
- Shannon and Wilson. 2005 (June) *Phase IV Remedial Investigation, Northeast Cape, St. Lawrence Island, Alaska*.
- Shewman, Aaron. 2012 (26 July). *Visual Inspection Checklist (Post-Closure) Site 7 Landfill and Site 9 Landfill*. FRMD Nos. F10AK096903_07.11_0501_p and F10AK096905_07.11_0501_p.
- URS Corporation. 1985 (August). *Defense Environmental Restoration Account, City of Gambell and Gambell, St. Lawrence Island, Alaska. Volume II. Final Environmental Assessment*.

- USACE. 2004 (March). *Human Health and Ecological Risk Assessment*. Northeast Cape Installation. St. Lawrence Island, Alaska. Final. Prepared by MWH. FRMD No. F10AK096903_03.11_0005_a.
- USACE. 2007a (March). *Feasibility Study*, Northeast Cape FUDS, St. Lawrence Island, Alaska. FRMD Nos. F10AK096904_04.09_0500_a and F10AK096905_0500_a.
- USACE. 2007b (4 April). *Submission for Groundwater Use Determination (18 AAC 350) at Northeast Cape on St. Lawrence Island*. Letter from Carey Cossaboom (USACE) to Jeff Brownlee (ADEC). FRMD No. F10AK096903_05.01_001_a.
- USACE. 2007c (November). *Geophysical Survey, Northeast Cape, St. Lawrence Island*. Prepared by R&M Consultants, Inc. FRMD No. F10AK096905_03.10_0500_a.
- USACE. 2009a (January). *Decision Document: Hazardous, Toxic, and Radioactive Waste (HTRW) Project #F10AK096903*. Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska. Signed 3 September 2009. FRMD No. F10AK09603_05.09_0500_a.
- USACE. 2009b (June). *Decision Document: Site 7 Cargo Beach Road Landfill, Containerized Hazardous, Toxic, and Radioactive Waste (CON-HTRW) Project #F10AK096905*. Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska. Signed 19 June 2009. FRMD No. F10AK096905_05.09_0500_a.
- USACE. 2010 (May). *Site 7 Landfill Cap Construction Completion Report, Northeast Cape, St. Lawrence Island, Alaska*. Prepared by Bristol Environmental Remediation Services, LLC. FRMD No. F10AK096905_07.08_0500_p.
- USACE. 2011 (July). *Northeast Cape HTRW Remedial Actions, Final Report*, St. Lawrence Island Alaska. Prepared by Bristol Environmental Remediation Services, LLC. FRMD No. F10AK096903_07.08_0502_a.
- USACE. 2012 (June). *Northeast Cape HTRW Remedial Actions, Final Removal Action Report*, St. Lawrence Island Alaska. Prepared by Bristol Environmental Remediation Services, LLC. FRMD No. F10AK096903_07.08_0503_a.
- USACE. 2014 (February). *2013 Sampling Conducted in Conjunction with the 2013 Five-Year Review at Northeast Cape*. Final. St. Lawrence Island, Alaska. Prepared by Jacobs Engineering Group Inc. FRMD Nos. F10AK096903_07.11_0504_p and F10AK096905_07.11_0503_p.
- USACE. 2015a (February). *First Five-Year Review Report, Northeast Cape FUDS*. St. Lawrence Island, Alaska. Prepared by Jacobs Engineering Group Inc. FRMD No. F10AK096903_07.11_0507_p.

USACE. 2015b (February). *First Periodic Review Report, Site 7 Cargo Beach Road Landfill*. St. Lawrence Island, Alaska. Prepared by Jacobs Engineering Group Inc. FRMD No. F10AK096905_07.11_0506_p.

USACE. 2015c (April). *2014 Remedial Action Report*. Final. Northeast Cape, St. Lawrence Island, Alaska. Prepared by Bristol Environmental Remediation Services, LLC. FRMD No. F10AK096903_07.08_0507_p.

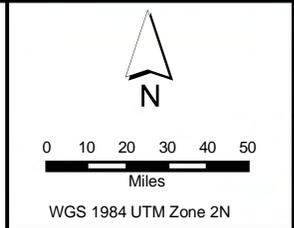
USACE. 2016a (April). *2015 Landfill Periodic Visual Inspection Report*. Final. Northeast Cape, St. Lawrence Island, Alaska. Prepared by Bristol Environmental Remediation Services, LLC. FRMD No. F10AK096905_07.11_0507_p.

USACE. 2016b (September). *Long-Term Management Plan Northeast Cape FUDS, St. Lawrence Island, Alaska. FUDS Nos. F10AK0969-03 and F10AK0969-05*. FRMD Nos. F10AK096903_07.11_0508_a and F10AK096905_07.11_0508_a.

APPENDIX A
Figures



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

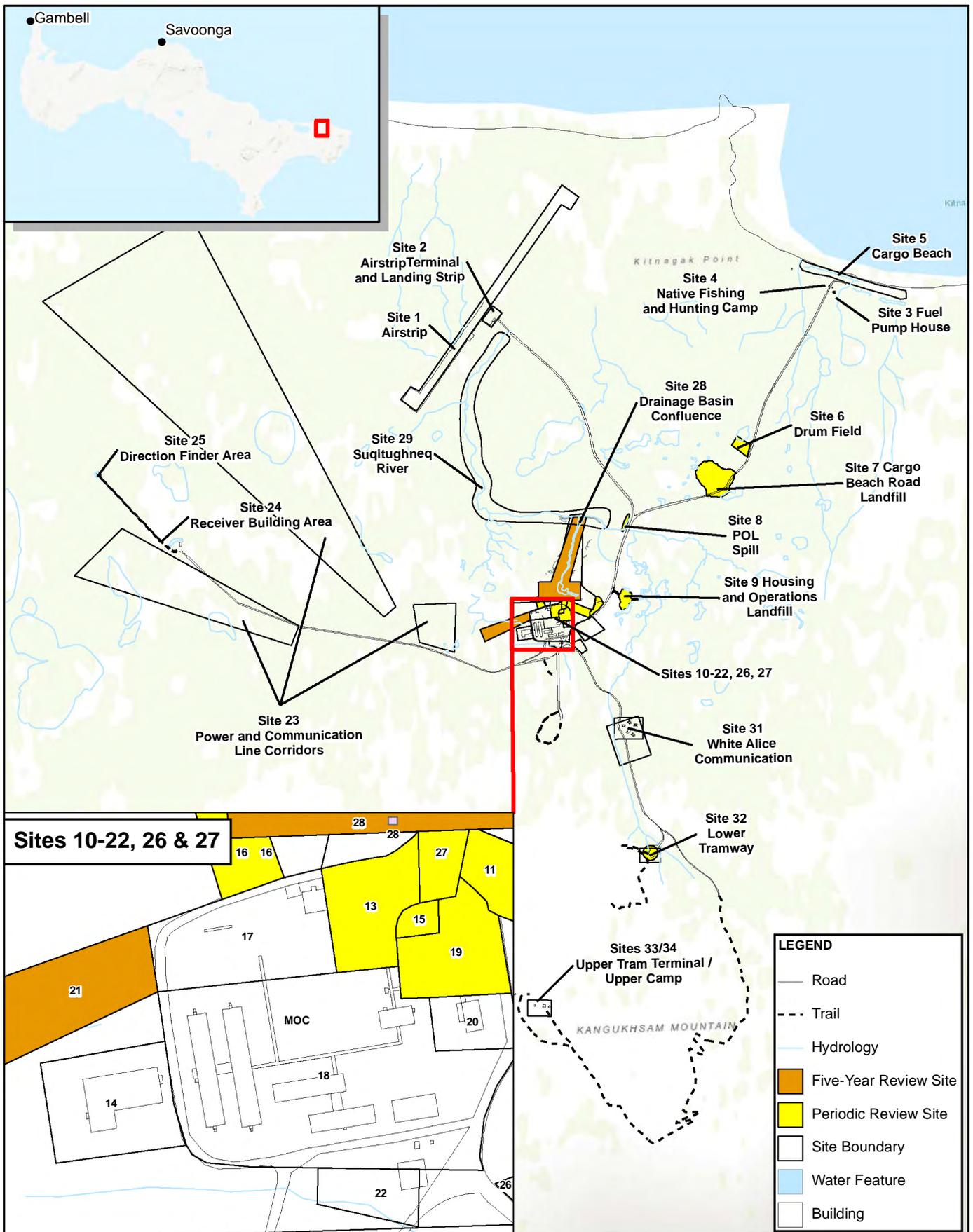


**SECOND PERIODIC REVIEW REPORT
SITE 7 CARGO BEACH ROAD LANDFILL
LOCATION AND VICINITY**



**FUDS PROPERTY - F10AK0969
SAINT LAWRENCE ISLAND, ALASKA**

FIGURE A-1



P:\S\LawrenceIsland\F10AK0969_Site7_PeriodicReview_Sup01_MAXD\FigA-2_Periodic_Review_Sites.mxd beatty/cj

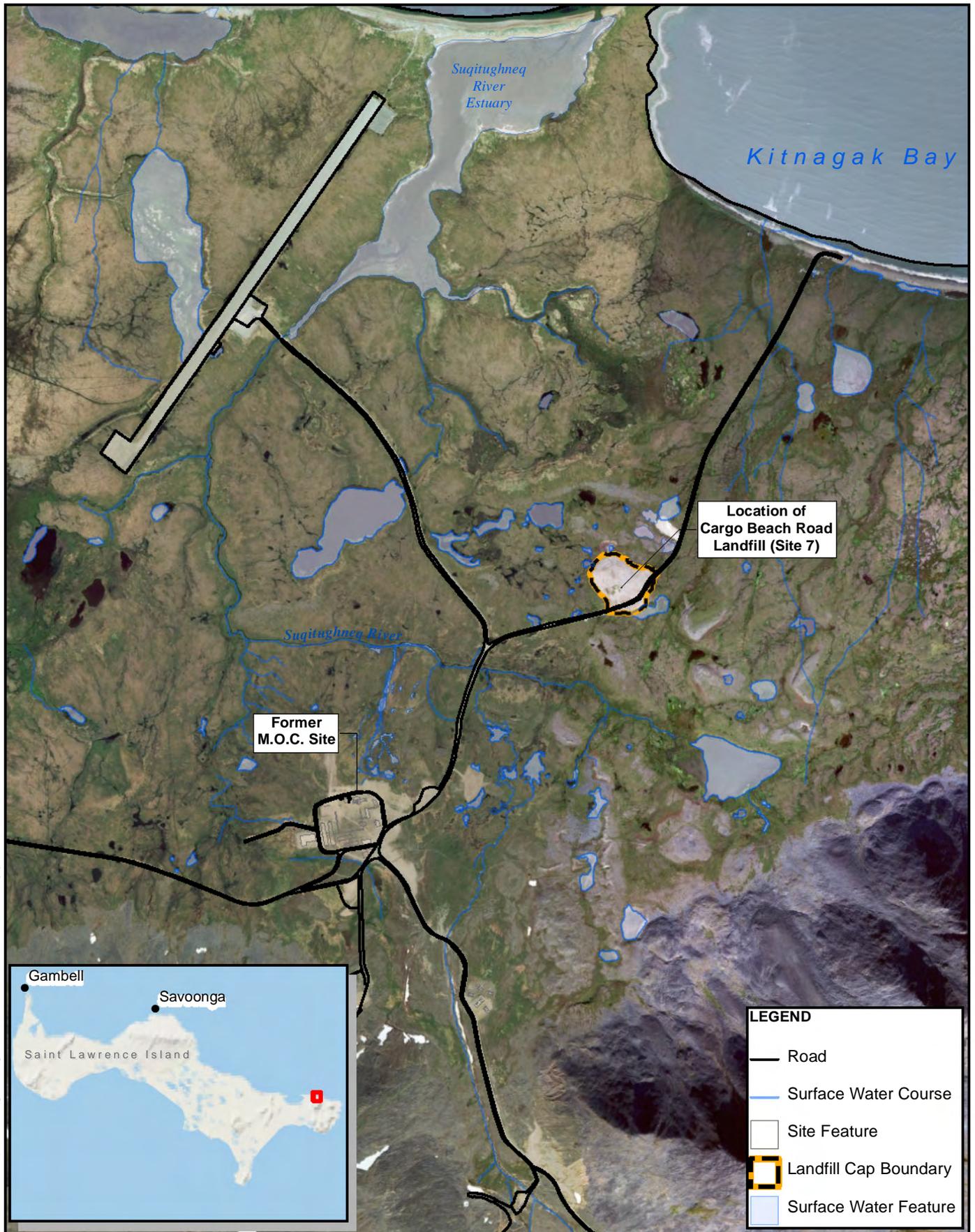
**SECOND PERIODIC REVIEW REPORT
SITE 7 CARGO BEACH ROAD LANDFILL
PERIODIC REVIEW SITES**

**FUDS PROPERTY - F10AK0969
SAINT LAWRENCE ISLAND, ALASKA**

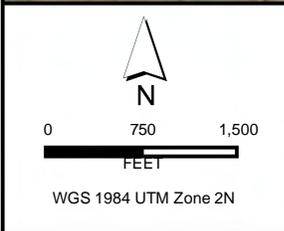
FIGURE A-2

0 145 290
FEET
WGS 1984 UTM Zone 2N

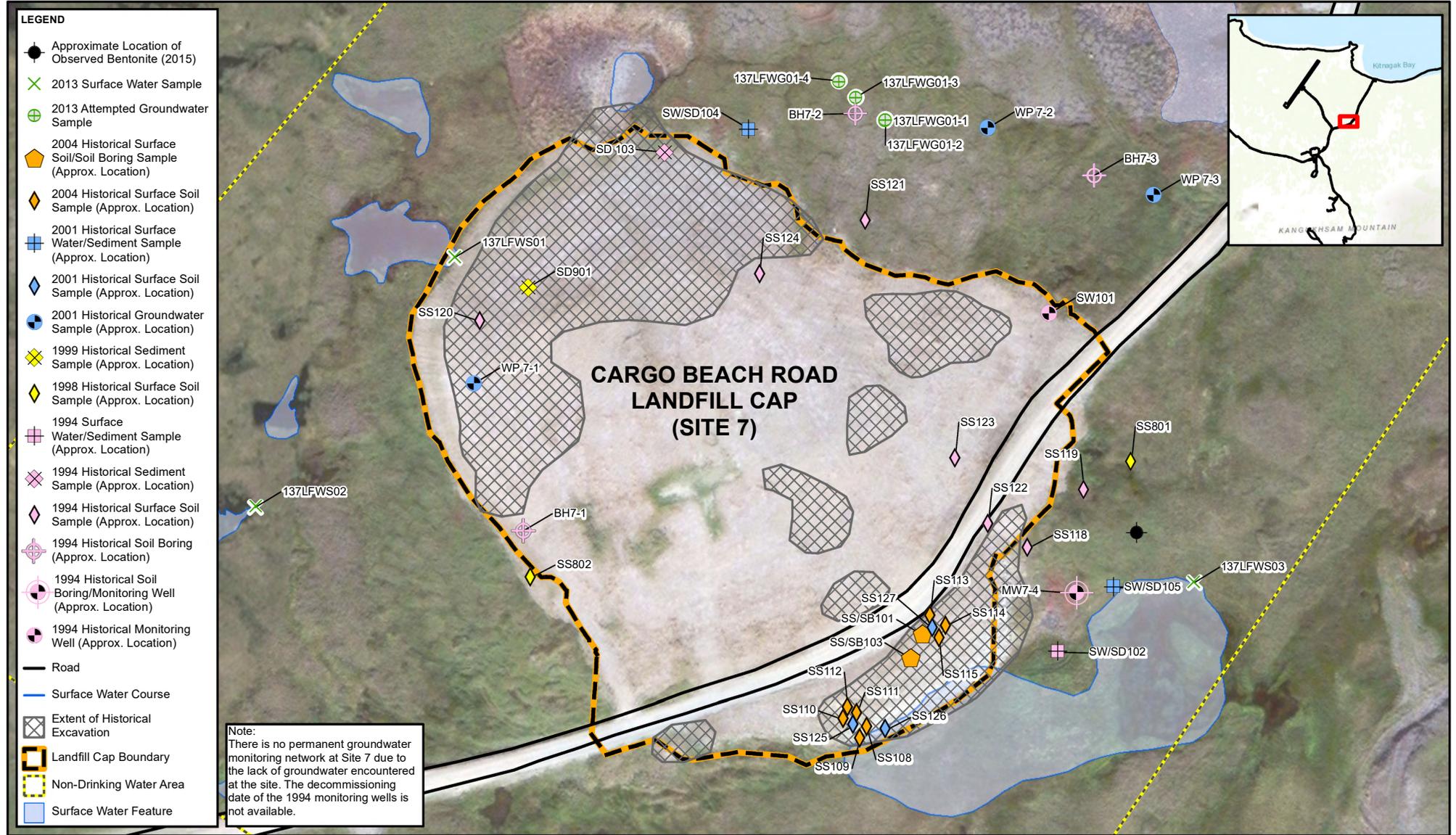
U.S. Army
Corps of Engineers
Alaska District



P:\SaintLawrenceIsland\FUDS_Site7_PeriodicReview\Sup01_MXD\FigA-3_Cargo_Beach_Road_Landfill_Location.mxd bestyj



<p>SECOND PERIODIC REVIEW REPORT SITE 7 CARGO BEACH ROAD LANDFILL CARGO BEACH ROAD LANDFILL LOCATION</p>		
<p>U.S. Army Corps of Engineers Alaska District</p>	<p>FUDS PROPERTY - F10AK0969 SAINT LAWRENCE ISLAND, ALASKA</p>	<p>FIGURE A-3</p>



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

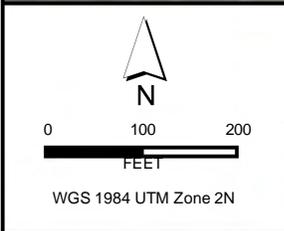
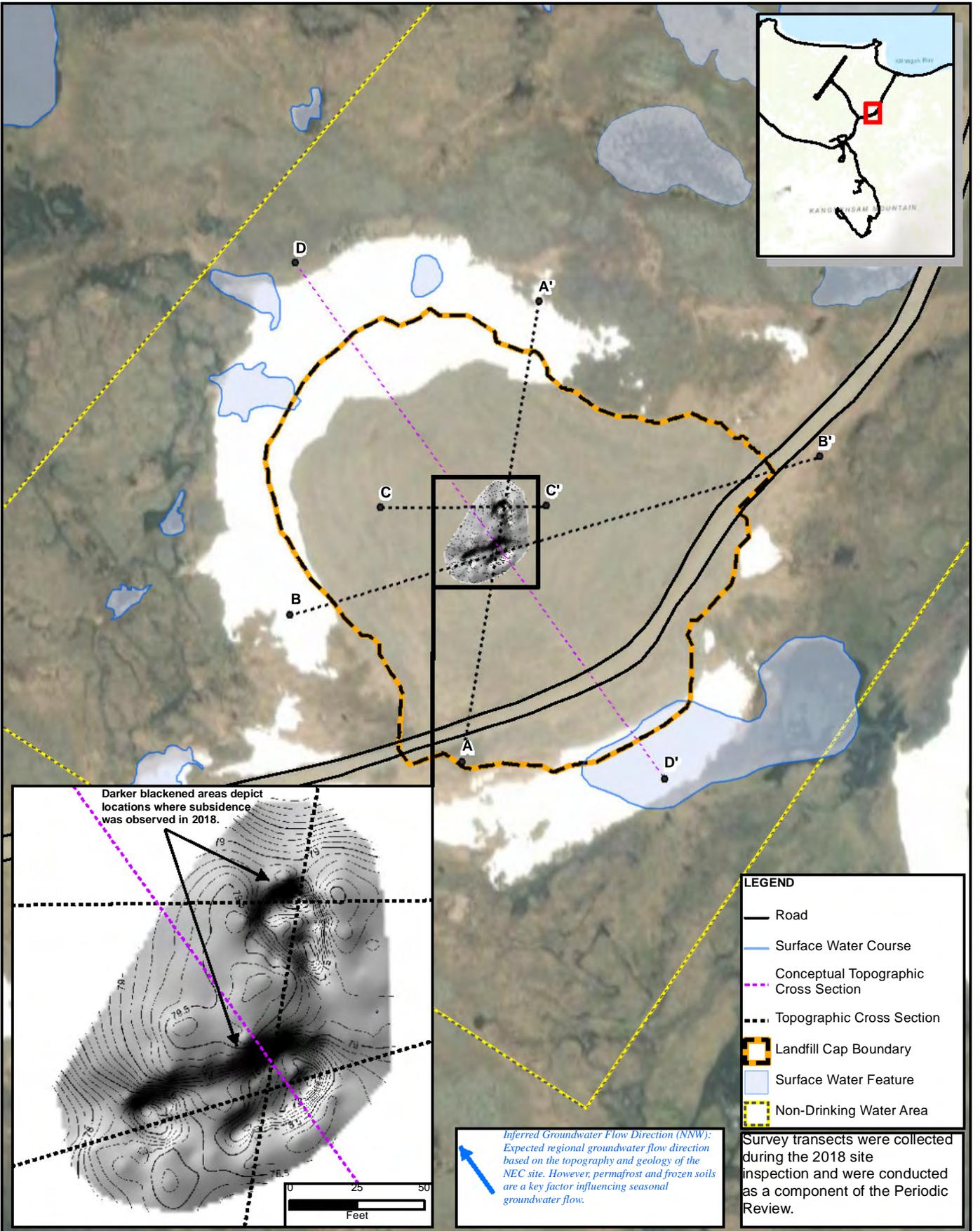
*Inferred Groundwater Flow Direction (NNW):
Expected regional groundwater flow direction based on the topography and geology of the NEC site. However, permafrost and frozen soils are a key factor influencing seasonal groundwater flow.*

0 30 60 90 120 150
Feet
WGS 1984 UTM Zone 2N

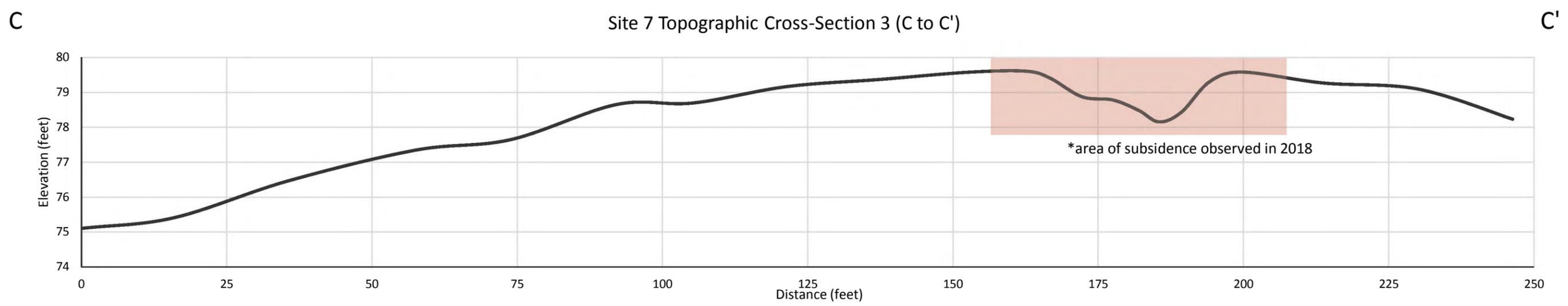
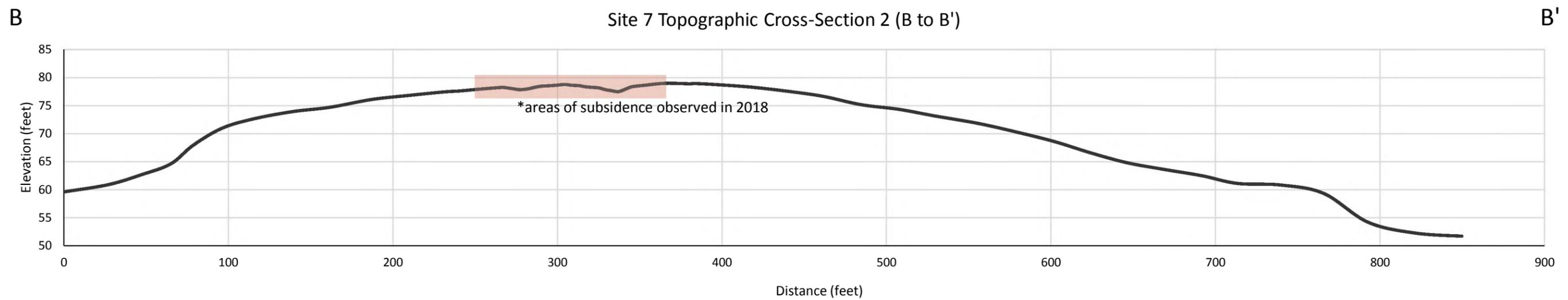
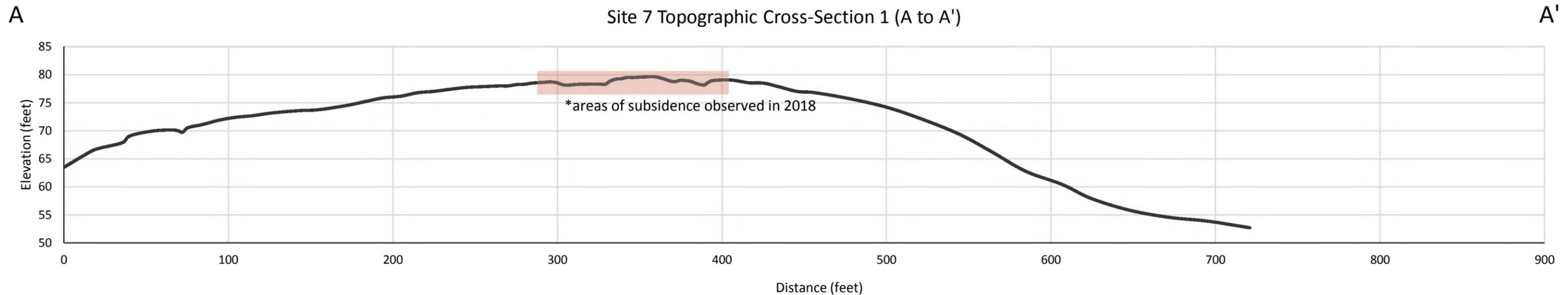
**SECOND PERIODIC REVIEW REPORT
SITE 7 CARGO BEACH ROAD LANDFILL
HISTORICAL SAMPLE LOCATIONS**

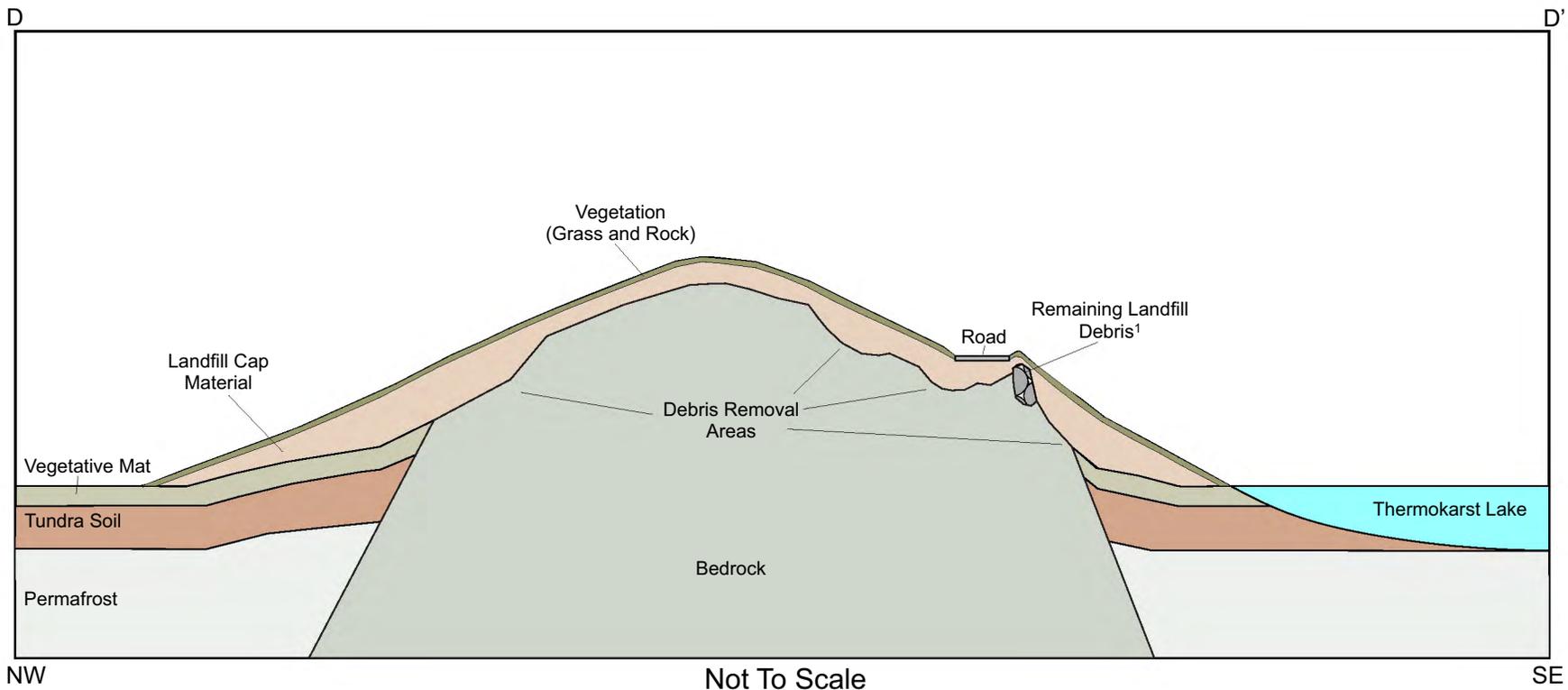
<p>U.S. Army Corps of Engineers Alaska District</p>	<p>FUDS PROPERTY - F10AK0969</p> <p>SAINT LAWRENCE ISLAND, ALASKA</p>	<p>FIGURE A-4</p>
---	--	--------------------------

\\dc1rs01\GISProj\UUSACE\AK_Northeast\Capel_FUDS_Site7_PeriodicReview_Sup\01_MXD\FigA-5_Cargo_Beach_Road_Landfill_Surface.mxd:baahy



SECOND PERIODIC REVIEW REPORT SITE 7 CARGO BEACH ROAD LANDFILL CARGO BEACH ROAD LANDFILL SURFACE		
FUDS PROPERTY - F10AK0969 SAINT LAWRENCE ISLAND, ALASKA	FIGURE A-5	
U.S. Army Corps of Engineers Alaska District		





Notes:

Thickness of units are estimated. Approximate transect distance is displayed on Figure A-5.

¹Other areas of landfill debris exist beneath the landfill cap, but the locations are not known so are not depicted on this conceptual cross-section.



Approximate Groundwater Flow Direction
 Expected regional groundwater flow direction based on the topography and geology of the NEC site. However, if any groundwater exists, permafrost and frozen soils are a key factor influencing seasonal groundwater flow.

SECOND PERIODIC REVIEW REPORT
 SITE 7 - CARGO BEACH LANDFILL
 CONCEPTUAL CROSS-SECTION D-D'

SAINT LAWRENCE ISLAND, ALASKA

DATE: 27 APR 2020	PROJECT MANAGER: H.HUFF	FIGURE NO: A-7
----------------------	----------------------------	-------------------

APPENDIX B
Cleanup Levels, Toxicity, and Risk Evaluation

**U.S. Army Corps of Engineers
Alaska District**

**SECOND PERIODIC REVIEW REPORT
SITE 7 CARGO BEACH ROAD LANDFILL**

**NORTHEAST CAPE FUDS
ST. LAWRENCE ISLAND, ALASKA**

**APPENDIX B
CLEANUP LEVELS, TOXICITY, AND
RISK EVALUATION**

FUDS F10AK0969-05

**FINAL
AUGUST 2020**

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
ACRONYMS AND ABBREVIATIONS	B-iii
INTRODUCTION	B-1
ADEC CLEANUP LEVELS USED FOR SOIL	B-1
CLEANUP LEVELS USED FOR SURFACE WATER.....	B-2
REFERENCES.....	B-3

TABLE

Table B-1	Evaluation of Changes in Chemical-Specific Standards.....	B-2
-----------	---	-----

(intentionally blank)

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
COC	contaminant of concern
COPC	contaminant of potential concern
DD	Decision Document
DRO	diesel-range organics
FRMD	FUDS Records Management Database
FUDS	Formerly Used Defense Site
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	not applicable
PCB	polychlorinated biphenyl
RAO	remedial action objective
RRO	residual-range organics
Site 7	Site 7 Cargo Beach Road Landfill
TAH	total aromatic hydrocarbon
TAqH	total aqueous hydrocarbon
USACE	U.S. Army Corps of Engineers

(intentionally blank)

INTRODUCTION

Updates to regulations and chemical-specific toxicity data may occur over time. The effects of those changes are evaluated as part of the technical assessment conducted for the Site 7 Cargo Beach Road Landfill (Site 7) Periodic Review to ensure the selected remedy remains protective of human health. The evaluation of regulatory updates involves a two-step process followed by the evaluation of chemical-specific toxicity data updates (risk evaluation), if necessary. The evaluation process is summarized below:

- The evaluation begins by determining whether any contaminants of potential concern (COPC) or contaminants of concern (COC) have new or changed standards since the time of the Decision Document (DD) (U.S. Army Corps of Engineers [USACE] 2009). All compounds identified in the DD are presented in Table B-1.
- If a new or more stringent standard was identified, the COPC or COC was evaluated further. No new or more stringent standards were identified for Site 7; therefore, no COPC or COCs were carried forward for the risk evaluation.

No additional analytical data has been collected from Site 7 since the publication of the DD.

ADEC CLEANUP LEVELS USED FOR SOIL

For soil cleanup levels, the Alaska Department of Environmental Conservation (ADEC) Method Two under 40-inch zone, most conservative human health cleanup level (Title 18 of the Alaska Administrative Code [AAC], Chapter 75, Table B1) (ADEC 2018b), was applied for all compounds not listed in the DD as COCs. For those compounds listed as COCs (diesel-range organics [DRO], residual-range organics [RRO], polychlorinated biphenyls [PCB], and arsenic), only the arsenic cleanup level has changed since the time of the last review. The arsenic human health cleanup level has increased from 4.5 mg/kg to 8.8 mg/kg (USACE 2004). However, the DD-specified cleanup level for arsenic is based on background concentration (11 mg/kg), so this restriction should not impact the administration of the Site 7 remedy. All other regulatory levels for compounds listed as COCs have not changed or were calculated using a Method 4 risk assessment. The DD-established cleanup levels for soil at Site 7 remain protective of human health.

CLEANUP LEVELS USED FOR SURFACE WATER

For surface water cleanup levels, the strictest cleanup levels or standards listed in 18 AAC 70 (ADEC 2018a) were used. There are no newly promulgated standards in 18 AAC 70 for the Site 7 surface water COCs (total aromatic hydrocarbon [TAH], total aqueous hydrocarbon [TAqH], and sheen). The DD-established cleanup levels for surface water at Site 7 remain protective of human health.

**Table B-1
Evaluation of Changes in Chemical-Specific Standards**

COPCs/COCs	DD- Established RAO for COCs	Source ^a	Current Alaska Cleanup Level	Is There a Newly Promulgated Cleanup Level Since Previous Review?	Is New Level More Stringent than Previous Standard?
Surface Water (mg/L)					
DRO C ₁₀ to C ₂₅	No Sheen	18 AAC 70	--	No	NA
RRO C ₂₅ to C ₃₆	No Sheen	18 AAC 70	--	No	NA
TAH	0.01	18 AAC 70	0.01	No	NA
TAqH	0.015	18 AAC 70	0.015	No	NA
Soil (mg/kg)					
DRO C ₁₀ to C ₂₅	9,200	18 AAC 75 Method 4 /site-specific	10,250	No	NA
RRO C ₂₅ to C ₃₆	9,200	18 AAC 75 Method 4 /site-specific	10,000	No	NA
Arsenic	11 ^b	Site-specific Background	8.8	No	NA
PCBs (sum)	1	18 AAC 75	1	No	NA

Notes:

^a Sources listed in the DD (USACE 2009) include the following:

18 AAC 75 Table C;

18 AAC 75 Table B1;

18 AAC 75 Method 4 risk-based residential cleanup level from the *Feasibility Study* (USACE 2007)

^b DD-specified limit based on elevated background concentrations.

For definitions, refer to the Acronyms and Abbreviations section.

REFERENCES

- ADEC (Alaska Department of Environmental Conservation). 2018a (04 April). *Water Quality Standards*. Division of Water. 18 AAC 70.
- ADEC. 2018b (29 September). *Oil and Other Hazardous Substances Pollution Control*. 18 AAC 75.
- USACE (U.S. Army Corps of Engineers). 2004 (March). *Human Health and Ecological Risk Assessment*. Northeast Cape Installation. St. Lawrence Island, Alaska. Final. Prepared by MWH. FRMD No. F10AK096903_03.11_0005_a.
- USACE. 2007 (March). *Feasibility Study*, Northeast Cape FUDS, St. Lawrence Island, Alaska. FRMD Nos. F10AK096904_04.09_0500_a and F10AK096905_0500_a.
- USACE. 2009 (June). Decision Document: *Site 7 Cargo Beach Road Landfill, Containerized Hazardous, Toxic, and Radioactive Waste (CON-HTRW) Project #F10AK096905, Northeast Cape Formerly Used Defense Site (FUDS)*. St. Lawrence Island, Alaska. Prepared by USACE-Alaska District, June 2009.

(intentionally blank)

APPENDIX C
Site Inspection Checklists and Logbook

2018 Site Inspection Checklists

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: <u>Site 7 - Cargo Beach Rd.</u>	Date of inspection: <u>8/2/2018</u>
Location and Region: <u>Landfill</u>	EPA ID: <u>AK9799F2999</u>
Agency, office, or company leading the five-year review: <u>USACE</u>	Weather/temperature: <u>Overcast, 50°f</u>
Remedy Includes: (Check all that apply) <input checked="" type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Access controls <input type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Other <u>Land Use Controls</u>	
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1. O&M site manager <u>N/A</u>	
Name	Title Date
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____	
2. O&M staff <u>N/A</u>	
Name	Title Date
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____	
3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.	
Agency <u>ADEC</u>	
Contact <u>CURTIS DUNKIN</u>	<u>Project Manager</u>
Name	Title Date Phone no.
Problems; suggestions; <input type="checkbox"/> Report attached _____	
Agency _____	
Contact _____	
Name	Title Date Phone no.
Problems; suggestions; <input type="checkbox"/> Report attached _____	
4. Other interviews (optional) <input type="checkbox"/> Report attached.	

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	O&M Documents <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks <u>As built information in 2010 Site 7 construction completion report</u>	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
4.	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	Settlement Monument Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

Five-Year Review Site Inspection Checklist

IV. O&M COSTS			
1.	O&M Organization	<input type="checkbox"/> State in-house <input type="checkbox"/> PRP in-house <input type="checkbox"/> Federal Facility in-house <input checked="" type="checkbox"/> Other <u>USACE</u>	<input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Contractor for Federal Facility
2.	O&M Cost Records	<input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate <u>\$300,000 for periodic review (per Decision Document estimate).</u> <input type="checkbox"/> Breakdown attached	
Total annual cost by year for review period if available			
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date Date	Total cost	
3.	Unanticipated or Unusually High O&M Costs During Review Period		
	Describe costs and reasons: _____ _____ _____ _____		
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable N/A ^{PM}			
A. Fencing			
1.	Fencing damaged	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Gates secured <u>N/A</u>
	Remarks _____		
B. Other Access Restrictions			
1.	Signs and other security measures	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	Remarks <u>Signs were installed along Carajo Beach Rd. and Runway.</u>		

C. Institutional Controls (ICs)			
1.	Implementation and enforcement		
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Periodic Reviews (visual inspection).</u>		
	Frequency <u>5-yr.</u>		
	Responsible party/agency <u>USACE</u>		
	Contact _____		
	Name	Title	Date
	Phone no.		
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
	<u>deed notice has not been recorded</u>		
2.	Adequacy	<input type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A
	Remarks <u>no evidence of ground disturbing activities on site 7 landfill.</u>		
D. General			
1.	Vandalism/trespassing	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks _____		
2.	Land use changes on site	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		
3.	Land use changes off site	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		
VI. GENERAL SITE CONDITIONS			
A. Roads			
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A	
1.	Roads damaged	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A
	Remarks _____		

Five-Year Review Site Inspection Checklist

B. Other Site Conditions		
Remarks <u>Road from MOC to fish camp passes over Eastern Shoulder of landfill. Landfill cover has sparse grass vegetation</u>		
VII. LANDFILL COVERS <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
A. Landfill Surface		
1.	Settlement (Low spots) <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent _____ Depth _____ Remarks <u>moderate low spots near top of landfill. 2-3' of settlement is apparent in two locations.</u>	
2.	Cracks <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident Lengths _____ Widths _____ Depths _____ Remarks <u>minor crack observed at northern edge of landfill</u>	
3.	Erosion <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident Areal extent _____ Depth _____ Remarks _____	
4.	Holes <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Holes not evident Areal extent _____ Depth _____ Remarks _____	
5.	Vegetative Cover <input checked="" type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks <u>sparse grass established across landfill cover. (50%)</u>	
6.	Alternative Cover (armored rock, concrete, etc.) <input type="checkbox"/> N/A Remarks <u>armored rock on NE side of landfill in good condition</u>	
7.	Bulges <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident Areal extent _____ Height _____ Remarks _____	

8.	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____	
9.	Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____ _____	<input checked="" type="checkbox"/> No evidence of slope instability	
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
2.	Bench Breached Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
C. Letdown Channels <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
2.	Material Degradation Material type _____ Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
3.	Erosion Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion

Five-Year Review Site Inspection Checklist

4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	Obstructions	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
<hr/>			
6.	Excessive Vegetative Growth	Type _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
D. Cover Penetrations <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<hr/>			
1.	Gas Vents	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks _____		
<hr/>			
2.	Gas Monitoring Probes	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
3.	Monitoring Wells (within surface area of landfill)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
4.	Leachate Extraction Wells	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	Settlement Monuments	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks <u>Survey cap "200" found near western portion of landfill cap.</u>		

E. Gas Collection and Treatment <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	Gas Monitoring Facilities (<i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
F. Cover Drainage Layer <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Outlet Pipes Inspected <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	Outlet Rock Inspected <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
G. Detention/Sedimentation Ponds <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Siltation Areal extent _____ Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	Erosion Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	Outlet Works <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	Dam <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

Five-Year Review Site Inspection Checklist

H. Retaining Walls		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		

2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		

I. Perimeter Ditches/Off-Site Discharge		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		

2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		

3.	Erosion	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		

4.	Discharge Structure	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		

VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Settlement	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		

2.	Performance Monitoring	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		

IX. GROUNDWATER/SURFACE WATER REMEDIES		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____		
B. Surface Water Collection Structures, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____		

Five-Year Review Site Inspection Checklist

C. Treatment System		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2.	Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	Tanks, Vaults, Storage Vessels <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4.	Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5.	Treatment Building(s) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6.	Monitoring Wells (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
D. Monitoring Data			
1.	Monitoring Data <input type="checkbox"/> Is routinely submitted on time <input type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining		

D. Monitored Natural Attenuation	
1.	Monitoring Wells (natural attenuation remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____ _____
X. OTHER REMEDIES	
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	Implementation of the Remedy Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). <u>The selected remedy was to implement a 2' cap over the landfill debris and implement land use controls. No debris was observed protruding from cap. Some debris remains near pond to the NW adjacent to the landfill. Two small areas of settlement (2-3' of settlement) were observed near the top of the landfill creating low spots. In general, the cap appears in good condition with no holes, penetrations, or erosion. The grass cover appears sparse in some areas.</u> _____ _____ _____
B.	Adequacy of O&M Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>The road between the MOC and fish camp travels across eastern shoulder of the landfill. The road is currently in good condition with no potholes, dips, or ruts. That is. Five-year periodic reviews to evaluate for settlement and vegetative cover condition are appropriate.</u> _____ _____ _____

Five-Year Review Site Inspection Checklist

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Areas of settlement (2-3' lower) were observed near top of landfill.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

minor scattered debris remains, mainly in areas of the pond^{PM} adjacent pond usually submerged.



2014 Cap Inspection Form

In 2014, the fifth annual cap inspection was performed. Also in 2014, cap maintenance occurred when fill material was added to a small area where settling was noted during the inspection. The 2014 cap maintenance was documented on the USACE 2014 Site 7 landfill cap inspection form. Unfortunately, this form was erroneously omitted from Appendix E of the 2015 Landfill Periodic Visual Inspection Report (USACE 2016). The cap inspection form is included below.

Visual Inspection Checklist (Post-Closure) Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Jeremy Craver Date: 3 Aug 2014
 Weather conditions: Sunny w/ few clouds Precipitation Yes No
 Temperature: 65°F Prevailing Wind Direction: SW Speed: 5 mph
 Photographs Taken: YES

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, <u>against</u> , or on surface of landfill?			Adjacent ponds. NO WATER ON SURFACE CAP.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?	X		SOME IN LARGE ROCKS ON SE END, SE OF ACCESS ROAD.
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		Might be in seed stage.
Estimated Percent Vegetative Cover: On Cap Surface <u>70%</u> On Sideslopes: <u>40%</u> Comments:			

General Comments: Structural integrity of landfill cap = great condition. Contractor plans to remove debris by hand and cap any with 2' gravel that can't be removed by hand.

Corrective Actions Taken: NONE.

(Use additional pages if necessary)

F10AK096903_07.11.0505_p

F10AK096905_07.11.0504_p

200-1f



Photo 1: View of upper SW side of landfill cap, facing NW.



Photo 2: View of top of landfill cap, facing north.



Photo 3: West side of cap, facing NW.



Photo 4: Northern side of top cap, facing east.



Photo 5: Eastern side of top cap, facing south toward MOC (in background).



Photo 6: Western side of top cap, facing SW toward MOC (in background).



Photo 7: East side of cap, east side of road, facing SW. Road to right of photo.

Photo 8: Road in foreground, west side of cap in background, facing west.



Photo 9: East side of cap, east side of road, toe of slope facing north.

Photo 10: East side of cap, east side of road, south side facing west.



Photo 11: Cap maintenance: A depression near the top of the cap on the west side of the road was filled with clean fine-grained material from the borrow area, compacted, fertilized, and seeded, facing NW.

Photo 12: Cap maintenance: Surface debris, mostly metal and cable, was removed primarily from the landfill cap on the east side of the road. Photo shows workers and an excavator removing only visible surface debris, facing NW.

2018 Logbook

Site Inspections



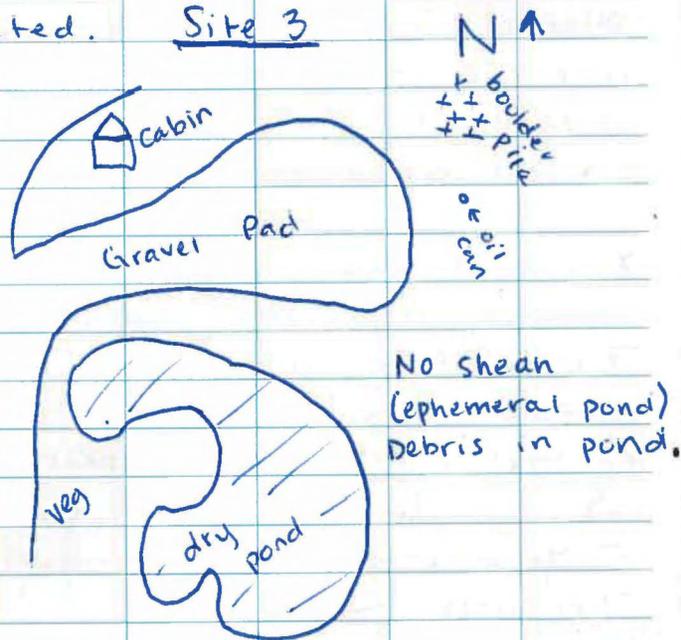
Rite in the Rain.
ALL-WEATHER
ENVIRONMENTAL
№ 550F

Authors

Haley Huff

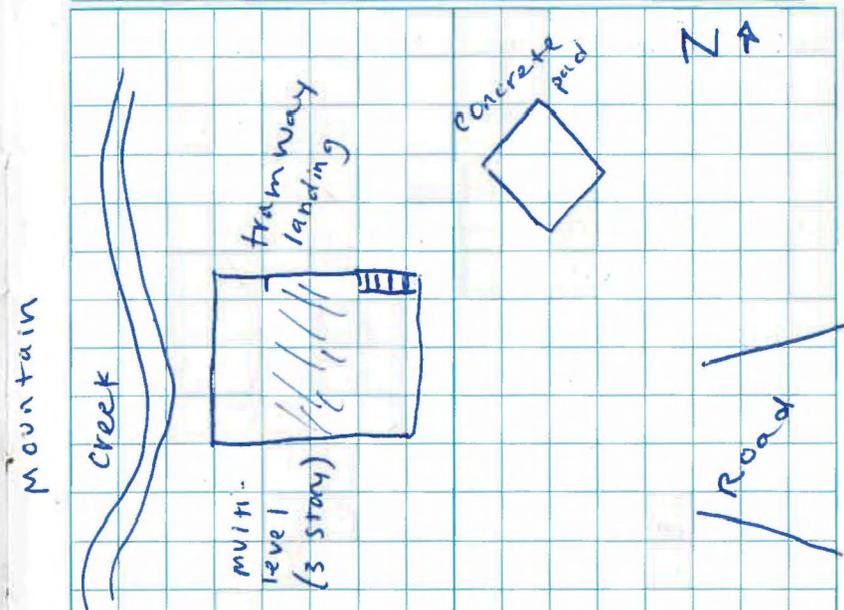
DCN: AE-ECC-J07-5FGA
4600-H04-0003



Location Northeast Cape Date 8/1/18Project / Client 5FGA4600 / USACESite 3 / Site 32collected. Site 3

1030 Completed site inspection at Site 3 - ~~completing~~ completing an orientation of the remaining sites.

1047 Arrived at Site 32 - lower tramway
Concrete structures still in place. (foundations)
Landing for tramway abuts to the mountain - scree sloping side.

Location Northeast Cape Date 8/1/18Project / Client 5FGA4600 / USACESite 32 / Site 1

Scattered metal debris on site.

1149^W: Completed site inspection at Site 32. Mobilizing to the Airstrip.

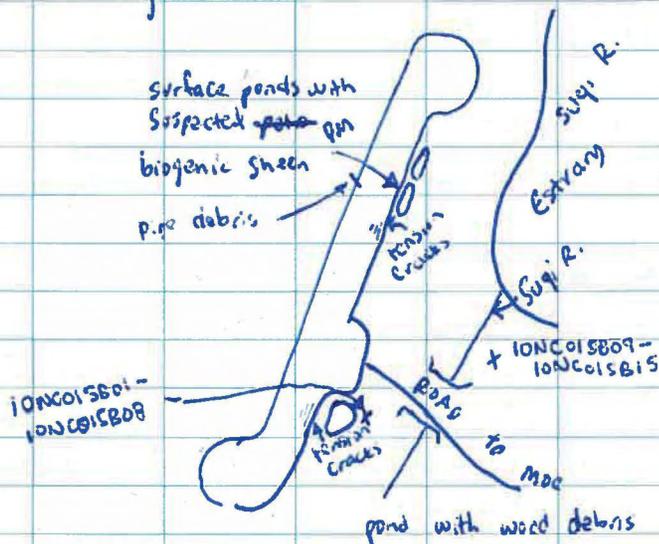
12:07 Arrived at Site 1 Airstrip.

12:15 driving perimeter of runway.
Observed sheen on ponded surface water on East side of runway. Suspected biogenic. due to "cracking".
Little debris present on site (wood, pps, metal).

6

Location Northeast Cape Date 8/1/18Project / Client SFGA4600/USACE

Site 2

1226 Completed drive - through of ~~Site~~ ^{Bm} Runway.

1240 Break for lunch

1330 Continued review of site docs for SIs

1630 Return to Site 1.. Inspect area near historic samples 10NCO15B07 - SB15
Sheen visible in marshy areas adjacent to Sugi River, suspected to be biogenic.

1650 Moved to area of historic samples 10NCO15B01 - SB08. Vegetative growth appears healthy

Location Northeast Cape Date 8/1/18 7Project / Client SFGA4600/USACE

Site 10

1700 left site 1. Detoured at Site 8 to confirm the locations of the decision units. Sediment sample locations appear to be sufficient for the ISM random sampling event.

1725: Arrived at Site 10 to perform site inspection.

1735 Site is well-graded with sparse vegetation. Minor debris (wood, metal, plastic fragments) present in fill. Some of the wood fragments are painted

1755 Leave Site 10 for camp.

1800 Back at camp. Completing the final notes before AC check.

(Signature) 8/1/18
CAC Rechecked

Location Northeast Cape Date 8/2/18

Project / Client SFGA4600/USACE

Site 11 / Site 27

Weather: Rainy/overcast, 50°F

PPE: Mod Level D - Rain gear + eye protection for UTV

Personnel: PM + HH

7:00: Safety tailgate

7:30: Assisted groundwater team with calibrations and completed preliminary paperwork for site inspections

9:00: Arrived at the MOC - starting with the site inspection for Site 11. Metal debris scattered on site. Vegetation regrowth over excavation is healthy for the rocky soil type. Heavy equipment marks still evident.

9:30 Arrived at site 27. Site appears to be adequately re-vegetating for the poor soil quality (rocky, immature). Heavy equipment tracks are still evident. Some remaining metal debris.

Location Northeast Cape Date 8/2/18

Project / Client SFGA4600/USACE

Site 21 / Site 19

Found abandoned well casing and a small amount of silica sand. We believe it is the remainder of 88-4.

0954: Arrived at Site 19.

1121: Arrived at Site 21. Clearly graded and re-graded. Veg growth poor on graded area due to poor soil conditions. Off-pad vegetation is healthy & thriving wetland/swamp.

1141: Completed MOC walk through to inspect the conditions of the wells and to orient ~~us~~ ourselves with the site layout. We will travel back to Site 19 to complete site inspections.

1152: Well MW88-1 has frost jacked at least 2-3", judging by the stick-up above the flush mount. Gravel pad has no vegetation. The previous excavation area it has fair vegetation regrowth - again,

10

Location Northeast Cape Date 8/2/18Project / Client SFGA4600/USACE

Site 19 / Site 15 / Site 13

poor soil conditions.

1208 Came across an abandoned well with PVC stick-up above ground surface. PVC clearly extends several feet bgs. We believe this well may have been recently exposed, ~~it~~ because it is within the gravel pad. We did not take a water measurement or identify a bentonite / silica sand fill.

1215 Arrived at Site 15. Excavation completed to grade. Veg regrowth is adequate for the poor, immature soil. No evidence of contamination on the site.

1233 Arrived at Site 13. Excavation has been backfilled to grade. No evidence of abandoned wells. The vegetation regrowth is adequate for the poor

Location Northeast Cape Date 8/2/18 11Project / Client SFGA4600/USACE

Site 13

soil quality - immature. Heavy equipment track marks obvious in vegetation regrowth.

12A2 Arrived at Site 16. Poor vegetative regrowth. Abandoned well MW16-03 contains the concrete outer mantle but no PVC remains. Excavation area indistinguishable from ~~the~~ building footprint / road. Rubber matting present in depression on the west side of the site.

Sample naming convention for surface water samples:

ISNEC - S9 - WS
- 8 (Duplicate)

Sample Quantities:

~~1-250 ml - filtered metals w/ nitric H₂O~~

1-250 ml - unfiltered metals w/ nitric

2-2L w/ HCl - DRO/RPO #

Location Northeast Cape Date 8/2/18Project / Client SFGA 4600 / USACE

Site 8

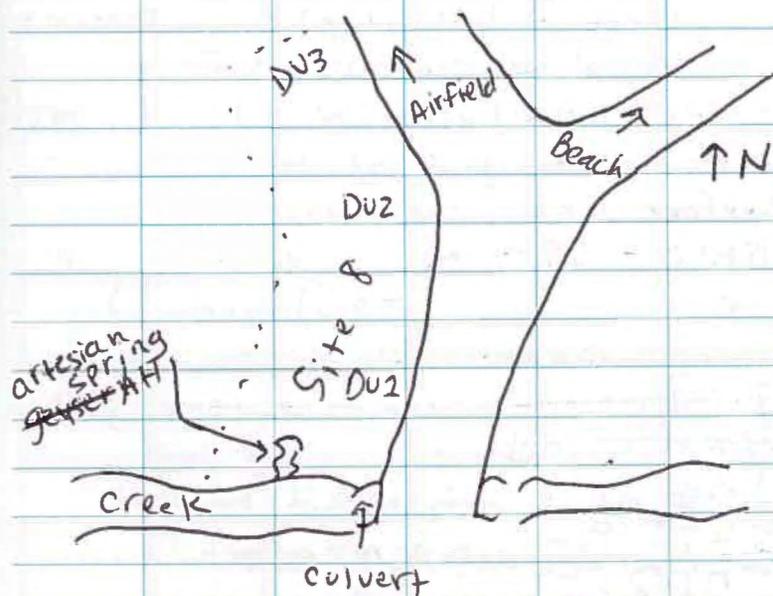
~~PEBs + HH~~~~1L - PAHS + PEBs HH~~

2 - 1L - PAHS

~~HH~~

We will measure YSI parameters and turbidity prior to sampling. Groundwater team will be handling surface water samples.

15:20: Arrived at Site 8.

Location Northeast Cape Date 8/2/18Project / Client SFGA 4600 / USACE

Site 8

Vegetation does not appear to be impacted by contamination. Fish are in the creek and the creek appears to not be impacted. Fairly dry conditions compared to observations from previous years. Small ponded water and submerged vegetative mat. Safety consideration: Ground fog closing in on site. Will leave if visibility decreases.

ISAS: Arrived at Site 9. Surface water surrounding the majority of the landfill. No ponding of surface water or erosion evident. No vegetation growth on the landfill cap. Surface water surrounding the cap is clear with no evidence of contamination impacts. The smallest amount of settling has occurred on portions of the landfill cap. There is

Location Northeast Cape Date 8/2/2018Project / Client SFGA4600 / USACESite 9

no sediment present in the diversion trench. The water is clear and free of debris - not turbid.

1630. Arrived at Site 7. Identified areas with significant settling.

QAR Sean Benjamin visited us on site to discuss documentation of the settling. We also spoke with the surveyors to find out if surveying the topography of the settled material is within the current contract. Slight vegetation - mosses, and sparse grasses. More vegetation than Site 9 but not ideal for erosion control. Site Manager Stan Seegars also visited the site to find out if we needed any assistance.

1800: Re-visited Site 18 to take photos of the asbestos taping posted during the remedial activities.

1830: end of day

Halley Huff

WM
7/31/18
CAR Review

Location Northeast Cape Date 8/3/2018Project / Client SFGA4600 / USACESite 6

Weather: 45°F, Overcast/low fog, light mist.
Level of PPE: modified level D. Eye protection on UVs.

Personnel: Peter Mamrai (PM), Halley Huff (HH).

Daily objectives: Site inspections, Site 6 and Site 28.

0700 Safety tailgate. Weather moving in from Sat Mon. Charter flight planned for today.

0740 Site 6 site inspection. Camp is located on site 6 gravel pad. Camp consists of 8 wall tents fed with 9 55-gal drum ASTs with proper containment. Camp is neat and no spills or leaks have been noted.

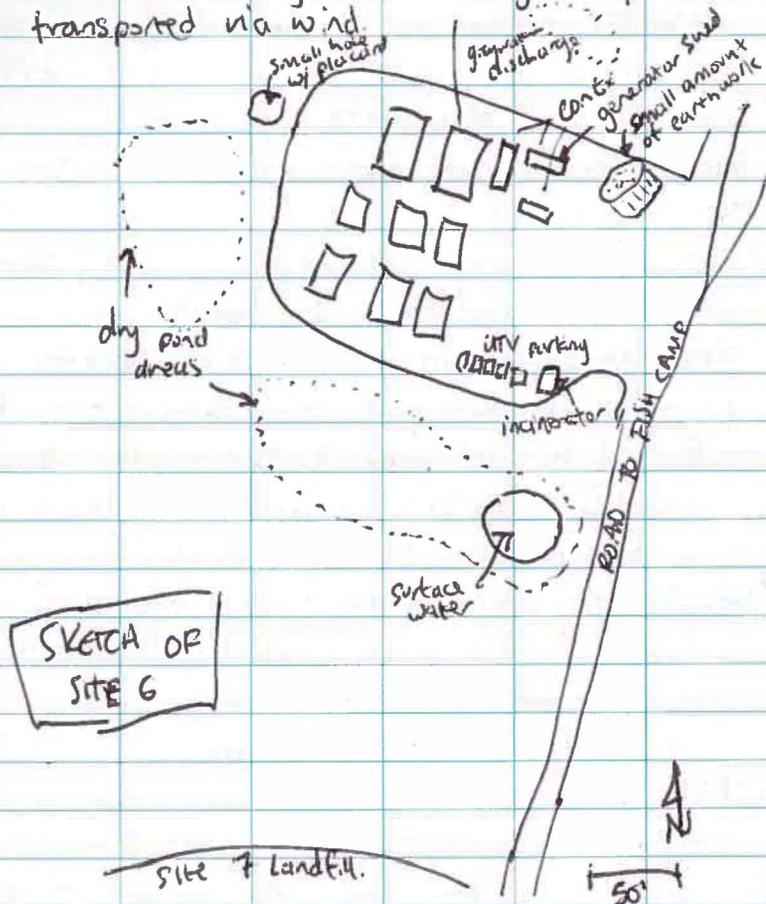
0745 Adjacent ponds are mostly dry. Small amount of water visible in pond to the south of gravel pad. Wood debris noted in rocks/pond bed to SW of gravel pad.

0755. Small amount of earthwork done on eastern portion of gravel pad. A small depression has been dug with adjacent stockpile (5-10 cy).

0800 5' x 5' hole (2-3' deep) observed to NW of gravel pad. Placard (#3432) sign found in bottom. No container observed.

Site in the rain

Placard was likely blown off gravel pad PM transported via wind



0915 met with surveyors at Site 7 landfill
Cap to discuss cross-section of cap surface.
Will collect cross-section across two
areas of settlement

0945 Arrived at Site 9 to photograph culvert on west side of landfill. Culvert is in good condition and clear of constructions. Appears to provide adequate path for drainage.

1000 Return to camp

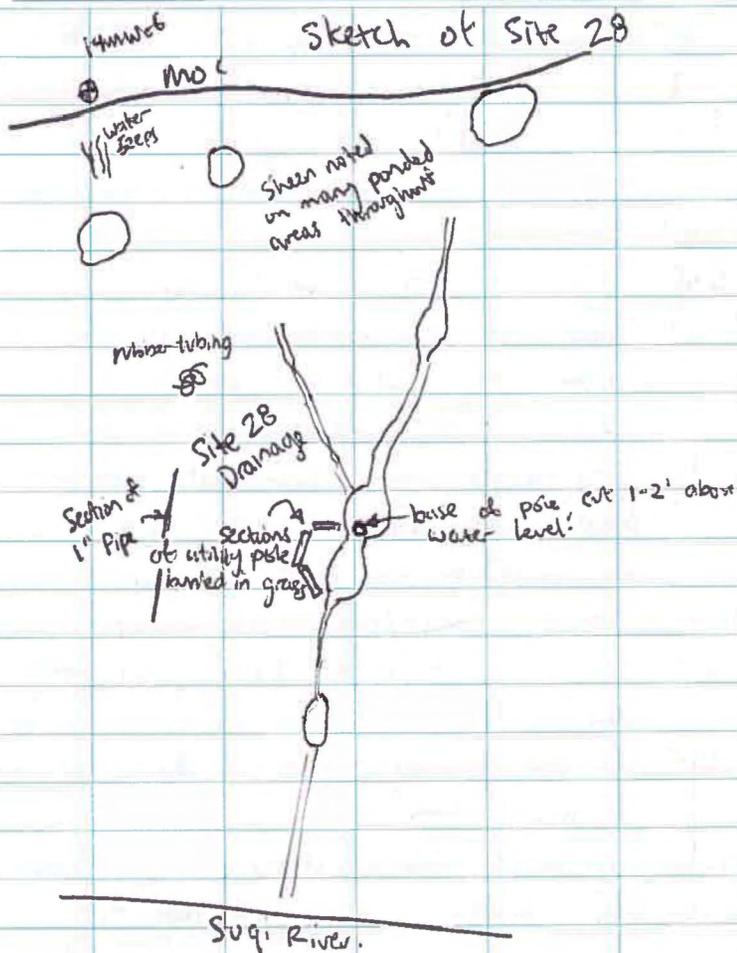
1115 Depart camp for Site 2B inspection.
Start at MOC border of Site 2B
Water seeps and ponds/streams begin just downgradient of MOC. Several ponds have visible sheen. Low water conditions. Areas where vegetation appears stressed - may be due to dry conditions

1135 Observed wood/plywood fragments

12:00 Small diameter rubber tubing, more wood debris

1215 1" pipe running toward Sigi River. Approximately 50' visible above tundra.

1220 18 to 24" base of utility pole (cut near base). located in middle of Area 4/9 pond. In grass on east side of pond, 3 sections of utility pole were found overgrown in the grass. The utility pole appears treated, with a tar-like substance covering the surface.



1245 Done with site walk at Site 28. Leave for camp

1906 End of Day

Peter Mamrosi

7/11
8/3/18
P. Mamrosi

Weather: 50°F, overcast

Level of PPE: Level D (modified)

Personnel: Peter Mamrosi (PM), Haley Huff (HH)

Daily objectives: measure distance of seeps to wells, photographs

1430 At site 28 border of MOC. Measuring distance from wells to seeps.

14mw04 - 36' down gradient

14mw05 - 44' down gradient

14mw06 - 18' down gradient

10mw-1 - base of stickup in marshy area

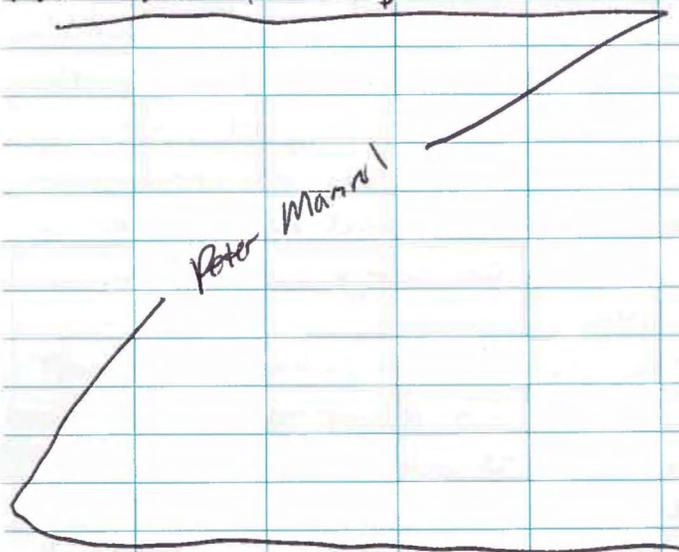
Prior to demob, surveyors indicated strong odors and sheen present at Site 28. As they walked through water bodies & disturbed sediment, additional odor and sheen would generate. This was again observed during sediment probing demonstration with site visitors. Strong sheen had developed in pond at MOC border and had strong fuel odor, even observing from a distance.

1500 Took photo 157 to attempt to replicate photo from first sediment mapping effort. Crossed area of Site 28 where herd of 400 reindeer had crossed and disturbed ground. Distinct fuel

Location Northeast CapeDate 8/6/18Project / Client SFGA4600 / USACE

odor was present again.
Additional debris observed included plywood,
rubber matting, corrugated metal,
No straw wattles observed in main
channel.

- 1600 Return to camp
1820 photograph monument location on Site 7
landfill and remove pin flags
1835 photograph LUC sign at N end of
runway
1845 remove pin flags from site 8 DUs.
1850 remove pin flags from site 9 landfill.
1930 Return to Camp.

Location Northeast CapeDate 8/6/18Project / Client SFGA4600 / USACE

Weather: ~~Overcast~~ ^{PM} Broken Clouds, 45°F
Calm

Level of PPE: Level D (modified)

Personnel: Peter Mammal (PM)

Daily objectives: photograph Site 28

Safety tailgate @ 7:00 AM.

0930 leaving camp for site 28 photographs

0940 #44, #45, #46 pond

image 0985 - N

0980 - W

#41 pond

image 0987 - N

#36, #37 pond

image 0988 - N

pond from reindeer tread.

image 0989 - N

0991 - S

pond "sediment"

image ~~0990~~ ^{PM} - N/A

0992

#1, #2 pond

image 0991 ^{PM}

0993, 0998

pond sediment, 0994, 0997

#3 pond

image 0999

#4 pond, image 1000

Location Northeast CapeDate 8/6/18Project / Client SFGA4600 / USACE

#5, #6 pond

image 1001

#7, #8, #9

image 1003

#10

image 1004

#11, #12

image 1005

section of stream, 1006

#13

image 1007

#14, #15, #16, #17, #18

image 1008

#19, #20

image 1009

#21, #22

image 1010

#23, #24

image 1011, 1012

#25

image 1013

#26, #28

image 1014

#27

image 1015

Location Northeast CapeDate 8/6/18Project / Client SFGA4600 / USACE

#29, #30

image 1016

#31

image 1017

#32, #33, #34, #35

image 1018

note: #35 is an artesian upwelling.

image 1020, 1021, 1022, 1023, 1024

note: sloughing off of high ground, 1026

#38, #39, #40

image 1027, 1028, 1029

#42

image 1030

#43

image 1031

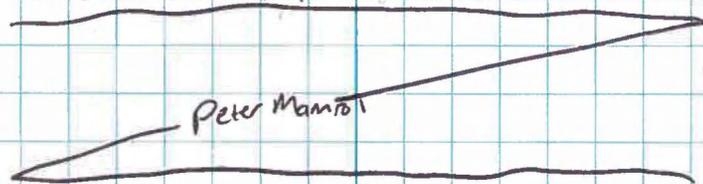
#47, #48, #49, #50, #51

image 1032

#36, #37

image 1033

1055 Return to camp.



Peter Mambrot

Photo Log

#	Description	View
1	Subsistence fishing hut w/ debris	SE ^{HH} SW
2	View facing west of site	W
3	Subsistence fishing hut	NE
4	View facing east of site	E
5	View facing SE^{HH} north of site	N
6	View facing north of site - subsistence supplies and structures	N
7	View of pond - dried	S
8/9/10	Debris in pond	Down
11	Motor oil at site	Down
12	Bone pile / fire ring at site	Down
<u>Site 32</u>		
13	Culvert -	N
14	Culvert	E
15	Stream drainage	N
16	concrete SE^{HH} former pad	down

#	Description	View
17	Lower tramway landing	E
18	Drainage pits - infilled w/ debris and rocks	E and down
19	Tramway landing	E
20	View of borrow pit	E
21	Long view of tramway	S
22	Concrete Pad	NW-down
23	Peter standing on 1 st excavation	NE
24	Peter standing on 2 nd excavation	N
25	Drainage off of excavation area	NW
26	Excavation proximity to stream (Peter standing on excavation)	N
27	Drainage at site, adjacent to excavation areas	W
<u>Site 1</u>		
28	Building foundation near road to MOC	N
29	View from edge of airstrip looking East.	E
30	Settlement Cracking on the edge of Runway	NE

31	Surface shown (possibly biogenic)	NE
32	on surface water ponded on East side of Runway	
33	Location of previous samples at Suai River	N
34	Test pit location (10NC015B01-15)	S
35	Views of historic test pit location, (Samples 10NC015B01-5B08).	E
36		E
37		NE
38	Site 10, approximate location of southern excavation	SE
39	Site 10, view of regraded slope.	E
40	Debris, well casing material, site 10.	Down
41	Wood debris with paint	Down
<u>Site 11</u>		
42	Site 11 view Monitoring Well MW10-1 in figure	NE
43	Site 11 view west	W
44	Photo of "new" MW west of 10-1, 14MW06	Down
45	Poor revegetation near new well	W

46	Photo of Site 11	N
47	Wood debris	Down
<u>Site 27</u>		
48/49	Abandoned well 88-4	Down
50	Metal debris	Down
51	New well north of 88-4	Down
52	View of Site 27 (14MW05)	South East
53	Veg. regrowth	W
54	MW 8 HH	
<u>Site 19</u>		
54	MW 88-3 (SITE 11)	Down
55	View of Site 19	NW
<u>Site 27</u>		
56	14MW04	Down
<u>MOC</u>		
57	14MW03 (Site 13)	Down
58	14MW02 (Site 13)	Down
59	14MW01 (Site 16)	Down
60	Rubber Matting in	NW
61	Depression (Site 16)	
70	Abandoned well MW16-3	Down
72	17MW01	Down
<u>Site 21</u>		
72	HH View	E
63		

73 64/65	View	W
65	Irregular topography	N
66 67	Rock pile	W
6	<u>Site 19</u>	
68	Peter standing on excavation H	W
69	Concrete pad	SW
70	Abandoned well	Down
	<u>Site 15</u>	
71	View	SE
	<u>Site 13</u>	
72	View	W
	<u>Site 16</u>	
73/74	View	N
	<u>Site 13</u>	
75	Slightly stressed veg on edge of site 13	N SE
	<u>Site 8</u>	
76	View	N
77	View	S
78/79	Stream	W
80	Artesian well	S
	<u>Site 9</u>	
81	View from middle	E

82	Slight settling on landfill cap	W
83	Vegetation regrowth on the landfill cap	W
84/85	Diversion trench	E
86	Diversion trench	NE
87	Silt fence	NW/Down
88	Metal debris	Down
89	Settling on cap	W
90	Surface water adjacent to landfill cap	N
91	View	E W
	<u>Site 7</u>	N
92	Identified low spot	SE
93	low spot on landfill cap	S
94	low spot on landfill cap	SE
95	minor cracking at NE edge of landfill	NW
96	debris remaining near pond on NW side of landfill	SW
97	debris near pond	down
98	debris near pond	SE
99	debris on NW side of landfill; ^{PM} top w/rover mutting	SE

100	Shallow rut on SW side of landfill	N
101	Culvert allowing surface water drainage off SSE edge of landfill.	pm SW SE SW
102	Road toward fish camp crossing landfill	NE
103	Armored rock on E side of landfill	NE
104/114	<u>Site 18</u>	
104/05	Asbestos tape	Down/N
	<u>Site 6</u>	
106	Small hole off NW edge of gravel pad	NE
107	View in hole with placard (3432) debris	Down
108	View of dry ponds to the west of W gravel pad	W
109	View of dry ponds to the SW of gravel pad	E
110	View of camp setup	NE
111	Pond to the South of gravel pad	NW
112	Minor earthwork done on eastern edge of gravel pad	NW
113	Camp graywater discharge setup	S
114	Camp tent setup configuration, with	N

(cont.)	55-gal ast and containment.	
115	Wood debris in pond bed to the east of camp.	N
116	Culvert to the west of Site 9 landfill	NW
117	culvert	down
118	culvert	S
119	Site 28. Sheen on surface water near MW15-1	N/A
120	Site 28 - Sheen on surface water near MW10-1	N/A
121	Pond near MOC border with Site 28	N
122	Sheen on surface water, Site 28	Down
123	partially-burned rubber matting, Site 28	E
124	Pond in site 28	N
125	Stressed vegetation in Site 28	SE
126	Rubber tubing debris, Site 28	down
127	Pond in site 28,	NE
128	Wood debris, Site 28	pm at SW
129	1" metal piping through site 28	N
130	utility pole base in Site 28 pond	NE
131	Tarp debris	E
132	utility pole base in pond	N
133	fallen utility pole w/ creosote covering	down
134	utility pole with creosote covering	down
135	utility pole with creosote covering	down
136	fallen utility pole	down

Location _____ Date _____

Project / Client _____

Officejet Pro 6830 PM		
137	fallen utility pole	N/A
138	plywood debris	W
139	main site 28 channel through grass	N
140	site 28 confluence w/ sugi River.	W
141	Site 28 channel	S
142	Site 28 channel branch	SE
143	Sheen on pond at site 28	down
144	14MW0 full of water	down
145	Site 28 pond with sheen	N
146	Seeps below 14MW04	S
147	seep and pond below 14MW04	S
148	Seep below 14MW05	S
149	Seep below 14MW06	S
150	Seep below 14MW06	S
151	Seep below 14MW06	down
152	well MW10-1 in marshy area	NE
153	well MW10-1 in marshy area	N
154	straw wattle at MOC/site 28 border	E
155	plywood debris site 28	E
156	reindeer herd tracks site 28	NE
157	replicate photo of site 28 main channel	S
158	Sediment probe technique	N
159	Site 7 monument area	N
160	Site 7 monument	N/A

The manufacturers of *Rite in the Rain* all-weather writing products are grateful to the numerous environmental experts who have contributed to the development of this book. Should you have any additions, improvements or corrections for future publications of this field book or have suggestions for other environmental field book formats, we welcome your input.

Although much effort has been taken to ensure the accuracy of the following reference pages, J L Darling LLC cannot guarantee the accuracy of the data.

To provide input or solicit pricing on these or custom printed field books, contact your *Rite in the Rain* dealer or J L Darling LLC, 253-922-5000 or fax 253-922-5300.

www.RiteintheRain.com / sales@riteintherain.com

Common Field Data Error Codes

Error codes are used to explain common mistakes and are written above or close to the mistake.

Commonly used error codes include:

RE	Recording Error
CE	Calculation Error
TE	Transcription Error
SE	Spelling Error
CL	Changed for Clarity
DC	Original Sample Description Changed After Further Evaluation
WO	Write Over
NI	Not Initialed and Dated at Time of Entry
OB	Not Recorded at the Time of Initial Observation

Note: Error code should be circled, dated, and initialed when recorded.

Hazard Classifications

- Class 1 Explosives
- Class 2 Gas
- Class 3 Flammable Liquid
- Class 4 Flammable Solids (Potential spontaneous combustion, or emission of flammable gases when in contact with water)
- Class 5 Oxidizing Substances and Organic Peroxides
- Class 6 Toxic (poisonous) and infectious substances
- Class 7 Radioactive material
- Class 8 Corrosives
- Class 9 Miscellaneous dangerous goods

Container type abbreviations (for sampling guidelines)

- BR - Boston Round • ABR - Amber Boston Round • AJ - Amber Jug • AWM - Amber Wide Mouth • Poly - Polyethylene Bottles • BOD - Bottle • CWM - Clear Wide Mouth

APPENDIX D
Photograph Log

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska

PHOTOGRAPH LOG
TABLE OF CONTENTS

<u>Photo Number</u>	<u>Page</u>
Photo No. 1 – 07 August 2018 View of NEC FUDS from Site 33 Upper Tram Terminal. View facing north.....	D-1
Photo No. 2 – 07 August 2018 View of the western slope of the Site 7 landfill cap from camp (Site 6). View facing southwest.	D-1
Photo No. 3 – 02 August 2018 Southwestern slope of the Site 7 landfill cap showing sparse vegetation. View facing north.	D-2
Photo No. 4 – 02 August 2018 Cargo Beach Road crossing over eastern portion of the Site 7 landfill cap. View facing northeast.	D-2
Photo No. 5 – 02 August 2018 Cargo Beach Road crossing and extending south of the Site 7 landfill cap, with culvert to provide drainage off landfill cap. View facing southwest.....	D-3
Photo No. 6 – 02 August 2018 Armored rock on the eastern side of the Site 7 landfill cap. View facing northeast.	D-3
Photo No. 7 – 02 August 2018 Minor cracking observed at the northern edge of the landfill cap. View facing northwest.....	D-4
Photo No. 8 – 02 August 2018 Photo showing low water level in pond to the northwest of the Site 7 landfill cap. Some scattered debris shown. View facing southeast.	D-4
Photo No. 9 – 02 August 2018 Pond to the northwest of the Site 7 landfill cap with debris including wood and pipe fragments. View facing southwest.	D-5
Photo No. 10 – 02 August 2018 Debris included film reels present in ponds to the northwest of the Site 7 landfill cap. View facing down.....	D-5
Photo No. 11 – 02 August 2018 Rubber mat exposed at the perimeter of the Site 7 landfill cap along the northwest side. View facing southeast.....	D-6
Photo No. 12 – 02 August 2018 Low spots near the top of the Site 7 landfill cap. View facing southeast.	D-6
Photo No. 13 – 02 August 2018 Low spots near the top of the Site 7 landfill cap. View facing south.	D-7
Photo No. 14 – 02 August 2018 Low spot near the top of the Site 7 landfill cap. View facing southwest.....	D-7
Photo No. 15 – 06 August 2018 Location of historical monument found along the northwestern slope of the Site 7 landfill cap. Monument reads “4469-S GPS-2 2001.” View facing north.	D-8
Photo No. 16 – 06 August 2018 Historical monument found along the northwestern slope of the Site 7 landfill cap. View facing down.	D-8

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska

**PHOTOGRAPH LOG
TABLE OF CONTENTS (Continued)**

<u>Photo Number</u>	<u>Page</u>
Photo No. 17 – 02 August 2018. Armored rock along the east side of the Site 7 landfill cap. View facing northeast.	D-9
Photo No. 18 – 02 August 2018 Wood fragment found along the armored rock along the east side of the Site 7 landfill cap. View facing down.	D-9
Photo No. 19 – 07 August 2018 Sign installed to inform site visitors against using groundwater as drinking water in the vicinity of Site 7 and identify landfill areas where ground disturbing activities are not recommended, located along the all-terrain vehicle trail at the north end of the runway. View facing southwest.	D-10

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 1 – 07 August 2018
View of NEC FUDS from Site 33 Upper Tram Terminal. View facing north.



Photo No. 2 – 07 August 2018
View of the western slope of the Site 7 landfill cap from camp (Site 6). View facing southwest.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 3 – 02 August 2018
Southwestern slope of the Site 7 landfill cap showing sparse vegetation. View facing north.



Photo No. 4 – 02 August 2018
Cargo Beach Road crossing over eastern portion of the Site 7 landfill cap. View facing northeast.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 5 – 02 August 2018
Cargo Beach Road crossing and extending south of the Site 7 landfill cap, with culvert to provide drainage off landfill cap. View facing southwest.



Photo No. 6 – 02 August 2018
Armored rock on the eastern side of the Site 7 landfill cap. View facing northeast.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 7 – 02 August 2018
Minor cracking observed at the northern edge of the landfill cap. View facing northwest.



Photo No. 8 – 02 August 2018
Photo showing low water level in pond to the northwest of the Site 7 landfill cap. Some scattered debris shown. View facing southeast.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 9 – 02 August 2018
Pond to the northwest of the Site 7 landfill cap with debris including wood and pipe fragments. View facing southwest.



Photo No. 10 – 02 August 2018
Debris included film reels present in ponds to the northwest of the Site 7 landfill cap. View facing down.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 11 – 02 August 2018

Rubber mat exposed at the perimeter of the Site 7 landfill cap along the northwest side. View facing southeast.



Photo No. 12 – 02 August 2018

Low spots near the top of the Site 7 landfill cap. View facing southeast.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 13 – 02 August 2018
Low spots near the top of the Site 7 landfill cap. View facing south.



Photo No. 14 – 02 August 2018
Low spot near the top of the Site 7 landfill cap. View facing southwest.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 15 – 06 August 2018

Location of historical monument found along the northwestern slope of the Site 7 landfill cap. Monument reads “4469-S GPS-2 2001.” View facing north.



Photo No. 16 – 06 August 2018

Historical monument found along the northwestern slope of the Site 7 landfill cap. View facing down.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 17 – 02 August 2018.
Armored rock along the east side of the Site 7 landfill cap. View facing northeast.



Photo No. 18 – 02 August 2018
Wood fragment found along the armored rock along the east side of the Site 7 landfill cap.
View facing down.

Site 7 Second Periodic Review Report – Northeast Cape, St. Lawrence Island, Alaska



Photo No. 19 – 07 August 2018

Sign installed to inform site visitors against using groundwater as drinking water in the vicinity of Site 7 and identifies landfill areas where ground disturbing activities are not recommended, located along the all-terrain vehicle trail at the north end of the runway. View facing southwest.

APPENDIX E
Community Involvement

Community Issues

COMMUNITY ISSUES

Issues raised by the community regarding the Northeast Cape (NEC) Formerly Used Defense Site (FUDS) cleanup were identified through a public meeting conducted on April 11, 2018 and through interviews conducted with community members and the Alaska Department of Environmental Conservation (ADEC) regulator. General issues were grouped based on similar topics and the U.S. Army Corps of Engineers (USACE) response to the general issues are provided in this appendix. The detailed April 11, 2018 meeting minutes and interview documentation are included in this appendix following these USACE responses. USACE appreciates the feedback and recommendations we have received from community members and the regulator, which it always considers carefully.

Uncertainty over site status and closure (Meeting Minutes, Savoonga, 11 April 2018, Appendix E)
--

The Site 7 Landfill project is open under the FUDS program and is currently in the remedial action operations phase (i.e., ongoing Periodic Reviews and implementation of land use controls [LUCs]). The primary Decision Document (DD) requirement limiting FUDS program closure of the project is full implementation of LUCs. Periodic Reviews will continue at the Site 7 Landfill until LUCs are fully implemented. When LUCs are fully implemented, then the site will have met DD requirements. Once DD requirements are met, the site will be closed in accordance with FUDS program project closeout procedures and monitoring will cease. Should new information become available that indicates the presence of FUDS-eligible contamination may pose an unacceptable risk, or an imminent and substantial endangerment to human health or the environment exists, then a new project may be opened and a preliminary assessment completed.

A summary of the draft Periodic Review Report findings in the form of a public meeting would help provide an opportunity for comments during the draft period.

The USACE will work with the community to schedule a public meeting to review the findings of the second Periodic Review following the distribution of the final report.

Clarity regarding which sites contain PCB contamination.

Polychlorinated biphenyls (PCBs) have been identified in soil at the Site 7 landfill. Interim removal activities conducted in 2005 prior to the DD involved the removal of 14 tons of PCB-contaminated soil. Remedial activities conducted in 2009 involved the removal of PCB light ballasts from landfill debris. All areas where PCB-contaminated soil may persist were covered by the 2-foot thick landfill cap, and no longer pose an unacceptable risk to visitors at Site 7.

Comment that only installing one or two signs to describe land use restrictions is inadequate

Signs informing site visitors of LUCs were installed at the two primary points of entry for the NEC FUDS.

Concern that additional unidentified landfills may exist at NEC.

No information has surfaced that suggests the presence of previously unidentified landfills at NEC. If additional landfills are discovered in the future, additional remedial actions may be conducted, and additional sites may be opened if needed.

Sites were prematurely closed without the consent of the tribes and they were not part of the Record of Decision (ROD). Tribal governments and people do not approve the minimal site characterization and remediation, it is not protective of the Sivuqaq Yupik peoples' health and well-being.

USACE response: The USACE followed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process for cleanup at the NEC FUDS. Specifically, a site assessment, four phases of remedial investigation, and a feasibility study were conducted prior to development of the Proposed Plans and DDs, and subsequent remedial actions. The sites that were closed were found not to pose an unacceptable risk to human health and the environment. The USACE gave serious consideration to the public comments received during the Proposed Plan stage and incorporated some of the comments into the DDs. The Assistant Secretary of the Army, Installations, Energy and Environment (ASA(IE&E)) is the lead agency. Under CERCLA, as the lead agency representative, USACE has sole

decision-making authority on non-National Priority List (NPL) sites, such as Northeast Cape FUDS. In accordance with the Defense Environmental Restoration Program-FUDS (DERP-FUDS), the USACE cannot incorporate cooperating agencies on CERCLA DDs.

There is not a good mechanism for re-opening sites because the process is too lengthy, “taking 2-3 years.”

USACE response: The USACE is bound by law to follow the CERCLA process to address contamination on FUDS properties. The CERCLA process is lengthy.

The full nature and extent of contamination has not been fully investigated, so the remediation is incomplete. Source areas of contamination, including the main complex and uncontrolled landfills, have not been fully characterized or removed and these continue to contaminate the Suqi River. The contaminants at NEC pose a significant source of pollution to traditional subsistence foods, water supplies, and medicinal plants. Contamination continues to affect water sources, traditional medicinal and food plants, fish, and wildlife, as well as the health of the people. The remedies are not protective of human health and the environment.

USACE response: The USACE followed the CERCLA process and conducted a site assessment, four phases of remedial investigation, and a feasibility study of contamination at the NEC FUDS. The ADEC concurred with the adequacy of the investigations, provided that the remedy is properly implemented and the CERCLA process continues to be followed to achieve and/or maintain protectiveness.

Remediation is considered complete at a site when the remedial action objectives (RAOs) established in the DDs for the site have been achieved. When RAOs have been met at a site, then the site is closed. For each site that remains open, Five-Year Reviews or Periodic Reviews will continue to occur to ensure the remedy at the site remains protective of human health and the environment.

Remedies selected in the DDs were developed based on the human health and ecological risk assessment and are considered protective of future residential use. Ground disturbing activities (e.g., construction, excavation, or debris removal) are not recommended on the Site 7 and 9 landfill caps, and it is not recommended that groundwater in the vicinity of Sites 4, 6, 7, 9, and

the Main Operations Complex (MOC) be used for drinking water. LUCs apply to these areas. Though the LUCs are not yet fully implemented, two signs have been installed at the FUDS to inform site visitors of these locations. The signs are printed in both English and Siberian Yupik.

There is a long way to go to achieve restoration and removal of the contamination. The premature closures, partial excavations, natural attenuation, and/or LUCs are completely inadequate. Additional remedies should be implemented including source removal and well-planned and executed remedial technologies such as in situ peroxidative and biological remediation.

USACE response: The remedy for each site was designed to protect human health and the environment by either removing contamination to risk-based cleanup levels or eliminating exposure pathways. At sites where contamination was left in place, LUCs are being implemented to ensure relevant exposure pathways remain incomplete, and Five-Year and Periodic Reviews are being conducted to ensure remedies remain protective of human health and the environment. Remedy components specific to Site 7 that have been completed to date include the removal of identified metallic debris (e.g., drums) and drum liquid contents and associated contaminated soil, installation of a 2-foot thick gravel landfill cap, and re-vegetation of the site. Remedy components that are currently in progress include the implementation of LUCs , which will limit the use of groundwater and prevent soil disturbance or construction of buildings at the site. These LUCs will eliminate the potential for exposure to contamination within the landfill. Periodic Reviews with visual inspections are currently ongoing, and will continue as necessary for up to 30 years, to confirm that no settlement or erosion has occurred on the landfill cap and that the remedy remains protective. These remedies ensure current and future generations will not be exposed to unsafe levels of contamination, and their health will not be harmed.

The plan for only one or two signs that describe the land use restrictions at NEC FUDS is not enough.

USACE response: USACE originally planned to install one sign along the road near Site 4, and subsequently accommodated a request from the Native Village of Savoonga Council for one additional sign near the NEC airstrip. Two signs were developed and installed during the summer of 2018. The signs are printed in both English and Siberian Yupik. The signs indicate

locations where ground disturbing activities (e.g., construction, excavation, or debris removal) are not recommended on the Sites 7 and 9 landfill caps, and it is not recommended that groundwater in the vicinity of Sites 4, 6, 7, 9, and the MOC be used for drinking water. LUCs in the form of deed notices will also be developed in accordance with the DD. Periodic Reviews with visual inspections are currently ongoing, and will continue as necessary for up to 30 years, to confirm that no settlement or erosion has occurred on the landfill cap and that the cap remains protective.

Everything before and after the NEC ROD happened without government to government consultation with our tribes. Local voices and knowledge have not been heard or considered. The USACE did not fulfill their government to government obligation.

USACE response: The USACE follows U.S. Department of Defense Native American Indian and Alaska Native Policy. We believe government to government relationships have been established with the Native Village of Savoonga and the Native Village of Gambell. The USACE will continue to consult with the Tribes on a government to government basis. The USACE strongly values the knowledge we have gained about NEC through consultation with the Tribes, and has incorporated that knowledge into site investigations and remedies.

It is requested that a new ROD be implemented with the full participation and consultation with tribal governments. The omission of the tribes from the ROD warrants inclusion of the tribes in any decisions concerning site remediation, acknowledging and using local knowledge and community-based participatory research data to drive adequate site characterization and remediation.

USACE response: USACE is required to follow the CERCLA clean-up process. The USACE consulted the Tribes during the proposed plan phase and will continue to consult with the Tribes through the 5-year review process. It is not possible to implement a new ROD with Tribes as signatories. Under CERCLA, as the lead agency representative, USACE, has sole decision-making authority on non- NPL sites, such as NEC. In accordance with the DERP-FUDS, the USACE cannot incorporate cooperating agencies on CERCLA DDs.

Native Village of NEC residents are now displaced due to the military toxic contamination from the abandoned FUDS at NEC. There is interest in re-establishing

the NEC site because of the growing population of Savoonga. The site has not been cleaned up to residential standards.

USACE response: Many of the NEC sites have been cleaned up to residential standards. The remedy for each site was designed to protect human health and the environment for future residential use by either removing contamination to risk-based cleanup levels or eliminating exposure pathways. At sites where contamination was left in place, institutional controls in the form of deed notices are being implemented to ensure relevant exposure pathways remain incomplete, and Five-Year Reviews and Periodic Reviews are being conducted to ensure remedies remain protective of human health and the environment.

The real estate value at NEC has been severely depreciated and the community would like to see compensation for that.

USACE response: Compensation for real estate depreciation is not authorized by the Defense Environmental Restoration Program-FUDS.

There is concern that people are drinking water from the Suqi River and other sources at NEC. They are also concerned that families who live and/or travel through NEC may be exposed to hazardous chemicals through inhalation, ingestion, and consumption of traditional foods. A community member requested that signs should be placed to warn the public against consuming the fish and the water from the Suqi River. A community member also requested that seals and fish coming into the Suqi River be tested.

USACE response: Water quality sampling has found contaminants are not present above cleanup levels in Suqi River water.

Two signs were developed and installed at NEC during the summer of 2018. The signs are printed in both English and Siberian Yupik. The signs state that ground disturbing activities (e.g., construction, excavation, or debris removal) are not recommended on the Sites 7 and 9 landfill caps. They also state that it is not recommended to use groundwater as drinking water at Sites 4, 6, 7, 9, and the MOC. LUCs in the form of deed notices are also being developed.

According to the human health risk assessment, site users will not be exposed to unsafe levels of contamination through the inhalation, ingestion, or traditional food consumption pathways.

Testing the seals and fish coming into the Suqi River is not warranted. The Agency for Toxic Substances and Disease Registry (ATSDR) performed a health consultation to evaluate the community's contaminant concerns at NEC (Public Comment draft released July 24, 2017). The health consultation concluded that "eating fish from NEC in the summer (3 months) is not expected to harm people's health" because "contaminants are not present in fish at sufficiently elevated levels to be harmful."

The USACE has not assessed the effects of climate warming on the mobilization of contaminants that have been sequestered in landfills and within permafrost. Erosion and permafrost melting will likely increase the mobilization and bioavailability of contaminants at NEC, thus increasing hazards to the health of fish, wildlife, and people.

USACE response: Information gathered during future Five-Year and Periodic Review site inspections and long-term monitoring (LTM) events will be used to evaluate protectiveness of the remedies at each site. If during a future review USACE finds evidence a remedy is no longer protective, then actions would be taken to ensure protectiveness.

The military did not honor the agreement that was signed by the Secretary of State (1951) not to pollute the Suqi with any human waste or any other pollutants or violate our hunting/trapping grounds. The community does not believe they will see the river come back to life in their lifetime and it is questionable if the river will ever come back to its former state. A human rights violation was committed – the Suqi river was wiped out with fish and the seals do not haul out anymore.

USACE response: The USACE appreciates these concerns. The USACE is constrained by the cleanup authority of the DERP-FUDS. Our mandate for environmental remediation is to achieve protection of human health and the environment, rather than return the site to its pristine condition.

USACE has yet to develop a Notice of Environmental Contamination as well as institutional controls with the landowner, which is a primary requirement for several of the remedies associated with NEC sites. This requirement is specified in both 2009

DDs, the LTMMP, and other project documents and correspondence since the removal actions were completed in 2014, and is also a site closure requirement of 18 Alaska Administrative Code (AAC) 75. The current Five-Year Review effort needs to discuss and include these issues as well as outline milestone dates for their completion.

USACE response: USACE agrees LUCs such as the Notice of Environmental Contamination and institutional controls are an important part of the remedy. LUCs will be implemented at NEC in the form of Deed Notices containing information regarding designated non-drinking water source areas, recommendations for preventing construction of buildings on top of the landfill areas, and the recommendation to not install drinking water wells within the MOC area until RAOs (cleanup levels) are achieved through natural attenuation processes. Deed Notices provide information or notification to local communities and landowners that residual or contained contamination may remain on site. Deed Notices will play an important role at NEC, by notifying site visitors of the locations of non-drinking water source areas and landfills. The USACE will continue efforts to coordinate with the landowner to develop Deed Notices. Once finalized, Deed Notices will be implemented through filing a Notice of Environmental Contamination at the State Recorder's Office.

A discussion of LUCs and milestone dates is included in this Periodic Review Report in the Summary Form.

All applicable surface water criteria should apply as ARARs at all applicable sites; even though the DDs may have limited the specifications of surface water cleanup level(s) and/or criteria to TAH/TAqH and sheen.

USACE response: ARARs were established in the DDs, and are considered protective of human health and the environment. ARARs as specified in the DDs will not be changed for the NEC FUDS unless it is determined the DD remedies are no longer protective of human health and the environment.

Site 7 and other uncharacterized landfills at NEC will continue to require CERCLA Five-Year Reviews until such time that the agencies concur that Periodic Reviews are appropriate. Although the DD states the term Periodic Reviews, the Site 7 landfill has had prior sources and residual concentrations of CERCLA contaminants identified; while the agencies have agreed to disagree on this issue based upon prior

deliberations, the uncharacterized areas of concern require CERCLA Five-Year Reviews until otherwise determined appropriate to change the process to Periodic Reviews. Additionally, ongoing monitoring of the downgradient surface water and/or groundwater at these landfills is also applicable and necessary during the CERCLA Five-Year Review until such time that the agencies conclusively concur that any contaminant migration and/or exposure pathways are incomplete and that the remedy remains protective.

USACE response: Sites 7 and 9 have been investigated, the remedies selected, and aside from LUCs, the remedies have been implemented. There are no “uncharacterized areas of concern that require CERCLA Five-Year Reviews.”

The selected remedy at Site 7 (Cargo Beach Landfill) did not include a requirement for monitoring surface water or groundwater. Sampling of shallow groundwater was attempted in the vicinity of Site 7 with only limited success due to the tundra/wetland environment, the presence of subsurface rock/boulders, the intermittent presence of water, and slow recharge of shallow groundwater within temporary wells. A LUC at Site 7 will be implemented because groundwater use as drinking water is not recommended at Site 7. Though the LUCs are not yet fully implemented, two signs have been installed at the FUDS to inform site visitors of these locations. The signs are printed in both English and Siberian Yupik. In addition, the groundwater exposure pathway at Site 7 is incomplete because there is not a sufficient quantity of water produced to be considered a reasonable potential future source for drinking water. Periodic Reviews in accordance with the Long-Term Management Plan will continue at this site.

Details of the most recent Periodic Review related to Site 9 (Housing and Operations Landfill) are included in a separate document. The remedy at Site 9 included removal of submerged debris in active stream channels adjacent to the landfill, construction of a minimum 2-foot thick landfill cap, visual inspection of the landfill cap on an annual basis for settlement and erosion for five years, implementing LUCs, and LTM. LTM included three monitoring events spaced five years apart to demonstrate the shallow groundwater meets RAOs for a non-drinking water source, and six monitoring events spaced five years apart to demonstrate the shallow groundwater meets RAOs for a non-drinking water source. Removal of submerged debris in

active stream channels adjacent to the landfill, construction of a minimum 2-foot thick landfill cap, and visual inspection of the landfill cap on an annual basis for settlement and erosion for five years have been implemented. LUC implementation is underway, but not yet complete. As a result of insufficient shallow groundwater volumes in the vicinity of the landfill, surface water has been used to demonstrate the shallow groundwater meets RAOs for a non-drinking water source. Surface water sample results to-date indicate the remedy is protective. Periodic Reviews in accordance with the Long-Term Management Plan will continue at this site.

Settling/subsidence has been observed at the Site 7 landfill, as well as poor and inadequate vegetation establishment associated with the covers and adjacent surfaces of the Site 7 and Site 9 landfills.

USACE response: The Second Periodic Review for Site 7 (Cargo Beach Landfill) includes details of issues noted during landfill visual inspections. The Second Periodic Review for Site 7 includes a recommendation to conduct cap maintenance in areas where settling was observed. Granular fertilizer and seed were spread over the landfill cap following cap construction in 2009. In an attempt to address limited vegetative growth observed on the Site 7 landfill cap, granular fertilizer and seed were again spread over the landfill cap during 2011. A stabilization analysis conducted in 2011 determined the landfill cap met non-vegetative permanent stabilization requirements established in the 2011 Alaska Construction General Permit. During the 2018 landfill visual inspection, it was noted the soil used to construct the cap was very coarse and rocky, which significantly contributed to the sparse nature of vegetative growth.

Site 9: Vegetative cover observed during visual landfill cap inspections has been estimated at 70 to 80 percent on the cap surface and side slopes. Vegetative cover was noted as being short, but with good coverage. The cap appeared structurally sound and stable with no evidence of leaching or erosion. The landfill cap will continue to be visually monitored on a periodic basis, likely in conjunction with CERCLA Five-Year Reviews at other NEC sites, for up to 30 years.

SUGGESTIONS REGARDING FUTURE OPERATION, MAINTENANCE, AND MONITORING AT THE SITE

The following suggestions for the future operation, maintenance, and monitoring at NEC:

Suggestion: Complete removal of the solid and hazardous waste materials at the NEC Site 7 and other landfills.

Response: The current remedy remains protective of human health and the environment. The USACE does not intend to remove remaining materials at the Site 7 and 9 landfills. Periodic Reviews in accordance with the Long-Term Management Plan will continue at Sites 7 and 9.

Suggestion: Continue to include LTM of surface water and shallow groundwater at landfill sites.

Response: Continued LTM of surface and shallow groundwater at the landfill sites is not warranted. The selected remedy at Site 7 (Cargo Beach Landfill) did not include a requirement for monitoring surface water or shallow groundwater. Sampling of shallow groundwater was attempted in the vicinity of Site 7 with only limited success due to the tundra/wetland environment, the presence of subsurface rock/boulders, the intermittent presence of water, and slow recharge of shallow groundwater within temporary wells. A LUC at Site 7 will be implemented because shallow groundwater use as drinking water is not recommended at Site 7. Though the LUCs are not yet fully implemented, two signs have been installed at the FUDS to inform site visitors of these locations. The signs are printed in both English and Siberian Yupik. In addition, the groundwater exposure pathway at Site 7 is incomplete because there is not a sufficient quantity of water produced to be considered a reasonable potential future source for drinking water.

Details of the most recent Periodic Review related to Site 9 (Housing and Operations Landfill) are included in a separate document. The remedy at Site 9 included removal of submerged debris in active stream channels adjacent to the landfill, construction of a minimum 2-foot thick landfill cap, visual inspection of the landfill cap on an annual basis for settlement and erosion for five years, implementing LUCs, and LTM. LTM included three monitoring events spaced five years apart to demonstrate the shallow groundwater meets RAOs for a non-drinking water source, and six monitoring events spaced five years apart to demonstrate the shallow groundwater meets RAOs for a non-drinking water source. Removal of submerged debris in

active stream channels adjacent to the landfill, construction of a minimum 2-foot thick landfill cap, and visual inspection of the landfill cap on an annual basis for settlement and erosion for five years have been implemented. LUC implementation is underway, but not yet complete. As a result of insufficient shallow groundwater volumes in the vicinity of the landfill, surface water has been used to demonstrate the shallow groundwater meets RAOs for a non-drinking water source. Surface water sample results to-date indicate the remedy is protective. Periodic Reviews will continue at this site.

Suggestion: Complete removal or destruction of the contaminants identified at the former village site at NEC. Provide adequate funding for Native American Lands Environmental Mitigation Program at Native Village of NEC, including provisions to adequately support and build capacity with training and jobs for the Native Village of Savoonga.

Response: Petroleum contaminated soils were excavated from this site by the FUDS program in 2000-2001. The NEC DD stated that no further action was required at this site. In 2014, the Native Village of Savoonga excavated PCB-contaminated soil under the NALEMP program. Confirmation sample results indicated that PCBs remained in the soil slightly above the ADEC clean-up level of 1.0 mg/kg.

The Native Village of Savoonga is not currently eligible to participate in NALEMP due to financial issues. However, the USACE has requested funding to conduct a preliminary assessment at the former village site, also known as the Fish Camp, to determine if a FUDS-eligible project exists there.

Suggestion: Provide more advanced notice to ADEC, community members, and other stakeholders whenever USACE is planning and scheduling future community meetings in order to ensure all parties have adequate time to make arrangements for travel, schedule participation, provide input to the agenda, etc.

Response: Agreed. USACE will make every effort to work with the ADEC, community, and other stakeholders to identify the most appropriate dates to schedule meetings. Once scheduled,

USACE will announce meetings well in advance to ensure optimal opportunity for participation.

Suggestion: Ensure that complete and comprehensive responsiveness summaries (e.g., complete responses to comments, meeting minutes, review and/or deliberation determinations) be provided to all stakeholders and attached to all respective documents for all applicable actions.

Response: Agreed.

Suggestion: Evaluate and apply the revisions and changes to 18 AAC 75 cleanup levels and what impacts have resulted to any sites and their respective remedies.

Response: Protectiveness of the remedy at each site is re-evaluated during each Five-Year and Periodic Review as stipulated in CERCLA guidance. This involves consideration of whether ADEC cleanup levels have changed since the last review. More fundamentally, the review assesses changes to scientific knowledge about the toxicity of COCs by evaluating whether EPA-derived reference doses or cancer slope factors for COCs have changed since the prior review.

---End of Comments---

Meeting Minutes

MEETING MINUTES

NORTHEAST CAPE FORMERLY USED DEFENSE SITE 5-YEAR REVIEW PUBLIC MEETING	DATE HELD: 11 APRIL 2018
	DATE ISSUED: 16 APRIL 2018
	RECORDED BY: HALEY HUFF & JESSICA BAY
DOC. NO: AE-ECC-J07-5FGA4600-G01-0001	PLACE: SAVOONGA CITY HALL
SUBJECT: SECOND NE CAPE FIVE-YEAR REVIEW	
PARTICIPANTS :	
ANDREA ELCONIN – USACE JESSICA BAY – ECC PAM MILLER – ACAT (VIA PHONE)	
AARON SCHEWMAN – USACE KEVIN MAHER – JACOBS	
CURTIS DUNKIN – ADEC HALEY HUFF – JACOBS	
12 RESIDENTS OF SAVOONGA (SEE INCLUDED SIGN-IN SHEET)	

MEETING NOTES

Andrea Elconin opened the meeting by introducing USACE and ECC/Jacobs staff followed by a brief overview of the meeting purpose. Kevin Maher began the slide presentation following the USACE introduction.

Meeting Overview

The USACE met with the community of Savoonga to kick-off the Second Five-Year Review (5YR) at Northeast Cape Formerly Used Defense Site (NE Cape FUDS) and provide community members the opportunity to have ECC/Jacobs staff assist with the completion of a site questionnaire.

During the slide presentation, the following questions and USACE responses occurred:

QUESTIONS

- Once sites are closed, how often is the site monitored?
 - a. Response - The sites will be closed when the remedial action objectives defined in the decision document have been met. Once the site is closed, there will be no further monitoring at the site unless new information is presented to the USACE that justifies re-opening the site.
- Will global warming/climate change have an effect on the contaminated sites?
 - a. Response - If the site changes due to climate change (e.g., melting permafrost), then this will be noted during the next five-year review site inspections. Additional sampling may be warranted if new contamination is discovered.
- Which sites have not received site closure? Is there a way to re-open a site once it is closed?
 - a. Response - New data that indicates a risk to human health can re-open a site.
- Sites with PCBs are not listed specifically in the mailer.
 - a. Response - Sites with PCBs were cleaned up and are not listed because the USACE believes that all PCBs above the 1 ppm cleanup level have been removed from the Northeast Cape FUDS.

A community member stated that they do not feel like there is a good mechanism for re-opening sites because the process is too lengthy, "taking 2-3 years".

A community member stated that they do not feel like there is clarity on which sites are open and which sites are closed. Additional community member statements at this time included:

- The five-year review report documents are not understandable to the public who are not familiar with the scientific information presented.

MEETING MINUTES

MEETING NOTES

- A summary of the draft five-year review report findings in the form of a public meeting would help the community provide comments during the draft five-year review report public comment period.

USACE Response - The USACE would consider the request to add a public meeting during the public comment period related to the draft five-year review report.

A community member stated that the plan for only one or two signs that describe the land use restrictions at NE Cape FUDS is not enough.

USACE Response – The USACE response included a summary of the current signage plan as follows:

- The Signage will be added this summer and will indicate the areas where groundwater use is discouraged and the capped landfill areas where construction is discouraged.
- A meeting with the Native Village of Savoonga Council resulted in a request for an additional sign near the Northeast Cape airstrip.

The USACE stated that the signs would be in English and Siberian Yupik. A community member recommended George Noonwook as a translator.

A community member requested that signs should be placed to warn the public against consuming the fish and the water from the Suqi River.

- Alaska Community Action on Toxics (ACAT) mentioned that they have data suggesting that the Suqi River is still highly contaminated.

USACE Response - The USACE responded that the sample results from the Suqi River, described in the administrative record, do not show contamination is present above the cleanup levels. The USACE requested that ACAT provide the data they referenced to the USACE PM, Andrea Elconin, for evaluation.

A community member requested that seals and fish coming into the Suqi River be tested.

USACE Response included the following:

- The USACE cannot test animals or fish at the NE Cape Site.
- The USACE suggests that another entity, such as ACAT, can pursue a grant to conduct this type of testing and would alert ACAT if they become aware such a grant is available.
 - ACAT replied that there is not currently a grant available or a funding mechanism for fish/animal testing and would like to collaborate with the USACE for possible funding sources and a letter of support for the work.
 - ACAT is currently collaborating with the universities for further research at the Northeast Cape FUDS.
- Note: The USACE representative present at the meeting was incorrect. Fish tissue sampling was performed at Northeast Cape during 1999 and 2001. During these events, fish were collected from the Site 28 Drainage Basin, Suqi River and control streams/rivers using electrofishing techniques, traps, seines, gillnets, dipnets, and angling. The fish were sorted by species, measured, photographed, counted, and visually inspected for deformities and disease. During 1999, captured fish species from the Site 28 Drainage Basin and Suqi River included Dolly Varden char and Alaska Blackfish, ninespine stickleback, and fourhorn sculpin. During 2001, Dolly Varden char were collected from the Suqi River, and Alaska Blackfish were

MEETING MINUTES

MEETING NOTES

collected from Site 28 Drainage Basin in order to assess toxicity and compare with previous sample results. Fish tissue samples were submitted for laboratory analysis of PAHs, PCBs, metals, and total lipids. A draft Health Consultation prepared by the Agency for Toxic Substances and Disease Registry (ATSDR) dated July 2017 concluded eating fish from Northeast Cape in the summer (3 months) is not expected to harm people's health.

A community member stated that they had uncovered a landfill and reburied it when performing dirt work with heavy equipment near the dome associated with the White Alice site on top of Kangukhsam Mountain. The type of debris uncovered and reburied was not identified in the discussion.

USACE Response – The USACE asked if there was a way to identify the location such as GPS coordinates. The community member did not have GPS coordinates.

A community member asked "What if the military wants to build another site at NE Cape due to tensions with North Korea or Russia?"

The USACE responded that they would not be made aware of this type of information and that they are only involved with the Northeast Cape FUDS clean-up.

A community member asked if the Suqi River could be stocked with fish in the future?

USACE Response – Their technical expertise was not in the field of fishery management. However, they were not aware of any reason why this could not occur.

During the presentation of the slide describing 2018 Northeast Cape FUDS fieldwork, Pam Miller with ACAT requested more detailed information regarding the number of analytical samples and the associated analytical suites, and which areas would be sampled. The USACE suggested that this discussion occur after the slide presentation concluded so that others who did not want to hear the detailed information could leave the meeting.

USACE SUMMARY OF THE SAMPLING PLAN WITH PAM MILLER (ACAT) AFTER THE SLIDE PRESENTATION CONCLUDED:

Approximately four community members remained in the room and Pam Miller remained on the teleconference line for the detailed description of 2018 fieldwork. The USACE described the sample quantities and analytical methods that are planned for surface water samples, groundwater samples, and sediment samples, as well as the locations where samples will be collected.

Pam Miller asked if the USACE will analyze samples for PCB congeners instead of Aroclors?

USACE Response – The USACE said they are not planning on analyzing for congeners because the Decision Document cleanup levels are specific to total PCBs and that there are no regulatory-based cleanup levels for congeners.

Pam Miller stated that recent samples of Suqi River fish collected by a third party identified congeners are present and are a human health risk. Therefore, specific congeners should be measured.

USACE Response:

- The USACE requested that these data be provided to USACE PM, Andrea Elconin, for evaluation.
- Congeners do not have a regulatory cleanup level and the DD remedial action objective was to cleanup total PCBs to 1 ppm. Note: This was a mis-statement. The PCB cleanup level applicable to Site 29 Suqi River sediment is 0.70 ppm.

MEETING MINUTES

MEETING NOTES

Pam Miller stated an Incremental Sampling Method (ISM) was not adequate because hot spots could be missed. Comment was specific to Site 8.

USACE Response - Decision Unit placement and extents have been revised to account for the 2016 discrete sample data set which identified the suspected area of release.

Pam Miller asked if mercury would be sampled for at Site 28.

USACE Response - Mercury has not been found in previous Site 28 samples above the cleanup level and Mercury would not be part of the analytical suite at Site 28.

Pam replied that her samples indicated mercury was present in the sediment of Site 28.

USACE Response - The USACE asked that data which showed mercury is present above the cleanup level, through third party sampling, be provided to the USACE for evaluation. Additionally, the USACE responded the MOC buildings that may have contained mercury light switches were removed along with any potentially contaminated soil. Therefore, all sources of mercury which could contribute to Site 28 have been removed.

A community member stated the USACE is not sampling at locations suggested by the community, is only following the work plan, and is doing the minimum requirements to satisfy the law.

USACE Response - The USACE is bound by the regulation and the USACE is complying with regulation for the cleanup of the Northeast Cape FUDS.

A community member stated the community feels the previous 5 year-review did not address community concerns. The community feels their opinions are not impactful.

USACE Response - The USACE responded that the community input is impactful, but the request of PCB congener analysis has to go down a different route and become an established cleanup level by regulation. The USACE identified that the planned signage was a result of community comments and that having onsite accommodations for community members to be present during 2018 fieldwork was also a result of community comments.

A community member recommended USACE meet with the Native corporations, as the landowners, in addition to the Native Village of Savoonga Council before the 2018 fieldwork occurs. Other suggestions included:

- Allow the corporations to review the sampling plan
- Present a digestible format of the results of the draft five-year review report

USACE Response – The USACE identified that the Native corporations were contacted and that they provided a right-of-entry to conduct 2018 fieldwork.

The public would also like the USACE to write a courtesy note to the Native corporations – re-stating the USACE is bound by law (specifically, the DD) and is limited in the types of sampling that can be performed. The note should also include appreciation of the public involvement and being welcomed into the village.

The meeting concluded.

MEETING MINUTES

MEETING NOTES
Note – Nobody from the community remained after the meeting to complete and submit a five-year review questionnaire. Additionally, no one from the community returned to City Hall the next day to complete and submit a five-year review questionnaire.

Interview Record

Interview Record

Name: Curtis Dunkin	Date: February 15, 2019
Organization: ADEC	Phone Number: 907.269.3053
Title: ADEC Regulatory Project Manager for the Northeast Cape FUDS	Email: Curtis.dunkin@alaska.gov
Interview Type:	<input checked="" type="checkbox"/> <u>Mail/Email</u> <input type="checkbox"/> Phone/In Person
Site Name: Northeast Cape, St. Lawrence Island	

The following interview questions are based on EPA guidance (EPA 540-R-01-007). Questions may be left unanswered if they do not apply to you.

Interview Questions

1. **What is your overall impression of the project (general sentiment)?**

ADEC appreciates the opportunity to submit its comments and concerns on the prospective second five-year review (FYR) effort for the Northeast Cape (NEC) Formerly Used Defense Site (FUDS).

Within the current FYR period, spanning between 2014 and 2019, the Army Corps of Engineers (USACE) has continued to conduct monitoring and periodic reviews at specified sites of the NEC FUDS as required by both the 2009 NEC Site 7 Decision Document (DD) and the 2009 NEC Site Wide DD, and the 2016 NEC Long-term Management Plan (LTMP). USACE has made progress on addressing site management needs including developing the 2016 LTMP and developing conceptual Land Use Control (LUC) boundaries at sites where required by the DD.

USACE has been responsive to evaluating and implementing additional investigation activities to address newly identified data gaps and site characterization needs at several NEC sites during the current FYR period.

USACE has continued to work on and has achieved many of the action items and milestones which were specified in the preceding FYR report (2015) section 9.0 table 9.1. In general, the Alaska Department of Environmental Conservation's Contaminated Sites Program (ADEC) continues to agree with and perceives the site-specific protectiveness statements that were presented in the 2015 FYR report section 10 as continuing to be applicable and appropriate at the time of this questionnaire. ADEC is not aware of any major site management changes, issues, and/or concerns (i.e. land use changes, contamination migration, exposure risk, etc.) that would be considered inconsistent with what was identified in the 2009 DDs and/or the 2015 FYR that have been identified since the 2015 FYR report.

One of the accomplishments of the 2018 site work was the USACE installing signage along the Cargo Beach Road which had information detailing and figures depicting site locations, conceptual land use control boundaries, and warnings - as requested by community members and other stakeholders including ADEC. The signage included information in English on one side, and Siberian Yupik on the other.

ADEC's overall impression is that USACE has kept stakeholders adequately apprised of the project activities and schedules and have been responsive to community and agency involvement.

2. **From your perspective, what effects have site operations had on the surrounding community? Are you aware of any community concerns/complaints regarding site operations, administration, implementation, or overall protectiveness of the remedies in the Decision Documents?** ADEC perceives USACE's site operations to have had overall positive effects on the communities of Saint Lawrence Island. During the numerous mobilizations and implementations of field efforts over the years (both prior to as well as during the current FYR period), USACE consistently made it a priority objective to include community members in its hired field crews, has provided opportunities for community members to be designated community observers, and has also coordinated the logistics for community and agency members to travel to NEC to conduct field visits. USACE has also coordinated with ADEC for staff to conduct multi-day site inspections during the implementation of field work as well as participation in community outreach.
ADEC is aware of numerous instances over the years, including during the current FYR period, that the USACE field staff provided major critical medical care to community members who were traveling to visit the Native Village of Northeast Cape (NVNC) and/or traveling between the surrounding fish and hunting camps.
USACE site operations over the years have resulted in economic contributions to the local economies of the communities of Gambell and Savoonga.
ADEC is aware of several ongoing concerns which have been expressed by community members via written and/or oral comments on projects (documents) and/or public meetings which have occurred prior to as well as during the current FYR period, including but not limited to the following: 1) potential leachate in surface and/or groundwater that could be associated with the landfills, 2) residual contamination in waters, sediments, and/or fish within the Site 28 and Suqi River drainages – including respective concerns associated with potential exposure risk(s); 3) potential residual FUDS contamination at several of the NVNC fish camp sites, and 4) FUDS debris and structural materials that represent health hazards to community members and/or wildlife.
3. **Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.** ADEC is not aware of any such events listed in the question as having occurred in association with the Northeast Cape FUDS areas of concern (sites).
4. **Do you feel well informed about the site's activities and progress? Have there been communications or activities regarding the site?** ADEC feels that it is adequately informed regarding the site's activities and progress. USACE has coordinated public meetings in Savoonga to discuss the planning of and to solicit input for the prior draft 2014 FYR report and also in April 2018 to inform the community and to solicit input from stakeholders regarding the draft 2018 Remedial Action Review Work Plan. USACE has provided ADEC with the opportunity to review and comment on the LTM work plans and reports that have been implemented during the current FYR period, and has also hosted numerous technical planning meetings
USACE has provided ADEC with regular updates during the implementation of field work during this FYR period. In instances that warranted consideration of potential or

necessary changes to the field and/or project plans, USACE has apprised ADEC and allowed ADEC the opportunity to review, make additional comments, and approve those changes prior to implementing them in the field. USACE has generally provided ADEC with complete and thorough documentation (electronic and hard copy) for draft and final documents, meeting materials, agendas, minutes, and decisions during this FYR period. While there have been a couple of minor instances where USACE's responsive summary to ADEC was delayed and/or not complete, (including meeting minutes and final responses associated with the two draft reports in 2016 associated with the Main Operations Complex LTM, Suqi River Current Conditions Evaluation, and the Site 8 LTM and investigation, as well as the meeting minutes from the April 2018 public meeting for the draft 2018 Remedial Action Review Work Plan), these instances have not resulted in negative impacts to any sites, their respective remedies and/or protectiveness, or the progress of implementing respective site work.

5. **Do you have any suggestions regarding future operation, maintenance, and monitoring at the site?** ADEC requests USACE consider the following to be included in the current FYR evaluation as well as future site investigation and/or monitoring activities: 1) evaluate and continue the extent investigation as determined necessary for soils and groundwater at Site 8; 2) continue to include LTM of surface water and groundwater at landfill sites; 3) continue LTM of groundwater at the MOC sites and evaluate additional LTM investigation in soils and groundwater in areas adjacent to and immediately downgradient of MOC (aka the upgradient areas of the Site 28 Drainage); 4) conduct surface water sampling at Site 28 and consider whether tissue sampling is necessary based upon historical and/or 2018 sediment sample results; 5) assess the residual contamination remaining at the Fish Camp sites as indicated by the most recent site investigation analysis results (most/all of which were conducted under the prior NALEMP efforts) – which appear to indicate that residual concentrations of PCBs, metals, and POL COCs remained in soils and surface water; and 6) evaluate and apply the revisions and changes to 18AAC75 cleanup levels and what impacts have resulted to any sites and their respective remedies.

Additionally, USACE has yet to develop a Notice of Environmental Contamination as well as Institutional Controls with the landowner, which is a primary requirement for several of the remedies associated with NEC sites. This requirement is specified in both 2009 DDs, the LTMMP and other project documents and correspondence since the removal actions were completed in 2014, and is also a site closure requirement of 18 AAC 75. The current FYR effort needs to discuss and include these issues as well as outline milestone dates for their completion.

6. **Have any problems been encountered which required, or will require, changes to the remedy or Decision Document?**

As of the date of the subject questionnaire, ADEC is not aware of any problems having been encountered, specifically during this FYR period that would require changes to the remedy or DDs. However, ADEC has noted its concerns (both prior to as well as within the current FYR period), via written comments and discussions associated with work plans, reports, meetings, etc., with regard to several issues and concerns discussed below. **Site 28 Drainage:** ADEC continues to have concerns regarding whether or not the issues of contaminant migration and/or exposure pathways via sediments and/or surface water at Site 28 and related drainages have been adequately investigated and/or monitored; including concerns regarding the state of the residual contamination source areas which

remain within the tundra at Site 28 as well as likely ongoing sources from the MOC plumes which are located immediately adjacent to/upgradient of Site 28. ADEC acknowledges that additional Site 28 sediment investigation data will be available and evaluated based upon the results of the 2018 investigation activities. However, ADEC noted in its responses to additional RTCs on the revised final 2018 work plan, that data gaps could still result from USACE's decision to not include surface water sampling at Site 28. Per ADEC's email to USACE dated July 11, 2018, "ADEC's comment was based on the issue that all of the existing surface water data from sample locations collected within the Site 28 drainage (i.e. upgradient of the confluence with the Suqi River), were either collected over the years of the RI phases or during the remedy implementation and sediment removal actions completed in 2013/14. ADEC's rationale for requesting additional surface water sampling from within the drainage during the 2018 effort was to provide current data to confirm whether surface water criteria are still being met five years after completion of the removal action; to support making a defensible determination with re: to the protectiveness of the remedy within this five-year review period."

Additionally, in the years following the finalization of the DDs in 2009, ADEC has emphasized its position that all applicable surface water criteria continue to apply as ARARs at all applicable sites; even though the DDs may have limited the specifications of surface water cleanup level(s) and/or criteria to i.e. TAH/TAqH and sheen. ADEC's current position is that additional surface water monitoring data from Site 28 may be necessary in the future in order to make conclusive determinations regarding the status of migration and/or exposure pathways. Further deliberations regarding comments and responses on the revised final 2018 work plan noted that USACE would include further evaluation of this issue in the prospective 2018-19 FYR report.

Site 8: Field conditions at the time of implementing the initial field activities, including surveying and locates of planned 2018 sediment sampling and mapping locations, indicated that sediment and/or surface water were not present within the targeted decision units. Subsequent site inspections conducted by ADEC, USACE, and the field team resulted in concurrence that the Site 8 sediment and surface water could not be investigated as specified in the 2018 work plan. Further discussion and observations by the project team members resulted in concurrence that the extents of subsurface soil and groundwater contamination on both sides of the road remained the primary data gap at this site and would require further evaluation in the current FYR in order to determine/recommend the appropriate and necessary path forward.

Site 7: ADEC has previously commented and noted its position that this and other uncharacterized landfills at Northeast Cape will continue to require CERCLA FYRs until such time that the agencies concur that Periodic Reviews are appropriate. While ADEC acknowledges that the DD states the term periodic reviews, the Site 7 landfill has had prior sources and residual concentrations of CERCLA contaminants identified; and while the agencies have agreed to disagree on this issue based upon prior deliberations, ADEC's position is that the uncharacterized areas of concern require CERCLA FYRs until otherwise determined appropriate to change the process to periodic reviews. Additionally, ongoing monitoring of the downgradient surface water and/or groundwater at these landfills is also applicable and necessary during the CERCLA FYR until such time that the agencies conclusively concur that any contaminant migration and/or exposure pathways are incomplete and that the remedy remains protective.

Fish Camp: Please see and apply ADEC's comment on this area of concern in response to question #5 in this questionnaire.

General: Please see and apply other applicable comments, responses, and/or deliberations from meeting and resolution minutes associated with activities which occurred within the current FYR period that are relevant to considerations regarding the functionality and/or protectiveness of the implemented remedies, site statuses, etc. including for example the development of the 2016 LTMMP, the development and implementation of the 2016 LTM and Suqi River and Site 8 LTM Work Plans and Reports, the 2018 public meeting, and the 2018 Remedial Action Review Work Plan; including related email correspondence between ADEC and USACE such as that referenced in the Site 28 discussion, dated July 2018 above and others.

7. **Are you aware of any changes in land use, access, or other site conditions that have occurred in the past five years that you feel may impact the protectiveness of the site?** ADEC is not aware of any changes to land use or access in association with the Northeast Cape FUDS and/or immediately adjacent areas. ADEC however does note that changes in site conditions have been observed and confirmed to have occurred at several sites - as identified since the DDs and within this FYR period including : 1) the drainage and surface water characteristics within the Site 8 areas of concern; 2) increased concentrations and extents of contamination in soils associated with Site 8 that have been identified since the DD and within this FYR period, 3) settling/subsidence at the Site 7 landfill; 4) poor and inadequate vegetation establishment associated with the covers and adjacent surfaces of the Site 7 and Site 9 landfills; and 5) sediment transport and deposition appears to have recurred within the Site 28 drainage however it is still unclear whether or not residual contamination is continuing to migrate through the system.

8. **Do you have any comments, suggestions, or recommendations regarding the site's management or operation?** ADEC would request/suggest the following of USACE: 1) to provide more advanced notice to ADEC, community members, and other stakeholders whenever USACE is planning and scheduling future community meetings in order to ensure all parties have adequate time to make arrangements for travel, schedule participation, provide input to the agenda, etc.; 2) ensure that complete and comprehensive responsiveness summaries (i.e. complete responses to comments, meeting minutes, review and/or deliberation determinations) be provided to all stakeholders and attached to all respective documents for all applicable actions (noting the two instances described in more detail in response #3 above); 3) incorporate ATSDR health consultation conclusions and status of draft or final documents into this FYR; and 4) ADEC appreciates USACE's coordination of the November 15, 2018 technical meeting which enabled the project team members to have a pre-draft FYR report discussion of the preliminary data from the 2018 efforts. ADEC was notified at that meeting that the results of the 2018 work would be presented as an appendix in and distributed simultaneously with the draft FYR report. ADEC noted that while it did not necessarily object to that approach, that having an earlier opportunity to review and comment on the draft 2018 report in its entirety would have allowed ADEC to be better-informed for submittal of the subject questionnaire; as it would have also likely addressed some of ADEC's comments and concerns which are notated in the subject questionnaire.

Final Mailer

ADDITIONAL INFORMATION

Documents pertaining to Northeast Cape background information and the decision documents for Northeast Cape are on file at the following Information Repository locations:

Alaska Resources Library and Information Services, University of Alaska, Anchorage
3211 Providence Drive
(907) 786-1871

Savoonga City Hall
(907) 984-6614

Gambell Sivuqaq Lodge
(907) 985-5335

Information on the cleanup process is shared with interested persons through periodic Northeast Cape public meetings held in Savoonga, Alaska. If you would like to be added to the contact list, please contact USACE Public Affairs at (907) 753-2615 or POA-FUDS@usace.army.mil

US ARMY CORPS OF ENGINEERS

Alaska District
P.O. Box 6898 (CEPOA-PM-ESP)
JBER, AK 99506-0898

OFFICIAL BUSINESS

DELIVER TO:

FIVE-YEAR REVIEW NORTHEAST CAPE FORMERLY USED DEFENSE SITE ST. LAWRENCE ISLAND, ALASKA



March 2018

FIVE-YEAR REVIEW

The United States Army Corps of Engineers (USACE) at Joint Base Elmendorf Richardson is conducting a Five-Year Review of remedial actions implemented at the Northeast Cape Formerly Used Defense Site located on St. Lawrence Island, Alaska.

The Five-Year Review is a detailed evaluation of the implementation and performance of the selected remedy (i.e., the environmental cleanup work). The objective of the evaluation is to document if cleanup activities (or “remedies”) are protecting people and the environment from contamination. If the remedies are not protective, the Five-Year Review makes recommendations to improve protectiveness. Federal regulations require this type of evaluation, and the Alaska Department of Environmental Conservation (ADEC) will review the process to ensure completeness and accuracy. This will be the second five-year review for Northeast Cape.

SITES INCLUDED IN THE FIVE-YEAR REVIEW

Based on the signed decision document, remedial actions were selected for various sites to address surface soil, subsurface soil, groundwater, and sediment, contaminated with polychlorinated biphenyls (PCB), diesel-range organics (DRO), residual-range organics (RRO), arsenic, benzene, and naphthalene. These actions include.

Site Number and Name		Action
Site 1	Air Strip	EX/D
Site 3	Fuel Pumphouse	EX/D
Site 6	Gravel Pad	EX/D
Site 7	Cargo Beach Road Landfill	C/LUC
Site 8	Petroleum, Oil, and Lubricant Spill	MNA/LUC
Site 9	Housing and Operations Landfill	C/LUC
Site 10	Buried Drums	EX/D and MNA/LUC ¹
Site 11	Fuel Tanks	EX/D and MNA/LUC ¹
Site 13	Heat and Power Plant	EX/D and MNA/LUC ¹

Site Number and Name		Action
Site 15	Fuel Pipeline	EX/D and MNA/LUC ¹
Site 16	Paint and Dope Storage	EX/D
Site 19	Auto Maintenance	EX/D and MNA/LUC ¹
Site 21	Wastewater Tank	EX/D
Site 27	Diesel Fuel Pump	EX/D and MNA/LUC ¹
Site 28	Drainage Basin	EX/D
Site 29	Suqitughneq River	Incidental Debris Removal
Site 31	White Alice Communications	EX/D
Site 32	Lower Tramway	EX/D

Notes:

EX/D – Excavation with disposal or treatment

MNA/LUC – Monitored natural attenuation with land use controls

C/LUC – Capping with land use controls

¹Although chemical oxidation was identified as the primary remedy in the decision document, it was not implemented. The decision document contingency remedy, excavation of soil and monitored natural attenuation of groundwater, will be implemented.

COMMUNITY INVOLVEMENT

The community is encouraged to participate in the review process. A public meeting to review the five-year review process will be held at the Savoonga City Hall on 11 April 2018 at 2:00 pm. For those in other locations, please join us via teleconference using the toll free call-in number:

Toll Free Call-in Number: 1-855-209-1113

Access Code: 9077513429

Public comments may be provided immediately following a public meeting in Savoonga, or by responding to a written questionnaire through August 2018. The questionnaire can be requested from and comments submitted to:

Kevin Maher, Jacobs Engineering Group Inc.
949 E. 36th Ave Suite 500
Anchorage, AK 99508
kevin.maher@jacobs.com (907) 762-1500

Publisher's Affidavit

Publisher's Affidavit

UNITED STATES OF AMERICA,

State Of Alaska

Second Division

SS:

Rils Hahn, being first duly

sworn on oath deposes and says:

That I am and was at all times herein this affidavit mentioned,

Ad manager

of THE NOME NUGGET, a

newspaper of general circulation and published weekly at

Nome, Second Division, State of Alaska, and online that

the US Army Corps of Engineers
announces Start of Five-Year Review

a printed copy of which is hereto annexed, was published

in said paper once and every week for one

successive and consecutive weeks in the issues of the following

dates:

3.29.2018

[Signature]

SUBSCRIBED and SWORN to before me this

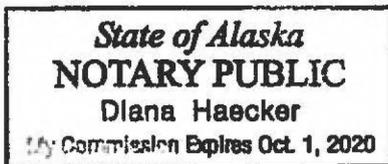
29 day of March, 2018

NOTARY PUBLIC in and for the

State of Alaska.

My commission expires

Oct 1. 2020



[Signature]

US Army Corps of Engineers Announces Start of Five-Year Review

The United States Army Corps of Engineers at Joint Base Elmendorf-Richardson (JBER) announces the beginning of the Five-Year Review of cleanup remedies being implemented at the Northeast Cape Formerly Used Defense Site located on St. Lawrence Island, Alaska.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 121, and the National Contingency Plan require that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure be subject to a five-year review.

The purpose of the Five-Year Review is to evaluate whether the remedies selected to clean up contaminated sites are operating as designed and remain protective of human health and the environment.

The community is encouraged to participate in the review process. A public meeting to review the five-year review process will be held at the Savoonga City Hall on 11 April 2018 at 2:00 pm.

Detailed information concerning the Northeast Cape cleanup effort is available at the following information repositories:

**Alaska Resources Library & Information Services,
University of Alaska, Anchorage
3211 Providence Drive
(907) 786-1871**

**Savoonga City Hall
(907) 984-6614**

**Gambell Sivuqaq Lodge
(907) 985-5335**

The findings of the Five-Year Review will be available after February 2020.

Interested persons can participate in the Five-Year Review process through August 2018 by responding to a questionnaire available from:

**Kevin Maher, Jacobs Engineering
949 E 36th, Suite 500
Anchorage, AK 99508
kevin.maher@jacobs.com (907) 762-1500**

Information on the cleanup process is shared with interested persons through periodic Northeast Cape public meetings held in Savoonga, Alaska. If you would like to be added to the contact list, then please contact USACE Public Affairs at (907) 753-2615 or POA-FUDS@usace.army.mil

Certified Receipts

7017 0530 0000 9548 3240

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

SAVONGA, AK 99739

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$3.95

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3226

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

SAVONGA, AK 99739

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$3.95

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3189

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

SAVONGA, AK 99739

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$6.70

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3233

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

GAMBELL, AK 99742

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$3.95

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3172

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

HEALD, AK 99743

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$3.95

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3196

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
 Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

ANCHORAGE, AK 99501

OFFICIAL USE

Certified Mail Fee	\$3.45
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.50
Total Postage and Fees	\$3.95

Sent To _____
 Street and Apt. No., or PO Box No. _____
 City, State, ZIP+4® _____

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3219

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

GAMBELL, AK 99742 OFFICIAL USE

Certified Mail Fee	\$3.45	0502
\$	\$0.00	09
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$0.50	
\$		
Total Postage and Fees	\$3.95	
\$		



Sent To
 Street and Apt. No., or PO Box No.
 City, State, ZIP+4®
 PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 0530 0000 9548 3219

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

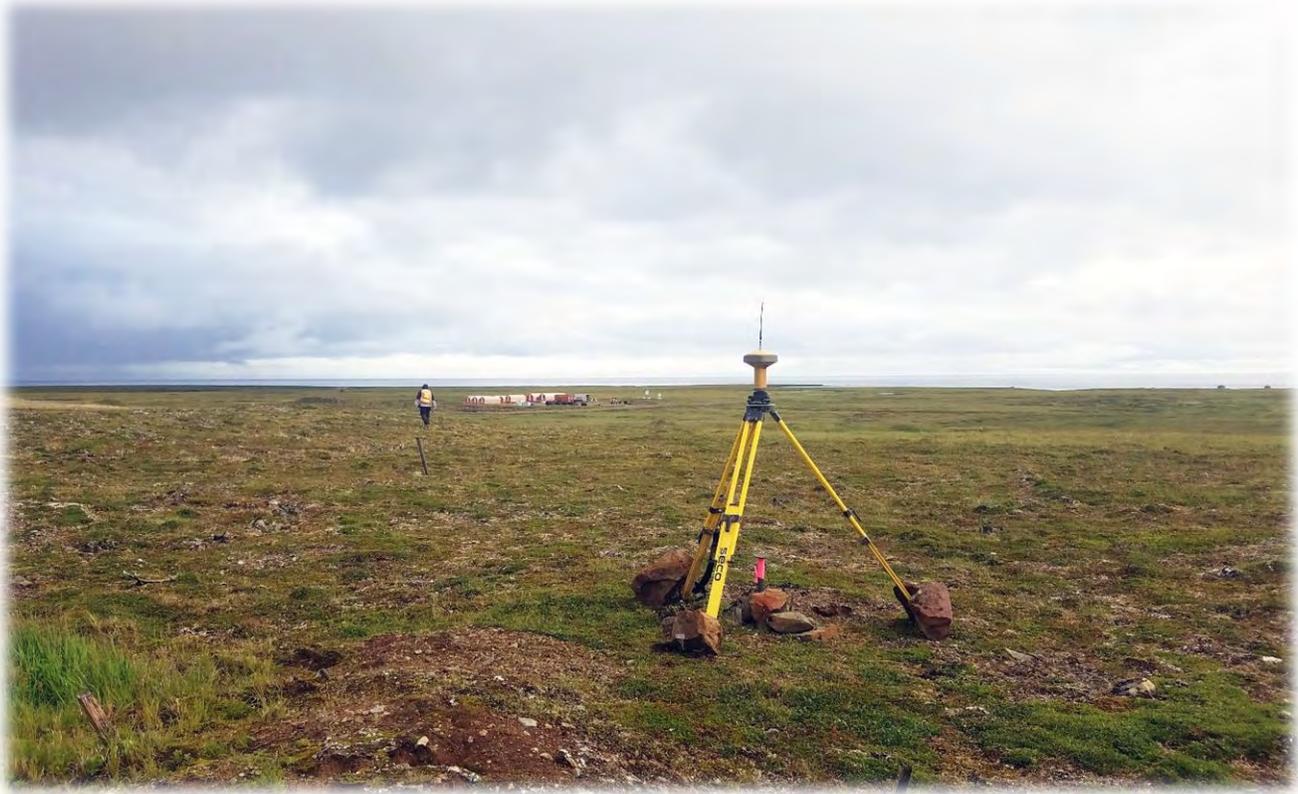
SAVDONGA, AK 99789 OFFICIAL USE

Certified Mail Fee	\$3.45	0502
\$	\$0.00	09
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$0.50	
\$		
Total Postage and Fees	\$3.95	
\$		



Sent To
 Street and Apt. No., or PO Box No.
 City, State, ZIP+4®
 PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

APPENDIX F
Survey Report



Northeast Cape Remedial Action Topographic Survey

Final Project Report

August, 2018

Contractor Job Number:

W911KB18F0020

Project Coordinates:

Latitude: 63°18'37.79"N

Longitude: 168°57'47.72"W

This page intentionally left blank.

Table of Contents

1. PROJECT DESCRIPTION	1
2. SURVEY CONTROL SUMMARY	1
3. SURVEY REDUCTION NARRATIVE.....	3
4. ISSUES AND PROBLEMS ENCOUNTERED.....	3
5. CHECK SHOT / QUALITY REPORTS.....	4
5.1 RTK Check Shots on Project Control	4
5.2 RTK Observation Quality	5
6. LEVEL REDUCTION REPORTS.....	41
7. TRAVERSE ADJUSTMENT REPORTS	42
8. SURVEY QUALITY	43

1. Project Description

Project Overview and Summary

Work for this project will be performed by Lounsbury & Associates, Inc. (Lounsbury) under contract to Environmental Compliance Consultants (ECC). The purpose of this survey will be to provide surveying and mapping support as discussed in the Northeast Cape Remedial Action Statement of Work dated November 8, 2017. Specific survey goals included tying into existing survey control and supplementing it as necessary, perform cross sections and a small topographic survey at Site #7, stake sample spots at Sites #7 and #28, and survey the edge of water at Site #28. Fieldwork for this survey was completed by Lounsbury & Associates, Inc. during August 2018.

USACE Contract Number: W911KB-17-D-0017

Horizontal Datum and Epoch:

The horizontal datum and epoch for the Survey is NAD83 (2011) (EPOCH: 2010.00). Coordinates have been provided in UTM Zone 2N, Alaska State Plane Zone 9 (U.S. Survey Feet), and in other datums in the project data table, per agreed-upon scope of work.

Vertical Datum and Epoch:

The vertical datum for the survey is NAVD 88, GEOID 12B. Elevations on project control were determined by GPS elevation transfer. The average of multiple NGS OPUS solutions, observed over different days, was held fixed for each project control point. The integrity of these elevations were confirmed with multiple RTK and static GPS checks.

Number of New Monuments Set:

This survey set one new project control monument and provided updated coordinates on four existing project control monuments.

2. Survey Control Summary

Primary Horizontal and Vertical Control Points:

The table on the following page lists the project primary horizontal and vertical control points.

Primary Horizontal and Vertical Control Points											
Field Survey Point ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing (Alaska State Plane Zone 9, U.S. Survey Feet)	Easting (Alaska State Plane Zone 9, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor
1	63°19'32.47895"N	168°58'15.32269"W	63°19'32.49446"N	168°58'15.23687"W	7023485.424	601618.564	3409053.356	1809572.561	28.409	8.659	CP 1 RTK BASE
2	63°18'57.69975"N	168°57'18.33986"W	63°18'57.71525"N	168°57'18.25406"W	7022434.584	602445.407	3405563.115	1812231.739	51.535	15.708	CRBC
59	63°20'08.83006"N	168°56'24.47121"W	63°20'08.84555"N	168°56'24.38532"W	7024659.259	603124.127	3412827.77	1814572.558	5.248	1.599	CBC
603	63°18'58.70241"N	168°56'27.27211"W	63°18'58.71790"N	168°56'27.18629"W	7022488.35	603154.891	3405703.216	1814562.383	78.814	24.023	BM B NGS
2600	63°18'42.73235"N	168°57'29.95052"W	63°18'42.74785"N	168°57'29.86474"W	7021966.361	602298.622	3404034.336	1811726.161	72.924	22.227	CRB

Static Processing

Lounsbury & Associates used the NGS OPUS Utility to process all static baselines and obtain the geodetic positions of project control. Values were obtained by averaging multiple solutions on each point, all of which were based upon at least two hours of static GPS observation time. Observations were obtained over multiple days and at different times each day in order to incorporate different satellite geometry. The integrity of the xyz positions on each control point were confirmed through multiple RTK checkshots on each point.

Checkshots / Other Control Points:

The primary control points listed in the table on the previous page were the only control points utilized for this survey.

3. Survey Reduction Narrative

Procedures Used and Survey Control Held:

The survey found several issues with the existing project control. Record coordinates on points derived from “Eco-Land” Surveys were listed as Alaska State Plane Zone 9, but initial field checks found this to be wrong. Most of the control set from that survey was found to be too sloppy to use. Furthermore, our OPUS solutions on Point #1 differed from the “Eco-Land” position by approximately 0.7’; while our OPUS solutions matched the published position of Point #59 by approximately 0.08’. It was determined that, given the issues with the existing control values and the high latitude of the project site, averaged OPUS solutions should be used on all project control in order to provide the most defensible, up-to-date geodetic coordinates of each control point. The coordinates of each project control point have thus been updated according to the mean OPUS values on each point.

RTK topographic survey data was processed using Topcon Magnet Ver 5.0.1 software. A large number of check shots were performed to ensure good on-the-fly initialization, and to rule out systematic errors. The vast majority of RTK check shots were under 0.10’ magnitude in XYZ with a small percentage of outliers, all within the RTK precision specifications of the equipment used. ASCII points were generated in Topcon Magnet software after reviewing the checkshot report and RTK system statistics reports. These reports have been included in the submitted deliverable package and are referenced in this report document.

Survey deliverables were then generated according to the specifications listed in the USACE Alaska District – Environmental Program Manual For Electronic Deliverables, April 2017.

4. Issues and Problems Encountered

Other than the discrepancies found with existing “Eco-Land” control described in Section 3 of this report, no significant issues or problems were encountered in this survey.

5. Check Shot / Quality Reports

5.1 RTK Check Shots on Project Control

From	To	Forward Azimuth	Backward Azimuth	Geodetic Dist. (USft)	Ground Dist. (USft)	Slope Dist. (USft)
5002	59_Mean_OPUS	305°20'12.0274"	125°20'12.0274"	0.016	0.016	0.02
5421	1_Mean_OPUS	70°09'22.3000"	250°09'22.3001"	0.028	0.028	0.038
10001	1_Mean_OPUS	65°16'41.7923"	245°16'41.7923"	0.011	0.011	0.041
10004	59_Mean_OPUS	322°11'09.9037"	142°11'09.9036"	0.014	0.014	0.05
5006	2600_Mean_OPUS	208°28'50.0765"	28°28'50.0763"	0.031	0.031	0.052
5115	59_Mean_OPUS	2°10'08.8688"	182°10'08.8688"	0.037	0.037	0.052
5228	1_Mean_OPUS	9°17'14.9805"	189°17'14.9806"	0.007	0.007	0.074
10136	59_Mean_OPUS	343°59'55.2779"	163°59'55.2778"	0.021	0.021	0.079
5009	1_Mean_OPUS	35°02'46.5820"	215°02'46.5820"	0.009	0.009	0.079
10236	2_Mean_OPUS	210°52'25.3985"	30°52'25.3984"	0.015	0.015	0.103
5231	2_Mean_OPUS	242°16'27.2284"	62°16'27.2283"	0.02	0.02	0.105
5229	2_Mean_OPUS	326°09'36.8126"	146°09'36.8123"	0.043	0.043	0.105
10519	GPS_2_OPUS	225°43'35.2393"	45°43'35.2389"	0.057	0.057	0.107
10003	2_Mean_OPUS	341°47'29.2983"	161°47'29.2981"	0.036	0.036	0.108
5114	2600_Mean_OPUS	287°32'45.0001"	107°32'45.0001"	0.03	0.03	0.117
10235	2_Mean_OPUS	293°36'20.6271"	113°36'20.6270"	0.05	0.05	0.12
5387	2600_Mean_OPUS	200°16'34.6263"	20°16'34.6260"	0.062	0.062	0.12
10234	2_Mean_OPUS	269°56'15.5115"	89°56'15.5115"	0.027	0.027	0.12
10002	2600_Mean_OPUS	218°10'29.4533"	38°10'29.4532"	0.023	0.023	0.12
10520	2600_Mean_OPUS	208°51'32.0517"	28°51'32.0514"	0.04	0.04	0.127
10135	2_Mean_OPUS	298°19'17.4252"	118°19'17.4251"	0.018	0.018	0.136
5391	GPS_2_OPUS	211°52'20.4448"	31°52'20.4442"	0.079	0.079	0.142

From	To	Forward Azimuth	Backward Azimuth	Geodetic Dist. (USft)	Ground Dist. (USft)	Slope Dist. (USft)
5394	2_Mean_OPUS	129°37'22.3715"	309°37'22.3716"	0.019	0.019	0.243
5420	2_Mean_OPUS	322°10'05.7059"	142°10'05.7057"	0.026	0.026	0.256
5392	2_Mean_OPUS	63°59'24.8944"	243°59'24.8945"	0.014	0.014	0.481
5393	2_Mean_OPUS	327°19'59.4012"	147°19'59.4010"	0.025	0.025	0.495

5.2 RTK Observation Quality

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
1_Mean_OPUS-5002	3774.405	5000.011	-23.214	0.012	0.015
1_Mean_OPUS-5003	3575.944	4892.167	-23.431	0.013	0.016
1_Mean_OPUS-5003	3575.954	4892.157	-23.435	0.013	0.016
1_Mean_OPUS-5004	3322.317	4700.852	-23.927	0.012	0.015
1_Mean_OPUS-5004	3322.324	4700.84	-23.938	0.012	0.015
1_Mean_OPUS-5005	-5424.463	423.411	47.584	0.011	0.013
1_Mean_OPUS-5006	-5019.003	2153.621	45.16	0.012	0.014
1_Mean_OPUS-5006	-5018.993	2153.614	45.162	0.012	0.014
1_Mean_OPUS-5007	-5418.432	1702.719	66.116	0.013	0.017
1_Mean_OPUS-5008	-7878.646	2407.138	212.354	0.014	0.016
1_Mean_OPUS-5008	-7878.622	2407.162	212.356	0.013	0.015
603_Mean_OPUS-5001	3305.88	2620.741	-52.192	0.011	0.014
603_Mean_OPUS-5009	3350.133	-4989.827	-48.56	0.018	0.033
603_Mean_OPUS-5010	-1382.478	-3696.888	-19.087	0.017	0.027
603_Mean_OPUS-5011	-1394.685	-3677.133	-19.074	0.011	0.015
603_Mean_OPUS-5012	-1409.686	-3667.085	-19.055	0.011	0.014
603_Mean_OPUS-5013	-1407.245	-3657.459	-19.1	0.012	0.015
603_Mean_OPUS-5014	-1394.93	-3653.609	-19.138	0.012	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5015	-1378.828	-3649.477	-19.098	0.011	0.014
603_Mean_OPUS-5016	-1364.455	-3653.827	-19.078	0.011	0.014
603_Mean_OPUS-5017	-1364.81	-3669.486	-19.119	0.012	0.015
603_Mean_OPUS-5018	-1354.356	-3678.788	-19.057	0.011	0.014
603_Mean_OPUS-5019	-1357.804	-3685.786	-19.109	0.011	0.014
603_Mean_OPUS-5020	-1377.675	-3695.28	-19.064	0.011	0.014
603_Mean_OPUS-5021	-1370.141	-3588.193	-18.173	0.018	0.026
603_Mean_OPUS-5022	-1372.319	-3578.998	-18.216	0.018	0.026
603_Mean_OPUS-5023	-1364.065	-3566.953	-18.177	0.018	0.026
603_Mean_OPUS-5024	-1345.531	-3571.082	-18.193	0.018	0.026
603_Mean_OPUS-5025	-1338.042	-3554.454	-18.149	0.018	0.026
603_Mean_OPUS-5026	-1322.789	-3545.684	-18.192	0.018	0.026
603_Mean_OPUS-5027	-1314.94	-3554.082	-18.216	0.018	0.026
603_Mean_OPUS-5028	-1324.361	-3572.78	-18.146	0.018	0.026
603_Mean_OPUS-5029	-1339.302	-3578.247	-18.079	0.018	0.026
603_Mean_OPUS-5030	-1356.395	-3585.042	-18.248	0.018	0.026
603_Mean_OPUS-5031	-1401.479	-3405.184	-18.522	0.013	0.018
603_Mean_OPUS-5032	-1386.454	-3398.304	-18.496	0.013	0.018
603_Mean_OPUS-5033	-1383.109	-3385.869	-18.522	0.013	0.018
603_Mean_OPUS-5034	-1400.734	-3375.255	-18.516	0.013	0.018
603_Mean_OPUS-5035	-1415.174	-3366.668	-18.41	0.014	0.019
603_Mean_OPUS-5036	-1428.924	-3372.479	-18.412	0.013	0.018
603_Mean_OPUS-5037	-1417.508	-3390.27	-18.498	0.013	0.018
603_Mean_OPUS-5038	-1339.349	-3462.828	-19.444	0.013	0.017
603_Mean_OPUS-5039	-1336.475	-3445.568	-19.413	0.013	0.017
603_Mean_OPUS-5040	-1321.827	-3442.687	-19.409	0.012	0.016

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5041	-1309.704	-3454.94	-19.394	0.012	0.016
603_Mean_OPUS-5042	-1312.02	-3464.9	-19.539	0.012	0.016
603_Mean_OPUS-5043	-1324.833	-3463.467	-19.44	0.012	0.016
603_Mean_OPUS-5044	-1136.211	-3623.722	-21.98	0.011	0.013
603_Mean_OPUS-5045	-1138.433	-3622.075	-21.961	0.011	0.013
603_Mean_OPUS-5046	-1137.061	-3626.602	-21.982	0.011	0.013
603_Mean_OPUS-5047	-1127.568	-3622.953	-22.216	0.011	0.013
603_Mean_OPUS-5048	-1129.579	-3622.894	-22.237	0.011	0.013
603_Mean_OPUS-5049	-1128.093	-3619.089	-22.294	0.011	0.013
603_Mean_OPUS-5050	-1126.715	-3619.856	-22.364	0.011	0.013
603_Mean_OPUS-5051	-1122.438	-3617.869	-22.393	0.011	0.013
603_Mean_OPUS-5052	-1123.324	-3613.781	-22.462	0.012	0.014
603_Mean_OPUS-5053	-1118.008	-3614.809	-22.423	0.011	0.013
603_Mean_OPUS-5054	-1121.164	-3618.711	-22.42	0.011	0.013
603_Mean_OPUS-5055	-1118.112	-3621.759	-22.807	0.011	0.013
603_Mean_OPUS-5056	-1115.78	-3624.3	-23.326	0.011	0.013
603_Mean_OPUS-5057	-1116.777	-3626.413	-23.349	0.014	0.016
603_Mean_OPUS-5058	-1121.215	-3628.61	-23.183	0.011	0.013
603_Mean_OPUS-5059	-1120.948	-3633.823	-23.166	0.011	0.013
603_Mean_OPUS-5060	-1118.101	-3633.473	-23.25	0.011	0.013
603_Mean_OPUS-5061	-1118.076	-3630.257	-23.19	0.011	0.013
603_Mean_OPUS-5062	-1116.153	-3627.365	-23.394	0.011	0.013
603_Mean_OPUS-5063	-1114.449	-3626.483	-23.407	0.011	0.013
603_Mean_OPUS-5064	-1111.087	-3626.506	-23.466	0.012	0.014
603_Mean_OPUS-5065	-1106.492	-3626.128	-23.777	0.012	0.014
603_Mean_OPUS-5066	-1102.805	-3624.455	-24.138	0.011	0.012

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5067	-1096.092	-3617.693	-24.241	0.011	0.012
603_Mean_OPUS-5068	-1114.508	-3616.996	-22.537	0.011	0.012
603_Mean_OPUS-5069	-1106.543	-3618.406	-24.148	0.011	0.012
603_Mean_OPUS-5070	-1098.799	-3615.287	-24.127	0.011	0.012
603_Mean_OPUS-5071	-1115.421	-3617.635	-22.482	0.011	0.012
603_Mean_OPUS-5072	-1116.27	-3620.644	-22.975	0.011	0.012
603_Mean_OPUS-5073	-1114.4	-3623.729	-23.441	0.011	0.012
603_Mean_OPUS-5074	-1111.307	-3625.126	-23.438	0.011	0.012
603_Mean_OPUS-5075	-1106.867	-3625.262	-23.858	0.011	0.012
603_Mean_OPUS-5076	-1106.827	-3620.298	-24.107	0.011	0.012
603_Mean_OPUS-5077	-1086.819	-3611.26	-24.716	0.01	0.011
603_Mean_OPUS-5078	-1077.356	-3612.344	-24.844	0.01	0.011
603_Mean_OPUS-5079	-1069.345	-3611.635	-25.117	0.011	0.012
603_Mean_OPUS-5080	-1061.414	-3611.136	-25.472	0.011	0.012
603_Mean_OPUS-5081	-1059.247	-3609.097	-25.485	0.011	0.012
603_Mean_OPUS-5082	-1058.097	-3604.481	-25.537	0.011	0.013
603_Mean_OPUS-5083	-1055.7	-3600.536	-25.557	0.011	0.013
603_Mean_OPUS-5084	-1038.943	-3596.017	-26.196	0.011	0.013
603_Mean_OPUS-5085	-1030.01	-3598.582	-26.898	0.011	0.013
603_Mean_OPUS-5086	-1017.539	-3591.352	-27.273	0.011	0.013
603_Mean_OPUS-5087	-1013.945	-3588.356	-27.487	0.011	0.013
603_Mean_OPUS-5088	-1011.797	-3586.312	-27.731	0.011	0.013
603_Mean_OPUS-5089	-1009.107	-3584.365	-27.968	0.011	0.013
603_Mean_OPUS-5090	-1004.523	-3588.091	-28.153	0.011	0.013
603_Mean_OPUS-5091	-995.181	-3588.872	-28.748	0.011	0.013
603_Mean_OPUS-5092	-996.649	-3611.306	-29.003	0.011	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5093	-998.238	-3612.534	-29.046	0.011	0.013
603_Mean_OPUS-5094	-997.69	-3614.035	-29.073	0.011	0.013
603_Mean_OPUS-5095	-995.77	-3613.47	-29.094	0.011	0.013
603_Mean_OPUS-5096	-989.631	-3590.565	-29.6	0.011	0.013
603_Mean_OPUS-5097	-984.856	-3593.787	-29.998	0.011	0.013
603_Mean_OPUS-5098	-983.498	-3598.726	-30.14	0.011	0.013
603_Mean_OPUS-5099	-977.198	-3606.788	-30.209	0.011	0.013
603_Mean_OPUS-5100	-969.449	-3603.688	-30.282	0.012	0.013
603_Mean_OPUS-5101	-961.904	-3602.186	-30.275	0.011	0.013
603_Mean_OPUS-5102	-954.441	-3599.272	-30.505	0.011	0.013
603_Mean_OPUS-5103	-947.001	-3598.69	-30.738	0.011	0.013
603_Mean_OPUS-5104	-938.545	-3591.828	-30.858	0.011	0.013
603_Mean_OPUS-5105	-938.391	-3588.714	-30.897	0.011	0.013
603_Mean_OPUS-5106	-937.009	-3586.514	-30.891	0.011	0.013
603_Mean_OPUS-5107	-928.999	-3580.431	-30.919	0.011	0.013
603_Mean_OPUS-5108	-927.785	-3574.427	-30.921	0.011	0.013
603_Mean_OPUS-5109	-928.915	-3570.71	-31.052	0.011	0.013
603_Mean_OPUS-5110	-922.907	-3566.682	-31.391	0.011	0.013
603_Mean_OPUS-5111	-916.159	-3565.391	-31.579	0.011	0.013
603_Mean_OPUS-5112	-909.059	-3560.881	-32.198	0.011	0.013
603_Mean_OPUS-5113	-896.37	-3555.103	-32.389	0.012	0.014
603_Mean_OPUS-5114	-1668.888	-2836.194	-4.12	0.012	0.014
603_Mean_OPUS-5115	7124.517	10.174	-72.321	0.012	0.015
603_Mean_OPUS-5116	-893.294	-3548.971	-32.301	0.018	0.033
603_Mean_OPUS-5117	-883.178	-3545.074	-32.559	0.012	0.015
603_Mean_OPUS-5118	-868.317	-3541.973	-32.785	0.012	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5119	-852.188	-3550.366	-33.011	0.012	0.014
603_Mean_OPUS-5120	-844.77	-3560.172	-33.122	0.012	0.014
603_Mean_OPUS-5121	-826.66	-3558.889	-33.141	0.012	0.014
603_Mean_OPUS-5122	-811.723	-3561.067	-33.122	0.012	0.014
603_Mean_OPUS-5123	-798.926	-3567.485	-33.014	0.013	0.015
603_Mean_OPUS-5124	-792.081	-3568.802	-33.128	0.012	0.014
603_Mean_OPUS-5125	-784.577	-3564.061	-33.001	0.012	0.014
603_Mean_OPUS-5126	-782.6	-3555.208	-32.996	0.013	0.015
603_Mean_OPUS-5127	-792.788	-3551.667	-33.039	0.013	0.015
603_Mean_OPUS-5128	-791.775	-3547.733	-33.049	0.013	0.015
603_Mean_OPUS-5129	-787.568	-3547.375	-33.035	0.012	0.014
603_Mean_OPUS-5130	-786.327	-3541.551	-33.054	0.012	0.014
603_Mean_OPUS-5131	-787.77	-3535.988	-33.03	0.012	0.014
603_Mean_OPUS-5132	-785.543	-3534.229	-33	0.012	0.014
603_Mean_OPUS-5133	-779.413	-3532.076	-33.074	0.013	0.015
603_Mean_OPUS-5134	-772.263	-3528.826	-33.033	0.012	0.014
603_Mean_OPUS-5135	-763.068	-3527.799	-33.069	0.012	0.014
603_Mean_OPUS-5136	-752.951	-3535.587	-33.097	0.012	0.014
603_Mean_OPUS-5137	-734.735	-3530.684	-33.137	0.013	0.015
603_Mean_OPUS-5138	-715.503	-3523.07	-33.088	0.012	0.014
603_Mean_OPUS-5139	-699.348	-3509.587	-33.066	0.012	0.014
603_Mean_OPUS-5140	-697.006	-3496.828	-33.018	0.012	0.014
603_Mean_OPUS-5141	-693.108	-3492.287	-33.076	0.013	0.015
603_Mean_OPUS-5142	-683.219	-3486.761	-33.131	0.012	0.014
603_Mean_OPUS-5143	-676.213	-3486.77	-33.283	0.012	0.014
603_Mean_OPUS-5144	-671.045	-3490.762	-33.266	0.012	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5145	-666.97	-3489.181	-33.272	0.012	0.014
603_Mean_OPUS-5146	-658.941	-3485.506	-33.668	0.012	0.014
603_Mean_OPUS-5147	-649.812	-3483.815	-33.81	0.013	0.015
603_Mean_OPUS-5148	-638.075	-3492.344	-33.822	0.012	0.014
603_Mean_OPUS-5149	-622.415	-3497.149	-33.815	0.013	0.015
603_Mean_OPUS-5150	-610.348	-3490.814	-33.822	0.012	0.015
603_Mean_OPUS-5151	-602.534	-3474.776	-33.771	0.013	0.015
603_Mean_OPUS-5152	-593.093	-3471.612	-33.832	0.012	0.015
603_Mean_OPUS-5153	-591.393	-3467.056	-33.873	0.012	0.014
603_Mean_OPUS-5154	-570.064	-3471.118	-33.996	0.012	0.015
603_Mean_OPUS-5155	-576.138	-3476.597	-34.001	0.012	0.014
603_Mean_OPUS-5156	-580.907	-3473.834	-33.962	0.012	0.014
603_Mean_OPUS-5157	-578.96	-3467.721	-33.988	0.012	0.014
603_Mean_OPUS-5158	-572.755	-3466.313	-34.02	0.012	0.014
603_Mean_OPUS-5159	-541.862	-3470.672	-34.61	0.011	0.014
603_Mean_OPUS-5160	-540.416	-3473.298	-34.532	0.011	0.014
603_Mean_OPUS-5161	-527.058	-3467.105	-35.244	0.011	0.014
603_Mean_OPUS-5162	-515.909	-3459.041	-35.4	0.011	0.014
603_Mean_OPUS-5163	-507.494	-3451.465	-35.547	0.012	0.015
603_Mean_OPUS-5164	-500.96	-3455.601	-35.574	0.012	0.014
603_Mean_OPUS-5165	-496.568	-3453.221	-35.615	0.011	0.014
603_Mean_OPUS-5166	-494.836	-3447.873	-35.664	0.011	0.014
603_Mean_OPUS-5167	-486.092	-3442.67	-35.777	0.011	0.014
603_Mean_OPUS-5168	-471.822	-3438.634	-35.92	0.012	0.014
603_Mean_OPUS-5169	-455.168	-3435.699	-36.038	0.012	0.014
603_Mean_OPUS-5170	-440.391	-3430.205	-36.136	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5171	-422.601	-3426.317	-36.449	0.011	0.014
603_Mean_OPUS-5172	-415.157	-3428.295	-36.589	0.011	0.014
603_Mean_OPUS-5173	-408.389	-3435.581	-36.66	0.011	0.013
603_Mean_OPUS-5174	-397.247	-3440.28	-36.731	0.011	0.014
603_Mean_OPUS-5175	-383.062	-3438.459	-36.756	0.011	0.014
603_Mean_OPUS-5176	-368.652	-3437.723	-36.871	0.011	0.014
603_Mean_OPUS-5177	-359.101	-3435.68	-36.871	0.011	0.013
603_Mean_OPUS-5178	-352.722	-3425.116	-36.934	0.011	0.013
603_Mean_OPUS-5179	-353.729	-3415.606	-36.984	0.011	0.013
603_Mean_OPUS-5180	-351.901	-3411.644	-36.973	0.011	0.014
603_Mean_OPUS-5181	-342.324	-3407.827	-37.086	0.011	0.013
603_Mean_OPUS-5182	-332.642	-3406.631	-37.142	0.011	0.014
603_Mean_OPUS-5183	-321.416	-3407.434	-37.249	0.011	0.013
603_Mean_OPUS-5184	-312.29	-3408.045	-37.331	0.011	0.013
603_Mean_OPUS-5185	-299.807	-3407.026	-37.326	0.011	0.013
603_Mean_OPUS-5186	-292.541	-3408.949	-37.334	0.011	0.013
603_Mean_OPUS-5187	-283.989	-3406.689	-37.375	0.011	0.014
603_Mean_OPUS-5188	-277.513	-3396.896	-37.397	0.011	0.013
603_Mean_OPUS-5189	-273.193	-3390.276	-37.438	0.011	0.013
603_Mean_OPUS-5190	-267.543	-3390.163	-37.458	0.011	0.014
603_Mean_OPUS-5191	-258.204	-3395.315	-37.431	0.011	0.013
603_Mean_OPUS-5192	-242.132	-3392.601	-37.468	0.011	0.013
603_Mean_OPUS-5193	-230.162	-3393.512	-37.717	0.011	0.013
603_Mean_OPUS-5194	-219.737	-3382.721	-37.978	0.011	0.013
603_Mean_OPUS-5195	-208.177	-3386.801	-37.959	0.011	0.014
603_Mean_OPUS-5196	-199.211	-3394.276	-38.099	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5200	-154.486	-3391.835	-38.739	0.011	0.014
603_Mean_OPUS-5201	-147.566	-3397.81	-39.158	0.011	0.013
603_Mean_OPUS-5202	-147.443	-3400.386	-39.23	0.011	0.013
603_Mean_OPUS-5203	-145.248	-3405.768	-39.128	0.011	0.013
603_Mean_OPUS-5204	-139.293	-3403.147	-39.258	0.011	0.013
603_Mean_OPUS-5205	-136.156	-3398.004	-39.158	0.011	0.013
603_Mean_OPUS-5206	-131.886	-3396	-39.171	0.01	0.013
603_Mean_OPUS-5207	-128.426	-3400.179	-39.203	0.01	0.013
603_Mean_OPUS-5208	-124.775	-3405.059	-39.235	0.011	0.013
603_Mean_OPUS-5209	-129.204	-3417.298	-39.191	0.01	0.013
603_Mean_OPUS-5210	-129.915	-3436.061	-39.19	0.011	0.014
603_Mean_OPUS-5211	-126.13	-3454.833	-39.266	0.01	0.013
603_Mean_OPUS-5212	-129.436	-3477.167	-39.302	0.011	0.013
603_Mean_OPUS-5213	-124.746	-3478.003	-39.363	0.011	0.013
603_Mean_OPUS-5214	-123.263	-3455.612	-39.32	0.01	0.013
603_Mean_OPUS-5215	-121.545	-3437.907	-39.267	0.01	0.013
603_Mean_OPUS-5216	-117.155	-3419.169	-39.192	0.01	0.012
603_Mean_OPUS-5217	-113.139	-3401.519	-39.276	0.01	0.012
603_Mean_OPUS-5218	-116.661	-3391.81	-39.181	0.011	0.013
603_Mean_OPUS-5219	-117.414	-3381.691	-39.181	0.011	0.013
603_Mean_OPUS-5220	-114.586	-3368.255	-39.2	0.01	0.012
603_Mean_OPUS-5221	-113.192	-3360.555	-39.225	0.01	0.012
603_Mean_OPUS-5222	-108.652	-3339.991	-39.207	0.011	0.013
603_Mean_OPUS-5223	-108.133	-3332.361	-39.217	0.016	0.019
603_Mean_OPUS-5224	-93.92	-3322.583	-39.213	0.011	0.013
603_Mean_OPUS-5225	-85.385	-3309.439	-39.2	0.011	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5226	-84.881	-3298.043	-39.203	0.01	0.012
603_Mean_OPUS-5227	-88.4	-3283.739	-39.082	0.01	0.012
603_Mean_OPUS-5228	3350.133	-4989.823	-47.442	0.011	0.014
603_Mean_OPUS-5229	-140.136	-2330.62	-24.661	0.013	0.019
603_Mean_OPUS-5230	-140.118	-2330.642	-24.673	0.012	0.015
603_Mean_OPUS-5231	-140.091	-2330.627	-25.209	0.014	0.022
603_Mean_OPUS-5232	506.914	-838.4	2.074	0.011	0.015
603_Mean_OPUS-5232_5233_stk	630.599	-815.911	1.849	0.012	0.015
603_Mean_OPUS-5232_5233_stk1	630.591	-815.941	1.811	0.011	0.014
603_Mean_OPUS-5233	604.423	-820.613	2.32	0.011	0.015
603_Mean_OPUS-5234	615.036	-818.699	2.386	0.011	0.014
603_Mean_OPUS-5235	625.476	-816.706	1.912	0.012	0.015
603_Mean_OPUS-5236	634.523	-815.115	1.83	0.011	0.014
603_Mean_OPUS-5237	644.097	-813.271	1.143	0.011	0.014
603_Mean_OPUS-5238	654.637	-811.633	0.355	0.011	0.014
603_Mean_OPUS-5239	664.759	-809.672	0.146	0.011	0.014
603_Mean_OPUS-5240	685.87	-805.79	-0.94	0.011	0.014
603_Mean_OPUS-5241	708.22	-801.644	-2.484	0.011	0.014
603_Mean_OPUS-5242	729.892	-797.719	-4.673	0.011	0.014
603_Mean_OPUS-5243	751.571	-793.769	-7.297	0.011	0.014
603_Mean_OPUS-5244	770.781	-790.187	-10.408	0.01	0.013
603_Mean_OPUS-5245	791.077	-786.605	-13.873	0.011	0.014
603_Mean_OPUS-5246	813.044	-782.532	-16.252	0.01	0.012
603_Mean_OPUS-5247	829.963	-779.51	-18.694	0.01	0.013
603_Mean_OPUS-5248	852.783	-775.149	-20.803	0.011	0.013
603_Mean_OPUS-5249	876.618	-770.98	-22.089	0.01	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5250	899.881	-766.641	-22.778	0.011	0.014
603_Mean_OPUS-5251	925.072	-762.072	-23.958	0.011	0.014
603_Mean_OPUS-5252	601.315	-821.235	1.989	0.011	0.014
603_Mean_OPUS-5253	598.823	-821.663	1.518	0.01	0.013
603_Mean_OPUS-5254	595.964	-822.138	1.631	0.01	0.013
603_Mean_OPUS-5255	593.708	-822.62	1.838	0.011	0.014
603_Mean_OPUS-5256	590.281	-823.222	2.198	0.01	0.013
603_Mean_OPUS-5257	586.89	-823.736	2.323	0.01	0.013
603_Mean_OPUS-5258	584.475	-824.284	2.341	0.011	0.014
603_Mean_OPUS-5259	581.257	-824.855	2.113	0.011	0.014
603_Mean_OPUS-5260	577.808	-825.433	2.273	0.01	0.013
603_Mean_OPUS-5261	574.198	-826.112	2.648	0.01	0.013
603_Mean_OPUS-5262	569.458	-827.021	2.972	0.01	0.013
603_Mean_OPUS-5263	565.521	-827.744	2.967	0.011	0.014
603_Mean_OPUS-5264	561.238	-828.492	2.932	0.01	0.013
603_Mean_OPUS-5265	556.253	-829.325	2.835	0.011	0.014
603_Mean_OPUS-5266	552.553	-830.176	2.847	0.01	0.013
603_Mean_OPUS-5267	549.336	-830.645	2.63	0.011	0.013
603_Mean_OPUS-5268	545.978	-831.319	2.555	0.011	0.014
603_Mean_OPUS-5269	542.655	-831.831	2.213	0.011	0.013
603_Mean_OPUS-5270	539.891	-832.282	1.676	0.011	0.014
603_Mean_OPUS-5271	536.727	-832.942	1.654	0.011	0.013
603_Mean_OPUS-5272	533.832	-833.472	1.687	0.011	0.014
603_Mean_OPUS-5273	530.667	-834.044	1.684	0.011	0.014
603_Mean_OPUS-5274	527.881	-834.627	1.643	0.011	0.013
603_Mean_OPUS-5275	524.829	-835.074	1.654	0.011	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5276	521.061	-835.772	1.582	0.011	0.013
603_Mean_OPUS-5277	518.21	-836.368	1.502	0.011	0.013
603_Mean_OPUS-5278	518.127	-836.464	1.487	0.01	0.012
603_Mean_OPUS-5279	514.338	-836.991	1.545	0.011	0.013
603_Mean_OPUS-5280	510.705	-837.78	1.921	0.01	0.012
603_Mean_OPUS-5281	503.733	-839.062	2.008	0.01	0.012
603_Mean_OPUS-5282	496.179	-840.36	1.854	0.01	0.012
603_Mean_OPUS-5283	491.344	-841.387	1.65	0.01	0.012
603_Mean_OPUS-5284	486.28	-842.209	1.57	0.01	0.012
603_Mean_OPUS-5285	481.286	-843.12	1.343	0.011	0.013
603_Mean_OPUS-5286	476.368	-843.969	1.345	0.011	0.013
603_Mean_OPUS-5287	466.517	-845.526	1.224	0.01	0.012
603_Mean_OPUS-5288	457.012	-847.581	1.091	0.01	0.012
603_Mean_OPUS-5289	447.18	-849.422	0.765	0.01	0.012
603_Mean_OPUS-5290	437.043	-851.066	0.377	0.01	0.012
603_Mean_OPUS-5291	427.206	-852.971	0.126	0.01	0.012
603_Mean_OPUS-5292	417.61	-854.683	-0.474	0.01	0.012
603_Mean_OPUS-5293	407.073	-856.46	-0.775	0.011	0.013
603_Mean_OPUS-5294	397.24	-858.546	-1.365	0.01	0.012
603_Mean_OPUS-5295	388.029	-860.125	-1.967	0.011	0.013
603_Mean_OPUS-5296	377.459	-862.228	-2.512	0.01	0.012
603_Mean_OPUS-5297	366.819	-863.948	-2.933	0.01	0.012
603_Mean_OPUS-5298	358.14	-865.593	-3.031	0.011	0.013
603_Mean_OPUS-5299	347.881	-867.476	-3.257	0.01	0.012
603_Mean_OPUS-5300	338.572	-869.075	-3.535	0.01	0.013
603_Mean_OPUS-5301	328.559	-870.886	-3.965	0.012	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5302	318.972	-872.599	-4.232	0.018	0.022
603_Mean_OPUS-5303	308.531	-874.505	-4.763	0.012	0.014
603_Mean_OPUS-5304	299.138	-876.278	-5.507	0.012	0.014
603_Mean_OPUS-5305	290.156	-878.014	-6.093	0.014	0.016
603_Mean_OPUS-5306	286.724	-878.37	-6.916	0.014	0.016
603_Mean_OPUS-5307	282.31	-879.235	-6.53	0.013	0.016
603_Mean_OPUS-5308	269.633	-881.804	-6.671	0.016	0.019
603_Mean_OPUS-5309	255.537	-884.151	-7.541	0.01	0.012
603_Mean_OPUS-5310	250.737	-884.968	-8.778	0.031	0.036
603_Mean_OPUS-5311	237.524	-887.531	-9.737	0.017	0.021
603_Mean_OPUS-5312	231.955	-888.55	-10.347	0.015	0.018
603_Mean_OPUS-5313	215.913	-891.446	-13.164	0.015	0.018
603_Mean_OPUS-5314	543.099	-774.945	2.292	0.017	0.02
603_Mean_OPUS-5315	504.358	-912.197	0.967	0.02	0.023
603_Mean_OPUS-5316	439.097	-1143.861	-17.05	0.017	0.02
603_Mean_OPUS-5317	446.208	-1117.791	-15.748	0.016	0.018
603_Mean_OPUS-5318	451.824	-1097.952	-13.93	0.019	0.021
603_Mean_OPUS-5319	456.696	-1081.249	-12.024	0.013	0.015
603_Mean_OPUS-5320	460.269	-1068.298	-8.749	0.025	0.029
603_Mean_OPUS-5321	464.984	-1051.653	-5.734	0.011	0.013
603_Mean_OPUS-5322	470.133	-1033.431	-4.054	0.014	0.016
603_Mean_OPUS-5323	476.663	-1010.226	-2.732	0.01	0.012
603_Mean_OPUS-5324	482.888	-988.18	-1.944	0.011	0.013
603_Mean_OPUS-5325	489.632	-963.802	-0.561	0.011	0.014
603_Mean_OPUS-5326	495.801	-942.017	0.168	0.011	0.014
603_Mean_OPUS-5327	501.546	-921.991	0.776	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5328	506.951	-903.218	1.222	0.011	0.014
603_Mean_OPUS-5329	510.193	-891.369	1.518	0.011	0.014
603_Mean_OPUS-5330	511.234	-887.334	1.596	0.011	0.014
603_Mean_OPUS-5331	512.212	-883.98	1.494	0.011	0.014
603_Mean_OPUS-5332	513.373	-880.365	1.329	0.011	0.014
603_Mean_OPUS-5333	514.286	-877.006	1.196	0.011	0.014
603_Mean_OPUS-5334	515.734	-872.328	1.348	0.011	0.014
603_Mean_OPUS-5335	516.828	-868.2	1.627	0.011	0.014
603_Mean_OPUS-5336	517.918	-864.386	1.821	0.011	0.014
603_Mean_OPUS-5337	519.113	-859.662	1.9	0.011	0.014
603_Mean_OPUS-5338	520.326	-855.685	1.992	0.011	0.014
603_Mean_OPUS-5339	521.489	-850.71	2.118	0.012	0.015
603_Mean_OPUS-5340	522.862	-846.673	1.98	0.012	0.015
603_Mean_OPUS-5341	523.946	-842.452	1.915	0.012	0.015
603_Mean_OPUS-5342	525.018	-838.81	1.718	0.012	0.015
603_Mean_OPUS-5343	526.164	-834.81	1.609	0.012	0.015
603_Mean_OPUS-5344	527.348	-830.977	1.512	0.012	0.015
603_Mean_OPUS-5345	528.441	-827.092	1.198	0.012	0.015
603_Mean_OPUS-5346	529.351	-823.585	1.019	0.012	0.015
603_Mean_OPUS-5347	530.312	-820.431	0.842	0.012	0.015
603_Mean_OPUS-5348	530.785	-818.386	0.918	0.012	0.015
603_Mean_OPUS-5349	531.861	-814.938	1.33	0.012	0.015
603_Mean_OPUS-5350	532.894	-811.538	1.714	0.012	0.015
603_Mean_OPUS-5351	534.822	-804.32	1.976	0.013	0.015
603_Mean_OPUS-5352	538.281	-792.012	2.329	0.013	0.015
603_Mean_OPUS-5353	542.224	-777.718	2.247	0.013	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5354	546.198	-764.051	2.134	0.013	0.016
603_Mean_OPUS-5355	552.259	-743.303	1.688	0.013	0.016
603_Mean_OPUS-5356	558.014	-721.759	0.963	0.013	0.015
603_Mean_OPUS-5357	564.233	-700.004	0.024	0.013	0.015
603_Mean_OPUS-5358	570.755	-677.573	-1.477	0.013	0.015
603_Mean_OPUS-5359	576.733	-655.342	-2.313	0.013	0.015
603_Mean_OPUS-5360	582.882	-633.867	-3.518	0.013	0.015
603_Mean_OPUS-5361	589.89	-608.93	-4.827	0.013	0.016
603_Mean_OPUS-5362	596.388	-585.831	-6.414	0.012	0.015
603_Mean_OPUS-5363	602.503	-563.992	-8.096	0.012	0.015
603_Mean_OPUS-5364	608.605	-542.844	-10.108	0.012	0.015
603_Mean_OPUS-5365	614.481	-521.847	-11.841	0.012	0.015
603_Mean_OPUS-5366	620.72	-500.357	-13.026	0.012	0.015
603_Mean_OPUS-5367	626.885	-478.026	-14.166	0.012	0.015
603_Mean_OPUS-5368	632.694	-457.327	-15.529	0.012	0.015
603_Mean_OPUS-5369	639.717	-431.904	-15.818	0.013	0.016
603_Mean_OPUS-5370	647.109	-406.864	-17.316	0.013	0.016
603_Mean_OPUS-5371	654.143	-380.8	-22.46	0.013	0.017
603_Mean_OPUS-5372	662.063	-353.325	-24.391	0.014	0.017
603_Mean_OPUS-5373	669.939	-326.094	-24.942	0.011	0.012
603_Mean_OPUS-5374	-1625.326	-3703.424	-15.03	0.015	0.019
603_Mean_OPUS-5375	-1623.252	-3701.802	-15.089	0.011	0.014
603_Mean_OPUS-5376	-1621.225	-3697.62	-15.111	0.016	0.02
603_Mean_OPUS-5377	-1618.409	-3694.915	-15.128	0.013	0.017
603_Mean_OPUS-5378	-1612.648	-3694.572	-15.16	0.014	0.018
603_Mean_OPUS-5379	-1607.466	-3691.477	-15.081	0.015	0.019

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-5380	-1608.29	-3686.173	-15.136	0.012	0.015
603_Mean_OPUS-5381	-1614.763	-3685.498	-15.135	0.021	0.027
603_Mean_OPUS-5382	-1622.173	-3683.406	-15.052	0.013	0.016
603_Mean_OPUS-5383	-1626.028	-3684.226	-15.055	0.012	0.015
603_Mean_OPUS-5384	-1628.782	-3684.29	-15.065	0.013	0.016
603_Mean_OPUS-5385	-1630.428	-3692.149	-15.087	0.012	0.016
603_Mean_OPUS-5386	-1629.398	-3700.688	-15.078	0.011	0.014
603_Mean_OPUS-5387	-1668.821	-2836.202	-3.62	0.011	0.014
603_Mean_OPUS-5388	-1504.675	-2524.669	-13.137	0.019	0.022
603_Mean_OPUS-5389	-1735.662	-2427.654	-5.219	0.018	0.021
603_Mean_OPUS-5390	-1612.01	-2226.704	-12.463	0.032	0.037
603_Mean_OPUS-5391	702.114	-1018.341	-4.598	0.011	0.014
603_Mean_OPUS-10001	3350.135	-4989.832	-48.6	0.014	0.018
603_Mean_OPUS-10002	-1668.861	-2836.209	-4.316	0.012	0.015
603_Mean_OPUS-10003	-140.134	-2330.633	-25.053	0.011	0.013
603_Mean_OPUS-10004	7124.543	10.184	-71.793	0.011	0.013
603_Mean_OPUS-10005	-1661.034	-3276.737	-12.915	0.013	0.015
603_Mean_OPUS-10006	-1657.122	-3269.846	-12.931	0.012	0.015
603_Mean_OPUS-10007	-1645.964	-3263.625	-12.926	0.012	0.015
603_Mean_OPUS-10008	-1634.485	-3253.804	-12.934	0.012	0.015
603_Mean_OPUS-10009	-1624.055	-3247.82	-12.887	0.012	0.015
603_Mean_OPUS-10010	-1622.199	-3252.381	-12.964	0.013	0.016
603_Mean_OPUS-10011	-1623.731	-3263.992	-12.894	0.012	0.015
603_Mean_OPUS-10012	-1622.833	-3269.279	-12.925	0.012	0.015
603_Mean_OPUS-10013	-1617.634	-3278.867	-12.914	0.012	0.015
603_Mean_OPUS-10014	-1617.386	-3285.995	-12.923	0.012	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10015	-1619.42	-3292.673	-12.951	0.013	0.016
603_Mean_OPUS-10016	-1615.483	-3295.377	-12.951	0.014	0.017
603_Mean_OPUS-10017	-1615.683	-3297.224	-12.915	0.013	0.016
603_Mean_OPUS-10018	-1622.362	-3299.737	-12.922	0.013	0.016
603_Mean_OPUS-10019	-1627.769	-3309.44	-12.94	0.012	0.015
603_Mean_OPUS-10020	-1635.502	-3313.371	-12.979	0.012	0.015
603_Mean_OPUS-10021	-1643.592	-3311.489	-12.994	0.013	0.016
603_Mean_OPUS-10022	-1645.98	-3308.165	-12.93	0.012	0.015
603_Mean_OPUS-10023	-1649.839	-3308.128	-12.937	0.012	0.015
603_Mean_OPUS-10024	-1652.912	-3295.855	-12.916	0.012	0.015
603_Mean_OPUS-10025	-1658.78	-3281.295	-12.953	0.012	0.015
603_Mean_OPUS-10026	-1660.838	-3279.023	-12.909	0.012	0.015
603_Mean_OPUS-10027	-1595.402	-3437.118	-15.631	0.013	0.016
603_Mean_OPUS-10028	-1588.859	-3431.576	-15.703	0.012	0.015
603_Mean_OPUS-10029	-1584.079	-3424.028	-15.625	0.016	0.02
603_Mean_OPUS-10030	-1579.093	-3417.445	-15.682	0.013	0.016
603_Mean_OPUS-10031	-1573.492	-3409.31	-15.689	0.012	0.015
603_Mean_OPUS-10032	-1570.5	-3406.814	-15.65	0.013	0.016
603_Mean_OPUS-10033	-1567.963	-3408.87	-15.696	0.013	0.016
603_Mean_OPUS-10034	-1576.582	-3423.122	-15.671	0.012	0.015
603_Mean_OPUS-10035	-1577.786	-3437.177	-15.698	0.013	0.016
603_Mean_OPUS-10036	-1573.999	-3452.214	-15.655	0.013	0.017
603_Mean_OPUS-10037	-1572.664	-3457.225	-15.629	0.013	0.017
603_Mean_OPUS-10038	-1558.441	-3457.64	-15.613	0.013	0.017
603_Mean_OPUS-10039	-1550.193	-3459.947	-15.65	0.013	0.017
603_Mean_OPUS-10040	-1539.644	-3469.363	-15.656	0.013	0.017

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10041	-1532.924	-3478.339	-15.684	0.013	0.017
603_Mean_OPUS-10042	-1539.862	-3491.02	-15.659	0.013	0.016
603_Mean_OPUS-10043	-1547.136	-3499.174	-15.651	0.013	0.016
603_Mean_OPUS-10044	-1556.157	-3508.969	-15.619	0.013	0.017
603_Mean_OPUS-10045	-1568.957	-3505.493	-15.654	0.013	0.016
603_Mean_OPUS-10046	-1578.186	-3495.24	-15.622	0.012	0.016
603_Mean_OPUS-10047	-1593.795	-3494.811	-15.617	0.012	0.016
603_Mean_OPUS-10048	-1594.443	-3492.133	-15.565	0.013	0.017
603_Mean_OPUS-10049	-1585.288	-3488.322	-15.674	0.013	0.017
603_Mean_OPUS-10050	-1587.066	-3475.778	-15.723	0.013	0.017
603_Mean_OPUS-10051	-1596.854	-3473.996	-15.67	0.013	0.016
603_Mean_OPUS-10052	-1598.277	-3469.357	-15.638	0.012	0.016
603_Mean_OPUS-10053	-1604.162	-3470.854	-15.468	0.012	0.016
603_Mean_OPUS-10054	-1605.963	-3456.212	-15.511	0.012	0.016
603_Mean_OPUS-10055	-1606.169	-3443.918	-15.339	0.012	0.016
603_Mean_OPUS-10056	-1606.532	-3443.623	-15.239	0.011	0.015
603_Mean_OPUS-10057	-1601.155	-3442.741	-15.616	0.012	0.015
603_Mean_OPUS-10058	-1596.063	-3438.252	-15.647	0.011	0.014
603_Mean_OPUS-10059	-1508.037	-3817.532	-15.444	0.012	0.016
603_Mean_OPUS-10060	-1505.226	-3820.266	-15.425	0.012	0.016
603_Mean_OPUS-10061	-1508.241	-3826.832	-15.41	0.013	0.017
603_Mean_OPUS-10062	-1516.276	-3827.623	-15.41	0.012	0.016
603_Mean_OPUS-10063	-1518	-3819.073	-15.494	0.013	0.017
603_Mean_OPUS-10064	-1513.218	-3816.486	-15.439	0.012	0.016
603_Mean_OPUS-10065	-1252.711	-3626.835	-19.31	0.013	0.017
603_Mean_OPUS-10066	-1246.804	-3615.698	-19.313	0.012	0.016

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10067	-1239.338	-3608.136	-19.354	0.012	0.016
603_Mean_OPUS-10068	-1235.89	-3600.412	-19.444	0.013	0.017
603_Mean_OPUS-10069	-1227.622	-3593.644	-19.479	0.012	0.016
603_Mean_OPUS-10070	-1221.191	-3593.014	-19.423	0.013	0.017
603_Mean_OPUS-10071	-1220.343	-3596.484	-19.527	0.013	0.017
603_Mean_OPUS-10072	-1227.675	-3601.708	-19.456	0.012	0.016
603_Mean_OPUS-10073	-1234.205	-3612.971	-19.36	0.012	0.016
603_Mean_OPUS-10074	-1240.568	-3622.754	-19.401	0.013	0.017
603_Mean_OPUS-10075	-1248.054	-3629.952	-19.307	0.012	0.016
603_Mean_OPUS-10076	-1095	-3529.345	-22.227	0.012	0.016
603_Mean_OPUS-10077	-1095.891	-3529.895	-22.17	0.012	0.016
603_Mean_OPUS-10078	-1088.692	-3538.539	-24.491	0.013	0.017
603_Mean_OPUS-10079	-1089.295	-3540.074	-24.422	0.012	0.016
603_Mean_OPUS-10080	-1080.708	-3539.169	-24.579	0.013	0.017
603_Mean_OPUS-10081	-1080.181	-3537.301	-24.53	0.012	0.016
603_Mean_OPUS-10082	-1072.855	-3544.526	-24.607	0.012	0.016
603_Mean_OPUS-10083	-1071.479	-3542.492	-24.627	0.013	0.017
603_Mean_OPUS-10084	-1067.468	-3542.694	-24.709	0.012	0.016
603_Mean_OPUS-10085	-1063.97	-3543.001	-24.692	0.012	0.016
603_Mean_OPUS-10086	-1066.657	-3536.153	-24.817	0.012	0.016
603_Mean_OPUS-10087	-1069.779	-3532.503	-24.751	0.012	0.016
603_Mean_OPUS-10088	-1059.346	-3536.043	-25.054	0.012	0.016
603_Mean_OPUS-10089	-1056.669	-3538.969	-25.175	0.013	0.017
603_Mean_OPUS-10090	-1051.296	-3526.173	-25.808	0.012	0.016
603_Mean_OPUS-10091	-1052.888	-3524.668	-25.853	0.011	0.013
603_Mean_OPUS-10092	-1035.869	-3527.972	-26.639	0.012	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10093	-1035.568	-3525.125	-26.481	0.012	0.014
603_Mean_OPUS-10094	-1030.142	-3521.25	-26.511	0.011	0.013
603_Mean_OPUS-10095	-1026.356	-3520.903	-26.569	0.011	0.013
603_Mean_OPUS-10096	-1017.468	-3528.127	-26.648	0.012	0.014
603_Mean_OPUS-10097	-1028.893	-3524.659	-26.6	0.011	0.013
603_Mean_OPUS-10098	-1022.026	-3529.633	-26.621	0.012	0.014
603_Mean_OPUS-10099	-1005.955	-3528.461	-26.8	0.012	0.014
603_Mean_OPUS-10100	-1008.41	-3523.767	-26.735	0.012	0.014
603_Mean_OPUS-10101	-990.075	-3529.906	-27.791	0.013	0.016
603_Mean_OPUS-10102	-990.395	-3534.195	-27.845	0.011	0.013
603_Mean_OPUS-10103	-976.3	-3540.86	-28.295	0.012	0.014
603_Mean_OPUS-10104	-975.814	-3537.654	-28.307	0.011	0.013
603_Mean_OPUS-10105	-1087.623	-3609.921	-24.052	0.02	0.022
603_Mean_OPUS-10106	-1077.539	-3609.954	-24.214	0.01	0.011
603_Mean_OPUS-10107	-1070.205	-3609.147	-24.483	0.011	0.012
603_Mean_OPUS-10108	-1060.773	-3603.469	-24.811	0.011	0.012
603_Mean_OPUS-10109	-1057.279	-3597.628	-24.856	0.011	0.013
603_Mean_OPUS-10110	-1038.831	-3593.899	-25.486	0.011	0.013
603_Mean_OPUS-10111	-1030.179	-3596.425	-26.174	0.011	0.013
603_Mean_OPUS-10112	-1018.563	-3590.292	-26.575	0.011	0.013
603_Mean_OPUS-10113	-1015.136	-3587.233	-26.804	0.011	0.013
603_Mean_OPUS-10114	-1014.826	-3583.779	-27.11	0.011	0.013
603_Mean_OPUS-10115	-1009.48	-3581.967	-27.359	0.011	0.013
603_Mean_OPUS-10116	-1003.515	-3580.782	-27.431	0.011	0.013
603_Mean_OPUS-10117	-993.137	-3583.269	-28.121	0.011	0.013
603_Mean_OPUS-10118	-988.271	-3586.061	-28.839	0.011	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10119	-983.432	-3590.811	-29.3	0.011	0.013
603_Mean_OPUS-10120	-981.068	-3596.853	-29.571	0.011	0.013
603_Mean_OPUS-10121	-974.128	-3600.373	-29.593	0.012	0.013
603_Mean_OPUS-10122	-970.309	-3601.41	-29.637	0.011	0.013
603_Mean_OPUS-10123	-962.706	-3600.103	-29.656	0.012	0.013
603_Mean_OPUS-10124	-955.509	-3596.433	-29.729	0.011	0.013
603_Mean_OPUS-10125	-947.708	-3596.385	-30.035	0.011	0.013
603_Mean_OPUS-10126	-941.016	-3587.067	-30.174	0.011	0.013
603_Mean_OPUS-10127	-938.831	-3584.462	-30.209	0.011	0.013
603_Mean_OPUS-10128	-930.993	-3579.21	-30.233	0.011	0.013
603_Mean_OPUS-10129	-929.597	-3574.984	-30.237	0.011	0.013
603_Mean_OPUS-10130	-930.325	-3570.13	-30.298	0.011	0.013
603_Mean_OPUS-10131	-923.594	-3565.331	-30.648	0.013	0.015
603_Mean_OPUS-10132	-916.936	-3563.684	-30.984	0.011	0.013
603_Mean_OPUS-10133	-909.799	-3559.813	-31.501	0.012	0.014
603_Mean_OPUS-10134	-898.332	-3553.641	-31.627	0.011	0.013
603_Mean_OPUS-10135	-140.109	-2330.629	-25.071	0.011	0.013
603_Mean_OPUS-10136	7124.533	10.181	-72.282	0.011	0.014
603_Mean_OPUS-10137	-895.147	-3547.046	-31.603	0.012	0.015
603_Mean_OPUS-10138	-884.571	-3542.03	-31.9	0.012	0.015
603_Mean_OPUS-10139	-869.979	-3538.791	-32.055	0.013	0.014
603_Mean_OPUS-10140	-850.755	-3543.331	-32.205	0.012	0.014
603_Mean_OPUS-10141	-843.725	-3550.729	-32.261	0.013	0.014
603_Mean_OPUS-10142	-833.915	-3543.482	-32.313	0.013	0.015
603_Mean_OPUS-10143	-830.411	-3547.369	-32.312	0.012	0.014
603_Mean_OPUS-10144	-823.938	-3547.626	-32.474	0.013	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10145	-823.171	-3540.863	-32.429	0.013	0.015
603_Mean_OPUS-10146	-817.944	-3539.042	-32.3	0.012	0.014
603_Mean_OPUS-10147	-817.967	-3544.704	-32.334	0.012	0.014
603_Mean_OPUS-10148	-811.564	-3550.614	-32.434	0.012	0.014
603_Mean_OPUS-10149	-803.119	-3544.182	-32.421	0.012	0.014
603_Mean_OPUS-10150	-813.37	-3534.353	-32.349	0.012	0.014
603_Mean_OPUS-10151	-805.199	-3527.878	-32.253	0.012	0.014
603_Mean_OPUS-10152	-798.038	-3528.972	-32.292	0.013	0.015
603_Mean_OPUS-10153	-791.988	-3525.383	-32.441	0.012	0.014
603_Mean_OPUS-10154	-790.959	-3512.408	-32.426	0.012	0.014
603_Mean_OPUS-10155	-780.083	-3499.337	-32.307	0.012	0.014
603_Mean_OPUS-10156	-769.039	-3509.571	-32.344	0.012	0.014
603_Mean_OPUS-10157	-756.445	-3504.242	-32.373	0.012	0.014
603_Mean_OPUS-10158	-739.774	-3504.791	-32.366	0.012	0.014
603_Mean_OPUS-10159	-727.02	-3506.913	-32.392	0.012	0.014
603_Mean_OPUS-10160	-713.731	-3501.842	-32.304	0.012	0.014
603_Mean_OPUS-10161	-701.998	-3491.857	-32.34	0.012	0.014
603_Mean_OPUS-10162	-694.931	-3490.126	-32.357	0.013	0.015
603_Mean_OPUS-10163	-684.434	-3484.821	-32.43	0.012	0.014
603_Mean_OPUS-10164	-676.703	-3484.499	-32.548	0.013	0.015
603_Mean_OPUS-10165	-675.62	-3480.973	-32.583	0.012	0.014
603_Mean_OPUS-10166	-671.155	-3479.436	-32.546	0.012	0.014
603_Mean_OPUS-10167	-666.755	-3484.143	-32.554	0.013	0.015
603_Mean_OPUS-10168	-659.949	-3483.183	-32.947	0.012	0.014
603_Mean_OPUS-10169	-650.794	-3480.257	-33.12	0.013	0.015
603_Mean_OPUS-10170	-648.398	-3475.79	-33.166	0.012	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10171	-639.066	-3467.926	-33.143	0.013	0.015
603_Mean_OPUS-10172	-631.183	-3460.284	-33.164	0.012	0.015
603_Mean_OPUS-10173	-611.137	-3458.855	-33.199	0.012	0.015
603_Mean_OPUS-10174	-594.964	-3459.959	-33.099	0.012	0.014
603_Mean_OPUS-10175	-592.873	-3461.207	-33.164	0.012	0.014
603_Mean_OPUS-10176	-537.159	-3467.605	-34.297	0.012	0.014
603_Mean_OPUS-10177	-528.224	-3464.761	-34.559	0.012	0.014
603_Mean_OPUS-10178	-518.587	-3455.287	-34.779	0.012	0.014
603_Mean_OPUS-10179	-509.164	-3448.286	-34.883	0.011	0.014
603_Mean_OPUS-10180	-501.69	-3449.095	-34.898	0.011	0.014
603_Mean_OPUS-10181	-497.667	-3443.196	-34.908	0.012	0.014
603_Mean_OPUS-10182	-487.194	-3439.815	-35.186	0.011	0.014
603_Mean_OPUS-10183	-473.78	-3433.916	-35.251	0.011	0.014
603_Mean_OPUS-10184	-457.437	-3428.459	-35.351	0.012	0.014
603_Mean_OPUS-10185	-441.336	-3424.377	-35.428	0.012	0.014
603_Mean_OPUS-10186	-435.608	-3422.849	-35.642	0.011	0.014
603_Mean_OPUS-10187	-424.571	-3423.432	-35.747	0.011	0.013
603_Mean_OPUS-10188	-415.597	-3423.754	-35.899	0.011	0.013
603_Mean_OPUS-10189	-405.802	-3424.021	-35.906	0.011	0.014
603_Mean_OPUS-10190	-398.441	-3427.736	-36.032	0.011	0.013
603_Mean_OPUS-10191	-384.313	-3422.183	-36.055	0.011	0.013
603_Mean_OPUS-10192	-381.286	-3427.267	-36.085	0.011	0.013
603_Mean_OPUS-10193	-367.372	-3424.444	-36.245	0.011	0.013
603_Mean_OPUS-10194	-367.896	-3418.33	-36.313	0.011	0.014
603_Mean_OPUS-10195	-366.079	-3410.565	-36.266	0.011	0.013
603_Mean_OPUS-10196	-355.95	-3405.306	-36.309	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10197	-348.869	-3402.148	-36.372	0.011	0.013
603_Mean_OPUS-10198	-342.706	-3396.752	-36.438	0.014	0.025
603_Mean_OPUS-10199	-329.579	-3397.161	-36.474	0.011	0.013
603_Mean_OPUS-10200	-318.324	-3392.233	-36.579	0.011	0.013
603_Mean_OPUS-10201	-307.986	-3387.34	-36.634	0.011	0.013
603_Mean_OPUS-10202	-295.016	-3387.562	-36.695	0.011	0.014
603_Mean_OPUS-10203	-284.67	-3381.708	-36.69	0.011	0.014
603_Mean_OPUS-10204	-274.094	-3374.547	-36.767	0.011	0.013
603_Mean_OPUS-10205	-267.491	-3373.302	-36.843	0.011	0.013
603_Mean_OPUS-10206	-257.647	-3376.006	-36.839	0.011	0.014
603_Mean_OPUS-10207	-253.769	-3375.549	-36.792	0.011	0.013
603_Mean_OPUS-10208	-244.437	-3372.192	-36.822	0.011	0.013
603_Mean_OPUS-10209	-230.963	-3370.713	-37.061	0.011	0.013
603_Mean_OPUS-10210	-223.522	-3364.109	-37.062	0.011	0.013
603_Mean_OPUS-10211	-212.977	-3375.281	-37.353	0.011	0.013
603_Mean_OPUS-10212	-204.049	-3377.921	-37.328	0.011	0.013
603_Mean_OPUS-10213	-190.1	-3381.803	-37.497	0.011	0.014
603_Mean_OPUS-10214	-181.998	-3373.646	-37.789	0.011	0.013
603_Mean_OPUS-10215	-167.783	-3384.127	-37.912	0.011	0.013
603_Mean_OPUS-10216	-152.864	-3389.049	-38.136	0.011	0.013
603_Mean_OPUS-10217	-151.306	-3393.588	-38.091	0.011	0.013
603_Mean_OPUS-10218	-146.999	-3396.224	-38.478	0.011	0.014
603_Mean_OPUS-10219	-145.677	-3391.642	-38.438	0.011	0.014
603_Mean_OPUS-10220	-135.254	-3391.481	-38.491	0.011	0.014
603_Mean_OPUS-10221	-131.042	-3395.189	-38.445	0.011	0.013
603_Mean_OPUS-10222	-126.576	-3397.694	-38.52	0.01	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10223	-124.234	-3397.716	-38.708	0.01	0.013
603_Mean_OPUS-10224	-121.784	-3393.965	-38.578	0.011	0.013
603_Mean_OPUS-10225	-124.191	-3382.631	-38.513	0.01	0.012
603_Mean_OPUS-10226	-124.31	-3367.063	-38.529	0.011	0.013
603_Mean_OPUS-10227	-122.226	-3359.399	-38.455	0.011	0.013
603_Mean_OPUS-10228	-114.742	-3337.903	-38.451	0.011	0.013
603_Mean_OPUS-10229	-117.079	-3329.723	-38.419	0.01	0.012
603_Mean_OPUS-10230	-116.177	-3322.625	-38.441	0.011	0.013
603_Mean_OPUS-10231	-104.402	-3309.496	-38.422	0.011	0.013
603_Mean_OPUS-10232	-95.242	-3296.255	-38.373	0.01	0.012
603_Mean_OPUS-10233	-92.866	-3285.062	-38.334	0.011	0.012
603_Mean_OPUS-10234	-140.1	-2330.618	-24.672	0.012	0.017
603_Mean_OPUS-10235	-140.12	-2330.598	-24.664	0.012	0.015
603_Mean_OPUS-10236	-140.088	-2330.637	-25.238	0.015	0.022
603_Mean_OPUS-10237	521.219	-816.563	1.865	0.012	0.016
603_Mean_OPUS-10238	521.931	-816.741	1.806	0.012	0.016
603_Mean_OPUS-10239	517.087	-826.604	1.562	0.011	0.015
603_Mean_OPUS-10240	512.171	-833.583	1.849	0.011	0.015
603_Mean_OPUS-10241	510.321	-840.13	1.954	0.012	0.015
603_Mean_OPUS-10242	507.269	-838.435	1.929	0.011	0.014
603_Mean_OPUS-10243	504.087	-847.271	1.783	0.011	0.014
603_Mean_OPUS-10244	506.836	-856.497	1.852	0.011	0.014
603_Mean_OPUS-10245	506.171	-870.81	1.816	0.012	0.014
603_Mean_OPUS-10246	505.993	-876.321	1.716	0.012	0.014
603_Mean_OPUS-10247	504.75	-877.137	1.697	0.011	0.014
603_Mean_OPUS-10248	505.131	-881.545	1.777	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10249	506.706	-887.489	1.623	0.011	0.014
603_Mean_OPUS-10250	512.673	-888.169	1.626	0.011	0.014
603_Mean_OPUS-10251	524.098	-887.453	1.79	0.011	0.014
603_Mean_OPUS-10252	526.568	-886.465	1.797	0.011	0.014
603_Mean_OPUS-10253	526.421	-886.971	1.714	0.011	0.014
603_Mean_OPUS-10254	528.928	-880.983	2.176	0.011	0.014
603_Mean_OPUS-10255	533.106	-871.489	2.643	0.011	0.014
603_Mean_OPUS-10256	535.974	-859.07	2.677	0.012	0.015
603_Mean_OPUS-10257	537.746	-849.096	2.676	0.011	0.014
603_Mean_OPUS-10258	543.492	-841.275	2.862	0.011	0.014
603_Mean_OPUS-10259	546	-833.829	2.555	0.011	0.014
603_Mean_OPUS-10260	545.384	-830.818	2.483	0.011	0.014
603_Mean_OPUS-10261	545.294	-830.867	2.456	0.011	0.014
603_Mean_OPUS-10262	548.233	-822.827	2.401	0.011	0.014
603_Mean_OPUS-10263	545.853	-818.002	2.371	0.011	0.014
603_Mean_OPUS-10264	543.757	-810.908	2.241	0.012	0.015
603_Mean_OPUS-10265	543.444	-811.495	2.09	0.011	0.014
603_Mean_OPUS-10266	538.245	-804.121	2.161	0.011	0.014
603_Mean_OPUS-10267	531.397	-807.652	1.934	0.012	0.015
603_Mean_OPUS-10268	523.309	-811.461	2.072	0.012	0.015
603_Mean_OPUS-10269	520.991	-806.849	1.946	0.012	0.015
603_Mean_OPUS-10270	515.3	-800.721	1.948	0.012	0.015
603_Mean_OPUS-10271	507.193	-809.232	1.893	0.012	0.015
603_Mean_OPUS-10272	512.8	-816.388	2.077	0.011	0.014
603_Mean_OPUS-10273	508.009	-823.292	2.126	0.011	0.014
603_Mean_OPUS-10274	498.221	-819.528	1.877	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10275	494.344	-828.219	1.772	0.011	0.014
603_Mean_OPUS-10276	502.552	-834.286	1.997	0.011	0.014
603_Mean_OPUS-10277	498.172	-843.11	1.95	0.011	0.014
603_Mean_OPUS-10278	488.418	-839.401	1.593	0.011	0.014
603_Mean_OPUS-10279	484.727	-848.838	1.546	0.011	0.014
603_Mean_OPUS-10280	495.598	-851.607	1.798	0.011	0.014
603_Mean_OPUS-10281	502.888	-855.305	1.918	0.011	0.014
603_Mean_OPUS-10282	502.222	-863.393	1.713	0.011	0.014
603_Mean_OPUS-10283	492.588	-863.039	1.842	0.011	0.014
603_Mean_OPUS-10284	484.115	-858.996	1.691	0.011	0.014
603_Mean_OPUS-10285	478.575	-867.671	1.776	0.011	0.014
603_Mean_OPUS-10286	491.716	-872.509	1.978	0.011	0.014
603_Mean_OPUS-10287	500.768	-874.721	1.906	0.011	0.014
603_Mean_OPUS-10288	501.937	-881.366	1.659	0.011	0.014
603_Mean_OPUS-10289	491.78	-881.689	1.718	0.011	0.014
603_Mean_OPUS-10290	482.685	-883.491	1.67	0.011	0.014
603_Mean_OPUS-10291	484.574	-895.135	1.41	0.011	0.014
603_Mean_OPUS-10292	493.743	-898.086	1.526	0.01	0.013
603_Mean_OPUS-10293	498.473	-889.093	1.815	0.01	0.013
603_Mean_OPUS-10294	510.375	-891.685	1.559	0.01	0.013
603_Mean_OPUS-10295	505.375	-900.332	1.615	0.01	0.013
603_Mean_OPUS-10296	509.893	-905.802	1.096	0.01	0.013
603_Mean_OPUS-10297	518.16	-911.164	0.963	0.01	0.013
603_Mean_OPUS-10298	498.441	-910.063	1.165	0.01	0.012
603_Mean_OPUS-10299	528.24	-916.308	0.935	0.01	0.012
603_Mean_OPUS-10300	530.636	-905.332	1.444	0.01	0.012

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10301	521.674	-898.737	1.366	0.01	0.013
603_Mean_OPUS-10302	513.858	-896.421	1.464	0.01	0.013
603_Mean_OPUS-10303	527.39	-891.044	1.726	0.01	0.013
603_Mean_OPUS-10304	535.182	-899.195	1.827	0.01	0.013
603_Mean_OPUS-10305	541.505	-889.349	2.249	0.01	0.013
603_Mean_OPUS-10306	531.609	-884.191	2.118	0.011	0.014
603_Mean_OPUS-10307	534.78	-873.688	2.598	0.01	0.013
603_Mean_OPUS-10308	544.936	-877.748	2.507	0.01	0.013
603_Mean_OPUS-10309	549.692	-869.355	2.962	0.011	0.014
603_Mean_OPUS-10310	540.72	-862.059	2.761	0.01	0.013
603_Mean_OPUS-10311	541.004	-851.365	2.72	0.01	0.013
603_Mean_OPUS-10312	550.098	-855.178	2.858	0.011	0.014
603_Mean_OPUS-10313	552.808	-863.1	2.951	0.01	0.013
603_Mean_OPUS-10314	554.989	-846.613	2.969	0.011	0.014
603_Mean_OPUS-10315	548.497	-845.027	2.886	0.011	0.014
603_Mean_OPUS-10316	545.143	-842.38	3.034	0.011	0.014
603_Mean_OPUS-10317	549.518	-833.552	2.761	0.01	0.013
603_Mean_OPUS-10318	559.975	-834.278	2.93	0.01	0.013
603_Mean_OPUS-10319	552.489	-823.458	2.669	0.01	0.013
603_Mean_OPUS-10320	560.41	-819.29	2.638	0.011	0.014
603_Mean_OPUS-10321	554.564	-807.434	2.444	0.01	0.013
603_Mean_OPUS-10322	547.067	-812.247	2.341	0.01	0.013
603_Mean_OPUS-10323	544.131	-804.8	2.367	0.01	0.013
603_Mean_OPUS-10324	545.639	-794.906	2.426	0.01	0.013
603_Mean_OPUS-10325	522.848	-794.211	2.065	0.01	0.013
603_Mean_OPUS-10326	529.276	-804.575	1.92	0.01	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10327	538.856	-799.928	2.199	0.01	0.013
603_Mean_OPUS-10328	534.682	-785.762	2.198	0.01	0.013
603_Mean_OPUS-10329	531.499	-817.366	1.008	0.01	0.013
603_Mean_OPUS-10330	527.474	-818.036	1.023	0.01	0.013
603_Mean_OPUS-10331	523.812	-820.971	1.128	0.011	0.014
603_Mean_OPUS-10332	517.75	-829.295	1.288	0.011	0.014
603_Mean_OPUS-10333	514.543	-836.983	1.489	0.01	0.013
603_Mean_OPUS-10334	511.494	-841.715	1.473	0.01	0.013
603_Mean_OPUS-10335	509.735	-847.256	1.495	0.01	0.013
603_Mean_OPUS-10336	511.736	-856.017	1.856	0.011	0.014
603_Mean_OPUS-10337	510.049	-864.286	1.736	0.011	0.014
603_Mean_OPUS-10338	508.446	-873.634	1.413	0.011	0.014
603_Mean_OPUS-10339	511.505	-880.209	1.32	0.019	0.023
603_Mean_OPUS-10340	517.956	-883.364	1.211	0.01	0.013
603_Mean_OPUS-10341	520.897	-881.103	1.009	0.01	0.013
603_Mean_OPUS-10342	519.788	-877.841	1.143	0.011	0.014
603_Mean_OPUS-10343	522.016	-870.971	1.426	0.011	0.013
603_Mean_OPUS-10344	525.251	-865.166	1.885	0.011	0.013
603_Mean_OPUS-10345	527.844	-855.501	2.041	0.011	0.013
603_Mean_OPUS-10346	529.731	-846.355	1.984	0.011	0.013
603_Mean_OPUS-10347	529.83	-840.047	1.728	0.011	0.013
603_Mean_OPUS-10348	535.167	-834.902	1.63	0.011	0.013
603_Mean_OPUS-10349	539.945	-830.031	1.469	0.011	0.013
603_Mean_OPUS-10350	538.314	-823.802	1.294	0.011	0.014
603_Mean_OPUS-10351	533.336	-819.936	1.108	0.011	0.013
603_Mean_OPUS-10352	535.973	-814.343	1.647	0.011	0.014

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10353	542.988	-819.232	1.921	0.011	0.014
603_Mean_OPUS-10354	532.547	-831.436	1.568	0.011	0.013
603_Mean_OPUS-10355	528.276	-839.113	1.79	0.01	0.012
603_Mean_OPUS-10356	524.439	-848.312	2.025	0.01	0.012
603_Mean_OPUS-10357	522.698	-857.765	2.061	0.01	0.012
603_Mean_OPUS-10358	521.331	-866.711	1.793	0.01	0.012
603_Mean_OPUS-10359	518.425	-871.596	1.52	0.01	0.012
603_Mean_OPUS-10360	514.195	-867.835	1.568	0.01	0.012
603_Mean_OPUS-10361	514.276	-859.759	1.827	0.011	0.013
603_Mean_OPUS-10362	517.223	-850.132	2.012	0.01	0.012
603_Mean_OPUS-10363	519.648	-844.383	1.984	0.011	0.013
603_Mean_OPUS-10364	522.397	-838.298	1.656	0.01	0.012
603_Mean_OPUS-10365	526.923	-831.94	1.53	0.011	0.013
603_Mean_OPUS-10366	528.915	-814.595	1.529	0.01	0.012
603_Mean_OPUS-10367	532.915	-824.048	1.407	0.01	0.012
603_Mean_OPUS-10368	541.984	-828.155	1.643	0.01	0.012
603_Mean_OPUS-10369	537.965	-834.703	1.821	0.01	0.012
603_Mean_OPUS-10370	539.955	-839.988	2.487	0.01	0.012
603_Mean_OPUS-10371	531.334	-834.481	1.698	0.01	0.012
603_Mean_OPUS-10372	520.283	-830.096	1.323	0.01	0.012
603_Mean_OPUS-10373	513.807	-841.86	1.508	0.01	0.012
603_Mean_OPUS-10374	517.935	-844.393	1.823	0.01	0.012
603_Mean_OPUS-10375	522.27	-846.634	2.009	0.01	0.012
603_Mean_OPUS-10376	525.445	-837.967	1.689	0.01	0.012
603_Mean_OPUS-10377	528.788	-833.113	1.56	0.01	0.012
603_Mean_OPUS-10378	531.235	-850.118	2.09	0.01	0.012

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10379	528.827	-861.306	2.13	0.011	0.013
603_Mean_OPUS-10380	518.229	-857.729	1.936	0.011	0.013
603_Mean_OPUS-10381	518.341	-865.707	1.795	0.01	0.012
603_Mean_OPUS-10382	524.771	-879.183	1.703	0.01	0.012
603_Mean_OPUS-10383	527.797	-870.481	2.007	0.01	0.012
603_Mean_OPUS-10384	511.591	-884.452	1.551	0.01	0.012
603_Mean_OPUS-10385	516.415	-877.887	1.164	0.01	0.012
603_Mean_OPUS-10386	512.065	-875.042	1.257	0.011	0.013
603_Mean_OPUS-10387	515.519	-873.493	1.246	0.012	0.014
603_Mean_OPUS-10388	512.415	-871.878	1.343	0.01	0.012
603_Mean_OPUS-10389	584.204	-840.057	2.708	0.01	0.012
603_Mean_OPUS-10390	584.673	-840.252	2.835	0.011	0.013
603_Mean_OPUS-10391	590.273	-841.54	2.958	0.01	0.012
603_Mean_OPUS-10392	597.557	-840.711	2.693	0.011	0.013
603_Mean_OPUS-10393	601.673	-836.008	2.45	0.011	0.013
603_Mean_OPUS-10394	602.769	-831.329	2.442	0.011	0.013
603_Mean_OPUS-10395	602.713	-831.779	2.508	0.01	0.012
603_Mean_OPUS-10396	605.243	-826.567	2.656	0.01	0.012
603_Mean_OPUS-10397	605.08	-819.975	2.385	0.01	0.012
603_Mean_OPUS-10398	604.313	-820.537	2.212	0.01	0.012
603_Mean_OPUS-10399	599.44	-815.615	2.566	0.01	0.013
603_Mean_OPUS-10400	593.281	-811.382	2.692	0.01	0.013
603_Mean_OPUS-10401	585.499	-810.674	2.681	0.01	0.012
603_Mean_OPUS-10402	578.409	-810.012	2.546	0.01	0.012
603_Mean_OPUS-10403	571.87	-810.705	2.478	0.01	0.012
603_Mean_OPUS-10404	568.812	-812.828	2.352	0.01	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10405	568.537	-813.218	2.225	0.01	0.012
603_Mean_OPUS-10406	568.017	-819.055	2.526	0.01	0.012
603_Mean_OPUS-10407	570.926	-824.06	2.784	0.01	0.012
603_Mean_OPUS-10408	574.477	-829.317	2.805	0.01	0.013
603_Mean_OPUS-10409	578.199	-834.405	2.781	0.01	0.013
603_Mean_OPUS-10410	581.898	-838.605	2.737	0.01	0.013
603_Mean_OPUS-10411	577.595	-840.93	2.809	0.01	0.012
603_Mean_OPUS-10412	569.766	-843.724	3	0.01	0.012
603_Mean_OPUS-10413	560.62	-844.471	3.025	0.01	0.012
603_Mean_OPUS-10414	568.432	-834.809	3.069	0.01	0.012
603_Mean_OPUS-10415	573.317	-831.6	2.734	0.01	0.012
603_Mean_OPUS-10416	566.67	-824.267	2.863	0.011	0.012
603_Mean_OPUS-10417	558.451	-825.634	2.79	0.01	0.012
603_Mean_OPUS-10418	552.093	-813.177	2.423	0.01	0.012
603_Mean_OPUS-10419	562.824	-805.866	2.521	0.01	0.012
603_Mean_OPUS-10420	555.672	-794.015	2.416	0.01	0.012
603_Mean_OPUS-10421	565.241	-790.802	2.599	0.01	0.012
603_Mean_OPUS-10422	568.131	-798.138	2.597	0.01	0.012
603_Mean_OPUS-10423	571.278	-806.328	2.556	0.01	0.012
603_Mean_OPUS-10424	584.447	-804.193	2.776	0.01	0.012
603_Mean_OPUS-10425	580.616	-796.452	2.496	0.01	0.012
603_Mean_OPUS-10426	571.559	-799.77	2.539	0.01	0.012
603_Mean_OPUS-10427	581.551	-787.832	2.543	0.01	0.012
603_Mean_OPUS-10428	594.543	-787.75	2.574	0.01	0.012
603_Mean_OPUS-10429	590.353	-797.529	2.629	0.01	0.012
603_Mean_OPUS-10430	587.901	-804.632	2.714	0.01	0.012

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10431	600.182	-809.167	2.879	0.01	0.012
603_Mean_OPUS-10432	604.527	-800.993	2.653	0.01	0.012
603_Mean_OPUS-10433	605.386	-790.138	2.543	0.01	0.012
603_Mean_OPUS-10434	617.095	-792.934	2.129	0.01	0.012
603_Mean_OPUS-10435	610.444	-804.574	2.568	0.01	0.012
603_Mean_OPUS-10436	605.495	-812.23	2.581	0.01	0.012
603_Mean_OPUS-10437	609.902	-821.029	2.357	0.01	0.012
603_Mean_OPUS-10438	616.854	-812.836	2.311	0.01	0.012
603_Mean_OPUS-10439	624.893	-803.486	1.914	0.01	0.012
603_Mean_OPUS-10440	632.756	-809.369	1.524	0.011	0.013
603_Mean_OPUS-10441	636.677	-822.38	1.332	0.01	0.012
603_Mean_OPUS-10442	623.487	-818.797	1.815	0.01	0.012
603_Mean_OPUS-10443	610.917	-826.777	2.368	0.01	0.012
603_Mean_OPUS-10444	607.317	-835.839	2.445	0.01	0.012
603_Mean_OPUS-10445	616.164	-839.826	2.306	0.01	0.012
603_Mean_OPUS-10446	626.512	-846.674	2.191	0.011	0.013
603_Mean_OPUS-10447	636.362	-836.015	1.388	0.011	0.013
603_Mean_OPUS-10448	622.772	-828.064	1.869	0.01	0.012
603_Mean_OPUS-10449	600.686	-841.157	2.737	0.01	0.012
603_Mean_OPUS-10450	605.197	-848.322	2.803	0.01	0.012
603_Mean_OPUS-10451	611.898	-858.546	2.468	0.011	0.013
603_Mean_OPUS-10452	621.997	-852.666	2.23	0.01	0.012
603_Mean_OPUS-10453	606.223	-866.63	2.446	0.011	0.013
603_Mean_OPUS-10454	598.174	-858.505	2.743	0.011	0.013
603_Mean_OPUS-10455	593.439	-848.352	2.911	0.011	0.013
603_Mean_OPUS-10456	581.094	-846.613	2.881	0.011	0.013

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10457	586.085	-856.038	2.797	0.011	0.013
603_Mean_OPUS-10458	591.68	-866.639	2.63	0.01	0.012
603_Mean_OPUS-10459	578.243	-868.662	2.615	0.01	0.012
603_Mean_OPUS-10460	577.56	-855.917	2.861	0.01	0.012
603_Mean_OPUS-10461	565.355	-848.15	2.885	0.01	0.012
603_Mean_OPUS-10462	559.759	-855.228	2.776	0.011	0.012
603_Mean_OPUS-10463	569.71	-864.31	2.747	0.01	0.012
603_Mean_OPUS-10464	559.262	-867.845	2.715	0.01	0.012
603_Mean_OPUS-10465	599.025	-822.495	1.41	0.011	0.014
603_Mean_OPUS-10466	599.271	-826.244	1.829	0.011	0.014
603_Mean_OPUS-10467	597.392	-831.398	1.996	0.011	0.014
603_Mean_OPUS-10468	589.893	-834.456	2.018	0.011	0.014
603_Mean_OPUS-10469	585.471	-832.281	2.319	0.011	0.014
603_Mean_OPUS-10470	580.119	-824.923	1.958	0.011	0.014
603_Mean_OPUS-10471	575.242	-818.388	1.705	0.011	0.014
603_Mean_OPUS-10472	574.572	-816.543	1.752	0.011	0.014
603_Mean_OPUS-10473	576.98	-816.982	1.798	0.011	0.014
603_Mean_OPUS-10474	582.2	-815.294	1.995	0.011	0.014
603_Mean_OPUS-10475	588.696	-815.179	1.862	0.011	0.014
603_Mean_OPUS-10476	595.05	-817.954	1.834	0.011	0.014
603_Mean_OPUS-10477	597.75	-823.928	1.34	0.011	0.014
603_Mean_OPUS-10478	593.754	-822.316	1.869	0.012	0.015
603_Mean_OPUS-10479	589.649	-821.636	2.206	0.012	0.015
603_Mean_OPUS-10480	585.224	-818.097	2.029	0.012	0.015
603_Mean_OPUS-10481	581.694	-820.029	1.78	0.012	0.015
603_Mean_OPUS-10482	583.771	-823.425	2.097	0.012	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10483	588.583	-827.48	2.282	0.012	0.015
603_Mean_OPUS-10484	594.782	-827.425	1.803	0.012	0.015
603_Mean_OPUS-10485	598.511	-834.03	2.301	0.012	0.015
603_Mean_OPUS-10486	591.973	-836.167	2.161	0.012	0.015
603_Mean_OPUS-10487	586.196	-836.578	2.575	0.012	0.015
603_Mean_OPUS-10488	581.217	-830.501	2.337	0.012	0.015
603_Mean_OPUS-10489	577.198	-824.448	2.238	0.012	0.015
603_Mean_OPUS-10490	571.908	-818.813	2.019	0.012	0.015
603_Mean_OPUS-10491	574.779	-813.423	2.153	0.012	0.015
603_Mean_OPUS-10492	580.84	-813.368	2.27	0.013	0.015
603_Mean_OPUS-10493	589.562	-813.041	2.284	0.013	0.015
603_Mean_OPUS-10494	596.143	-815.683	2.226	0.013	0.015
603_Mean_OPUS-10495	601.804	-821.322	2.081	0.013	0.016
603_Mean_OPUS-10496	601.847	-825.757	2.172	0.013	0.016
603_Mean_OPUS-10497	595.803	-760.743	1.555	0.014	0.017
603_Mean_OPUS-10498	594.687	-776.932	2.414	0.013	0.015
603_Mean_OPUS-10499	595.828	-793.247	2.59	0.013	0.015
603_Mean_OPUS-10500	595.514	-807.237	2.903	0.013	0.016
603_Mean_OPUS-10501	595.544	-812.854	2.631	0.013	0.015
603_Mean_OPUS-10502	594.828	-817.787	1.749	0.013	0.015
603_Mean_OPUS-10503	594.964	-821.611	1.478	0.013	0.015
603_Mean_OPUS-10504	594.556	-825.093	1.805	0.013	0.015
603_Mean_OPUS-10505	594.431	-829.512	2.103	0.013	0.015
603_Mean_OPUS-10506	594.859	-834.854	2.197	0.013	0.016
603_Mean_OPUS-10507	594.979	-840.43	2.736	0.012	0.015
603_Mean_OPUS-10508	594.877	-844.487	2.929	0.012	0.015

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
603_Mean_OPUS-10509	594.107	-854.452	2.899	0.012	0.015
603_Mean_OPUS-10510	596.767	-869.542	2.693	0.013	0.016
603_Mean_OPUS-10511	596.406	-885.686	2.486	0.013	0.016
603_Mean_OPUS-10512	597.394	-901.833	2.017	0.012	0.015
603_Mean_OPUS-10513	597.78	-914.971	1.974	0.012	0.015
603_Mean_OPUS-10514	597.573	-933.199	0.968	0.013	0.016
603_Mean_OPUS-10515	599.052	-949.571	0.666	0.012	0.015
603_Mean_OPUS-10516	596.831	-971.487	-0.214	0.013	0.016
603_Mean_OPUS-10517	596.271	-991.187	-1.27	0.014	0.017
603_Mean_OPUS-10518	596.833	-1007.064	-1.574	0.013	0.016
603_Mean_OPUS-10519	702.087	-1018.341	-4.616	0.012	0.013
603_Mean_OPUS-10520	-1668.844	-2836.204	-3.592	0.012	0.014
2600_Mean_OPUS-5392	1528.773	505.565	-21.328	0.012	0.014
2600_Mean_OPUS-5393	1528.758	505.592	-21.315	0.011	0.011
2600_Mean_OPUS-5394	1528.791	505.563	-21.319	0.011	0.014
2600_Mean_OPUS-5395	62.824	-647.804	-10.599	0.01	0.012
2600_Mean_OPUS-5396	110.486	-678.596	-12.879	0.011	0.013
2600_Mean_OPUS-5397	146.225	-647.895	-12.338	0.011	0.012
2600_Mean_OPUS-5398	110.477	-602.716	-12.504	0.011	0.014
2600_Mean_OPUS-5399	50.405	-843.58	-11.28	0.011	0.014
2600_Mean_OPUS-5400	63.603	-856.866	-11.496	0.012	0.015
2600_Mean_OPUS-5401	50.395	-865.309	-10.804	0.011	0.014
2600_Mean_OPUS-5402	37.13	-856.848	-10.84	0.011	0.014
2600_Mean_OPUS-5403	261.377	-837.612	-14.292	0.011	0.014
2600_Mean_OPUS-5404	289.262	-808.102	-14.907	0.011	0.013
2600_Mean_OPUS-5405	310.398	-837.573	-14.768	0.01	0.012

Name	dN (USft)	dE (USft)	dHt (USft)	Horz RMS	Vert RMS
2600_Mean_OPUS-5406	289.348	-861.73	-14.861	0.011	0.014
2600_Mean_OPUS-5407	321.47	-620.981	-15.178	0.011	0.014
2600_Mean_OPUS-5408	341.21	-601.309	-15.462	0.011	0.015
2600_Mean_OPUS-5409	371.587	-621.08	-15.06	0.013	0.016
2600_Mean_OPUS-5410	341.205	-641.183	-14.933	0.013	0.016
2600_Mean_OPUS-5411	294.207	-541.311	-14.093	0.012	0.015
2600_Mean_OPUS-5412	259.08	-519.546	-13.619	0.012	0.015
2600_Mean_OPUS-5413	231.758	-541.363	-13.742	0.013	0.016
2600_Mean_OPUS-5414	259.092	-564.264	-15.649	0.013	0.016
2600_Mean_OPUS-5415	867.558	-716.287	-28.191	0.013	0.017
2600_Mean_OPUS-5416	879.163	-717.187	-29.106	0.014	0.019
2600_Mean_OPUS-5417	884.851	-728.942	-28.685	0.014	0.02
2600_Mean_OPUS-5418	883.02	-669.322	-28.814	0.014	0.019
2600_Mean_OPUS-5419	891.986	-658.719	-28.513	0.015	0.021
2600_Mean_OPUS-5420	1528.759	505.594	-21.331	0.01	0.012
2600_Mean_OPUS-5421	5019.01	-2153.626	-43.821	0.01	0.012

6. Level Reduction Reports

No differential levelling was performed for this project. The GPS elevations returned by the mean OPUS solution on each primary project control point proved to be very accurate through the project control checkshots and exceeded the required vertical tolerances for the project.

7. Traverse Adjustment Reports

While conventional traversing was not performed on this project, the following spreadsheets have been included that demonstrate how mean OPUS values were calculated for each project control point.

All latitude and longitude values in the tables below are NAD83(2011)(EPOCH: 2010.0000). All ellipsoid heights are given in Meters.

For report brevity, the complete OPUS solutions have not been included, but can be found in the 'OPUS Solution Reports' section of the deliverable directory.

OPUS SOLUTIONS – POINT 1									
LAT	63	19	32.49462	W LON	168	58	15.23734	EL HGT	13.61
LAT	63	19	32.49415	W LON	168	58	15.23622	EL HGT	13.63
LAT	63	19	32.49462	W LON	168	58	15.23705	EL HGT	13.613
MEAN LAT	63	19	32.49446	MEAN LONG	168	58	15.23687	MEAN EL HT	13.61767

OPUS SOLUTIONS – POINT 2									
LAT	63	18	57.71524	W LON	168	57	18.25405	EL HGT	20.899
LAT	63	18	57.71524	W LON	168	57	18.25402	EL HGT	20.624
LAT	63	18	57.71516	W LON	168	57	18.2543	EL HGT	20.776
LAT	63	18	57.71534	W LON	168	57	18.25387	EL HGT	20.449
MEAN LAT	63	19	57.715245	MEAN LONG	168	57	18.25406	MEAN EL HT	20.687

OPUS SOLUTIONS – POINT 59									
LAT	63	20	8.84555	W LON	168	56	24.38538	EL HGT	6.55
LAT	63	20	8.84548	W LON	168	56	24.3852	EL HGT	6.546
LAT	63	20	8.84548	W LON	168	56	24.3852	EL HGT	6.546
LAT	63	20	8.84562	W LON	168	56	24.38542	EL HGT	6.543
LAT	63	20	8.84562	W LON	168	56	24.38542	EL HGT	6.543
MEAN LAT	63	20	8.84555	MEAN LONG	168	56	24.385324	MEAN EL HT	6.5456

OPUS SOLUTIONS – POINT 2600									
LAT	63	18	42.74795	W LON	168	57	29.8651	EL HGT	27.1
LAT	63	18	42.74759	W LON	168	57	29.8643	EL HGT	27.244
LAT	63	18	42.74791	W LON	168	57	29.86445	EL HGT	27.252
LAT	63	18	42.74795	W LON	168	57	29.8651	EL HGT	27.272
MEAN LAT	63	18	42.74785	MEAN LONG	168	57	29.8647375	MEAN EL HT	27.217

OPUS SOLUTIONS – POINT 603									
LAT	63	18	58.71784	W LON	168	56	27.18618	EL HGT	29.002
LAT	63	18	58.71744	W LON	168	56	27.18586	EL HGT	29.006
LAT	63	18	58.7182	W LON	168	56	27.18629	EL HGT	29.004
LAT	63	18	58.71827	W LON	168	56	27.1865	EL HGT	29.01
LAT	63	18	58.71773	W LON	168	56	27.18661	EL HGT	29.006
MEAN LAT	63	18	58.717896	MEAN LONG	168	56	27.186288	MEAN EL HT	29.0056

8. Survey Quality

The survey quality achieved exceeds all quality requirements outlined in Table 4-3 of the USACE Alaska District – Environmental Program Manual For Electronic Deliverables, April 2017. The RMS Values in the OPUS Solutions, RTK Survey Checkshots, and RTK RMS Values were all used to evaluate the survey quality. These values can all be found/confirmed in this report document and associated deliverable package.

Attachment 1
Control Statement

N.E. Cape Remedial Action Control Statement

This memo describes the relationship between the 2018 Lounsbury survey coordinate system and the 2013 Eco-Land survey coordinate system. During the field survey, discrepancies were found between provided control, NGS control and stakeout coordinates. The following is a summary of the steps taken to reconcile old data with new data.

Coordinate System Summary

COORDINATE SYSTEM

THIS PROJECT IS LOCATED ENTIRELY WITHIN ALASKA STATE PLANE ZONE 9 (AKSPZ9) U.S. SURVEY FOOT GRID COORDINATE SYSTEM.

BASIS OF COORDINATES

THE BASIS OF COORDINATES IS CONTROL POINT #1, A FOUND 5/8" REBAR LOCATED AT THE SOUTHEAST CORNER OF THE GRAVEL APRON SERVICING THE NORTHEAST CAPE RUNWAY. SAID POINT WAS SET BY ECO-LAND SURVEYS IN 2013 AND HAS AKSPZ9 COORDINATES OF 3409053.3560' NORTH, 1809572.5610' EAST.

BASIS OF BEARINGS

THIS PROJECT PRESERVES ALASKA STATE PLANE ZONE 9 GRID BEARINGS.

CONVERSION PARAMETERS

TO CONVERT AKSPZ9 U.S. SURVEY FOOT GRID COORDINATES TO "ECO-LAND" LOCAL COORDINATES:

1. ADD +0.245 EAST AND SUBTRACT -0.704 NORTH FROM THE GRID COORDINATES.
2. ROTATE THE RESULTING COORDINATES ABOUT CONTROL POINT #1 (3409053.3560 N, 1809572.5610 E) N 00°55'05.6805" E
3. SCALE THE RESULTING COORDINATES ABOUT CONTROL POINT #1 (3409053.3560 N, 1809572.5610 E) USING 1.000051579.

TO CONVERT "ECO-LAND" LOCAL COORDINATES TO AKSPZ9 U.S. SURVEY FOOT GRID COORDINATES:

1. SCALE THE "ECO-LAND" LOCAL COORDINATES ABOUT CONTROL POINT #1 (3409052.6520 N, 1809572.8060 E) USING 0.999948424.
2. ROTATE THE RESULTING COORDINATES ABOUT CONTROL POINT #1 (3409052.6520 N, 1809572.8060 E) N 00°55'05.6805" W
3. SUBTRACT -0.245 EAST AND ADD +0.704 NORTH TO THE RESULTING COORDINATES.

VERTICAL CONTROL STATEMENT

THE VERTICAL DATUM FOR THIS SURVEY IS NAVD88(GEOID 12B) IN U.S. SURVEY FEET, AS ESTABLISHED BY GPS ELEVATION TRANSFER. THE AVERAGE OF MULTIPLE NGS OPUS SOLUTIONS, OBSERVED OVER DIFFERENT DAYS, WAS HELD FIXED FOR EACH PROJECT CONTROL POINT.

Attachment 2
Descriptor Key

**Northeast Cape Remedial Action –
Site 28 Sediment Mapping Survey Services
Topographic Survey Descriptor Key**

Field Code	Full Description
BM	Benchmark
Calc	Calculated or Staked Point
CBC	Brass Cap Monument
CHK	Checkshot
CP	Control Point
CRBC	Rebar with Cap
EPP	Power Pole
GB	Grade Break
GS	Ground Shot
GTOE	Toe of Slope
GTOP	Top of Slope
HEW	Edge of Water
ML	Misc. Linear Feature
MP	Misc Point
RCL	Centerline of Road
RSH	Shoulder of Road
VEG	Edge of Vegetation

Attachment 3
Survey Data Table

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
1	CP 1 RTK BASE	63°19'32.47895"N	168°58'15.32269"W	63°19'32.49446"N	168°58'15.23687"W	7023485.9420	601619.7430	3409053.356	1809572.561	28.409	8.659	CP 1 RTK BASE	8/1/2018 10:19
2	2	63°18'57.69975"N	168°57'18.33986"W	63°18'57.71525"N	168°57'18.25406"W	7022435.1010	602446.5850	3405563.115	1812231.739	51.535	15.708	CRBC	8/1/2018 16:35
59	8039 A	63°20'08.83006"N	168°56'24.47121"W	63°20'08.84555"N	168°56'24.38532"W	7024659.7760	603125.3060	3412827.77	1814572.558	5.248	1.599	CBC	8/1/2018 10:19
603	BM B	63°18'58.70241"N	168°56'27.27211"W	63°18'58.71790"N	168°56'27.18629"W	7022488.8670	603156.0700	3405703.216	1814562.383	78.814	24.023	BM B NGSCBC	8/1/2018 8:42
1002	GPS-2	63°19'05.77800"N	168°56'49.31203"W	63°19'05.79349"N	168°56'49.22621"W	7022697.9410	602842.4310	3406405.262	1813544.002	71.976	21.938	CRBC	8/4/2018 9:33
2600	2600	63°18'42.73235"N	168°57'29.95052"W	63°18'42.74785"N	168°57'29.86474"W	7021966.8780	602299.8010	3404034.336	1811726.161	72.924	22.227	CRB	8/1/2018 15:07
2558	2558	63°18'45.36876"N	168°57'41.70504"W	63°18'45.38426"N	168°57'41.61925"W	7022043.2400	602133.6480	3404293.3920	1811184.9030	58.683	17.886	2018NEC28-SS01	8/3/2018 12:40
2559	2559	63°18'58.00178"N	168°57'41.76207"W	63°18'58.01728"N	168°57'41.67627"W	7022434.0660	602120.4250	3405576.4120	1811161.5190	37.804	11.523	2018NEC28-SS02	8/3/2018 12:41
2560	2560	63°18'57.83948"N	168°57'41.79408"W	63°18'57.85498"N	168°57'41.70828"W	7022429.0300	602120.1390	3405559.9040	1811160.3240	37.818	11.527	2018NEC28-SS03	8/3/2018 12:43
2561	2561	63°18'57.40699"N	168°57'41.55871"W	63°18'57.42249"N	168°57'41.47291"W	7022415.7540	602123.8400	3405516.1530	1811171.7850	38.752	11.812	2018NEC28-SS04	8/3/2018 12:44
2562	2562	63°18'56.93005"N	168°57'41.59496"W	63°18'56.94555"N	168°57'41.50916"W	7022400.9820	602123.8040	3405467.6860	1811170.9140	39.443	12.022	2018NEC28-SS05	8/3/2018 12:45
2563	2563	63°18'56.56474"N	168°57'41.48112"W	63°18'56.58024"N	168°57'41.39533"W	7022389.7300	602125.7480	3405430.6680	1811176.7140	39.597	12.069	2018NEC28-SS06	8/3/2018 12:47
2564	2564	63°18'56.33084"N	168°57'41.89117"W	63°18'56.34634"N	168°57'41.80538"W	7022382.3120	602120.2730	3405406.6090	1811158.3710	39.707	12.103	2018NEC28-SS07	8/3/2018 12:48
2565	2565	63°18'56.32647"N	168°57'41.66119"W	63°18'56.34197"N	168°57'41.57539"W	7022382.2790	602123.4770	3405406.3350	1811168.8820	39.666	12.090	2018NEC28-SS08	8/3/2018 12:50
2566	2566	63°18'56.13910"N	168°57'41.77685"W	63°18'56.15460"N	168°57'41.69105"W	7022376.4300	602122.0520	3405387.2190	1811163.9080	39.740	12.113	2018NEC28-SS09	8/3/2018 12:51
2567	2567	63°18'55.83461"N	168°57'41.91883"W	63°18'55.85011"N	168°57'41.83303"W	7022366.9470	602120.3760	3405356.1890	1811157.9240	39.968	12.182	2018NEC28-SS10	8/3/2018 12:52
2568	2568	63°18'55.57061"N	168°57'42.56023"W	63°18'55.58611"N	168°57'42.47444"W	7022358.4950	602111.7120	3405328.9020	1811129.0640	40.210	12.256	2018NEC28-SS11	8/3/2018 12:54
2569	2569	63°18'55.40361"N	168°57'42.54043"W	63°18'55.41911"N	168°57'42.45463"W	7022353.3370	602112.1520	3405311.9550	1811130.2430	40.293	12.281	2018NEC28-SS12	8/3/2018 12:55
2570	2570	63°18'53.60124"N	168°57'43.48041"W	63°18'53.61674"N	168°57'43.39462"W	7022297.1580	602100.8470	3405128.2040	1811090.2750	43.051	13.122	2018NEC28-SS13	8/3/2018 12:57
2571	2571	63°18'53.37489"N	168°57'43.24702"W	63°18'53.39039"N	168°57'43.16122"W	7022290.2580	602104.3170	3405105.3870	1811101.3070	43.217	13.172	2018NEC28-SS14	8/3/2018 12:58
2572	2572	63°18'50.11207"N	168°57'45.97513"W	63°18'50.12757"N	168°57'45.88934"W	7022188.1040	602069.5690	3404771.9850	1810982.0660	46.239	14.094	2018NEC28-SS15	8/3/2018 12:59
2573	2573	63°18'49.74352"N	168°57'46.45252"W	63°18'49.75902"N	168°57'46.36672"W	7022176.4900	602063.2890	3404734.2010	1810960.8670	46.827	14.273	2018NEC28-SS16	8/3/2018 13:01
2574	2574	63°18'49.14343"N	168°57'46.38444"W	63°18'49.15893"N	168°57'46.29865"W	7022157.9540	602064.8260	3404673.3040	1810964.9620	50.273	15.323	2018NEC28-SS17	8/3/2018 13:02
2575	2575	63°18'48.74094"N	168°57'46.69880"W	63°18'48.75644"N	168°57'46.61301"W	7022145.3620	602060.8480	3404632.1930	1810951.2650	52.085	15.875	2018NEC28-SS18	8/3/2018 13:04
2576	2576	63°18'48.26228"N	168°57'47.09359"W	63°18'48.27777"N	168°57'47.00780"W	7022130.3780	602055.8260	3404583.2860	1810934.0190	53.955	16.445	2018NEC28-SS19	8/3/2018 13:05
2577	2577	63°18'45.79453"N	168°57'48.66116"W	63°18'45.81003"N	168°57'48.57537"W	7022053.3360	602036.4400	3404331.4940	1810866.4710	0.000	0.000	2018NEC28-SS20	8/3/2018 13:06
2578	2578	63°18'43.37121"N	168°57'48.78994"W	63°18'43.38671"N	168°57'48.70415"W	7021978.3050	602037.0300	3404085.2760	1810864.5670	0.000	0.000	2018NEC28-SS21	8/3/2018 13:08
2579	2579	63°18'43.30102"N	168°57'48.68876"W	63°18'43.31652"N	168°57'48.60297"W	7021976.1780	602038.5070	3404078.2220	1810869.3040	61.506	18.747	2018NEC28-SS22	8/3/2018 13:09
2580	2580	63°18'43.27332"N	168°57'48.50612"W	63°18'43.28882"N	168°57'48.42033"W	7021975.4020	602041.0760	3404075.5440	1810877.6920	61.548	18.760	2018NEC28-SS23	8/3/2018 13:11
2581	2581	63°18'56.73315"N	168°57'41.52678"W	63°18'56.74865"N	168°57'41.44098"W	7022394.9210	602124.9470	3405447.7390	1811174.3520	39.590	12.067	2018NEC28-SS24	8/3/2018 13:12
2582	2582	63°18'53.31642"N	168°57'43.39645"W	63°18'53.33192"N	168°57'43.31066"W	7022288.3830	602102.2960	3405099.3380	1811094.5780	43.224	13.175	2018NEC28-SS25	8/3/2018 13:13
2583	2583	63°18'53.00234"N	168°57'43.60531"W	63°18'53.01784"N	168°57'43.51952"W	7022278.5740	602099.6980	3405067.2850	1811085.5550	43.196	13.166	2018NEC28-SS26	8/3/2018 13:15
2584	2584	63°18'53.15319"N	168°57'43.79994"W	63°18'53.16869"N	168°57'43.71414"W	7022283.1550	602096.8420	3405082.4620	1811076.4180	43.213	13.171	2018NEC28-SS27	8/3/2018 13:16
2585	2585	63°18'52.19933"N	168°57'44.53007"W	63°18'52.21483"N	168°57'44.44428"W	7022253.3200	602087.6220	3404985.0440	1811044.6380	43.953	13.397	2018NEC28-SS28	8/3/2018 13:18
2586	2586	63°18'51.93826"N	168°57'44.40747"W	63°18'51.95376"N	168°57'44.32167"W	7022245.2970	602089.5850	3404958.6190	1811050.6670	43.957	13.398	2018NEC28-SS29	8/3/2018 13:19
2587	2587	63°18'51.47323"N	168°57'45.38310"W	63°18'51.48873"N	168°57'45.29731"W	7022230.4780	602076.4670	3404910.6680	1811006.8700	43.983	13.406	2018NEC28-SS30	8/3/2018 13:20
2588	2588	63°18'51.19354"N	168°57'45.40300"W	63°18'51.20904"N	168°57'45.31720"W	7022221.8160	602076.4660	3404882.2470	1811006.4210	43.895	13.379	2018NEC28-SS31	8/3/2018 13:22
2589	2589	63°18'50.84200"N	168°57'45.15946"W	63°18'50.85750"N	168°57'45.07367"W	7022211.0480	602080.2000	3404846.7230	1811018.1220	44.141	13.454	2018NEC28-SS32	8/3/2018 13:23
2590	2590	63°18'50.53227"N	168°57'45.14459"W	63°18'50.54777"N	168°57'45.05880"W	7022201.4720	602080.7110	3404815.2760	1811019.3100	0.000	0.000	2018NEC28-SS33	8/3/2018 13:25
2591	2591	63°18'49.46651"N	168°57'46.71894"W	63°18'49.48201"N	168°57'46.63315"W	7022167.8020	602059.8540	3404705.8700	1810949.1530	48.108	14.663	2018NEC28-SS34	8/3/2018 13:26
2592	2592	63°18'49.28645"N	168°57'46.11318"W	63°18'49.30195"N	168°57'46.02739"W	7022162.4990	602068.4600	3404688.0300	1810977.1170	0.000	0.000	2018NEC28-SS35	8/3/2018 13:27
2593	2593	63°18'48.93748"N	168°57'46.37466"W	63°18'48.95298"N	168°57'46.28887"W	7022151.5870	602065.1650	3404652.3940	1810965.7470	51.379	15.660	2018NEC28-SS36	8/3/2018 13:29
2594	2594	63°18'48.44538"N	168°57'46.92171"W	63°18'48.46088"N	168°57'46.83592"W	7022136.1200	602058.0370	3404602.0100	1810941.5690	53.039	16.166	2018NEC28-SS37	8/3/2018 13:30
2595	2595	63°18'48.25673"N	168°57'46.84484"W	63°18'48.27223"N	168°57'46.75905"W	7022130.3170	602059.2920	3404582.9070	1810945.3900	54.759	16.691	2018NEC28-SS38	8/3/2018 13:32

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
2596	2596	63°18'48.10275"N	168°57'46.99710"W	63°18'48.11825"N	168°57'46.91131"W	7022125.4860	602057.3250	3404567.1550	1810938.6880	55.144	16.808	2018NEC28-SS39	8/3/2018 13:33
2597	2597	63°18'46.31033"N	168°57'43.50799"W	63°18'46.32583"N	168°57'43.42220"W	7022071.5730	602107.6350	3404387.6880	1811101.0020	57.705	17.588	2018NEC28-SS40	8/3/2018 13:34
2598	2598	63°18'46.18960"N	168°57'43.41918"W	63°18'46.20510"N	168°57'43.33339"W	7022067.8770	602108.9900	3404375.4920	1811105.2570	57.736	17.598	2018NEC28-SS41	8/3/2018 13:36
2599	2599	63°18'45.73777"N	168°57'47.98254"W	63°18'45.75327"N	168°57'47.89675"W	7022051.8800	602045.9390	3404326.2300	1810897.5610	58.066	17.698	2018NEC28-SS42	8/3/2018 13:37
2601	2601	63°18'43.91482"N	168°57'43.95988"W	63°18'43.93032"N	168°57'43.87410"W	7021997.2590	602103.7040	3404144.0560	1811084.2990	60.815	18.536	2018NEC28-SS44	8/3/2018 13:39
2602	2602	63°18'43.89071"N	168°57'44.19305"W	63°18'43.90621"N	168°57'44.10727"W	7021996.4100	602100.4830	3404141.4350	1811073.6880	0.000	0.000	2018NEC28-SS45	8/3/2018 13:40
2603	2603	63°18'43.81229"N	168°57'44.07087"W	63°18'43.82778"N	168°57'43.98508"W	7021994.0380	602102.2600	3404133.5600	1811079.3980	60.820	18.538	2018NEC28-SS46	8/3/2018 13:41
2604	2604	63°18'43.95943"N	168°57'49.29893"W	63°18'43.97493"N	168°57'49.21314"W	7021996.2780	602029.3700	3404144.6420	1810840.3520	0.000	0.000	2018NEC28-SS47	8/3/2018 13:43
2605	2605	63°18'44.46432"N	168°57'51.46056"W	63°18'44.47982"N	168°57'51.37477"W	7022010.9440	601998.7960	3404194.3260	1810740.7860	61.016	18.598	2018NEC28-SS48	8/3/2018 13:44
2606	2606	63°18'43.26886"N	168°57'48.97296"W	63°18'43.28436"N	168°57'48.88718"W	7021975.0570	602034.5840	3404074.7460	1810856.3750	0.000	0.000	2018NEC28-SS49	8/3/2018 13:46
2607	2607	63°18'43.28481"N	168°57'48.50842"W	63°18'43.30031"N	168°57'48.42263"W	7021975.7560	602041.0320	3404076.7090	1810877.5680	61.552	18.761	2018NEC28-SS50	8/3/2018 13:47
2608	2608	63°18'52.97857"N	168°57'43.83129"W	63°18'52.99407"N	168°57'43.74550"W	7022277.7380	602096.5780	3405064.7030	1811075.2730	43.213	13.171	2018NEC28-SS51	8/3/2018 13:48
2610	2610	63°18'45.64487"N	168°57'48.27629"W	63°18'45.66037"N	168°57'48.19050"W	7022048.8760	602041.9430	3404316.5780	1810884.2960	58.085	17.704	2018NEC28-SS43	8/3/2018 13:50
5001	STOKE	63°19'30.81381"N	168°55'28.69088"W	63°19'30.82929"N	168°55'28.60503"W	7023508.6300	603938.9000	3409009.096	1817183.125	24.847	7.573	CHK 0 HV	8/1/2018 9:38
5002	5002	63°20'08.82997"N	168°56'24.47091"W	63°20'08.84546"N	168°56'24.38504"W	7024659.7730	603125.3100	3412827.761	1814572.572	5.236	1.596	CHK 59 HV	8/1/2018 11:30
5003	5003	63°20'06.89410"N	168°56'26.90524"W	63°20'06.90959"N	168°56'26.81935"W	7024598.7930	603093.3900	3412629.31	1814464.718	4.512	1.375	CHK 59 HV BM 8039B	8/1/2018 11:43
5004	5004	63°20'04.42856"N	168°56'31.18733"W	63°20'04.44406"N	168°56'31.10147"W	7024520.6000	603036.3040	3412375.673	1814273.413	4.018	1.225	CHK 0 HV BM 8039C	8/1/2018 11:48
5005	5005	63°18'39.01668"N	168°58'07.96138"W	63°18'39.03218"N	168°58'07.87561"W	7021835.1160	601774.5380	3403628.893	1809995.972	75.385	22.977	CHK 0 HV NEAR 34009	8/1/2018 12:54
5006	5006	63°18'42.73262"N	168°57'29.95021"W	63°18'42.74812"N	168°57'29.86442"W	7021966.8860	602299.8050	3404034.363	1811726.175	72.966	22.24	CHK 2600 HV	8/1/2018 15:02
5007	5007	63°18'38.87278"N	168°57'39.96044"W	63°18'38.88828"N	168°57'39.87465"W	7021843.0340	602164.3150	3403634.924	1811275.28	93.913	28.625	CHK 0 HV	8/1/2018 15:16
5008	5008	63°18'14.54356"N	168°57'25.41886"W	63°18'14.55905"N	168°57'25.33309"W	7021096.7590	602390.6520	3401174.734	1811979.723	240.069	73.173	CHK 0 HV	8/1/2018 15:33
5009	5009	63°19'32.47889"N	168°58'15.32280"W	63°19'32.49439"N	168°58'15.23698"W	7023485.9400	601619.7410	3409053.349	1809572.556	28.488	8.683	CHK 0 HV	8/2/2018 11:04
5010	5010	63°18'45.68881"N	168°57'48.68632"W	63°18'45.70431"N	168°57'48.60053"W	7022050.0540	602036.1940	3404320.738	1810865.495	58.08	17.703	HEW1	8/2/2018 11:24
5011	5011	63°18'45.56551"N	168°57'48.25826"W	63°18'45.58101"N	168°57'48.17248"W	7022046.4290	602042.2710	3404308.531	1810885.25	58.092	17.707	HEW1	8/2/2018 11:24
5012	5012	63°18'45.41625"N	168°57'48.04362"W	63°18'45.43175"N	168°57'47.95784"W	7022041.9060	602045.4050	3404293.53	1810895.299	58.11	17.712	HEW1	8/2/2018 11:25
5013	5013	63°18'45.43875"N	168°57'47.83209"W	63°18'45.45424"N	168°57'47.74630"W	7022042.6950	602048.3260	3404295.971	1810904.924	58.065	17.698	HEW1	8/2/2018 11:25
5014	5014	63°18'45.55935"N	168°57'47.74347"W	63°18'45.57485"N	168°57'47.65767"W	7022046.4660	602049.4410	3404308.286	1810908.774	58.028	17.687	HEW1	8/2/2018 11:25
5015	5015	63°18'45.71720"N	168°57'47.64733"W	63°18'45.73269"N	168°57'47.56154"W	7022051.3920	602050.6230	3404324.388	1810912.906	58.068	17.699	HEW1	8/2/2018 11:26
5016	5016	63°18'45.85936"N	168°57'47.73746"W	63°18'45.87486"N	168°57'47.65166"W	7022055.7500	602049.2290	3404338.76	1810908.556	58.088	17.705	HEW1	8/2/2018 11:26
5017	5017	63°18'45.85837"N	168°57'48.08032"W	63°18'45.87386"N	168°57'47.99453"W	7022055.5680	602044.4600	3404338.406	1810892.897	58.048	17.693	HEW1	8/2/2018 11:26
5018	5018	63°18'45.96275"N	168°57'48.28021"W	63°18'45.97824"N	168°57'48.19442"W	7022058.7090	602041.5760	3404348.86	1810883.595	58.11	17.712	HEW1	8/2/2018 11:26
5019	5019	63°18'45.92992"N	168°57'48.43460"W	63°18'45.94542"N	168°57'48.34881"W	7022057.6250	602039.4600	3404345.412	1810876.597	58.058	17.696	HEW1	8/2/2018 11:27
5020	5020	63°18'45.73583"N	168°57'48.64943"W	63°18'45.75133"N	168°57'48.56364"W	7022051.5250	602036.6610	3404325.541	1810867.103	58.102	17.71	HEW1 C	8/2/2018 11:27
5021	5021	63°18'45.79295"N	168°57'46.30289"W	63°18'45.80845"N	168°57'46.21711"W	7022054.3300	602069.2550	3404333.075	1810974.191	58.993	17.981	HEW2	8/2/2018 11:44
5022	5022	63°18'45.77005"N	168°57'46.10243"W	63°18'45.78555"N	168°57'46.01664"W	7022053.7100	602072.0670	3404330.897	1810983.385	58.951	17.968	HEW2	8/2/2018 11:45
5023	5023	63°18'45.84938"N	168°57'45.83588"W	63°18'45.86488"N	168°57'45.75008"W	7022056.2820	602075.6980	3404339.151	1810995.43	58.99	17.98	HEW2	8/2/2018 11:45
5024	5024	63°18'46.03247"N	168°57'45.91969"W	63°18'46.04797"N	168°57'45.83390"W	7022061.9100	602074.3520	3404357.685	1810991.301	58.974	17.975	HEW2	8/2/2018 11:46
5025	5025	63°18'46.10354"N	168°57'45.55309"W	63°18'46.11904"N	168°57'45.46730"W	7022064.2710	602079.3830	3404365.174	1811007.929	59.018	17.989	HEW2	8/2/2018 11:46
5026	5026	63°18'46.25229"N	168°57'45.35572"W	63°18'46.26778"N	168°57'45.26994"W	7022068.9600	602081.9830	3404380.427	1811016.7	58.975	17.976	HEW2	8/2/2018 11:46
5027	5027	63°18'46.33088"N	168°57'45.53677"W	63°18'46.34638"N	168°57'45.45097"W	7022071.3120	602079.3860	3404388.276	1811008.301	58.952	17.968	HEW2	8/2/2018 11:47
5028	5028	63°18'46.24113"N	168°57'45.94936"W	63°18'46.25662"N	168°57'45.86357"W	7022068.3520	602073.7340	3404378.855	1810989.603	59.021	17.99	HEW2	8/2/2018 11:47
5029	5029	63°18'46.09493"N	168°57'46.07431"W	63°18'46.11042"N	168°57'45.98851"W	7022063.7740	602072.1390	3404363.914	1810984.136	59.088	18.01	HEW2	8/2/2018 11:47
5030	5030	63°18'45.92776"N	168°57'46.22906"W	63°18'45.94326"N	168°57'46.14328"W	7022058.5330	602070.1500	3404346.821	1810977.342	58.919	17.959	HEW2 C	8/2/2018 11:48
5031	5031	63°18'45.45531"N	168°57'42.30845"W	63°18'45.47082"N	168°57'42.22655"W	7022045.6510	602125.1670	3404301.736	1811157.199	58.643	17.874	HEW3	8/2/2018 12:02

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5032	5032	63°18'45.60212"N	168°57'42.15254"W	63°18'45.61762"N	168°57'42.06675"W	7022050.2620	602127.1920	3404316.762	1811164.079	58.67	17.883	HEW3	8/2/2018 12:02
5033	5033	63°18'45.63307"N	168°57'41.87918"W	63°18'45.64857"N	168°57'41.79339"W	7022051.3400	602130.9650	3404320.107	1811176.514	58.643	17.874	HEW3	8/2/2018 12:03
5034	5034	63°18'45.45789"N	168°57'41.65312"W	63°18'45.47338"N	168°57'41.56733"W	7022046.0200	602134.2830	3404302.482	1811187.128	58.648	17.876	HEW3	8/2/2018 12:03
5035	5035	63°18'45.31438"N	168°57'41.47029"W	63°18'45.32987"N	168°57'41.38449"W	7022041.6610	602136.9680	3404288.042	1811195.715	58.754	17.908	HEW3	8/2/2018 12:03
5036	5036	63°18'45.17996"N	168°57'41.60235"W	63°18'45.19546"N	168°57'41.51655"W	7022037.4440	602135.2630	3404274.292	1811189.904	58.752	17.907	HEW3	8/2/2018 12:04
5037	5037	63°18'45.29517"N	168°57'41.98770"W	63°18'45.31066"N	168°57'41.90190"W	7022040.8380	602129.7880	3404285.708	1811172.113	58.666	17.881	HEW3 C	8/2/2018 12:04
5038	5038	63°18'46.07608"N	168°57'43.54810"W	63°18'46.09157"N	168°57'43.46232"W	7022064.3080	602107.3070	3404363.867	1811099.555	57.722	17.594	HEW4	8/2/2018 12:05
5039	5039	63°18'46.10161"N	168°57'43.16931"W	63°18'46.11711"N	168°57'43.08352"W	7022065.2660	602112.5530	3404366.74	1811116.815	57.753	17.603	HEW4	8/2/2018 12:06
5040	5040	63°18'46.24535"N	168°57'43.10106"W	63°18'46.26085"N	168°57'43.01527"W	7022069.7430	602113.3610	3404381.389	1811119.696	57.758	17.605	HEW4	8/2/2018 12:06
5041	5041	63°18'46.36663"N	168°57'43.36495"W	63°18'46.38213"N	168°57'43.27916"W	7022073.3790	602109.5700	3404393.512	1811107.443	57.773	17.609	HEW4	8/2/2018 12:06
5042	5042	63°18'46.34542"N	168°57'43.58377"W	63°18'46.36092"N	168°57'43.49797"W	7022072.6260	602106.5460	3404391.196	1811097.483	57.628	17.565	HEW4	8/2/2018 12:07
5043	5043	63°18'46.21907"N	168°57'43.55692"W	63°18'46.23457"N	168°57'43.47114"W	7022068.7280	602107.0440	3404378.383	1811098.917	57.727	17.595	HEW4 C	8/2/2018 12:07
5044	5044	63°18'48.10128"N	168°57'46.99773"W	63°18'48.11678"N	168°57'46.91194"W	7022125.4400	602057.3180	3404567.005	1810938.662	55.192	16.823	MP SPRING	8/2/2018 12:12
5045	5045	63°18'48.07914"N	168°57'46.96249"W	63°18'48.09464"N	168°57'46.87669"W	7022124.7710	602057.8300	3404564.783	1810940.308	55.211	16.828	HEW5HEW6	8/2/2018 12:14
5046	5046	63°18'48.09337"N	168°57'47.06109"W	63°18'48.10886"N	168°57'46.97530"W	7022125.1670	602056.4440	3404566.155	1810935.781	55.19	16.822	HEW6	8/2/2018 12:14
5047	5047	63°18'48.18623"N	168°57'46.97783"W	63°18'48.20173"N	168°57'46.89205"W	7022128.0770	602057.5110	3404575.648	1810939.431	54.957	16.751	HEW6	8/2/2018 12:14
5048	5048	63°18'48.16642"N	168°57'46.97728"W	63°18'48.18192"N	168°57'46.89149"W	7022127.4640	602057.5380	3404573.636	1810939.489	54.935	16.744	HEW5	8/2/2018 12:14
5049	5049	63°18'48.18045"N	168°57'46.89347"W	63°18'48.19595"N	168°57'46.80768"W	7022127.9350	602058.6900	3404575.123	1810943.294	54.879	16.727	HEW5	8/2/2018 12:15
5050	5050	63°18'48.19413"N	168°57'46.90977"W	63°18'48.20963"N	168°57'46.82397"W	7022128.3520	602058.4500	3404576.501	1810942.527	54.809	16.706	HEW6	8/2/2018 12:15
5051	5051	63°18'48.23592"N	168°57'46.86476"W	63°18'48.25142"N	168°57'46.77897"W	7022129.6640	602059.0350	3404580.778	1810944.514	54.78	16.697	HEW6	8/2/2018 12:15
5052	5052	63°18'48.22654"N	168°57'46.77560"W	63°18'48.24204"N	168°57'46.68981"W	7022129.4140	602060.2850	3404579.891	1810948.602	54.71	16.676	HEW5	8/2/2018 12:15
5053	5053	63°18'48.27904"N	168°57'46.79622"W	63°18'48.29454"N	168°57'46.71043"W	7022131.0290	602059.9470	3404585.208	1810947.574	54.75	16.688	HEW5	8/2/2018 12:15
5054	5054	63°18'48.24859"N	168°57'46.88272"W	63°18'48.26409"N	168°57'46.79694"W	7022130.0480	602058.7730	3404582.052	1810943.673	54.752	16.689	HEW6	8/2/2018 12:16
5055	5055	63°18'48.27912"N	168°57'46.94838"W	63°18'48.29462"N	168°57'46.86258"W	7022130.9640	602057.8300	3404585.104	1810940.624	54.365	16.571	HEW6	8/2/2018 12:16
5056	5056	63°18'48.30248"N	168°57'47.00317"W	63°18'48.31798"N	168°57'46.91738"W	7022131.6620	602057.0440	3404587.436	1810938.083	53.847	16.413	HEW6	8/2/2018 12:16
5057	5057	63°18'48.29300"N	168°57'47.04975"W	63°18'48.30850"N	168°57'46.96396"W	7022131.3480	602056.4050	3404586.439	1810935.971	53.824	16.406	HEW6	8/2/2018 12:16
5058	5058	63°18'48.24967"N	168°57'47.09941"W	63°18'48.26516"N	168°57'47.01362"W	7022129.9860	602055.7570	3404582.001	1810933.774	53.989	16.456	HEW6	8/2/2018 12:17
5059	5059	63°18'48.25312"N	168°57'47.21343"W	63°18'48.26862"N	168°57'47.12765"W	7022130.0420	602054.1670	3404582.268	1810928.56	54.007	16.461	HEW6	8/2/2018 12:17
5060	5060	63°18'48.28109"N	168°57'47.20477"W	63°18'48.29659"N	168°57'47.11897"W	7022130.9120	602054.2600	3404585.115	1810928.91	53.923	16.436	HEW6	8/2/2018 12:17
5061	5061	63°18'48.28083"N	168°57'47.13437"W	63°18'48.29633"N	168°57'47.04858"W	7022130.9350	602055.2400	3404585.14	1810932.126	53.983	16.454	HEW6	8/2/2018 12:17
5062	5062	63°18'48.29929"N	168°57'47.07039"W	63°18'48.31479"N	168°57'46.98460"W	7022131.5340	602056.1120	3404587.063	1810935.018	53.779	16.392	HEW6	8/2/2018 12:17
5063	5063	63°18'48.31592"N	168°57'47.05046"W	63°18'48.33142"N	168°57'46.96467"W	7022132.0570	602056.3730	3404588.766	1810935.901	53.766	16.388	HEW6	8/2/2018 12:17
5064	5064	63°18'48.34902"N	168°57'47.04977"W	63°18'48.36452"N	168°57'46.96399"W	7022133.0820	602056.3500	3404592.129	1810935.878	53.706	16.37	HEW6	8/2/2018 12:18
5065	5065	63°18'48.39420"N	168°57'47.03987"W	63°18'48.40969"N	168°57'46.95409"W	7022134.4840	602056.4430	3404596.724	1810936.256	53.396	16.275	HEW6	8/2/2018 12:18
5066	5066	63°18'48.43022"N	168°57'47.00195"W	63°18'48.44572"N	168°57'46.91616"W	7022135.6150	602056.9360	3404600.411	1810937.929	53.035	16.165	HEW6	8/2/2018 12:18
5067	5067	63°18'48.49522"N	168°57'46.85158"W	63°18'48.51072"N	168°57'46.76579"W	7022137.6930	602058.9640	3404607.124	1810944.69	52.932	16.134	HEW6	8/2/2018 12:18
5068	5068	63°18'48.31384"N	168°57'46.84283"W	63°18'48.32934"N	168°57'46.75705"W	7022132.0850	602059.2640	3404588.708	1810945.388	54.635	16.653	HEW5	8/2/2018 12:19
5069	5069	63°18'48.39246"N	168°57'46.87089"W	63°18'48.40796"N	168°57'46.78509"W	7022134.5050	602058.7960	3404596.673	1810943.977	53.025	16.162	HEW5	8/2/2018 12:19
5070	5070	63°18'48.46819"N	168°57'46.79986"W	63°18'48.48369"N	168°57'46.71408"W	7022136.8790	602059.7100	3404604.417	1810947.097	53.046	16.168	HEW5	8/2/2018 12:19
5071	5071	63°18'48.30494"N	168°57'46.85714"W	63°18'48.32045"N	168°57'46.77136"W	7022131.8030	602059.0740	3404587.794	1810944.749	54.691	16.67	HEW7	8/2/2018 12:20
5072	5072	63°18'48.29707"N	168°57'46.92332"W	63°18'48.31257"N	168°57'46.83753"W	7022131.5300	602058.1600	3404586.946	1810941.739	54.198	16.52	HEW7	8/2/2018 12:20
5073	5073	63°18'48.31597"N	168°57'46.99016"W	63°18'48.33147"N	168°57'46.90438"W	7022132.0860	602057.2120	3404588.816	1810938.655	53.732	16.378	HEW7	8/2/2018 12:20
5074	5074	63°18'48.34664"N	168°57'47.01966"W	63°18'48.36214"N	168°57'46.93387"W	7022133.0210	602056.7710	3404591.909	1810937.257	53.735	16.378	HEW7	8/2/2018 12:21
5075	5075	63°18'48.39037"N	168°57'47.02107"W	63°18'48.40586"N	168°57'46.93527"W	7022134.3740	602056.7090	3404596.349	1810937.121	53.315	16.25	HEW7	8/2/2018 12:21

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5076	5076	63°18'48.38997"N	168°57'46.91238"W	63°18'48.40547"N	168°57'46.82660"W	7022134.4090	602058.2210	3404596.389	1810942.086	53.066	16.175	HEW7 C	8/2/2018 12:21
5077	5077	63°18'48.58547"N	168°57'46.70750"W	63°18'48.60097"N	168°57'46.62170"W	7022140.5490	602060.8800	3404616.396	1810951.123	52.457	15.989	HEW6	8/2/2018 12:23
5078	5078	63°18'48.67880"N	168°57'46.72785"W	63°18'48.69430"N	168°57'46.64207"W	7022143.4270	602060.5050	3404625.86	1810950.04	52.33	15.95	HEW6	8/2/2018 12:23
5079	5079	63°18'48.75754"N	168°57'46.70950"W	63°18'48.77304"N	168°57'46.62371"W	7022145.8720	602060.6830	3404633.871	1810950.749	52.057	15.867	HEW6	8/2/2018 12:23
5080	5080	63°18'48.83553"N	168°57'46.69579"W	63°18'48.85103"N	168°57'46.61000"W	7022148.2900	602060.7970	3404641.802	1810951.247	51.702	15.759	HEW6	8/2/2018 12:24
5081	5081	63°18'48.85654"N	168°57'46.65037"W	63°18'48.87203"N	168°57'46.56459"W	7022148.9600	602061.4080	3404643.969	1810953.287	51.689	15.755	HEW6	8/2/2018 12:24
5082	5082	63°18'48.86711"N	168°57'46.54895"W	63°18'48.88261"N	168°57'46.46315"W	7022149.3330	602062.8090	3404645.118	1810957.902	51.637	15.739	HEW6	8/2/2018 12:24
5083	5083	63°18'48.89009"N	168°57'46.46175"W	63°18'48.90559"N	168°57'46.37596"W	7022150.0820	602064.0000	3404647.516	1810961.847	51.617	15.733	HEW6	8/2/2018 12:24
5084	5084	63°18'49.05431"N	168°57'46.35691"W	63°18'49.06981"N	168°57'46.27112"W	7022155.2090	602065.2970	3404664.273	1810966.366	50.978	15.538	HEW6	8/2/2018 12:25
5085	5085	63°18'49.14264"N	168°57'46.40987"W	63°18'49.15815"N	168°57'46.32409"W	7022157.9190	602064.4730	3404673.205	1810963.802	50.276	15.324	HEW6	8/2/2018 12:25
5086	5086	63°18'49.26426"N	168°57'46.24722"W	63°18'49.27976"N	168°57'46.16143"W	7022161.7530	602066.6170	3404685.677	1810971.031	49.902	15.21	HEW6	8/2/2018 12:25
5087	5087	63°18'49.29916"N	168°57'46.18035"W	63°18'49.31466"N	168°57'46.09457"W	7022162.8630	602067.5130	3404689.271	1810974.028	49.688	15.145	HEW6	8/2/2018 12:25
5088	5088	63°18'49.31998"N	168°57'46.13488"W	63°18'49.33548"N	168°57'46.04908"W	7022163.5270	602068.1250	3404691.419	1810976.071	49.444	15.071	HEW6	8/2/2018 12:26
5089	5089	63°18'49.34615"N	168°57'46.09129"W	63°18'49.36164"N	168°57'46.00550"W	7022164.3560	602068.7060	3404694.109	1810978.019	49.208	14.999	HEW6	8/2/2018 12:26
5090	5090	63°18'49.39186"N	168°57'46.17122"W	63°18'49.40736"N	168°57'46.08544"W	7022165.7350	602067.5490	3404698.693	1810974.293	49.022	14.942	HEW6	8/2/2018 12:26
5091	5091	63°18'49.48394"N	168°57'46.18500"W	63°18'49.49944"N	168°57'46.09922"W	7022168.5770	602067.2660	3404708.035	1810973.512	48.428	14.761	HEW6	8/2/2018 12:27
5092	5092	63°18'49.47307"N	168°57'46.67658"W	63°18'49.48856"N	168°57'46.59080"W	7022168.0230	602060.4370	3404706.567	1810951.077	48.173	14.683	HEW8	8/2/2018 12:29
5093	5093	63°18'49.45762"N	168°57'46.70402"W	63°18'49.47312"N	168°57'46.61823"W	7022167.5340	602060.0710	3404704.978	1810949.849	48.13	14.67	HEW8	8/2/2018 12:29
5094	5094	63°18'49.46325"N	168°57'46.73666"W	63°18'49.47875"N	168°57'46.65088"W	7022167.6930	602059.6110	3404705.526	1810948.349	48.102	14.662	HEW8	8/2/2018 12:29
5095	5095	63°18'49.48206"N	168°57'46.72364"W	63°18'49.49756"N	168°57'46.63784"W	7022168.2810	602059.7740	3404707.446	1810948.913	48.081	14.655	HEW8 C	8/2/2018 12:29
5096	5096	63°18'49.53884"N	168°57'46.22012"W	63°18'49.55435"N	168°57'46.13432"W	7022170.2610	602066.7240	3404713.585	1810971.818	47.576	14.501	HEW6	8/2/2018 12:29
5097	5097	63°18'49.58636"N	168°57'46.28895"W	63°18'49.60186"N	168°57'46.20316"W	7022171.7000	602065.7190	3404718.36	1810968.596	47.178	14.38	HEW6	8/2/2018 12:30
5098	5098	63°18'49.60051"N	168°57'46.39658"W	63°18'49.61601"N	168°57'46.31079"W	7022172.0900	602064.2080	3404719.718	1810963.657	47.036	14.336	HEW6	8/2/2018 12:30
5099	5099	63°18'49.66381"N	168°57'46.57081"W	63°18'49.67931"N	168°57'46.48501"W	7022173.9720	602061.7220	3404726.018	1810955.595	46.967	14.316	HEW6	8/2/2018 12:30
5100	5100	63°18'49.73959"N	168°57'46.50021"W	63°18'49.75509"N	168°57'46.41441"W	7022176.3480	602062.6290	3404733.767	1810958.695	46.894	14.293	HEW6	8/2/2018 12:30
5101	5101	63°18'49.81362"N	168°57'46.46466"W	63°18'49.82912"N	168°57'46.37887"W	7022178.6540	602063.0510	3404741.312	1810960.197	46.901	14.296	HEW6	8/2/2018 12:30
5102	5102	63°18'49.88662"N	168°57'46.39824"W	63°18'49.90212"N	168°57'46.31244"W	7022180.9410	602063.9040	3404748.775	1810963.111	46.672	14.226	HEW6	8/2/2018 12:31
5103	5103	63°18'49.95976"N	168°57'46.38287"W	63°18'49.97526"N	168°57'46.29707"W	7022183.2110	602064.0460	3404756.215	1810963.693	46.439	14.155	HEW6	8/2/2018 12:31
5104	5104	63°18'50.04191"N	168°57'46.22968"W	63°18'50.05741"N	168°57'46.14388"W	7022185.8200	602066.0960	3404764.671	1810970.555	46.319	14.118	HEW6	8/2/2018 12:31
5105	5105	63°18'50.04292"N	168°57'46.16146"W	63°18'50.05842"N	168°57'46.07567"W	7022185.8820	602067.0440	3404764.824	1810973.669	46.28	14.106	HEW6	8/2/2018 12:32
5106	5106	63°18'50.05617"N	168°57'46.11280"W	63°18'50.07167"N	168°57'46.02701"W	7022186.3140	602067.7080	3404766.206	1810975.87	46.286	14.108	HEW6	8/2/2018 12:32
5107	5107	63°18'50.13406"N	168°57'45.97684"W	63°18'50.14955"N	168°57'45.89105"W	7022188.7830	602069.5230	3404774.217	1810981.952	46.258	14.099	HEW6	8/2/2018 12:32
5108	5108	63°18'50.14504"N	168°57'45.84499"W	63°18'50.16054"N	168°57'45.75920"W	7022189.1820	602071.3470	3404775.43	1810987.956	46.256	14.099	HEW6	8/2/2018 12:32
5109	5109	63°18'50.13334"N	168°57'45.76403"W	63°18'50.14883"N	168°57'45.67824"W	7022188.8550	602072.4850	3404774.301	1810991.673	46.126	14.059	HEW6	8/2/2018 12:32
5110	5110	63°18'50.19183"N	168°57'45.67372"W	63°18'50.20733"N	168°57'45.58793"W	7022190.7050	602073.6840	3404780.309	1810995.702	45.787	13.956	HEW6	8/2/2018 12:33
5111	5111	63°18'50.25804"N	168°57'45.64309"W	63°18'50.27354"N	168°57'45.55730"W	7022192.7670	602074.0450	3404787.056	1810996.992	45.599	13.898	HEW6	8/2/2018 12:33
5112	5112	63°18'50.32722"N	168°57'45.54186"W	63°18'50.34272"N	168°57'45.45607"W	7022194.9520	602075.3860	3404794.157	1811001.502	44.979	13.71	HEW6	8/2/2018 12:33
5113	5113	63°18'50.45120"N	168°57'45.41087"W	63°18'50.46670"N	168°57'45.32509"W	7022198.8460	602077.0860	3404806.846	1811007.281	44.789	13.652	HEW6	8/2/2018 12:34
5114	5114	63°18'42.73227"N	168°57'29.94991"W	63°18'42.74776"N	168°57'29.86412"W	7021966.8750	602299.8100	3404034.328	1811726.189	73.037	22.262	CHK 2600 HV	8/2/2018 12:40
5115	5115	63°20'08.82969"N	168°56'24.47122"W	63°20'08.84519"N	168°56'24.38535"W	7024659.7650	603125.3050	3412827.733	1814572.558	5.285	1.611	CHK 59 HV	8/2/2018 14:35
5116	5116	63°18'50.48051"N	168°57'45.27559"W	63°18'50.49601"N	168°57'45.18978"W	7022199.8120	602078.9400	3404809.922	1811013.412	44.737	13.636	HEW6	8/2/2018 15:14
5117	5117	63°18'50.57946"N	168°57'45.18671"W	63°18'50.59496"N	168°57'45.10092"W	7022202.9130	602080.0790	3404820.038	1811017.309	44.48	13.557	HEW6	8/2/2018 15:16
5118	5118	63°18'50.72525"N	168°57'45.11357"W	63°18'50.74074"N	168°57'45.02778"W	7022207.4560	602080.9530	3404834.899	1811020.41	44.254	13.489	HEW6	8/2/2018 15:17
5119	5119	63°18'50.88535"N	168°57'45.29156"W	63°18'50.90085"N	168°57'45.20577"W	7022212.3310	602078.3190	3404851.028	1811012.017	44.028	13.42	HEW6	8/2/2018 15:17

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5120	5120	63°18'50.95993"N	168°57'45.50357"W	63°18'50.97543"N	168°57'45.41777"W	7022214.5440	602075.2960	3404858.446	1811002.211	43.918	13.386	HEW6	8/2/2018 15:18
5121	5121	63°18'51.13799"N	168°57'45.46906"W	63°18'51.15349"N	168°57'45.38327"W	7022220.0680	602075.6010	3404876.556	1811003.495	43.899	13.381	HEW6	8/2/2018 15:18
5122	5122	63°18'51.28536"N	168°57'45.51146"W	63°18'51.30086"N	168°57'45.42566"W	7022224.6090	602074.8660	3404891.492	1811001.316	43.919	13.387	HEW6	8/2/2018 15:19
5123	5123	63°18'51.41236"N	168°57'45.64741"W	63°18'51.42785"N	168°57'45.56162"W	7022228.4780	602072.8500	3404904.29	1810994.898	44.027	13.419	HEW6	8/2/2018 15:19
5124	5124	63°18'51.47995"N	168°57'45.67381"W	63°18'51.49545"N	168°57'45.58801"W	7022230.5580	602072.4160	3404911.135	1810993.581	43.913	13.385	HEW6	8/2/2018 15:19
5125	5125	63°18'51.55306"N	168°57'45.56738"W	63°18'51.56855"N	168°57'45.48158"W	7022232.8670	602073.8250	3404918.639	1810998.322	44.04	13.423	HEW6	8/2/2018 15:21
5126	5126	63°18'51.57111"N	168°57'45.37290"W	63°18'51.58661"N	168°57'45.28711"W	7022233.5110	602076.5130	3404920.616	1811007.175	44.046	13.425	HEW6	8/2/2018 15:21
5127	5127	63°18'51.47026"N	168°57'45.29900"W	63°18'51.48575"N	168°57'45.21320"W	7022230.4240	602077.6410	3404910.428	1811010.716	44.002	13.412	HEW6	8/2/2018 15:22
5128	5128	63°18'51.47959"N	168°57'45.21251"W	63°18'51.49509"N	168°57'45.12673"W	7022230.7510	602078.8350	3404911.44	1811014.651	43.992	13.409	HEW6	8/2/2018 15:22
5129	5129	63°18'51.52096"N	168°57'45.20319"W	63°18'51.53645"N	168°57'45.11741"W	7022232.0340	602078.9240	3404915.648	1811015.009	44.006	13.413	HEW6	8/2/2018 15:22
5130	5130	63°18'51.53223"N	168°57'45.07529"W	63°18'51.54774"N	168°57'44.98949"W	7022232.4400	602080.6920	3404916.888	1811020.832	43.987	13.407	HEW6	8/2/2018 15:22
5131	5131	63°18'51.51715"N	168°57'44.95404"W	63°18'51.53266"N	168°57'44.86824"W	7022232.0270	602082.3940	3404915.446	1811026.395	44.011	13.415	HEW6	8/2/2018 15:22
5132	5132	63°18'51.53880"N	168°57'44.91472"W	63°18'51.55430"N	168°57'44.82894"W	7022232.7140	602082.9200	3404917.673	1811028.155	44.041	13.424	HEW6	8/2/2018 15:23
5133	5133	63°18'51.59879"N	168°57'44.86543"W	63°18'51.61429"N	168°57'44.77964"W	7022234.5920	602083.5460	3404923.803	1811030.308	43.967	13.401	HEW6	8/2/2018 15:23
5134	5134	63°18'51.66866"N	168°57'44.79178"W	63°18'51.68416"N	168°57'44.70597"W	7022236.7860	602084.5030	3404930.953	1811033.557	44.008	13.414	HEW6	8/2/2018 15:23
5135	5135	63°18'51.75900"N	168°57'44.76604"W	63°18'51.77450"N	168°57'44.68025"W	7022239.5930	602084.7720	3404940.148	1811034.584	43.972	13.403	HEW6	8/2/2018 15:23
5136	5136	63°18'51.85983"N	168°57'44.93291"W	63°18'51.87533"N	168°57'44.84712"W	7022242.6380	602082.3510	3404950.265	1811026.797	43.945	13.394	HEW6	8/2/2018 15:24
5137	5137	63°18'52.03835"N	168°57'44.81913"W	63°18'52.05386"N	168°57'44.73335"W	7022248.2120	602083.7580	3404968.481	1811031.7	43.906	13.382	HEW6	8/2/2018 15:24
5138	5138	63°18'52.22644"N	168°57'44.64568"W	63°18'52.24194"N	168°57'44.55989"W	7022254.1080	602085.9870	3404987.712	1811039.313	43.955	13.398	HEW6	8/2/2018 15:25
5139	5139	63°18'52.38332"N	168°57'44.34484"W	63°18'52.39882"N	168°57'44.25904"W	7022259.0950	602090.0180	3405003.868	1811052.796	43.977	13.404	HEW6	8/2/2018 15:25
5140	5140	63°18'52.40434"N	168°57'44.06471"W	63°18'52.41984"N	168°57'43.97892"W	7022259.8690	602093.8950	3405006.21	1811065.556	44.025	13.419	HEW6	8/2/2018 15:25
5141	5141	63°18'52.44199"N	168°57'43.96395"W	63°18'52.45749"N	168°57'43.87815"W	7022261.0780	602095.2600	3405010.108	1811070.096	43.967	13.401	HEW6	8/2/2018 15:26
5142	5142	63°18'52.53845"N	168°57'43.83949"W	63°18'52.55395"N	168°57'43.75370"W	7022264.1180	602096.8970	3405019.997	1811075.622	43.912	13.384	HEW6	8/2/2018 15:27
5143	5143	63°18'52.60742"N	168°57'43.83720"W	63°18'52.62291"N	168°57'43.75141"W	7022266.2520	602096.8610	3405027.003	1811075.613	43.76	13.338	HEW6	8/2/2018 15:27
5144	5144	63°18'52.65892"N	168°57'43.92273"W	63°18'52.67442"N	168°57'43.83695"W	7022267.8080	602095.6200	3405032.171	1811071.622	43.778	13.344	HEW6	8/2/2018 15:28
5145	5145	63°18'52.69878"N	168°57'43.88668"W	63°18'52.71428"N	168°57'43.80090"W	7022269.0570	602096.0820	3405036.246	1811073.203	43.772	13.342	HEW6	8/2/2018 15:28
5146	5146	63°18'52.77723"N	168°57'43.80342"W	63°18'52.79273"N	168°57'43.71762"W	7022271.5210	602097.1640	3405044.275	1811076.877	43.376	13.221	HEW6	8/2/2018 15:28
5147	5147	63°18'52.86681"N	168°57'43.76315"W	63°18'52.88231"N	168°57'43.67736"W	7022274.3110	602097.6360	3405053.403	1811078.569	43.235	13.178	HEW6	8/2/2018 15:29
5148	5148	63°18'52.98371"N	168°57'43.94568"W	63°18'52.99921"N	168°57'43.85989"W	7022277.8470	602094.9810	3405065.141	1811070.04	43.223	13.174	HEW6	8/2/2018 15:29
5149	5149	63°18'53.13862"N	168°57'44.04533"W	63°18'53.15412"N	168°57'43.95953"W	7022282.5960	602093.4420	3405080.801	1811065.234	43.23	13.176	HEW6	8/2/2018 15:30
5150	5150	63°18'53.25639"N	168°57'43.90237"W	63°18'53.27189"N	168°57'43.81658"W	7022286.3020	602095.3160	3405092.867	1811071.57	43.223	13.174	HEW6	8/2/2018 15:30
5151	5151	63°18'53.33076"N	168°57'43.54854"W	63°18'53.34626"N	168°57'43.46276"W	7022288.7600	602100.1650	3405100.682	1811087.608	43.275	13.19	HEW6	8/2/2018 15:31
5152	5152	63°18'53.42318"N	168°57'43.47596"W	63°18'53.43868"N	168°57'43.39016"W	7022291.6510	602101.0840	3405110.123	1811090.771	43.213	13.171	HEW6	8/2/2018 15:31
5153	5153	63°18'53.43918"N	168°57'43.37564"W	63°18'53.45469"N	168°57'43.28984"W	7022292.1910	602102.4640	3405111.822	1811095.327	43.172	13.159	HEW6	8/2/2018 15:32
5154	5154	63°18'53.64979"N	168°57'43.45697"W	63°18'53.66529"N	168°57'43.37118"W	7022298.6710	602101.1260	3405133.152	1811091.266	43.05	13.122	HEW9	8/2/2018 15:34
5155	5155	63°18'53.59086"N	168°57'43.57907"W	63°18'53.60637"N	168°57'43.49327"W	7022296.7940	602099.4850	3405127.077	1811085.786	43.045	13.12	HEW9	8/2/2018 15:34
5156	5156	63°18'53.54348"N	168°57'43.52028"W	63°18'53.55898"N	168°57'43.43449"W	7022295.3540	602100.3490	3405122.308	1811088.549	43.084	13.132	HEW9	8/2/2018 15:35
5157	5157	63°18'53.56168"N	168°57'43.38576"W	63°18'53.57718"N	168°57'43.29998"W	7022295.9760	602102.2030	3405124.256	1811094.663	43.058	13.124	HEW9	8/2/2018 15:35
5158	5158	63°18'53.62253"N	168°57'43.35277"W	63°18'53.63803"N	168°57'43.26697"W	7022297.8740	602102.6020	3405130.461	1811096.07	43.026	13.114	HEW9 C	8/2/2018 15:35
5159	5159	63°18'53.92732"N	168°57'43.43724"W	63°18'53.94282"N	168°57'43.35144"W	7022307.2660	602101.1270	3405161.354	1811091.711	42.437	12.935	HEW11HEW10	8/2/2018 15:37
5160	5160	63°18'53.94197"N	168°57'43.49420"W	63°18'53.95747"N	168°57'43.40840"W	7022307.6940	602100.3200	3405162.8	1811089.085	42.515	12.959	HEW11	8/2/2018 15:38
5161	5161	63°18'54.07248"N	168°57'43.35391"W	63°18'54.08797"N	168°57'43.26811"W	7022311.7940	602102.1440	3405176.158	1811095.278	41.803	12.742	HEW11	8/2/2018 15:38
5162	5162	63°18'54.18092"N	168°57'43.17345"W	63°18'54.19643"N	168°57'43.08765"W	7022315.2290	602104.5480	3405187.306	1811103.342	41.647	12.694	HEW11	8/2/2018 15:38
5163	5163	63°18'54.26256"N	168°57'43.00461"W	63°18'54.27806"N	168°57'42.91882"W	7022317.8290	602106.8160	3405195.722	1811110.919	41.5	12.649	HEW11	8/2/2018 15:39

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5164	5164	63°18'54.32754"N	168°57'43.09285"W	63°18'54.34303"N	168°57'43.00705"W	7022319.8000	602105.5250	3405202.256	1811106.782	41.474	12.641	HEW11	8/2/2018 15:39
5165	5165	63°18'54.37039"N	168°57'43.03920"W	63°18'54.38588"N	168°57'42.95340"W	7022321.1500	602106.2290	3405206.648	1811109.162	41.433	12.629	HEW11	8/2/2018 15:39
5166	5166	63°18'54.38658"N	168°57'42.92152"W	63°18'54.40208"N	168°57'42.83572"W	7022321.7030	602107.8510	3405208.38	1811114.51	41.383	12.614	HEW11	8/2/2018 15:39
5167	5167	63°18'54.47182"N	168°57'42.80453"W	63°18'54.48732"N	168°57'42.71874"W	7022324.3920	602109.3940	3405217.123	1811119.713	41.271	12.579	HEW11	8/2/2018 15:39
5168	5168	63°18'54.61165"N	168°57'42.71113"W	63°18'54.62715"N	168°57'42.62533"W	7022328.7590	602110.5560	3405231.394	1811123.749	41.129	12.536	HEW11	8/2/2018 15:40
5169	5169	63°18'54.77511"N	168°57'42.64098"W	63°18'54.79061"N	168°57'42.55518"W	7022333.8480	602111.3720	3405248.048	1811126.684	41.011	12.5	HEW11	8/2/2018 15:40
5170	5170	63°18'54.91968"N	168°57'42.51549"W	63°18'54.93519"N	168°57'42.42968"W	7022338.3760	602112.9750	3405262.824	1811132.178	40.913	12.47	HEW11	8/2/2018 15:40
5171	5171	63°18'55.09419"N	168°57'42.42406"W	63°18'55.10969"N	168°57'42.33827"W	7022343.8160	602114.0760	3405280.615	1811136.067	40.601	12.375	HEW11	8/2/2018 15:41
5172	5172	63°18'55.16777"N	168°57'42.46474"W	63°18'55.18327"N	168°57'42.37894"W	7022346.0740	602113.4370	3405288.058	1811134.088	40.461	12.333	HEW11	8/2/2018 15:42
5173	5173	63°18'55.23556"N	168°57'42.62180"W	63°18'55.25106"N	168°57'42.53601"W	7022348.1020	602111.1850	3405294.827	1811126.803	40.39	12.311	HEW11	8/2/2018 15:42
5174	5174	63°18'55.34598"N	168°57'42.72073"W	63°18'55.36148"N	168°57'42.63493"W	7022351.4750	602109.7000	3405305.969	1811122.103	40.319	12.289	HEW11	8/2/2018 15:43
5175	5175	63°18'55.48532"N	168°57'42.67584"W	63°18'55.50082"N	168°57'42.59004"W	7022355.8060	602110.1880	3405320.154	1811123.924	40.294	12.282	HEW11	8/2/2018 15:43
5176	5176	63°18'55.62705"N	168°57'42.65463"W	63°18'55.64255"N	168°57'42.56883"W	7022360.2000	602110.3440	3405334.564	1811124.66	40.18	12.247	HEW11	8/2/2018 15:44
5177	5177	63°18'55.72074"N	168°57'42.60650"W	63°18'55.73624"N	168°57'42.52071"W	7022363.1200	602110.9210	3405344.115	1811126.704	40.18	12.247	HEW11	8/2/2018 15:44
5178	5178	63°18'55.78184"N	168°57'42.37300"W	63°18'55.79734"N	168°57'42.28721"W	7022365.1130	602114.1090	3405350.494	1811137.268	40.117	12.228	HEW11	8/2/2018 15:44
5179	5179	63°18'55.77042"N	168°57'42.16521"W	63°18'55.78591"N	168°57'42.07940"W	7022364.8520	602117.0120	3405349.487	1811146.777	40.066	12.212	HEW11	8/2/2018 15:45
5180	5180	63°18'55.78778"N	168°57'42.07781"W	63°18'55.80328"N	168°57'41.99202"W	7022365.4280	602118.2100	3405351.315	1811150.74	40.078	12.216	HEW11	8/2/2018 15:45
5181	5181	63°18'55.88144"N	168°57'41.99089"W	63°18'55.89694"N	168°57'41.90509"W	7022368.3640	602119.3280	3405360.892	1811154.556	39.966	12.182	HEW11	8/2/2018 15:45
5182	5182	63°18'55.97655"N	168°57'41.96125"W	63°18'55.99205"N	168°57'41.87546"W	7022371.3200	602119.6460	3405370.574	1811155.753	39.909	12.164	HEW11	8/2/2018 15:46
5183	5183	63°18'56.08718"N	168°57'41.97487"W	63°18'56.10268"N	168°57'41.88908"W	7022374.7370	602119.3480	3405381.8	1811154.949	39.803	12.132	HEW11	8/2/2018 15:46
5184	5184	63°18'56.17711"N	168°57'41.98501"W	63°18'56.19261"N	168°57'41.89921"W	7022377.5140	602119.1190	3405390.926	1811154.338	39.721	12.107	HEW11	8/2/2018 15:46
5185	5185	63°18'56.29982"N	168°57'41.95828"W	63°18'56.31532"N	168°57'41.87249"W	7022381.3230	602119.3700	3405403.409	1811155.357	39.726	12.109	HEW11	8/2/2018 15:46
5186	5186	63°18'56.37165"N	168°57'41.99778"W	63°18'56.38715"N	168°57'41.91199"W	7022383.5280	602118.7490	3405410.675	1811153.435	39.719	12.106	HEW11	8/2/2018 15:46
5187	5187	63°18'56.45547"N	168°57'41.94530"W	63°18'56.47097"N	168°57'41.85950"W	7022386.1440	602119.3970	3405419.227	1811155.694	39.677	12.094	HEW11	8/2/2018 15:47
5188	5188	63°18'56.51765"N	168°57'41.72864"W	63°18'56.53315"N	168°57'41.64284"W	7022388.1640	602122.3500	3405425.702	1811165.487	39.655	12.087	HEW11	8/2/2018 15:48
5189	5189	63°18'56.55912"N	168°57'41.58220"W	63°18'56.57462"N	168°57'41.49639"W	7022389.5120	602124.3470	3405430.022	1811172.107	39.615	12.075	HEW11	8/2/2018 15:48
5190	5190	63°18'56.61472"N	168°57'41.57772"W	63°18'56.63022"N	168°57'41.49192"W	7022391.2340	602124.3550	3405435.673	1811172.22	39.595	12.069	HEW11	8/2/2018 15:48
5191	5191	63°18'56.70746"N	168°57'41.68719"W	63°18'56.72297"N	168°57'41.60139"W	7022394.0550	602122.7400	3405445.011	1811167.068	39.622	12.077	HEW11	8/2/2018 15:49
5192	5192	63°18'56.86524"N	168°57'41.62208"W	63°18'56.88074"N	168°57'41.53627"W	7022398.9650	602123.4910	3405461.084	1811169.782	39.586	12.066	HEW11	8/2/2018 15:51
5193	5193	63°18'56.98321"N	168°57'41.63776"W	63°18'56.99872"N	168°57'41.55197"W	7022402.6080	602123.1570	3405473.054	1811168.872	39.337	11.99	HEW11	8/2/2018 15:52
5194	5194	63°18'57.08411"N	168°57'41.39785"W	63°18'57.09961"N	168°57'41.31206"W	7022405.8360	602126.3950	3405483.479	1811179.663	39.076	11.911	HEW11	8/2/2018 15:52
5195	5195	63°18'57.19855"N	168°57'41.48308"W	63°18'57.21405"N	168°57'41.39728"W	7022409.3390	602125.0970	3405495.039	1811175.582	39.095	11.916	HEW11	8/2/2018 15:53
5196	5196	63°18'57.28800"N	168°57'41.64353"W	63°18'57.30350"N	168°57'41.55773"W	7022412.0350	602122.7770	3405504.005	1811168.107	38.956	11.874	HEW11	8/2/2018 15:53
5200	5200	63°18'57.72786"N	168°57'41.57424"W	63°18'57.74336"N	168°57'41.48844"W	7022425.6750	602123.3080	3405548.73	1811170.548	38.317	11.679	HEW11	8/2/2018 15:55
5201	5201	63°18'57.79693"N	168°57'41.70258"W	63°18'57.81242"N	168°57'41.61678"W	7022427.7540	602121.4540	3405555.65	1811164.573	37.897	11.551	HEW11	8/2/2018 15:55
5202	5202	63°18'57.79854"N	168°57'41.75890"W	63°18'57.81404"N	168°57'41.67311"W	7022427.7800	602120.6690	3405555.772	1811161.998	37.825	11.529	HEW11	8/2/2018 15:55
5203	5203	63°18'57.82101"N	168°57'41.87596"W	63°18'57.83651"N	168°57'41.79016"W	7022428.4230	602119.0180	3405557.968	1811156.615	37.927	11.56	HEW11	8/2/2018 15:55
5204	5204	63°18'57.87921"N	168°57'41.81647"W	63°18'57.89471"N	168°57'41.73067"W	7022430.2500	602119.7890	3405563.923	1811159.236	37.798	11.521	HEW11	8/2/2018 15:56
5205	5205	63°18'57.90927"N	168°57'41.70278"W	63°18'57.92477"N	168°57'41.61698"W	7022431.2300	602121.3410	3405567.06	1811164.379	37.897	11.551	HEW11	8/2/2018 15:56
5206	5206	63°18'57.95097"N	168°57'41.65740"W	63°18'57.96647"N	168°57'41.57160"W	7022432.5410	602121.9310	3405571.329	1811166.383	37.885	11.547	HEW11	8/2/2018 15:56
5207	5207	63°18'57.98571"N	168°57'41.74763"W	63°18'58.00120"N	168°57'41.66184"W	7022433.5750	602120.6420	3405574.79	1811162.205	37.853	11.538	HEW11	8/2/2018 15:57
5208	5208	63°18'58.02242"N	168°57'41.85318"W	63°18'58.03792"N	168°57'41.76738"W	7022434.6650	602119.1370	3405578.441	1811157.324	37.821	11.528	HEW11	8/2/2018 15:58
5209	5209	63°18'57.98078"N	168°57'42.12264"W	63°18'57.99627"N	168°57'42.03685"W	7022433.2570	602115.4290	3405574.012	1811145.086	37.865	11.541	HEW11	8/2/2018 15:58
5210	5210	63°18'57.97677"N	168°57'42.53363"W	63°18'57.99227"N	168°57'42.44783"W	7022432.9510	602109.7150	3405573.301	1811126.322	37.866	11.542	HEW11	8/2/2018 15:58

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5211	5211	63°18'58.01702"N	168°57'42.94321"W	63°18'58.03252"N	168°57'42.85741"W	7022434.0150	602103.9770	3405577.086	1811107.55	37.79	11.519	HEW11	8/2/2018 15:59
5212	5212	63°18'57.98803"N	168°57'43.43325"W	63°18'58.00353"N	168°57'43.34746"W	7022432.9010	602097.1880	3405573.78	1811085.217	37.754	11.508	HEW11	8/2/2018 15:59
5213	5213	63°18'58.03433"N	168°57'43.44991"W	63°18'58.04983"N	168°57'43.36410"W	7022434.3270	602096.9110	3405578.47	1811084.38	37.693	11.489	HEW12	8/2/2018 16:00
5214	5214	63°18'58.04535"N	168°57'42.95922"W	63°18'58.06086"N	168°57'42.87343"W	7022434.8850	602103.7270	3405579.952	1811106.772	37.737	11.502	HEW12	8/2/2018 16:00
5215	5215	63°18'58.05945"N	168°57'42.57107"W	63°18'58.07495"N	168°57'42.48527"W	7022435.4930	602109.1130	3405581.671	1811124.476	37.789	11.518	HEW12	8/2/2018 16:01
5216	5216	63°18'58.09968"N	168°57'42.15934"W	63°18'58.11517"N	168°57'42.07354"W	7022436.9190	602114.8020	3405586.061	1811143.214	37.864	11.541	HEW12	8/2/2018 16:01
5217	5217	63°18'58.13640"N	168°57'41.77156"W	63°18'58.15189"N	168°57'41.68576"W	7022438.2270	602120.1610	3405590.077	1811160.864	37.78	11.515	HEW12	8/2/2018 16:01
5218	5218	63°18'58.10018"N	168°57'41.56028"W	63°18'58.11568"N	168°57'41.47448"W	7022437.2000	602123.1360	3405586.555	1811170.573	37.876	11.545	HEW12	8/2/2018 16:02
5219	5219	63°18'58.09115"N	168°57'41.33905"W	63°18'58.10665"N	168°57'41.25325"W	7022437.0190	602126.2220	3405585.802	1811180.692	37.875	11.544	HEW12	8/2/2018 16:02
5220	5220	63°18'58.11684"N	168°57'41.04391"W	63°18'58.13234"N	168°57'40.95812"W	7022437.9440	602130.3030	3405588.629	1811194.129	37.856	11.539	HEW12	8/2/2018 16:02
5221	5221	63°18'58.12933"N	168°57'40.87488"W	63°18'58.14484"N	168°57'40.78908"W	7022438.4050	602132.6430	3405590.023	1811201.828	37.831	11.531	HEW12	8/2/2018 16:03
5222	5222	63°18'58.17075"N	168°57'40.42311"W	63°18'58.18625"N	168°57'40.33732"W	7022439.8870	602138.8870	3405594.564	1811222.393	37.849	11.536	HEW12	8/2/2018 16:03
5223	5223	63°18'58.17464"N	168°57'40.25593"W	63°18'58.19014"N	168°57'40.17012"W	7022440.0810	602141.2090	3405595.083	1811230.022	37.839	11.533	HEW12	8/2/2018 16:04
5224	5224	63°18'58.31299"N	168°57'40.03684"W	63°18'58.32849"N	168°57'39.95104"W	7022444.4580	602144.1210	3405609.296	1811239.8	37.844	11.535	HEW12	8/2/2018 16:04
5225	5225	63°18'58.39490"N	168°57'39.74610"W	63°18'58.41040"N	168°57'39.66030"W	7022447.1210	602148.0850	3405617.83	1811252.944	37.856	11.539	HEW12	8/2/2018 16:04
5226	5226	63°18'58.39805"N	168°57'39.49646"W	63°18'58.41355"N	168°57'39.41066"W	7022447.3290	602151.5550	3405618.335	1811264.34	37.853	11.538	HEW12	8/2/2018 16:05
5227	5227	63°18'58.36113"N	168°57'39.18459"W	63°18'58.37663"N	168°57'39.09879"W	7022446.3250	602155.9310	3405614.816	1811278.644	37.974	11.575	HEW12	8/2/2018 16:05
5228	5228	63°19'32.47889"N	168°58'15.32271"W	63°19'32.49439"N	168°58'15.23690"W	7023485.9390	601619.7420	3409053.349	1809572.56	28.483	8.682	CHK 1 HV	8/2/2018 16:30
5229	5229	63°18'57.69940"N	168°57'18.33934"W	63°18'57.71489"N	168°57'18.25353"W	7022435.0910	602446.5930	3405563.08	1812231.763	51.439	15.679	CHK 2 HV	8/2/2018 17:34
5230	5230	63°18'57.69957"N	168°57'18.33980"W	63°18'57.71507"N	168°57'18.25400"W	7022435.0960	602446.5860	3405563.097	1812231.742	51.426	15.675	CHK 2 HV	8/2/2018 18:07
5231	5231	63°18'57.69985"N	168°57'18.33948"W	63°18'57.71534"N	168°57'18.25367"W	7022435.1040	602446.5910	3405563.125	1812231.756	51.432	15.677	CHK 2 HV	8/3/2018 9:00
5232	5232	63°19'03.82813"N	168°56'45.44221"W	63°19'03.84363"N	168°56'45.35639"W	7022639.3400	602898.1990	3406210.13	1813723.983	78.722	23.995	GS	8/3/2018 9:08
5233	5233	63°19'04.78507"N	168°56'45.01774"W	63°19'04.80056"N	168°56'44.93193"W	7022669.1350	602903.1550	3406307.639	1813741.77	78.97	24.07	GS	8/3/2018 9:09
5234	5234	63°19'04.88922"N	168°56'44.97200"W	63°19'04.90471"N	168°56'44.88619"W	7022672.3780	602903.6880	3406318.251	1813743.685	79.036	24.09	GS	8/3/2018 9:15
5235	5235	63°19'04.99167"N	168°56'44.92464"W	63°19'05.00716"N	168°56'44.83881"W	7022675.5690	602904.2450	3406328.692	1813745.677	78.562	23.946	GS	8/3/2018 9:20
5236	5236	63°19'05.08047"N	168°56'44.88655"W	63°19'05.09596"N	168°56'44.80073"W	7022678.3330	602904.6870	3406337.739	1813747.268	78.48	23.921	GS	8/3/2018 9:21
5237	5237	63°19'05.17441"N	168°56'44.84272"W	63°19'05.18990"N	168°56'44.75690"W	7022681.2590	602905.2040	3406347.313	1813749.113	77.794	23.712	GS	8/3/2018 9:21
5238	5238	63°19'05.27789"N	168°56'44.80309"W	63°19'05.29338"N	168°56'44.71726"W	7022684.4780	602905.6530	3406357.853	1813750.75	77.005	23.471	GS	8/3/2018 9:22
5239	5239	63°19'05.37720"N	168°56'44.75651"W	63°19'05.39269"N	168°56'44.67069"W	7022687.5720	602906.2020	3406367.974	1813752.711	76.797	23.408	GS	8/3/2018 9:22
5240	5240	63°19'05.58438"N	168°56'44.66393"W	63°19'05.59987"N	168°56'44.57811"W	7022694.0230	602907.2840	3406389.086	1813756.593	75.711	23.077	GS	8/3/2018 9:22
5241	5241	63°19'05.80371"N	168°56'44.56513"W	63°19'05.81920"N	168°56'44.47930"W	7022700.8520	602908.4410	3406411.436	1813760.739	74.168	22.606	GS	8/3/2018 9:23
5242	5242	63°19'06.01640"N	168°56'44.47140"W	63°19'06.03189"N	168°56'44.38558"W	7022707.4750	602909.5340	3406433.108	1813764.664	71.979	21.939	GS	8/3/2018 9:23
5243	5243	63°19'06.22916"N	168°56'44.37712"W	63°19'06.24465"N	168°56'44.29130"W	7022714.0990	602910.6350	3406454.787	1813768.614	69.356	21.14	GS	8/3/2018 9:24
5244	5244	63°19'06.41767"N	168°56'44.29179"W	63°19'06.43315"N	168°56'44.20597"W	7022719.9690	602911.6350	3406473.997	1813772.196	66.245	20.191	GS	8/3/2018 9:24
5245	5245	63°19'06.61687"N	168°56'44.20607"W	63°19'06.63236"N	168°56'44.12025"W	7022726.1710	602912.6300	3406494.293	1813775.778	62.78	19.135	GS	8/3/2018 9:25
5246	5246	63°19'06.83244"N	168°56'44.10900"W	63°19'06.84793"N	168°56'44.02318"W	7022732.8830	602913.7670	3406516.26	1813779.851	60.402	18.41	GS	8/3/2018 9:25
5247	5247	63°19'06.99848"N	168°56'44.03675"W	63°19'07.01397"N	168°56'43.95093"W	7022738.0530	602914.6070	3406533.178	1813782.873	57.96	17.666	END FILL BEGIN ORIGINAL GR	8/3/2018 9:26
5248	5248	63°19'07.22241"N	168°56'43.93307"W	63°19'07.23790"N	168°56'43.84724"W	7022745.0270	602915.8280	3406555.999	1813787.234	55.852	17.024	GS	8/3/2018 9:27
5249	5249	63°19'07.45635"N	168°56'43.83322"W	63°19'07.47184"N	168°56'43.74739"W	7022752.3090	602916.9850	3406579.834	1813791.403	54.566	16.632	GS	8/3/2018 9:27
5250	5250	63°19'07.68463"N	168°56'43.72983"W	63°19'07.70012"N	168°56'43.64401"W	7022759.4180	602918.1960	3406603.097	1813795.743	53.877	16.422	GS	8/3/2018 9:28
5251	5251	63°19'07.93186"N	168°56'43.62076"W	63°19'07.94735"N	168°56'43.53493"W	7022767.1160	602919.4690	3406628.288	1813800.311	52.698	16.062	GS	8/3/2018 9:28
5252	5252	63°19'04.75458"N	168°56'45.03246"W	63°19'04.77007"N	168°56'44.94665"W	7022668.1850	602902.9800	3406304.531	1813741.149	78.639	23.969	GS	8/3/2018 9:35
5253	5253	63°19'04.73012"N	168°56'45.04272"W	63°19'04.74561"N	168°56'44.95691"W	7022667.4240	602902.8620	3406302.039	1813740.721	78.167	23.825	GS	8/3/2018 9:35
5254	5254	63°19'04.70205"N	168°56'45.05417"W	63°19'04.71754"N	168°56'44.96834"W	7022666.5510	602902.7310	3406299.18	1813740.245	78.281	23.86	GS	8/3/2018 9:35

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5255	5255	63°19'04.67992"N	168°56'45.06551"W	63°19'04.69541"N	168°56'44.97970"W	7022665.8610	602902.5950	3406296.924	1813739.764	78.488	23.923	GS	8/3/2018 9:35
5256	5256	63°19'04.64629"N	168°56'45.07993"W	63°19'04.66178"N	168°56'44.99411"W	7022664.8140	602902.4270	3406293.497	1813739.162	78.848	24.033	GS	8/3/2018 9:36
5257	5257	63°19'04.61299"N	168°56'45.09242"W	63°19'04.62848"N	168°56'45.00659"W	7022663.7780	602902.2870	3406290.106	1813738.647	78.972	24.071	GS	8/3/2018 9:36
5258	5258	63°19'04.58931"N	168°56'45.10529"W	63°19'04.60480"N	168°56'45.01947"W	7022663.0400	602902.1310	3406287.691	1813738.099	78.99	24.076	GS	8/3/2018 9:36
5259	5259	63°19'04.55773"N	168°56'45.11894"W	63°19'04.57322"N	168°56'45.03312"W	7022662.0560	602901.9730	3406284.473	1813737.528	78.763	24.007	GS	8/3/2018 9:37
5260	5260	63°19'04.52387"N	168°56'45.13284"W	63°19'04.53936"N	168°56'45.04701"W	7022661.0030	602901.8130	3406281.024	1813736.95	78.922	24.056	GS	8/3/2018 9:37
5261	5261	63°19'04.48845"N	168°56'45.14900"W	63°19'04.50394"N	168°56'45.06317"W	7022659.9000	602901.6230	3406277.414	1813736.271	79.297	24.17	GS	8/3/2018 9:37
5262	5262	63°19'04.44193"N	168°56'45.17058"W	63°19'04.45742"N	168°56'45.08477"W	7022658.4510	602901.3690	3406272.674	1813735.363	79.621	24.268	GS	8/3/2018 9:37
5263	5263	63°19'04.40330"N	168°56'45.18785"W	63°19'04.41879"N	168°56'45.10203"W	7022657.2480	602901.1670	3406268.737	1813734.639	79.616	24.267	GS	8/3/2018 9:38
5264	5264	63°19'04.36126"N	168°56'45.20577"W	63°19'04.37675"N	168°56'45.11994"W	7022655.9390	602900.9600	3406264.454	1813733.891	79.581	24.256	GS	8/3/2018 9:38
5265	5265	63°19'04.31233"N	168°56'45.22580"W	63°19'04.32781"N	168°56'45.13998"W	7022654.4160	602900.7290	3406259.469	1813733.058	79.483	24.227	GS	8/3/2018 9:38
5266	5266	63°19'04.27604"N	168°56'45.24576"W	63°19'04.29153"N	168°56'45.15994"W	7022653.2850	602900.4880	3406255.769	1813732.207	79.496	24.23	GS	8/3/2018 9:39
5267	5267	63°19'04.24445"N	168°56'45.25718"W	63°19'04.25994"N	168°56'45.17136"W	7022652.3030	602900.3600	3406252.552	1813731.738	79.279	24.164	GS	8/3/2018 9:39
5268	5268	63°19'04.21151"N	168°56'45.27314"W	63°19'04.22700"N	168°56'45.18732"W	7022651.2760	602900.1710	3406249.194	1813731.064	79.204	24.141	GS	8/3/2018 9:40
5269	5269	63°19'04.17888"N	168°56'45.28555"W	63°19'04.19437"N	168°56'45.19972"W	7022650.2610	602900.0300	3406245.871	1813730.552	78.862	24.037	GS	8/3/2018 9:40
5270	5270	63°19'04.15175"N	168°56'45.29642"W	63°19'04.16724"N	168°56'45.21060"W	7022649.4170	602899.9060	3406243.107	1813730.101	78.324	23.873	GS	8/3/2018 9:42
5271	5271	63°19'04.12071"N	168°56'45.31198"W	63°19'04.13620"N	168°56'45.22617"W	7022648.4500	602899.7200	3406239.943	1813729.442	78.302	23.866	GS	8/3/2018 9:43
5272	5272	63°19'04.09230"N	168°56'45.32465"W	63°19'04.10779"N	168°56'45.23882"W	7022647.5650	602899.5720	3406237.048	1813728.911	78.335	23.877	GS	8/3/2018 9:43
5273	5273	63°19'04.06124"N	168°56'45.33831"W	63°19'04.07673"N	168°56'45.25249"W	7022646.5980	602899.4130	3406233.883	1813728.339	78.332	23.876	GS	8/3/2018 9:44
5274	5274	63°19'04.03391"N	168°56'45.35205"W	63°19'04.04940"N	168°56'45.26624"W	7022645.7460	602899.2490	3406231.097	1813727.757	78.291	23.863	GS	8/3/2018 9:44
5275	5275	63°19'04.00394"N	168°56'45.36296"W	63°19'04.01943"N	168°56'45.27714"W	7022644.8140	602899.1270	3406228.045	1813727.309	78.302	23.866	GS	8/3/2018 9:44
5276	5276	63°19'03.96696"N	168°56'45.37959"W	63°19'03.98245"N	168°56'45.29378"W	7022643.6630	602898.9320	3406224.277	1813726.611	78.23	23.844	GS	8/3/2018 9:44
5277	5277	63°19'03.93900"N	168°56'45.39367"W	63°19'03.95448"N	168°56'45.30784"W	7022642.7910	602898.7640	3406221.426	1813726.015	78.149	23.82	GS	8/3/2018 9:45
5278	5278	63°19'03.93819"N	168°56'45.39580"W	63°19'03.95369"N	168°56'45.30997"W	7022642.7660	602898.7350	3406221.343	1813725.919	78.135	23.816	GS	8/3/2018 9:45
5279	5279	63°19'03.90097"N	168°56'45.40868"W	63°19'03.91647"N	168°56'45.32286"W	7022641.6080	602898.5930	3406217.553	1813725.393	78.193	23.833	GS	8/3/2018 9:45
5280	5280	63°19'03.86535"N	168°56'45.42728"W	63°19'03.88084"N	168°56'45.34145"W	7022640.4980	602898.3700	3406213.921	1813724.603	78.568	23.948	GS	8/3/2018 9:46
5281	5281	63°19'03.79692"N	168°56'45.45785"W	63°19'03.81241"N	168°56'45.37202"W	7022638.3670	602898.0120	3406206.948	1813723.321	78.656	23.974	GS	8/3/2018 9:46
5282	5282	63°19'03.72278"N	168°56'45.48896"W	63°19'03.73827"N	168°56'45.40315"W	7022636.0590	602897.6530	3406199.395	1813722.024	78.501	23.927	GS	8/3/2018 9:46
5283	5283	63°19'03.67536"N	168°56'45.51318"W	63°19'03.69085"N	168°56'45.42737"W	7022634.5810	602897.3630	3406194.56	1813720.997	78.298	23.865	GS	8/3/2018 9:47
5284	5284	63°19'03.62564"N	168°56'45.53302"W	63°19'03.64113"N	168°56'45.44720"W	7022633.0340	602897.1360	3406189.496	1813720.174	78.218	23.841	GS	8/3/2018 9:48
5285	5285	63°19'03.57663"N	168°56'45.55476"W	63°19'03.59212"N	168°56'45.46893"W	7022631.5080	602896.8820	3406184.502	1813719.263	77.99	23.771	GS	8/3/2018 9:49
5286	5286	63°19'03.52836"N	168°56'45.57509"W	63°19'03.54385"N	168°56'45.48929"W	7022630.0060	602896.6470	3406179.584	1813718.415	77.992	23.772	GS	8/3/2018 9:49
5287	5287	63°19'03.43164"N	168°56'45.61272"W	63°19'03.44713"N	168°56'45.52691"W	7022626.9970	602896.2200	3406169.733	1813716.858	77.871	23.735	GS	8/3/2018 9:49
5288	5288	63°19'03.33842"N	168°56'45.66113"W	63°19'03.35391"N	168°56'45.57532"W	7022624.0910	602895.6390	3406160.228	1813714.803	77.738	23.695	GS	8/3/2018 9:50
5289	5289	63°19'03.24193"N	168°56'45.70499"W	63°19'03.25743"N	168°56'45.61918"W	7022621.0860	602895.1240	3406150.396	1813712.961	77.412	23.595	GS	8/3/2018 9:50
5290	5290	63°19'03.14242"N	168°56'45.74461"W	63°19'03.15791"N	168°56'45.65880"W	7022617.9900	602894.6720	3406140.259	1813711.318	77.023	23.477	GS	8/3/2018 9:50
5291	5291	63°19'03.04590"N	168°56'45.78987"W	63°19'03.06139"N	168°56'45.70405"W	7022614.9830	602894.1380	3406130.422	1813709.412	76.772	23.4	GS	8/3/2018 9:51
5292	5292	63°19'02.95172"N	168°56'45.83078"W	63°19'02.96721"N	168°56'45.74497"W	7022612.0510	602893.6620	3406120.826	1813707.701	76.172	23.217	GS	8/3/2018 9:52
5293	5293	63°19'02.84829"N	168°56'45.87347"W	63°19'02.86378"N	168°56'45.78766"W	7022608.8320	602893.1700	3406110.289	1813705.924	75.871	23.126	GS	8/3/2018 9:52
5294	5294	63°19'02.75183"N	168°56'45.92269"W	63°19'02.76733"N	168°56'45.83687"W	7022605.8260	602892.5810	3406100.456	1813703.837	75.28	22.946	GS	8/3/2018 9:52
5295	5295	63°19'02.66142"N	168°56'45.96055"W	63°19'02.67691"N	168°56'45.87474"W	7022603.0120	602892.1440	3406091.245	1813702.259	74.679	22.762	GS	8/3/2018 9:53
5296	5296	63°19'02.55772"N	168°56'46.01041"W	63°19'02.57320"N	168°56'45.92459"W	7022599.7810	602891.5540	3406080.675	1813700.155	74.133	22.596	GS	8/3/2018 9:53
5297	5297	63°19'02.45326"N	168°56'46.05189"W	63°19'02.46875"N	168°56'45.96607"W	7022596.5310	602891.0800	3406070.035	1813698.435	73.711	22.467	GS	8/3/2018 9:53
5298	5298	63°19'02.36810"N	168°56'46.09103"W	63°19'02.38359"N	168°56'46.00521"W	7022593.8790	602890.6200	3406061.356	1813696.79	73.613	22.437	GS	8/3/2018 9:54

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5299	5299	63°19'02.26742"N	168°56'46.13594"W	63°19'02.28291"N	168°56'46.05011"W	7022590.7440	602890.0950	3406051.097	1813694.907	73.387	22.368	GS	8/3/2018 9:54
5300	5300	63°19'02.17605"N	168°56'46.17427"W	63°19'02.19153"N	168°56'46.08846"W	7022587.9000	602889.6520	3406041.788	1813693.309	73.11	22.284	GS	8/3/2018 9:55
5301	5301	63°19'02.07778"N	168°56'46.21754"W	63°19'02.09327"N	168°56'46.13172"W	7022584.8400	602889.1480	3406031.775	1813691.497	72.679	22.153	GS	8/3/2018 9:56
5302	5302	63°19'01.98369"N	168°56'46.25848"W	63°19'01.99918"N	168°56'46.17267"W	7022581.9110	602888.6710	3406022.188	1813689.784	72.412	22.071	GS	8/3/2018 9:56
5303	5303	63°19'01.88122"N	168°56'46.30396"W	63°19'01.89671"N	168°56'46.21815"W	7022578.7210	602888.1400	3406011.747	1813687.878	71.881	21.909	GS	8/3/2018 9:57
5304	5304	63°19'01.78905"N	168°56'46.34613"W	63°19'01.80454"N	168°56'46.26033"W	7022575.8500	602887.6450	3406002.354	1813686.106	71.137	21.683	GS	8/3/2018 9:57
5305	5305	63°19'01.70092"N	168°56'46.38739"W	63°19'01.71641"N	168°56'46.30156"W	7022573.1050	602887.1590	3405993.372	1813684.369	70.55	21.504	GTOP	8/3/2018 9:57
5306	5306	63°19'01.66719"N	168°56'46.39642"W	63°19'01.68269"N	168°56'46.31060"W	7022572.0580	602887.0660	3405989.94	1813684.013	69.728	21.253	GTOE	8/3/2018 9:58
5307	5307	63°19'01.62388"N	168°56'46.41692"W	63°19'01.63938"N	168°56'46.33111"W	7022570.7090	602886.8240	3405985.526	1813683.149	70.113	21.371	RSH	8/3/2018 9:59
5308	5308	63°19'01.49952"N	168°56'46.47774"W	63°19'01.51501"N	168°56'46.39192"W	7022566.8340	602886.1010	3405972.849	1813680.579	69.972	21.327	RCL	8/3/2018 9:59
5309	5309	63°19'01.36114"N	168°56'46.53419"W	63°19'01.37663"N	168°56'46.44837"W	7022562.5270	602885.4530	3405958.753	1813678.232	69.101	21.062	RSH2	8/3/2018 10:00
5310	5310	63°19'01.31403"N	168°56'46.55380"W	63°19'01.32952"N	168°56'46.46798"W	7022561.0610	602885.2270	3405953.953	1813677.415	67.865	20.685	GTOE2	8/3/2018 10:00
5311	5311	63°19'01.18438"N	168°56'46.61466"W	63°19'01.19987"N	168°56'46.52883"W	7022557.0230	602884.5090	3405940.74	1813674.852	66.906	20.393	GS	8/3/2018 10:01
5312	5312	63°19'01.12972"N	168°56'46.63897"W	63°19'01.14521"N	168°56'46.55315"W	7022555.3210	602884.2250	3405935.17	1813673.833	66.295	20.207	GS	8/3/2018 10:01
5313	5313	63°19'00.97229"N	168°56'46.70813"W	63°19'00.98778"N	168°56'46.62231"W	7022550.4190	602883.4190	3405919.129	1813670.937	63.478	19.348	GS	8/3/2018 10:01
5314	5314	63°19'04.17405"N	168°56'44.04009"W	63°19'04.18953"N	168°56'43.95427"W	7022650.6670	602917.3620	3406246.315	1813787.438	78.94	24.061	GS	8/3/2018 10:07
5315	5315	63°19'03.81491"N	168°56'47.05862"W	63°19'03.83040"N	168°56'46.97280"W	7022638.2100	602875.7250	3406207.574	1813650.186	77.615	23.657	GS	8/3/2018 10:08
5316	5316	63°19'03.20997"N	168°56'52.15343"W	63°19'03.22546"N	168°56'52.06760"W	7022617.2240	602805.4470	3406142.313	1813418.522	59.598	18.166	GS	8/3/2018 10:10
5317	5317	63°19'03.27576"N	168°56'51.58016"W	63°19'03.29125"N	168°56'51.49435"W	7022619.5150	602813.3570	3406149.424	1813444.593	60.9	18.562	GS	8/3/2018 10:11
5318	5318	63°19'03.32782"N	168°56'51.14385"W	63°19'03.34332"N	168°56'51.05804"W	7022621.3200	602819.3750	3406155.039	1813464.432	62.718	19.116	GS	8/3/2018 10:11
5319	5319	63°19'03.37309"N	168°56'50.77647"W	63°19'03.38858"N	168°56'50.69065"W	7022622.8840	602824.4410	3406159.912	1813481.134	64.624	19.697	VEG2 BEGIB FILL END OG	8/3/2018 10:12
5320	5320	63°19'03.40617"N	168°56'50.49168"W	63°19'03.42166"N	168°56'50.40587"W	7022624.0340	602828.3700	3406163.485	1813494.085	67.899	20.696	GS	8/3/2018 10:12
5321	5321	63°19'03.44988"N	168°56'50.12559"W	63°19'03.46537"N	168°56'50.03978"W	7022625.5500	602833.4200	3406168.199	1813510.731	70.914	21.615	GS	8/3/2018 10:13
5322	5322	63°19'03.49763"N	168°56'49.72486"W	63°19'03.51312"N	168°56'49.63904"W	7022627.2060	602838.9470	3406173.349	1813528.952	72.594	22.127	GS	8/3/2018 10:13
5323	5323	63°19'03.55815"N	168°56'49.21454"W	63°19'03.57364"N	168°56'49.12871"W	7022629.3050	602845.9870	3406179.879	1813552.157	73.917	22.53	GS	8/3/2018 10:13
5324	5324	63°19'03.61586"N	168°56'48.72969"W	63°19'03.63135"N	168°56'48.64387"W	7022631.3070	602852.6750	3406186.104	1813574.203	74.704	22.77	GS	8/3/2018 10:14
5325	5325	63°19'03.67831"N	168°56'48.19361"W	63°19'03.69380"N	168°56'48.10779"W	7022633.4780	602860.0710	3406192.848	1813598.581	76.087	23.192	GS	8/3/2018 10:14
5326	5326	63°19'03.73551"N	168°56'47.71449"W	63°19'03.75100"N	168°56'47.62867"W	7022635.4610	602866.6790	3406199.017	1813620.366	76.816	23.414	GS	8/3/2018 10:14
5327	5327	63°19'03.78882"N	168°56'47.27404"W	63°19'03.80431"N	168°56'47.18822"W	7022637.3070	602872.7540	3406204.762	1813640.392	77.425	23.599	GS	8/3/2018 10:15
5328	5328	63°19'03.83898"N	168°56'46.86113"W	63°19'03.85447"N	168°56'46.77532"W	7022639.0430	602878.4480	3406210.167	1813659.165	77.87	23.735	GS	8/3/2018 10:15
5329	5329	63°19'03.86898"N	168°56'46.60058"W	63°19'03.88447"N	168°56'46.51476"W	7022640.0870	602882.0430	3406213.409	1813671.014	78.166	23.825	GS	8/3/2018 10:16
5330	5330	63°19'03.87857"N	168°56'46.51187"W	63°19'03.89406"N	168°56'46.42605"W	7022640.4230	602883.2680	3406214.45	1813675.049	78.245	23.849	GS	8/3/2018 10:16
5331	5331	63°19'03.88766"N	168°56'46.43810"W	63°19'03.90315"N	168°56'46.35228"W	7022640.7370	602884.2850	3406215.428	1813678.403	78.142	23.818	GS	8/3/2018 10:16
5332	5332	63°19'03.89849"N	168°56'46.35855"W	63°19'03.91399"N	168°56'46.27272"W	7022641.1080	602885.3810	3406216.588	1813682.018	77.977	23.768	GS	8/3/2018 10:16
5333	5333	63°19'03.90695"N	168°56'46.28469"W	63°19'03.92244"N	168°56'46.19886"W	7022641.4020	602886.4000	3406217.502	1813685.377	77.844	23.727	GS	8/3/2018 10:17
5334	5334	63°19'03.92044"N	168°56'46.18174"W	63°19'03.93593"N	168°56'46.09593"W	7022641.8660	602887.8190	3406218.95	1813690.056	77.996	23.773	GS	8/3/2018 10:17
5335	5335	63°19'03.93054"N	168°56'46.09100"W	63°19'03.94604"N	168°56'46.00517"W	7022642.2190	602889.0720	3406220.044	1813694.183	78.275	23.858	GS	8/3/2018 10:17
5336	5336	63°19'03.94065"N	168°56'46.00711"W	63°19'03.95615"N	168°56'45.92129"W	7022642.5690	602890.2280	3406221.134	1813697.997	78.469	23.917	GS	8/3/2018 10:17
5337	5337	63°19'03.95165"N	168°56'45.90327"W	63°19'03.96714"N	168°56'45.81745"W	7022642.9560	602891.6620	3406222.329	1813702.721	78.549	23.942	GS	8/3/2018 10:18
5338	5338	63°19'03.96294"N	168°56'45.81575"W	63°19'03.97844"N	168°56'45.72994"W	7022643.3440	602892.8680	3406223.541	1813706.699	78.64	23.97	GS	8/3/2018 10:18
5339	5339	63°19'03.97359"N	168°56'45.70645"W	63°19'03.98908"N	168°56'45.62063"W	7022643.7220	602894.3780	3406224.705	1813711.673	78.766	24.008	GS	8/3/2018 10:18
5340	5340	63°19'03.98645"N	168°56'45.61756"W	63°19'04.00194"N	168°56'45.53175"W	7022644.1600	602895.6020	3406226.078	1813715.711	78.629	23.966	GS	8/3/2018 10:19
5341	5341	63°19'03.99644"N	168°56'45.52479"W	63°19'04.01193"N	168°56'45.43896"W	7022644.5100	602896.8830	3406227.162	1813719.931	78.563	23.946	GS	8/3/2018 10:19
5342	5342	63°19'04.00640"N	168°56'45.44465"W	63°19'04.02189"N	168°56'45.35884"W	7022644.8540	602897.9880	3406228.234	1813723.574	78.366	23.886	GS	8/3/2018 10:19

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5343	5343	63°19'04.01703"N	168°56'45.35668"W	63°19'04.03252"N	168°56'45.27086"W	7022645.2220	602899.2010	3406229.379	1813727.574	78.257	23.853	GS	8/3/2018 10:19
5344	5344	63°19'04.02807"N	168°56'45.27234"W	63°19'04.04356"N	168°56'45.18653"W	7022645.6010	602900.3640	3406230.564	1813731.407	78.16	23.823	GS	8/3/2018 10:20
5345	5345	63°19'04.03820"N	168°56'45.18692"W	63°19'04.05369"N	168°56'45.10110"W	7022645.9530	602901.5420	3406231.657	1813735.291	77.847	23.728	GS	8/3/2018 10:20
5346	5346	63°19'04.04659"N	168°56'45.10982"W	63°19'04.06208"N	168°56'45.02400"W	7022646.2470	602902.6060	3406232.567	1813738.798	77.667	23.673	GS	8/3/2018 10:20
5347	5347	63°19'04.05554"N	168°56'45.04043"W	63°19'04.07103"N	168°56'44.95461"W	7022646.5550	602903.5630	3406233.528	1813741.952	77.49	23.619	GS	8/3/2018 10:20
5348	5348	63°19'04.05987"N	168°56'44.99550"W	63°19'04.07535"N	168°56'44.90967"W	7022646.7080	602904.1840	3406234.001	1813743.997	77.566	23.642	GS	8/3/2018 10:21
5349	5349	63°19'04.06989"N	168°56'44.91961"W	63°19'04.08538"N	168°56'44.83379"W	7022647.0520	602905.2290	3406235.076	1813747.446	77.979	23.768	GS	8/3/2018 10:21
5350	5350	63°19'04.07952"N	168°56'44.84483"W	63°19'04.09501"N	168°56'44.75900"W	7022647.3840	602906.2600	3406236.11	1813750.845	78.363	23.885	GS	8/3/2018 10:21
5351	5351	63°19'04.09733"N	168°56'44.68612"W	63°19'04.11281"N	168°56'44.60030"W	7022648.0050	602908.4500	3406238.038	1813758.063	78.624	23.965	GS	8/3/2018 10:21
5352	5352	63°19'04.12938"N	168°56'44.41542"W	63°19'04.14487"N	168°56'44.32961"W	7022649.1180	602912.1840	3406241.497	1813770.372	78.977	24.072	GS	8/3/2018 10:22
5353	5353	63°19'04.16588"N	168°56'44.10109"W	63°19'04.18137"N	168°56'44.01528"W	7022650.3870	602916.5210	3406245.44	1813784.666	78.895	24.047	GS	8/3/2018 10:22
5354	5354	63°19'04.20279"N	168°56'43.80050"W	63°19'04.21828"N	168°56'43.71468"W	7022651.6630	602920.6660	3406249.414	1813798.332	78.782	24.013	GS	8/3/2018 10:22
5355	5355	63°19'04.25909"N	168°56'43.34412"W	63°19'04.27457"N	168°56'43.25830"W	7022653.6080	602926.9590	3406255.475	1813819.08	78.336	23.877	GS	8/3/2018 10:24
5356	5356	63°19'04.31225"N	168°56'42.87042"W	63°19'04.32774"N	168°56'42.78460"W	7022655.4640	602933.4970	3406261.23	1813840.624	77.611	23.656	GS	8/3/2018 10:24
5357	5357	63°19'04.36994"N	168°56'42.39194"W	63°19'04.38543"N	168°56'42.30612"W	7022657.4630	602940.0960	3406267.449	1813862.379	76.672	23.37	GS	8/3/2018 10:24
5358	5358	63°19'04.43051"N	168°56'41.89855"W	63°19'04.44599"N	168°56'41.81273"W	7022659.5560	602946.8990	3406273.971	1813884.81	75.171	22.912	GS	8/3/2018 10:25
5359	5359	63°19'04.48574"N	168°56'41.40974"W	63°19'04.50123"N	168°56'41.32391"W	7022661.4830	602953.6450	3406279.948	1813907.041	74.335	22.657	GS	8/3/2018 10:26
5360	5360	63°19'04.54280"N	168°56'40.93741"W	63°19'04.55829"N	168°56'40.85159"W	7022663.4590	602960.1590	3406286.098	1813928.516	73.13	22.29	GS	8/3/2018 10:26
5361	5361	63°19'04.60773"N	168°56'40.38898"W	63°19'04.62322"N	168°56'40.30316"W	7022665.7130	602967.7240	3406293.105	1813953.453	71.821	21.891	GS	8/3/2018 10:26
5362	5362	63°19'04.66795"N	168°56'39.88098"W	63°19'04.68344"N	168°56'39.79516"W	7022667.8030	602974.7310	3406299.603	1813976.552	70.234	21.407	GS	8/3/2018 10:27
5363	5363	63°19'04.72461"N	168°56'39.40069"W	63°19'04.74010"N	168°56'39.31487"W	7022669.7700	602981.3570	3406305.719	1813998.391	68.552	20.895	GS	8/3/2018 10:27
5364	5364	63°19'04.78124"N	168°56'38.93554"W	63°19'04.79673"N	168°56'38.84972"W	7022671.7300	602987.7720	3406311.82	1814019.539	66.54	20.281	GS	8/3/2018 10:27
5365	5365	63°19'04.83567"N	168°56'38.47375"W	63°19'04.85117"N	168°56'38.38793"W	7022673.6200	602994.1420	3406317.696	1814040.537	64.807	19.753	GS	8/3/2018 10:28
5366	5366	63°19'04.89361"N	168°56'38.00108"W	63°19'04.90910"N	168°56'37.91526"W	7022675.6230	603000.6600	3406323.936	1814062.026	63.622	19.392	GS	8/3/2018 10:28
5367	5367	63°19'04.95067"N	168°56'37.51000"W	63°19'04.96616"N	168°56'37.42418"W	7022677.6080	603007.4350	3406330.101	1814084.357	62.483	19.045	GS	8/3/2018 10:28
5368	5368	63°19'05.00450"N	168°56'37.05478"W	63°19'05.01999"N	168°56'36.96896"W	7022679.4760	603013.7140	3406335.91	1814105.056	61.119	18.629	RSH3	8/3/2018 10:29
5369	5369	63°19'05.06949"N	168°56'36.49571"W	63°19'05.08499"N	168°56'36.40989"W	7022681.7370	603021.4270	3406342.932	1814130.479	60.83	18.541	RCL1	8/3/2018 10:30
5370	5370	63°19'05.13820"N	168°56'35.94488"W	63°19'05.15369"N	168°56'35.85905"W	7022684.1080	603029.0220	3406350.325	1814155.519	59.332	18.085	RSH1	8/3/2018 10:30
5371	5371	63°19'05.20321"N	168°56'35.37177"W	63°19'05.21870"N	168°56'35.28594"W	7022686.3750	603036.9300	3406357.359	1814181.583	54.188	16.516	GTOE1	8/3/2018 10:30
5372	5372	63°19'05.27671"N	168°56'34.76745"W	63°19'05.29221"N	168°56'34.68163"W	7022688.9190	603045.2640	3406365.279	1814209.058	52.257	15.928	GS	8/3/2018 10:31
5373	5373	63°19'05.34981"N	168°56'34.16848"W	63°19'05.36531"N	168°56'34.08266"W	7022691.4480	603053.5240	3406373.154	1814236.289	51.706	15.76	GS	8/3/2018 10:31
5374	5374	63°18'43.29940"N	168°57'48.91529"W	63°18'43.31490"N	168°57'48.82951"W	7021976.0270	602035.3570	3404077.89	1810858.959	61.58	18.77	HEW13	8/3/2018 11:13
5375	5375	63°18'43.31956"N	168°57'48.87906"W	63°18'43.33505"N	168°57'48.79326"W	7021976.6670	602035.8410	3404079.964	1810860.581	61.521	18.752	HEW13	8/3/2018 11:14
5376	5376	63°18'43.33884"N	168°57'48.78681"W	63°18'43.35434"N	168°57'48.70102"W	7021977.3050	602037.1060	3404081.991	1810864.763	61.499	18.745	HEW13	8/3/2018 11:14
5377	5377	63°18'43.36613"N	168°57'48.72659"W	63°18'43.38163"N	168°57'48.64081"W	7021978.1750	602037.9170	3404084.807	1810867.469	61.482	18.74	HEW13	8/3/2018 11:14
5378	5378	63°18'43.42278"N	168°57'48.71707"W	63°18'43.43828"N	168°57'48.63128"W	7021979.9320	602037.9940	3404090.568	1810867.811	61.45	18.73	HEW13	8/3/2018 11:15
5379	5379	63°18'43.47330"N	168°57'48.64749"W	63°18'43.48880"N	168°57'48.56171"W	7021981.5260	602038.9120	3404095.75	1810870.906	61.529	18.754	HEW13	8/3/2018 11:15
5380	5380	63°18'43.46435"N	168°57'48.53167"W	63°18'43.47984"N	168°57'48.44590"W	7021981.3000	602040.5320	3404094.926	1810876.211	61.475	18.738	HEW13	8/3/2018 11:15
5381	5381	63°18'43.40052"N	168°57'48.51921"W	63°18'43.41602"N	168°57'48.43343"W	7021979.3310	602040.7690	3404088.453	1810876.885	61.475	18.738	HEW13	8/3/2018 11:16
5382	5382	63°18'43.32725"N	168°57'48.47603"W	63°18'43.34275"N	168°57'48.39025"W	7021977.0830	602041.4410	3404081.043	1810878.978	61.558	18.763	HEW13	8/3/2018 11:16
5383	5383	63°18'43.28943"N	168°57'48.49534"W	63°18'43.30493"N	168°57'48.40956"W	7021975.9050	602041.2100	3404077.188	1810878.158	61.555	18.762	HEW13	8/3/2018 11:16
5384	5384	63°18'43.26233"N	168°57'48.49771"W	63°18'43.27784"N	168°57'48.41194"W	7021975.0650	602041.2030	3404074.434	1810878.094	61.545	18.759	HEW13	8/3/2018 11:16
5385	5385	63°18'43.24738"N	168°57'48.67032"W	63°18'43.26288"N	168°57'48.58454"W	7021974.5260	602038.8160	3404072.788	1810870.234	61.523	18.752	HEW13	8/3/2018 11:16
5386	5386	63°18'43.25888"N	168°57'48.85685"W	63°18'43.27437"N	168°57'48.77106"W	7021974.7990	602036.2100	3404073.818	1810861.695	61.531	18.755	HEW13 C	8/3/2018 11:17

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
5387	5387	63°18'42.73292"N	168°57'29.95007"W	63°18'42.74842"N	168°57'29.86427"W	7021966.8960	602299.8070	3404034.394	1811726.181	73.027	22.259	CHK 2600 HV	8/3/2018 12:40
5388	5388	63°18'44.29882"N	168°57'23.07316"W	63°18'44.31431"N	168°57'22.98738"W	7022018.3920	602393.9510	3404198.541	1812037.715	63.513	19.359	MP SW03	8/3/2018 15:27
5389	5389	63°18'42.00958"N	168°57'21.03215"W	63°18'42.02507"N	168°57'20.94635"W	7021948.4710	602424.6100	3403967.554	1812134.729	71.424	21.77	MP SW01	8/3/2018 15:30
5390	5390	63°18'43.19450"N	168°57'16.58994"W	63°18'43.20999"N	168°57'16.50414"W	7021987.1030	602485.2510	3404091.206	1812335.679	64.182	19.563	MP SW02	8/3/2018 15:33
5391	5391	63°19'05.77866"N	168°56'49.31111"W	63°19'05.79415"N	168°56'49.22530"W	7022697.9620	602842.4430	3406405.33	1813544.043	72.095	21.975	CHK HV GPS 2	8/3/2018 15:42
5392	5392	63°18'57.69969"N	168°57'18.34014"W	63°18'57.71519"N	168°57'18.25434"W	7022435.0990	602446.5810	3405563.109	1812231.726	52.016	15.855	CHK 0 HV	8/3/2018 17:19
5393	5393	63°18'57.69955"N	168°57'18.33958"W	63°18'57.71504"N	168°57'18.25377"W	7022435.0950	602446.5900	3405563.095	1812231.752	52.029	15.859	CHK 2 HV	8/3/2018 18:27
5394	5394	63°18'57.69988"N	168°57'18.34020"W	63°18'57.71537"N	168°57'18.25439"W	7022435.1050	602446.5810	3405563.128	1812231.723	51.293	15.634	CHK 0 HV	8/4/2018 7:54
5395	5395	63°18'43.45415"N	168°57'44.10655"W	63°18'43.46965"N	168°57'44.02076"W	7021982.9420	602102.1160	3404097.16	1811078.357	61.981	18.892	MP	8/4/2018 8:02
5396	5396	63°18'43.92821"N	168°57'44.76361"W	63°18'43.94371"N	168°57'44.67782"W	7021997.3180	602092.5070	3404144.822	1811047.565	59.703	18.197	MP	8/4/2018 8:04
5397	5397	63°18'44.27513"N	168°57'44.07902"W	63°18'44.29062"N	168°57'43.99322"W	7022008.3540	602101.6920	3404180.562	1811078.265	60.244	18.362	MP	8/4/2018 8:07
5398	5398	63°18'43.91604"N	168°57'43.10283"W	63°18'43.93154"N	168°57'43.01705"W	7021997.6760	602115.6280	3404144.813	1811123.445	60.077	18.311	MP	8/4/2018 8:08
5399	5399	63°18'43.36308"N	168°57'48.39586"W	63°18'43.37858"N	168°57'48.31007"W	7021978.2270	602042.5220	3404084.741	1810882.581	61.301	18.684	MP	8/4/2018 8:14
5400	5400	63°18'43.49510"N	168°57'48.68198"W	63°18'43.51061"N	168°57'48.59619"W	7021982.1850	602038.4110	3404097.939	1810869.295	61.084	18.619	MP	8/4/2018 8:15
5401	5401	63°18'43.36644"N	168°57'48.87144"W	63°18'43.38194"N	168°57'48.78565"W	7021978.1210	602035.9010	3404084.731	1810860.852	61.777	18.83	MP	8/4/2018 8:15
5402	5402	63°18'43.23452"N	168°57'48.69097"W	63°18'43.25001"N	168°57'48.60518"W	7021974.1190	602038.5420	3404071.466	1810869.312	61.74	18.818	MP	8/4/2018 8:16
5403	5403	63°18'45.43881"N	168°57'48.19059"W	63°18'45.45431"N	168°57'48.10481"W	7022042.5390	602043.3380	3404295.713	1810888.549	58.293	17.768	MP	8/4/2018 8:19
5404	5404	63°18'45.70860"N	168°57'47.53485"W	63°18'45.72410"N	168°57'47.44905"W	7022051.1760	602052.1970	3404323.598	1810918.058	57.679	17.581	MP	8/4/2018 8:20
5405	5405	63°18'45.92134"N	168°57'48.17241"W	63°18'45.93684"N	168°57'48.08661"W	7022057.4760	602043.1160	3404344.734	1810888.587	57.819	17.623	MP	8/4/2018 8:22
5406	5406	63°18'45.71798"N	168°57'48.70857"W	63°18'45.73348"N	168°57'48.62279"W	7022050.9470	602035.8560	3404323.684	1810864.431	57.725	17.595	MP	8/4/2018 8:23
5407	5407	63°18'45.99584"N	168°57'43.42784"W	63°18'46.01134"N	168°57'43.34205"W	7022061.8790	602109.0600	3404355.806	1811105.18	57.409	17.498	MP	8/4/2018 8:27
5408	5408	63°18'46.18701"N	168°57'42.99028"W	63°18'46.20251"N	168°57'42.90449"W	7022067.9870	602114.9600	3404375.546	1811124.852	57.125	17.412	MP	8/4/2018 8:28
5409	5409	63°18'46.48918"N	168°57'43.41225"W	63°18'46.50468"N	168°57'43.32646"W	7022077.1490	602108.7910	3404405.924	1811105.081	57.528	17.534	MP	8/4/2018 8:31
5410	5410	63°18'46.19333"N	168°57'43.86304"W	63°18'46.20882"N	168°57'43.77724"W	7022067.7960	602102.8100	3404375.542	1811084.977	57.654	17.573	MP	8/4/2018 8:32
5411	5411	63°18'45.71478"N	168°57'41.69374"W	63°18'45.73028"N	168°57'41.60795"W	7022053.9500	602133.4650	3404328.543	1811184.85	58.493	17.829	MP	8/4/2018 8:37
5412	5412	63°18'45.36554"N	168°57'41.22981"W	63°18'45.38104"N	168°57'41.14402"W	7022043.3510	602140.2640	3404293.416	1811206.615	58.966	17.973	MP	8/4/2018 8:39
5413	5413	63°18'45.10008"N	168°57'41.71701"W	63°18'45.11558"N	168°57'41.63123"W	7022034.9220	602133.7460	3404266.094	1811184.798	58.842	17.935	MP	8/4/2018 8:40
5414	5414	63°18'45.37279"N	168°57'42.20856"W	63°18'45.38828"N	168°57'42.12278"W	7022043.1420	602126.6380	3404293.428	1811161.897	56.936	17.354	MP	8/4/2018 8:42
5415	5415	63°18'51.38639"N	168°57'45.32046"W	63°18'51.40189"N	168°57'45.23466"W	7022227.8190	602077.4250	3404901.894	1811009.874	44.41	13.536	EPP BASE ONLY	8/4/2018 8:53
5416	5416	63°18'51.50076"N	168°57'45.33605"W	63°18'51.51626"N	168°57'45.25026"W	7022231.3510	602077.0950	3404913.499	1811008.974	43.494	13.257	ML1 SUBMERGED PP	8/4/2018 8:57
5417	5417	63°18'51.55863"N	168°57'45.59133"W	63°18'51.57413"N	168°57'45.50554"W	7022233.0280	602073.4860	3404919.188	1810997.219	43.915	13.385	ML1 SUBMERGED PP	8/4/2018 8:58
5418	5418	63°18'51.53111"N	168°57'44.28701"W	63°18'51.54661"N	168°57'44.20120"W	7022232.7540	602091.6610	3404917.356	1811056.838	43.787	13.346	L2 PARTIALLY SUBMERGED P	8/4/2018 9:00
5419	5419	63°18'51.61767"N	168°57'44.05173"W	63°18'51.63317"N	168°57'43.96594"W	7022235.5360	602094.8490	3404926.322	1811067.442	44.088	13.438	ML2 PARTIALY SUBMERGED P	8/4/2018 9:00
5420	5420	63°18'57.69955"N	168°57'18.33951"W	63°18'57.71505"N	168°57'18.25371"W	7022435.0950	602446.5900	3405563.095	1812231.755	51.28	15.63	CHK 2 HV	8/4/2018 9:15
5421	5421	63°19'32.47886"N	168°58'15.32326"W	63°19'32.49437"N	168°58'15.23744"W	7023485.9390	601619.7350	3409053.346	1809572.535	28.383	8.651	CHK 1 HV	8/4/2018 9:20
8733	8733	63°18'02.49176"N	168°57'19.09969"W	63°18'02.50725"N	168°57'19.01393"W	7020726.6950	602490.4970	3399955.406	1812288.389	359.968	109.718	MAG NAIL	
8734	8734	63°18'16.63308"N	168°57'28.66663"W	63°18'16.64857"N	168°57'28.58086"W	7021159.9660	602343.3890	3401384.541	1811827.883	219.728	66.973	MAG NAIL	
10001	10001	63°19'32.47891"N	168°58'15.32291"W	63°19'32.49442"N	168°58'15.23709"W	7023485.9400	601619.7390	3409053.351	1809572.551	28.449	8.671	CHK 1 HV	8/2/2018 8:52
10002	10002	63°18'42.73254"N	168°57'29.95021"W	63°18'42.74803"N	168°57'29.86443"W	7021966.8840	602299.8050	3404034.355	1811726.175	73.042	22.263	CHK 2600 HV	8/2/2018 9:09
10003	10003	63°18'57.69942"N	168°57'18.33963"W	63°18'57.71491"N	168°57'18.25381"W	7022435.0910	602446.5890	3405563.082	1812231.75	51.433	15.677	CHK 0 HV	8/2/2018 9:27
10004	10004	63°20'08.82995"N	168°56'24.47102"W	63°20'08.84544"N	168°56'24.38513"W	7024659.7730	603125.3080	3412827.759	1814572.567	5.296	1.614	CHK 59 HV	8/2/2018 9:51
10005	10005	63°18'42.87993"N	168°57'39.58913"W	63°18'42.89543"N	168°57'39.50335"W	7021967.1750	602165.5390	3404042.181	1811285.647	63.523	19.362	HEW100	8/2/2018 10:40
10006	10006	63°18'42.91734"N	168°57'39.43692"W	63°18'42.93284"N	168°57'39.35114"W	7021968.4000	602167.6200	3404046.094	1811292.538	63.507	19.357	HEW100	8/2/2018 10:40
10007	10007	63°18'43.02619"N	168°57'39.29680"W	63°18'43.04168"N	168°57'39.21102"W	7021971.8290	602169.4620	3404057.252	1811298.759	63.512	19.359	HEW100	8/2/2018 10:40

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10008	10008	63°18'43.13760"N	168°57'39.07780"W	63°18'43.15310"N	168°57'38.99201"W	7021975.3730	602172.4000	3404068.73	1811308.579	63.505	19.356	HEW100	8/2/2018 10:41
10009	10009	63°18'43.23931"N	168°57'38.94311"W	63°18'43.25481"N	168°57'38.85733"W	7021978.5800	602174.1740	3404079.16	1811314.564	63.551	19.37	HEW100	8/2/2018 10:41
10010	10010	63°18'43.25831"N	168°57'39.04228"W	63°18'43.27381"N	168°57'38.95650"W	7021979.1240	602172.7750	3404081.016	1811310.003	63.475	19.347	HEW100	8/2/2018 10:42
10011	10011	63°18'43.24509"N	168°57'39.29697"W	63°18'43.26059"N	168°57'39.21118"W	7021978.6020	602169.2440	3404079.485	1811298.391	63.545	19.368	HEW100	8/2/2018 10:42
10012	10012	63°18'43.25478"N	168°57'39.41235"W	63°18'43.27027"N	168°57'39.32657"W	7021978.8500	602167.6290	3404080.383	1811293.105	63.514	19.359	HEW100	8/2/2018 10:42
10013	10013	63°18'43.30748"N	168°57'39.62035"W	63°18'43.32297"N	168°57'39.53457"W	7021980.3890	602164.6830	3404085.582	1811283.517	63.525	19.363	HEW100	8/2/2018 10:42
10014	10014	63°18'43.31106"N	168°57'39.77627"W	63°18'43.32656"N	168°57'39.69050"W	7021980.4310	602162.5100	3404085.83	1811276.389	63.516	19.36	HEW100	8/2/2018 10:43
10015	10015	63°18'43.29209"N	168°57'39.92316"W	63°18'43.30759"N	168°57'39.83738"W	7021979.7790	602160.4850	3404083.795	1811269.711	63.488	19.351	HEW100	8/2/2018 10:44
10016	10016	63°18'43.33129"N	168°57'39.98096"W	63°18'43.34678"N	168°57'39.89517"W	7021980.9660	602159.6420	3404087.733	1811267.006	63.488	19.351	HEW100	8/2/2018 10:44
10017	10017	63°18'43.32961"N	168°57'40.02146"W	63°18'43.34511"N	168°57'39.93567"W	7021980.8960	602159.0800	3404087.533	1811265.159	63.524	19.362	HEW100	8/2/2018 10:44
10018	10018	63°18'43.26427"N	168°57'40.07881"W	63°18'43.27976"N	168°57'39.99303"W	7021978.8490	602158.3470	3404080.854	1811262.647	63.516	19.36	HEW100	8/2/2018 10:45
10019	10019	63°18'43.21258"N	168°57'40.29311"W	63°18'43.22808"N	168°57'40.20732"W	7021977.1550	602155.4160	3404075.446	1811252.943	63.499	19.354	HEW100	8/2/2018 10:46
10020	10020	63°18'43.13710"N	168°57'40.38189"W	63°18'43.15260"N	168°57'40.29610"W	7021974.7800	602154.2550	3404067.714	1811249.012	63.459	19.342	HEW100	8/2/2018 10:47
10021	10021	63°18'43.05717"N	168°57'40.34357"W	63°18'43.07266"N	168°57'40.25778"W	7021972.3240	602154.8670	3404059.624	1811250.894	63.445	19.338	HEW100	8/2/2018 10:47
10022	10022	63°18'43.03313"N	168°57'40.27164"W	63°18'43.04863"N	168°57'40.18586"W	7021971.6130	602155.8910	3404057.236	1811254.219	63.508	19.357	HEW100	8/2/2018 10:47
10023	10023	63°18'42.99513"N	168°57'40.27220"W	63°18'43.01063"N	168°57'40.18642"W	7021970.4370	602155.9200	3404053.376	1811254.256	63.501	19.355	HEW100	8/2/2018 10:47
10024	10024	63°18'42.96293"N	168°57'40.00470"W	63°18'42.97843"N	168°57'39.91891"W	7021969.5590	602159.6740	3404050.304	1811266.528	63.522	19.361	HEW100	8/2/2018 10:48
10025	10025	63°18'42.90285"N	168°57'39.68809"W	63°18'42.91834"N	168°57'39.60231"W	7021967.8400	602164.1390	3404044.436	1811281.089	63.485	19.35	HEW100	8/2/2018 10:48
10026	10026	63°18'42.88223"N	168°57'39.63911"W	63°18'42.89773"N	168°57'39.55333"W	7021967.2240	602164.8410	3404042.378	1811283.36	63.529	19.364	HEW100 C	8/2/2018 10:48
10027	10027	63°18'43.55155"N	168°57'43.07608"W	63°18'43.56705"N	168°57'42.99030"W	7021986.4110	602116.3580	3404107.814	1811125.266	60.809	18.535	HEW101	8/2/2018 10:52
10028	10028	63°18'43.61507"N	168°57'42.95247"W	63°18'43.63057"N	168°57'42.86669"W	7021988.4310	602118.0160	3404114.357	1811130.808	60.738	18.513	HEW101	8/2/2018 10:52
10029	10029	63°18'43.66092"N	168°57'42.78559"W	63°18'43.67642"N	168°57'42.69981"W	7021989.9230	602120.2930	3404119.137	1811138.355	60.816	18.537	HEW101	8/2/2018 10:53
10030	10030	63°18'43.70895"N	168°57'42.63972"W	63°18'43.72444"N	168°57'42.55394"W	7021991.4740	602122.2750	3404124.123	1811144.939	60.759	18.519	HEW101	8/2/2018 10:53
10031	10031	63°18'43.76279"N	168°57'42.45971"W	63°18'43.77828"N	168°57'42.37392"W	7021993.2190	602124.7270	3404129.724	1811153.073	60.751	18.517	HEW101	8/2/2018 10:53
10032	10032	63°18'43.79184"N	168°57'42.40402"W	63°18'43.80734"N	168°57'42.31823"W	7021994.1430	602125.4730	3404132.716	1811155.569	60.791	18.529	HEW101	8/2/2018 10:53
10033	10033	63°18'43.81714"N	168°57'42.44812"W	63°18'43.83263"N	168°57'42.36233"W	7021994.9060	602124.8350	3404135.253	1811153.513	60.745	18.515	HEW101	8/2/2018 10:54
10034	10034	63°18'43.73457"N	168°57'42.76311"W	63°18'43.75006"N	168°57'42.67731"W	7021992.2120	602120.5330	3404126.634	1811139.261	60.769	18.522	HEW101	8/2/2018 10:55
10035	10035	63°18'43.72496"N	168°57'43.07113"W	63°18'43.74045"N	168°57'42.98536"W	7021991.7780	602116.2570	3404125.43	1811125.207	60.743	18.514	HEW101	8/2/2018 10:55
10036	10036	63°18'43.76463"N	168°57'43.39893"W	63°18'43.78013"N	168°57'43.31314"W	7021992.8610	602111.6570	3404129.217	1811110.169	60.785	18.527	HEW101	8/2/2018 11:05
10037	10037	63°18'43.77857"N	168°57'43.50813"W	63°18'43.79407"N	168°57'43.42234"W	7021993.2440	602110.1240	3404130.552	1811105.158	60.812	18.535	HEW101	8/2/2018 11:06
10038	10038	63°18'43.91864"N	168°57'43.51217"W	63°18'43.93414"N	168°57'43.42638"W	7021997.5750	602109.9300	3404144.775	1811104.743	60.828	18.541	HEW101	8/2/2018 11:06
10039	10039	63°18'44.00020"N	168°57'43.55974"W	63°18'44.01570"N	168°57'43.47395"W	7022000.0780	602109.1870	3404153.023	1811102.436	60.791	18.529	HEW101	8/2/2018 11:07
10040	10040	63°18'44.10554"N	168°57'43.76209"W	63°18'44.12103"N	168°57'43.67630"W	7022003.2470	602106.2680	3404163.572	1811093.02	60.786	18.528	HEW101	8/2/2018 11:08
10041	10041	63°18'44.17311"N	168°57'43.95615"W	63°18'44.18861"N	168°57'43.87037"W	7022005.2520	602103.5010	3404170.292	1811084.045	60.758	18.519	HEW101	8/2/2018 11:09
10042	10042	63°18'44.10684"N	168°57'44.23618"W	63°18'44.12234"N	168°57'44.15039"W	7022003.0780	602099.6700	3404163.354	1811071.363	60.783	18.527	HEW101	8/2/2018 11:09
10043	10043	63°18'44.03654"N	168°57'44.41722"W	63°18'44.05203"N	168°57'44.33142"W	7022000.8230	602097.2200	3404156.08	1811063.209	60.791	18.529	HEW101	8/2/2018 11:10
10044	10044	63°18'43.94930"N	168°57'44.63480"W	63°18'43.96479"N	168°57'44.54901"W	7021998.0270	602094.2790	3404147.059	1811053.414	60.822	18.539	HEW101	8/2/2018 11:11
10045	10045	63°18'43.82275"N	168°57'44.56323"W	63°18'43.83825"N	168°57'44.47745"W	7021994.1440	602095.3990	3404134.259	1811056.891	60.787	18.528	HEW101	8/2/2018 11:11
10046	10046	63°18'43.73027"N	168°57'44.34211"W	63°18'43.74577"N	168°57'44.25633"W	7021991.3800	602098.5670	3404125.03	1811067.143	60.818	18.537	HEW101	8/2/2018 11:12
10047	10047	63°18'43.57656"N	168°57'44.33825"W	63°18'43.59206"N	168°57'44.25246"W	7021986.6260	602098.7720	3404109.421	1811067.572	60.824	18.539	HEW101	8/2/2018 11:12
10048	10048	63°18'43.56975"N	168°57'44.27985"W	63°18'43.58525"N	168°57'44.19407"W	7021986.4420	602099.5910	3404108.773	1811070.251	60.875	18.555	HEW101	8/2/2018 11:13
10049	10049	63°18'43.65926"N	168°57'44.19322"W	63°18'43.67476"N	168°57'44.10742"W	7021989.2490	602100.7080	3404117.928	1811074.061	60.767	18.522	HEW101	8/2/2018 11:14
10050	10050	63°18'43.63976"N	168°57'43.91930"W	63°18'43.65526"N	168°57'43.83351"W	7021988.7670	602104.5390	3404116.15	1811086.605	60.718	18.507	HEW101	8/2/2018 11:15
10051	10051	63°18'43.54313"N	168°57'43.88376"W	63°18'43.55863"N	168°57'43.79797"W	7021985.7930	602105.1280	3404106.362	1811088.387	60.77	18.523	HEW101	8/2/2018 11:15

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10052	10052	63°18'43.52839"N	168°57'43.78273"W	63°18'43.54388"N	168°57'43.69695"W	7021985.3810	602106.5490	3404104.939	1811093.026	60.802	18.532	HEW101	8/2/2018 11:15
10053	10053	63°18'43.47070"N	168°57'43.81758"W	63°18'43.48620"N	168°57'43.73179"W	7021983.5810	602106.1210	3404099.054	1811091.529	60.972	18.584	HEW101	8/2/2018 11:16
10054	10054	63°18'43.45063"N	168°57'43.49773"W	63°18'43.46613"N	168°57'43.41195"W	7021983.1020	602110.5910	3404097.253	1811106.172	60.929	18.571	HEW101	8/2/2018 11:16
10055	10055	63°18'43.44664"N	168°57'43.22873"W	63°18'43.46214"N	168°57'43.14295"W	7021983.0980	602114.3380	3404097.046	1811118.466	61.101	18.624	HEW101	8/2/2018 11:16
10056	10056	63°18'43.44303"N	168°57'43.22240"W	63°18'43.45852"N	168°57'43.13662"W	7021982.9880	602114.4290	3404096.684	1811118.761	61.2	18.654	MP infall	8/2/2018 11:20
10057	10057	63°18'43.49582"N	168°57'43.20121"W	63°18'43.51131"N	168°57'43.11542"W	7021984.6310	602114.6720	3404102.061	1811119.642	60.824	18.539	HEW101	8/2/2018 11:27
10058	10058	63°18'43.54522"N	168°57'43.10116"W	63°18'43.56072"N	168°57'43.01536"W	7021986.2040	602116.0160	3404107.153	1811124.131	60.793	18.53	HEW101 C	8/2/2018 11:27
10059	10059	63°18'44.47207"N	168°57'51.37127"W	63°18'44.48757"N	168°57'51.28549"W	7022011.2230	602000.0310	3404195.179	1810744.852	61	18.593	HEW102	8/2/2018 11:39
10060	10060	63°18'44.50018"N	168°57'51.43013"W	63°18'44.51567"N	168°57'51.34434"W	7022012.0660	601999.1840	3404197.99	1810742.117	61.019	18.599	HEW102	8/2/2018 11:39
10061	10061	63°18'44.47154"N	168°57'51.57489"W	63°18'44.48704"N	168°57'51.48911"W	7022011.1170	601997.1980	3404194.975	1810735.552	61.034	18.603	HEW102	8/2/2018 11:39
10062	10062	63°18'44.39257"N	168°57'51.59504"W	63°18'44.40807"N	168°57'51.50926"W	7022008.6640	601996.9950	3404186.939	1810734.761	61.033	18.603	HEW102	8/2/2018 11:39
10063	10063	63°18'44.37425"N	168°57'51.40854"W	63°18'44.38974"N	168°57'51.32274"W	7022008.1800	601999.6080	3404185.216	1810743.31	60.949	18.577	HEW102	8/2/2018 11:40
10064	10064	63°18'44.42090"N	168°57'51.35023"W	63°18'44.43640"N	168°57'51.26443"W	7022009.6490	602000.3740	3404189.997	1810745.897	61.004	18.594	HEW102 C	8/2/2018 11:40
10065	10065	63°18'46.95501"N	168°57'47.10710"W	63°18'46.97051"N	168°57'47.02132"W	7022089.9270	602056.9230	3404450.505	1810935.549	57.14	17.416	HEW103	8/2/2018 11:45
10066	10066	63°18'47.01138"N	168°57'46.86125"W	63°18'47.02688"N	168°57'46.77546"W	7022091.7800	602060.2880	3404456.411	1810946.686	57.136	17.415	HEW103	8/2/2018 11:46
10067	10067	63°18'47.08367"N	168°57'46.69309"W	63°18'47.09917"N	168°57'46.60731"W	7022094.0910	602062.5570	3404463.878	1810954.248	57.096	17.403	HEW103	8/2/2018 11:46
10068	10068	63°18'47.11638"N	168°57'46.52283"W	63°18'47.13188"N	168°57'46.43704"W	7022095.1780	602064.8940	3404467.326	1810961.971	57.006	17.375	HEW103	8/2/2018 11:47
10069	10069	63°18'47.19668"N	168°57'46.37175"W	63°18'47.21218"N	168°57'46.28597"W	7022097.7300	602066.9170	3404475.593	1810968.74	56.971	17.365	HEW103	8/2/2018 11:47
10070	10070	63°18'47.25989"N	168°57'46.35570"W	63°18'47.27539"N	168°57'46.26990"W	7022099.6920	602067.0780	3404482.025	1810969.369	57.027	17.382	HEW103	8/2/2018 11:48
10071	10071	63°18'47.26879"N	168°57'46.43135"W	63°18'47.28429"N	168°57'46.34555"W	7022099.9340	602066.0170	3404482.873	1810965.899	56.923	17.35	HEW103	8/2/2018 11:49
10072	10072	63°18'47.19744"N	168°57'46.54827"W	63°18'47.21295"N	168°57'46.46248"W	7022097.6750	602064.4600	3404475.54	1810960.676	56.994	17.372	HEW103	8/2/2018 11:49
10073	10073	63°18'47.13497"N	168°57'46.79710"W	63°18'47.15046"N	168°57'46.71132"W	7022095.6320	602061.0590	3404469.011	1810949.413	57.09	17.401	HEW103	8/2/2018 11:50
10074	10074	63°18'47.07389"N	168°57'47.01350"W	63°18'47.08939"N	168°57'46.92772"W	7022093.6470	602058.1080	3404462.648	1810939.629	57.049	17.388	HEW103	8/2/2018 11:50
10075	10075	63°18'47.00135"N	168°57'47.17367"W	63°18'47.01685"N	168°57'47.08789"W	7022091.3320	602055.9510	3404455.162	1810932.432	57.142	17.417	HEW103 C	8/2/2018 11:50
10076	10076	63°18'48.49190"N	168°57'44.91742"W	63°18'48.50740"N	168°57'44.83164"W	7022138.4450	602085.8780	3404608.216	1811033.039	54.226	16.528	HEW104	8/2/2018 12:06
10077	10077	63°18'48.48322"N	168°57'44.92980"W	63°18'48.49872"N	168°57'44.84400"W	7022138.1710	602085.7150	3404607.325	1811032.488	54.283	16.546	HEW105	8/2/2018 12:06
10078	10078	63°18'48.55545"N	168°57'45.11645"W	63°18'48.57095"N	168°57'45.03066"W	7022140.3240	602083.0470	3404614.523	1811023.844	51.962	15.838	HEW104	8/2/2018 12:07
10079	10079	63°18'48.54977"N	168°57'45.15024"W	63°18'48.56527"N	168°57'45.06446"W	7022140.1330	602082.5820	3404613.921	1811022.31	52.031	15.859	HEW105	8/2/2018 12:07
10080	10080	63°18'48.63414"N	168°57'45.12741"W	63°18'48.64964"N	168°57'45.04162"W	7022142.7530	602082.8170	3404622.507	1811023.214	51.875	15.811	HEW105	8/2/2018 12:07
10081	10081	63°18'48.63903"N	168°57'45.08632"W	63°18'48.65453"N	168°57'45.00053"W	7022142.9230	602083.3840	3404623.034	1811025.083	51.924	15.826	HEW104	8/2/2018 12:07
10082	10082	63°18'48.71231"N	168°57'45.24188"W	63°18'48.72781"N	168°57'45.15610"W	7022145.1210	602081.1470	3404630.361	1811017.857	51.847	15.803	HEW105	8/2/2018 12:08
10083	10083	63°18'48.72552"N	168°57'45.19688"W	63°18'48.74102"N	168°57'45.11108"W	7022145.5500	602081.7610	3404631.736	1811019.891	51.826	15.797	HEW104	8/2/2018 12:08
10084	10084	63°18'48.76504"N	168°57'45.19988"W	63°18'48.78054"N	168°57'45.11409"W	7022146.7710	602081.6800	3404635.748	1811019.689	51.745	15.772	HEW104	8/2/2018 12:08
10085	10085	63°18'48.79952"N	168°57'45.20536"W	63°18'48.81502"N	168°57'45.11956"W	7022147.8350	602081.5700	3404639.246	1811019.382	51.762	15.777	HEW105	8/2/2018 12:09
10086	10086	63°18'48.77197"N	168°57'45.05640"W	63°18'48.78747"N	168°57'44.97061"W	7022147.0490	602083.6690	3404636.558	1811026.231	51.637	15.739	HEW105	8/2/2018 12:09
10087	10087	63°18'48.74067"N	168°57'44.97764"W	63°18'48.75616"N	168°57'44.89185"W	7022146.1150	602084.7960	3404633.437	1811029.88	51.702	15.759	HEW104	8/2/2018 12:09
10088	10088	63°18'48.84393"N	168°57'45.05142"W	63°18'48.85942"N	168°57'44.96564"W	7022149.2770	602083.6680	3404643.87	1811026.34	51.4	15.667	HEW104	8/2/2018 12:10
10089	10089	63°18'48.87075"N	168°57'45.11452"W	63°18'48.88625"N	168°57'45.02873"W	7022150.0790	602082.7640	3404646.547	1811023.414	51.279	15.63	HEW105	8/2/2018 12:10
10090	10090	63°18'48.92160"N	168°57'44.83254"W	63°18'48.93710"N	168°57'44.74674"W	7022151.7770	602086.6370	3404651.92	1811036.21	50.647	15.437	HEW105	8/2/2018 12:10
10091	10091	63°18'48.90569"N	168°57'44.80016"W	63°18'48.92118"N	168°57'44.71436"W	7022151.2990	602087.1030	3404650.328	1811037.715	50.601	15.423	HEW104	8/2/2018 12:11
10092	10092	63°18'49.07374"N	168°57'44.86643"W	63°18'49.08923"N	168°57'44.78065"W	7022156.4690	602086.0160	3404667.347	1811034.412	49.815	15.184	HEW105	8/2/2018 12:11
10093	10093	63°18'49.07625"N	168°57'44.80401"W	63°18'49.09174"N	168°57'44.71822"W	7022156.5740	602086.8820	3404667.648	1811037.259	49.973	15.232	HEW104	8/2/2018 12:12
10094	10094	63°18'49.12904"N	168°57'44.71727"W	63°18'49.14454"N	168°57'44.63149"W	7022158.2460	602088.0370	3404673.074	1811041.134	49.944	15.223	HEW104	8/2/2018 12:12
10095	10095	63°18'49.16625"N	168°57'44.70833"W	63°18'49.18175"N	168°57'44.62255"W	7022159.4010	602088.1250	3404676.86	1811041.481	49.886	15.205	HEW104	8/2/2018 12:12

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10096	10096	63°18'49.25489"N	168°57'44.86333"W	63°18'49.27039"N	168°57'44.77753"W	7022162.0750	602085.8810	3404685.748	1811034.256	49.807	15.181	HEW104	8/2/2018 12:13
10097	10097	63°18'49.14188"N	168°57'44.79144"W	63°18'49.15738"N	168°57'44.70566"W	7022158.6110	602086.9920	3404674.323	1811037.725	49.855	15.196	HEW105	8/2/2018 12:13
10098	10098	63°18'49.21026"N	168°57'44.89788"W	63°18'49.22576"N	168°57'44.81210"W	7022160.6790	602085.4440	3404681.19	1811032.751	49.834	15.19	HEW105	8/2/2018 12:13
10099	10099	63°18'49.36826"N	168°57'44.86654"W	63°18'49.38376"N	168°57'44.78076"W	7022165.5820	602085.7250	3404697.26	1811033.923	49.655	15.135	HEW105	8/2/2018 12:14
10100	10100	63°18'49.34336"N	168°57'44.76469"W	63°18'49.35886"N	168°57'44.67889"W	7022164.8560	602087.1670	3404694.806	1811038.616	49.72	15.155	HEW104	8/2/2018 12:14
10101	10101	63°18'49.52480"N	168°57'44.89256"W	63°18'49.54031"N	168°57'44.80677"W	7022170.4130	602085.2090	3404713.14	1811032.477	48.664	14.833	HEW104	8/2/2018 12:15
10102	10102	63°18'49.52235"N	168°57'44.98656"W	63°18'49.53784"N	168°57'44.90076"W	7022170.2950	602083.9030	3404712.821	1811028.188	48.611	14.817	HEW105	8/2/2018 12:15
10103	10103	63°18'49.66215"N	168°57'45.12745"W	63°18'49.67765"N	168°57'45.04165"W	7022174.5590	602081.8060	3404726.916	1811021.523	48.161	14.68	HEW105	8/2/2018 12:16
10104	10104	63°18'49.66643"N	168°57'45.05710"W	63°18'49.68192"N	168°57'44.97131"W	7022174.7220	602082.7800	3404727.402	1811024.729	48.149	14.676	HEW104	8/2/2018 12:16
10105	10105	63°18'48.57734"N	168°57'46.67847"W	63°18'48.59284"N	168°57'46.59268"W	7022140.3100	602061.2920	3404615.592	1810952.462	52.402	15.972	HEW5	8/2/2018 12:23
10106	10106	63°18'48.67661"N	168°57'46.67561"W	63°18'48.69211"N	168°57'46.58983"W	7022143.3830	602061.2340	3404625.676	1810952.43	52.239	15.923	HEW5	8/2/2018 12:23
10107	10107	63°18'48.74868"N	168°57'46.65537"W	63°18'48.76417"N	168°57'46.56958"W	7022145.6210	602061.4450	3404633.011	1810953.236	51.971	15.841	HEW5	8/2/2018 12:23
10108	10108	63°18'48.84062"N	168°57'46.52775"W	63°18'48.85612"N	168°57'46.44195"W	7022148.5220	602063.1300	3404642.443	1810958.914	51.643	15.741	HEW5	8/2/2018 12:24
10109	10109	63°18'48.87408"N	168°57'46.39866"W	63°18'48.88958"N	168°57'46.31287"W	7022149.6150	602064.8930	3404645.937	1810964.755	51.599	15.727	HEW5	8/2/2018 12:24
10110	10110	63°18'49.05508"N	168°57'46.31051"W	63°18'49.07058"N	168°57'46.22472"W	7022155.2530	602065.9420	3404664.385	1810968.484	50.968	15.535	HEW5	8/2/2018 12:24
10111	10111	63°18'49.14065"N	168°57'46.36274"W	63°18'49.15615"N	168°57'46.27694"W	7022157.8780	602065.1310	3404673.037	1810965.958	50.281	15.326	HEW5	8/2/2018 12:25
10112	10112	63°18'49.25401"N	168°57'46.22439"W	63°18'49.26951"N	168°57'46.13859"W	7022161.4460	602066.9440	3404684.653	1810972.091	49.88	15.204	HEW5	8/2/2018 12:25
10113	10113	63°18'49.28725"N	168°57'46.15620"W	63°18'49.30275"N	168°57'46.07041"W	7022162.5050	602067.8600	3404688.079	1810975.151	49.651	15.134	HEW5	8/2/2018 12:25
10114	10114	63°18'49.28976"N	168°57'46.08051"W	63°18'49.30526"N	168°57'45.99472"W	7022162.6160	602068.9110	3404688.39	1810978.604	49.346	15.041	HEW5	8/2/2018 12:26
10115	10115	63°18'49.34209"N	168°57'46.03895"W	63°18'49.35759"N	168°57'45.95316"W	7022164.2530	602069.4380	3404693.736	1810980.416	49.096	14.965	HEW5	8/2/2018 12:26
10116	10116	63°18'49.40062"N	168°57'46.01090"W	63°18'49.41612"N	168°57'45.92511"W	7022166.0770	602069.7710	3404699.701	1810981.601	49.025	14.943	HEW5	8/2/2018 12:26
10117	10117	63°18'49.50317"N	168°57'46.06166"W	63°18'49.51867"N	168°57'45.97587"W	7022169.2270	602068.9630	3404710.079	1810979.114	48.335	14.733	HEW5	8/2/2018 12:27
10118	10118	63°18'49.55150"N	168°57'46.12105"W	63°18'49.56701"N	168°57'46.03526"W	7022170.6960	602068.0900	3404714.944	1810976.322	47.617	14.514	HEW5	8/2/2018 12:27
10119	10119	63°18'49.59989"N	168°57'46.22331"W	63°18'49.61540"N	168°57'46.13752"W	7022172.1480	602066.6190	3404719.783	1810971.572	47.156	14.373	HEW5	8/2/2018 12:27
10120	10120	63°18'49.62413"N	168°57'46.35472"W	63°18'49.63963"N	168°57'46.26892"W	7022172.8400	602064.7670	3404722.148	1810965.53	46.885	14.291	HEW5	8/2/2018 12:30
10121	10121	63°18'49.69301"N	168°57'46.42931"W	63°18'49.70851"N	168°57'46.34351"W	7022174.9380	602063.6620	3404729.088	1810962.01	46.863	14.284	HEW5	8/2/2018 12:30
10122	10122	63°18'49.73076"N	168°57'46.45065"W	63°18'49.74626"N	168°57'46.36487"W	7022176.0960	602063.3270	3404732.906	1810960.973	46.82	14.271	HEW5	8/2/2018 12:30
10123	10123	63°18'49.80540"N	168°57'46.41933"W	63°18'49.82090"N	168°57'46.33355"W	7022178.4190	602063.6900	3404740.51	1810962.281	46.8	14.265	HEW5	8/2/2018 12:31
10124	10124	63°18'49.87566"N	168°57'46.33648"W	63°18'49.89116"N	168°57'46.25069"W	7022180.6300	602064.7740	3404747.707	1810965.95	46.727	14.243	HEW5	8/2/2018 12:31
10125	10125	63°18'49.95244"N	168°57'46.33264"W	63°18'49.96793"N	168°57'46.24686"W	7022183.0070	602064.7510	3404755.508	1810965.999	46.422	14.149	HEW5	8/2/2018 12:31
10126	10126	63°18'50.01683"N	168°57'46.12634"W	63°18'50.03232"N	168°57'46.04055"W	7022185.0900	602067.5590	3404762.2	1810975.316	46.283	14.107	HEW5	8/2/2018 12:31
10127	10127	63°18'50.03792"N	168°57'46.06855"W	63°18'50.05341"N	168°57'45.98276"W	7022185.7680	602068.3420	3404764.385	1810977.921	46.248	14.096	HEW5	8/2/2018 12:32
10128	10128	63°18'50.11423"N	168°57'45.95082"W	63°18'50.12973"N	168°57'45.86501"W	7022188.1810	602069.9050	3404772.223	1810983.173	46.224	14.089	HEW5	8/2/2018 12:32
10129	10129	63°18'50.12729"N	168°57'45.85782"W	63°18'50.14280"N	168°57'45.77203"W	7022188.6270	602071.1860	3404773.618	1810987.399	46.22	14.088	HEW5	8/2/2018 12:32
10130	10130	63°18'50.11936"N	168°57'45.75183"W	63°18'50.13486"N	168°57'45.66604"W	7022188.4280	602072.6690	3404772.891	1810992.253	46.16	14.069	HEW5	8/2/2018 12:32
10131	10131	63°18'50.18486"N	168°57'45.64441"W	63°18'50.20036"N	168°57'45.55862"W	7022190.5020	602074.0990	3404779.622	1810997.052	45.809	13.963	HEW5	8/2/2018 12:33
10132	10132	63°18'50.25013"N	168°57'45.60598"W	63°18'50.26563"N	168°57'45.52019"W	7022192.5380	602074.5690	3404786.28	1810998.7	45.473	13.86	HEW5	8/2/2018 12:33
10133	10133	63°18'50.31977"N	168°57'45.51874"W	63°18'50.33526"N	168°57'45.43296"W	7022194.7310	602075.7140	3404793.417	1811002.57	44.957	13.703	HEW5	8/2/2018 12:33
10134	10134	63°18'50.43166"N	168°57'45.37959"W	63°18'50.44716"N	168°57'45.29380"W	7022198.2550	602077.5410	3404804.884	1811008.742	44.831	13.665	HEW5	8/2/2018 12:34
10135	10135	63°18'57.69967"N	168°57'18.33953"W	63°18'57.71517"N	168°57'18.25372"W	7022435.0990	602446.5900	3405563.107	1812231.754	51.4	15.667	CHK 2 HV	8/2/2018 12:50
10136	10136	63°20'08.82985"N	168°56'24.47107"W	63°20'08.84535"N	168°56'24.38519"W	7024659.7700	603125.3080	3412827.749	1814572.565	5.323	1.623	CHK 0 HV	8/2/2018 14:33
10137	10137	63°18'50.46195"N	168°57'45.23411"W	63°18'50.47745"N	168°57'45.14831"W	7022199.2560	602079.5350	3404808.068	1811015.337	44.715	13.629	HEW5	8/2/2018 15:16
10138	10138	63°18'50.56526"N	168°57'45.12057"W	63°18'50.58076"N	168°57'45.03477"W	7022202.5030	602081.0130	3404818.645	1811020.353	44.418	13.539	HEW5	8/2/2018 15:16
10139	10139	63°18'50.70838"N	168°57'45.04451"W	63°18'50.72388"N	168°57'44.95871"W	7022206.9650	602081.9310	3404833.237	1811023.592	44.264	13.492	HEW5	8/2/2018 15:17

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10140	10140	63°18'50.89834"N	168°57'45.13705"W	63°18'50.91383"N	168°57'45.05127"W	7022212.8000	602080.4560	3404852.461	1811019.053	44.114	13.446	HEW5	8/2/2018 15:18
10141	10141	63°18'50.96871"N	168°57'45.29649"W	63°18'50.98421"N	168°57'45.21071"W	7022214.9070	602078.1690	3404859.491	1811011.655	44.058	13.429	HEW5	8/2/2018 15:19
10142	10142	63°18'51.06412"N	168°57'45.13441"W	63°18'51.07962"N	168°57'45.04861"W	7022217.9310	602080.3300	3404869.301	1811018.901	44.006	13.413	HEW5	8/2/2018 15:19
10143	10143	63°18'51.09923"N	168°57'45.21825"W	63°18'51.11473"N	168°57'45.13246"W	7022218.9800	602079.1290	3404872.805	1811015.014	44.007	13.413	HEW5	8/2/2018 15:19
10144	10144	63°18'51.16299"N	168°57'45.22156"W	63°18'51.17849"N	168°57'45.13578"W	7022220.9510	602079.0200	3404879.278	1811014.758	43.846	13.364	HEW5	8/2/2018 15:19
10145	10145	63°18'51.16946"N	168°57'45.07328"W	63°18'51.18496"N	168°57'44.98749"W	7022221.2170	602081.0770	3404880.045	1811021.52	43.891	13.378	HEW5	8/2/2018 15:20
10146	10146	63°18'51.22063"N	168°57'45.03157"W	63°18'51.23612"N	168°57'44.94577"W	7022222.8190	602081.6070	3404885.272	1811023.341	44.02	13.417	HEW5	8/2/2018 15:20
10147	10147	63°18'51.22130"N	168°57'45.15551"W	63°18'51.23680"N	168°57'45.06971"W	7022222.7850	602079.8820	3404885.249	1811017.679	43.986	13.407	HEW5	8/2/2018 15:20
10148	10148	63°18'51.28527"N	168°57'45.28261"W	63°18'51.30076"N	168°57'45.19680"W	7022224.7070	602078.0510	3404891.652	1811011.769	43.886	13.377	HEW5	8/2/2018 15:21
10149	10149	63°18'51.36737"N	168°57'45.13883"W	63°18'51.38287"N	168°57'45.05304"W	7022227.3110	602079.9700	3404900.097	1811018.201	43.9	13.381	HEW5	8/2/2018 15:21
10150	10150	63°18'51.26490"N	168°57'44.92732"W	63°18'51.28040"N	168°57'44.84152"W	7022224.2350	602083.0140	3404889.846	1811028.03	43.971	13.403	HEW5	8/2/2018 15:22
10151	10151	63°18'51.34430"N	168°57'44.78269"W	63°18'51.35980"N	168°57'44.69690"W	7022226.7550	602084.9480	3404898.017	1811034.505	44.068	13.432	HEW5	8/2/2018 15:22
10152	10152	63°18'51.41496"N	168°57'44.80410"W	63°18'51.43047"N	168°57'44.71830"W	7022228.9320	602084.5810	3404905.178	1811033.411	44.028	13.42	HEW5	8/2/2018 15:23
10153	10153	63°18'51.47395"N	168°57'44.72340"W	63°18'51.48944"N	168°57'44.63761"W	7022230.7920	602085.6450	3404911.228	1811037	43.879	13.374	HEW5	8/2/2018 15:23
10154	10154	63°18'51.48201"N	168°57'44.43904"W	63°18'51.49750"N	168°57'44.35324"W	7022231.1670	602089.5940	3404912.257	1811049.975	43.894	13.379	HEW5	8/2/2018 15:24
10155	10155	63°18'51.58698"N	168°57'44.14908"W	63°18'51.60248"N	168°57'44.06328"W	7022234.5430	602093.5250	3404923.133	1811063.046	44.013	13.415	HEW5	8/2/2018 15:24
10156	10156	63°18'51.69732"N	168°57'44.36915"W	63°18'51.71282"N	168°57'44.28336"W	7022237.8600	602090.3550	3404934.177	1811052.813	43.977	13.404	HEW5	8/2/2018 15:25
10157	10157	63°18'51.82044"N	168°57'44.24807"W	63°18'51.83594"N	168°57'44.16227"W	7022241.7230	602091.9180	3404946.771	1811058.141	43.949	13.396	HEW5	8/2/2018 15:25
10158	10158	63°18'51.98462"N	168°57'44.25416"W	63°18'52.00012"N	168°57'44.16837"W	7022246.8000	602091.6720	3404963.441	1811057.593	43.956	13.398	HEW5	8/2/2018 15:25
10159	10159	63°18'52.11051"N	168°57'44.29611"W	63°18'52.12601"N	168°57'44.21030"W	7022250.6760	602090.9650	3404976.196	1811055.47	43.93	13.39	HEW5	8/2/2018 15:26
10160	10160	63°18'52.24051"N	168°57'44.18040"W	63°18'52.25601"N	168°57'44.09460"W	7022254.7490	602092.4470	3404989.485	1811060.541	44.018	13.417	HEW5	8/2/2018 15:26
10161	10161	63°18'52.35441"N	168°57'43.95769"W	63°18'52.36991"N	168°57'43.87189"W	7022258.3720	602095.4330	3405001.218	1811070.526	43.983	13.406	HEW5	8/2/2018 15:26
10162	10162	63°18'52.42370"N	168°57'43.91729"W	63°18'52.43920"N	168°57'43.83150"W	7022260.5330	602095.9270	3405008.285	1811072.257	43.966	13.401	HEW5	8/2/2018 15:27
10163	10163	63°18'52.52618"N	168°57'43.79746"W	63°18'52.54168"N	168°57'43.71166"W	7022263.7570	602097.4940	3405018.782	1811077.562	43.893	13.378	HEW5	8/2/2018 15:27
10164	10164	63°18'52.60223"N	168°57'43.78765"W	63°18'52.61772"N	168°57'43.70186"W	7022266.1140	602097.5550	3405026.513	1811077.885	43.776	13.343	HEW5	8/2/2018 15:27
10165	10165	63°18'52.61232"N	168°57'43.71008"W	63°18'52.62782"N	168°57'43.62430"W	7022266.4610	602098.6240	3405027.595	1811081.411	43.74	13.332	HEW5	8/2/2018 15:28
10166	10166	63°18'52.65603"N	168°57'43.67488"W	63°18'52.67153"N	168°57'43.58908"W	7022267.8280	602099.0710	3405032.061	1811082.947	43.778	13.343	HEW5	8/2/2018 15:28
10167	10167	63°18'52.70010"N	168°57'43.77635"W	63°18'52.71559"N	168°57'43.69056"W	7022269.1470	602097.6160	3405036.461	1811078.24	43.77	13.341	HEW5	8/2/2018 15:28
10168	10168	63°18'52.76694"N	168°57'43.75293"W	63°18'52.78243"N	168°57'43.66712"W	7022271.2250	602097.8760	3405043.267	1811079.2	43.377	13.221	HEW5	8/2/2018 15:28
10169	10169	63°18'52.85658"N	168°57'43.68564"W	63°18'52.87208"N	168°57'43.59984"W	7022274.0280	602098.7240	3405052.421	1811082.126	43.204	13.169	HEW5	8/2/2018 15:29
10170	10170	63°18'52.87946"N	168°57'43.58701"W	63°18'52.89495"N	168°57'43.50122"W	7022274.7800	602100.0740	3405054.818	1811086.593	43.158	13.155	HEW5	8/2/2018 15:29
10171	10171	63°18'52.97007"N	168°57'43.41155"W	63°18'52.98557"N	168°57'43.32576"W	7022277.6610	602102.4260	3405064.15	1811094.458	43.181	13.162	HEW5	8/2/2018 15:30
10172	10172	63°18'53.04644"N	168°57'43.24148"W	63°18'53.06194"N	168°57'43.15570"W	7022280.0990	602104.7170	3405072.033	1811102.1	43.16	13.155	HEW5	8/2/2018 15:30
10173	10173	63°18'53.24354"N	168°57'43.20310"W	63°18'53.25904"N	168°57'43.11731"W	7022286.2140	602105.0570	3405092.079	1811103.529	43.126	13.145	HEW5	8/2/2018 15:31
10174	10174	63°18'53.40291"N	168°57'43.22155"W	63°18'53.41840"N	168°57'43.13575"W	7022291.1360	602104.6440	3405108.252	1811102.424	43.226	13.175	HEW5	8/2/2018 15:31
10175	10175	63°18'53.42369"N	168°57'43.24813"W	63°18'53.43919"N	168°57'43.16233"W	7022291.7680	602104.2540	3405110.343	1811101.176	43.161	13.156	HEW5 jpn5153	8/2/2018 15:32
10176	10176	63°18'53.97313"N	168°57'43.36841"W	63°18'53.98863"N	168°57'43.28262"W	7022308.7140	602102.0400	3405166.057	1811094.779	42.03	12.811	HEW10	8/2/2018 15:37
10177	10177	63°18'54.06062"N	168°57'43.30302"W	63°18'54.07612"N	168°57'43.21721"W	7022311.4500	602102.8640	3405174.992	1811097.622	41.768	12.731	HEW10	8/2/2018 15:38
10178	10178	63°18'54.15397"N	168°57'43.09222"W	63°18'54.16947"N	168°57'43.00643"W	7022314.4310	602105.7040	3405184.628	1811107.096	41.548	12.664	HEW10	8/2/2018 15:38
10179	10179	63°18'54.24561"N	168°57'42.93564"W	63°18'54.26111"N	168°57'42.84984"W	7022317.3350	602107.7930	3405194.052	1811114.097	41.444	12.632	HEW10	8/2/2018 15:39
10180	10180	63°18'54.31931"N	168°57'42.95070"W	63°18'54.33481"N	168°57'42.86490"W	7022319.6090	602107.5110	3405201.526	1811113.288	41.429	12.628	HEW10	8/2/2018 15:39
10181	10181	63°18'54.35797"N	168°57'42.82015"W	63°18'54.37347"N	168°57'42.73434"W	7022320.8630	602109.2890	3405205.549	1811119.187	41.419	12.625	HEW10	8/2/2018 15:39
10182	10182	63°18'54.46052"N	168°57'42.74243"W	63°18'54.47602"N	168°57'42.65664"W	7022324.0700	602110.2690	3405216.022	1811122.568	41.142	12.54	HEW10	8/2/2018 15:39
10183	10183	63°18'54.59162"N	168°57'42.60855"W	63°18'54.60712"N	168°57'42.52275"W	7022328.1850	602112.0030	3405229.436	1811128.467	41.077	12.52	HEW10	8/2/2018 15:40

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10184	10184	63°18'54.75162"N	168°57'42.48331"W	63°18'54.76713"N	168°57'42.39751"W	7022333.1910	602113.5880	3405245.779	1811133.924	40.977	12.49	HEW10	8/2/2018 15:40
10185	10185	63°18'54.90946"N	168°57'42.38825"W	63°18'54.92496"N	168°57'42.30245"W	7022338.1160	602114.7560	3405261.88	1811138.006	40.901	12.467	HEW10	8/2/2018 15:41
10186	10186	63°18'54.96559"N	168°57'42.35278"W	63°18'54.98109"N	168°57'42.26698"W	7022339.8690	602115.1940	3405267.607	1811139.534	40.686	12.401	HEW10	8/2/2018 15:41
10187	10187	63°18'55.07434"N	168°57'42.36163"W	63°18'55.08983"N	168°57'42.27583"W	7022343.2290	602114.9640	3405278.645	1811138.951	40.582	12.369	HEW10	8/2/2018 15:42
10188	10188	63°18'55.16272"N	168°57'42.36547"W	63°18'55.17822"N	168°57'42.27968"W	7022345.9620	602114.8230	3405287.619	1811138.63	40.431	12.323	HEW10	8/2/2018 15:42
10189	10189	63°18'55.25918"N	168°57'42.36787"W	63°18'55.27468"N	168°57'42.28206"W	7022348.9450	602114.6950	3405297.414	1811138.362	40.423	12.321	HEW10	8/2/2018 15:42
10190	10190	63°18'55.33222"N	168°57'42.44658"W	63°18'55.34772"N	168°57'42.36077"W	7022351.1700	602113.5280	3405304.774	1811134.647	40.297	12.283	HEW10	8/2/2018 15:43
10191	10191	63°18'55.47040"N	168°57'42.31999"W	63°18'55.48591"N	168°57'42.23421"W	7022355.5020	602115.1530	3405318.902	1811140.201	40.275	12.276	HEW10	8/2/2018 15:43
10192	10192	63°18'55.50102"N	168°57'42.43023"W	63°18'55.51652"N	168°57'42.34442"W	7022356.4000	602113.5900	3405321.93	1811135.116	40.245	12.267	HEW10	8/2/2018 15:43
10193	10193	63°18'55.63753"N	168°57'42.36348"W	63°18'55.65303"N	168°57'42.27769"W	7022360.6530	602114.3840	3405335.844	1811137.94	40.085	12.218	HEW10	8/2/2018 15:44
10194	10194	63°18'55.63140"N	168°57'42.22986"W	63°18'55.64689"N	168°57'42.14406"W	7022360.5220	602116.2490	3405335.32	1811144.053	40.018	12.197	HEW10	8/2/2018 15:44
10195	10195	63°18'55.64805"N	168°57'42.05924"W	63°18'55.66354"N	168°57'41.97344"W	7022361.1130	602118.6070	3405337.137	1811151.818	40.064	12.212	HEW10	8/2/2018 15:45
10196	10196	63°18'55.74691"N	168°57'41.94051"W	63°18'55.76241"N	168°57'41.85472"W	7022364.2240	602120.1610	3405347.266	1811157.078	40.022	12.199	HEW10	8/2/2018 15:45
10197	10197	63°18'55.81611"N	168°57'41.86890"W	63°18'55.83161"N	168°57'41.78310"W	7022366.3970	602121.0890	3405354.347	1811160.235	39.959	12.179	HEW10	8/2/2018 15:45
10198	10198	63°18'55.87591"N	168°57'41.74858"W	63°18'55.89142"N	168°57'41.66279"W	7022368.3000	602122.7040	3405360.51	1811165.632	39.892	12.159	HEW10	8/2/2018 15:46
10199	10199	63°18'56.00519"N	168°57'41.75288"W	63°18'56.02069"N	168°57'41.66709"W	7022372.2980	602122.5170	3405373.637	1811165.223	39.858	12.149	HEW10	8/2/2018 15:46
10200	10200	63°18'56.11520"N	168°57'41.64104"W	63°18'56.13070"N	168°57'41.55523"W	7022375.7510	602123.9650	3405384.892	1811170.15	39.752	12.117	HEW10	8/2/2018 15:46
10201	10201	63°18'56.21618"N	168°57'41.53027"W	63°18'56.23168"N	168°57'41.44447"W	7022378.9240	602125.4070	3405395.23	1811175.043	39.697	12.1	HEW10	8/2/2018 15:47
10202	10202	63°18'56.34387"N	168°57'41.53053"W	63°18'56.35937"N	168°57'41.44473"W	7022382.8750	602125.2780	3405408.199	1811174.821	39.637	12.081	HEW10	8/2/2018 15:47
10203	10203	63°18'56.44479"N	168°57'41.39870"W	63°18'56.46029"N	168°57'41.31291"W	7022386.0550	602127.0120	3405418.546	1811180.676	39.642	12.083	HEW10	8/2/2018 15:48
10204	10204	63°18'56.54775"N	168°57'41.23819"W	63°18'56.56325"N	168°57'41.15241"W	7022389.3120	602129.1440	3405429.122	1811187.837	39.565	12.06	HEW10	8/2/2018 15:48
10205	10205	63°18'56.61255"N	168°57'41.20862"W	63°18'56.62805"N	168°57'41.12282"W	7022391.3300	602129.4920	3405435.725	1811189.081	39.49	12.036	HEW10	8/2/2018 15:49
10206	10206	63°18'56.70988"N	168°57'41.26432"W	63°18'56.72537"N	168°57'41.17852"W	7022394.3160	602128.6210	3405445.569	1811186.377	39.494	12.038	HEW10	8/2/2018 15:49
10207	10207	63°18'56.74798"N	168°57'41.25294"W	63°18'56.76348"N	168°57'41.16714"W	7022395.5000	602128.7420	3405449.447	1811186.834	39.541	12.052	HEW10	8/2/2018 15:50
10208	10208	63°18'56.83930"N	168°57'41.17615"W	63°18'56.85480"N	168°57'41.09036"W	7022398.3600	602129.7200	3405458.779	1811190.191	39.511	12.043	HEW10	8/2/2018 15:50
10209	10209	63°18'56.97168"N	168°57'41.13900"W	63°18'56.98719"N	168°57'41.05321"W	7022402.4720	602130.1070	3405472.252	1811191.67	39.273	11.97	HEW10	8/2/2018 15:51
10210	10210	63°18'57.04388"N	168°57'40.99180"W	63°18'57.05938"N	168°57'40.90601"W	7022404.7710	602132.0840	3405479.693	1811198.274	39.272	11.97	HEW10	8/2/2018 15:52
10211	10211	63°18'57.14947"N	168°57'41.23261"W	63°18'57.16496"N	168°57'41.14681"W	7022407.9310	602128.6300	3405490.239	1811187.102	38.981	11.881	HEW10	8/2/2018 15:53
10212	10212	63°18'57.23777"N	168°57'41.28724"W	63°18'57.25327"N	168°57'41.20144"W	7022410.6390	602127.7830	3405499.167	1811184.462	39.006	11.889	HEW10	8/2/2018 15:53
10213	10213	63°18'57.37569"N	168°57'41.36727"W	63°18'57.39119"N	168°57'41.28147"W	7022414.8700	602126.5340	3405513.116	1811180.58	38.837	11.838	HEW10	8/2/2018 15:54
10214	10214	63°18'57.45414"N	168°57'41.18582"W	63°18'57.46964"N	168°57'41.10003"W	7022417.3780	602128.9810	3405521.218	1811188.738	38.545	11.749	HEW10	8/2/2018 15:54
10215	10215	63°18'57.59574"N	168°57'41.41023"W	63°18'57.61124"N	168°57'41.32443"W	7022421.6600	602125.7200	3405535.433	1811178.256	38.423	11.711	HEW10	8/2/2018 15:54
10216	10216	63°18'57.74338"N	168°57'41.51266"W	63°18'57.75887"N	168°57'41.42687"W	7022426.1820	602124.1490	3405550.352	1811173.335	38.199	11.643	HEW10	8/2/2018 15:55
10217	10217	63°18'57.75943"N	168°57'41.61149"W	63°18'57.77493"N	168°57'41.52568"W	7022426.6350	602122.7590	3405551.909	1811168.795	38.244	11.657	HEW10	8/2/2018 15:55
10218	10218	63°18'57.80225"N	168°57'41.66764"W	63°18'57.81775"N	168°57'41.58185"W	7022427.9350	602121.9350	3405556.217	1811166.16	37.857	11.539	HEW10	8/2/2018 15:55
10219	10219	63°18'57.81454"N	168°57'41.56687"W	63°18'57.83004"N	168°57'41.48108"W	7022428.3600	602123.3250	3405557.539	1811170.742	37.898	11.551	HEW10	8/2/2018 15:56
10220	10220	63°18'57.91710"N	168°57'41.55967"W	63°18'57.93260"N	168°57'41.47387"W	7022431.5360	602123.3240	3405567.961	1811170.902	37.845	11.535	HEW10	8/2/2018 15:56
10221	10221	63°18'57.95916"N	168°57'41.63933"W	63°18'57.97466"N	168°57'41.55354"W	7022432.8020	602122.1750	3405572.174	1811167.195	37.891	11.549	HEW10	8/2/2018 15:56
10222	10222	63°18'58.00352"N	168°57'41.69260"W	63°18'58.01902"N	168°57'41.60679"W	7022434.1510	602121.3900	3405576.64	1811164.689	37.816	11.526	HEW10	8/2/2018 15:57
10223	10223	63°18'58.02658"N	168°57'41.69225"W	63°18'58.04207"N	168°57'41.60644"W	7022434.8640	602121.3720	3405578.982	1811164.667	37.628	11.469	HEW10	8/2/2018 15:59
10224	10224	63°18'58.05008"N	168°57'41.60925"W	63°18'58.06559"N	168°57'41.52346"W	7022435.6280	602122.5040	3405581.431	1811168.419	37.758	11.509	HEW10	8/2/2018 16:01
10225	10225	63°18'58.02459"N	168°57'41.36203"W	63°18'58.04010"N	168°57'41.27623"W	7022434.9490	602125.9680	3405579.025	1811179.752	37.822	11.528	HEW10	8/2/2018 16:02
10226	10226	63°18'58.02094"N	168°57'41.02129"W	63°18'58.03644"N	168°57'40.93548"W	7022434.9870	602130.7130	3405578.906	1811195.32	37.807	11.524	HEW10	8/2/2018 16:02
10227	10227	63°18'58.04022"N	168°57'40.85278"W	63°18'58.05573"N	168°57'40.76699"W	7022435.6580	602133.0380	3405580.989	1811202.984	37.88	11.546	HEW10	8/2/2018 16:03

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10228	10228	63°18'58.11047"N	168°57'40.37958"W	63°18'58.12597"N	168°57'40.29378"W	7022438.0410	602139.5520	3405588.474	1811224.48	37.885	11.547	HEW10	8/2/2018 16:03
10229	10229	63°18'58.08616"N	168°57'40.20135"W	63°18'58.10166"N	168°57'40.11555"W	7022437.3680	602142.0560	3405586.137	1811232.66	37.917	11.557	HEW10	8/2/2018 16:03
10230	10230	63°18'58.09391"N	168°57'40.04564"W	63°18'58.10941"N	168°57'39.95984"W	7022437.6760	602144.2140	3405587.039	1811239.759	37.895	11.55	HEW10	8/2/2018 16:04
10231	10231	63°18'58.20772"N	168°57'39.75409"W	63°18'58.22322"N	168°57'39.66828"W	7022441.3260	602148.1590	3405598.814	1811252.887	37.914	11.556	HEW10	8/2/2018 16:04
10232	10232	63°18'58.29578"N	168°57'39.46099"W	63°18'58.31127"N	168°57'39.37520"W	7022444.1800	602152.1490	3405607.974	1811266.128	37.963	11.571	HEW10	8/2/2018 16:05
10233	10233	63°18'58.31738"N	168°57'39.21514"W	63°18'58.33288"N	168°57'39.12933"W	7022444.9580	602155.5490	3405610.35	1811277.321	38.002	11.583	HEW10	8/2/2018 16:05
10234	10234	63°18'57.69976"N	168°57'18.33929"W	63°18'57.71525"N	168°57'18.25347"W	7022435.1020	602446.5930	3405563.116	1812231.765	51.418	15.672	CHK 2 HV	8/2/2018 17:11
10235	10235	63°18'57.69956"N	168°57'18.33886"W	63°18'57.71505"N	168°57'18.25305"W	7022435.0960	602446.5990	3405563.096	1812231.785	51.426	15.675	CHK 2 HV	8/2/2018 18:09
10236	10236	63°18'57.69988"N	168°57'18.33970"W	63°18'57.71538"N	168°57'18.25389"W	7022435.1050	602446.5870	3405563.128	1812231.746	51.433	15.677	CHK 0 HV	8/3/2018 8:57
10237	10237	63°19'03.96540"N	168°56'44.95903"W	63°19'03.98089"N	168°56'44.87322"W	7022643.8020	602904.7840	3406224.434	1813745.82	78.543	23.94	MP flag	8/3/2018 9:09
10238	10238	63°19'03.97244"N	168°56'44.96267"W	63°19'03.98793"N	168°56'44.87685"W	7022644.0180	602904.7270	3406225.146	1813745.642	78.484	23.922	GB1	8/3/2018 9:10
10239	10239	63°19'03.92636"N	168°56'45.18033"W	63°19'03.94185"N	168°56'45.09450"W	7022642.4950	602901.7450	3406220.303	1813735.779	78.239	23.847	GB1	8/3/2018 9:10
10240	10240	63°19'03.87910"N	168°56'45.33485"W	63°19'03.89459"N	168°56'45.24904"W	7022640.9640	602899.6420	3406215.387	1813728.801	78.527	23.935	GB1	8/3/2018 9:11
10241	10241	63°19'03.86195"N	168°56'45.47886"W	63°19'03.87744"N	168°56'45.39304"W	7022640.3690	602897.6550	3406213.537	1813722.253	78.632	23.967	GB1	8/3/2018 9:11
10242	10242	63°19'03.83162"N	168°56'45.44285"W	63°19'03.84712"N	168°56'45.35703"W	7022639.4480	602898.1860	3406210.484	1813723.948	78.607	23.959	MP flag	8/3/2018 9:12
10243	10243	63°19'03.80174"N	168°56'45.63743"W	63°19'03.81723"N	168°56'45.55161"W	7022638.4360	602895.5090	3406207.303	1813715.112	78.461	23.915	GB1	8/3/2018 9:12
10244	10244	63°19'03.83028"N	168°56'45.83840"W	63°19'03.84578"N	168°56'45.75258"W	7022639.2300	602892.6850	3406210.051	1813705.886	78.53	23.936	GB1	8/3/2018 9:12
10245	10245	63°19'03.82605"N	168°56'46.15197"W	63°19'03.84155"N	168°56'46.06615"W	7022638.9590	602888.3270	3406209.386	1813691.573	78.494	23.925	GB1	8/3/2018 9:13
10246	10246	63°19'03.82520"N	168°56'46.27267"W	63°19'03.84070"N	168°56'46.18685"W	7022638.8790	602886.6480	3406209.209	1813686.062	78.394	23.895	GB1	8/3/2018 9:14
10247	10247	63°19'03.81310"N	168°56'46.29096"W	63°19'03.82859"N	168°56'46.20515"W	7022638.4960	602886.4060	3406207.966	1813685.247	78.375	23.889	MP flag	8/3/2018 9:14
10248	10248	63°19'03.81756"N	168°56'46.38734"W	63°19'03.83305"N	168°56'46.30153"W	7022638.5910	602885.0610	3406208.347	1813680.838	78.455	23.913	GB1	8/3/2018 9:14
10249	10249	63°19'03.83403"N	168°56'46.51687"W	63°19'03.84952"N	168°56'46.43106"W	7022639.0430	602883.2420	3406209.922	1813674.895	78.301	23.866	GB1	8/3/2018 9:15
10250	10250	63°19'03.89286"N	168°56'46.52961"W	63°19'03.90836"N	168°56'46.44380"W	7022640.8580	602883.0070	3406215.888	1813674.215	78.304	23.867	GB1	8/3/2018 9:15
10251	10251	63°19'04.00522"N	168°56'46.50985"W	63°19'04.02071"N	168°56'46.42403"W	7022644.3420	602883.1710	3406227.314	1813674.93	78.469	23.917	GB1	8/3/2018 9:15
10252	10252	63°19'04.02937"N	168°56'46.48731"W	63°19'04.04486"N	168°56'46.40150"W	7022645.1000	602883.4600	3406229.784	1813675.919	78.475	23.919	GB1	8/3/2018 9:15
10253	10253	63°19'04.02801"N	168°56'46.49844"W	63°19'04.04349"N	168°56'46.41263"W	7022645.0530	602883.3060	3406229.637	1813675.413	78.392	23.894	MP flag	8/3/2018 9:16
10254	10254	63°19'04.05172"N	168°56'46.36648"W	63°19'04.06721"N	168°56'46.28066"W	7022645.8450	602885.1190	3406232.144	1813681.4	78.855	24.035	GB1	8/3/2018 9:16
10255	10255	63°19'04.09130"N	168°56'46.15714"W	63°19'04.10679"N	168°56'46.07131"W	7022647.1630	602887.9920	3406236.322	1813690.894	79.322	24.177	GB1	8/3/2018 9:17
10256	10256	63°19'04.11753"N	168°56'45.88422"W	63°19'04.13301"N	168°56'45.79841"W	7022648.0960	602891.7630	3406239.19	1813703.314	79.356	24.188	GB1	8/3/2018 9:17
10257	10257	63°19'04.13334"N	168°56'45.66526"W	63°19'04.14884"N	168°56'45.57944"W	7022648.6830	602894.7930	3406240.961	1813713.287	79.355	24.187	GB1	8/3/2018 9:17
10258	10258	63°19'04.18864"N	168°56'45.49199"W	63°19'04.20413"N	168°56'45.40617"W	7022650.4710	602897.1490	3406246.707	1813721.108	79.54	24.244	GB1	8/3/2018 9:17
10259	10259	63°19'04.21213"N	168°56'45.32808"W	63°19'04.22762"N	168°56'45.24226"W	7022651.2710	602899.4060	3406249.216	1813728.554	79.234	24.151	GB1	8/3/2018 9:18
10260	10260	63°19'04.20558"N	168°56'45.26239"W	63°19'04.22107"N	168°56'45.17657"W	7022651.0980	602900.3260	3406248.6	1813731.565	79.162	24.129	GB1	8/3/2018 9:18
10261	10261	63°19'04.20470"N	168°56'45.26350"W	63°19'04.22020"N	168°56'45.17767"W	7022651.0700	602900.3120	3406248.51	1813731.516	79.135	24.12	MP flag	8/3/2018 9:18
10262	10262	63°19'04.23233"N	168°56'45.08643"W	63°19'04.24782"N	168°56'45.00061"W	7022652.0040	602902.7470	3406251.449	1813739.556	79.079	24.103	GB1	8/3/2018 9:18
10263	10263	63°19'04.20811"N	168°56'44.98164"W	63°19'04.22361"N	168°56'44.89583"W	7022651.3010	602904.2290	3406249.068	1813744.382	79.05	24.094	GB1	8/3/2018 9:18
10264	10264	63°19'04.18633"N	168°56'44.82712"W	63°19'04.20183"N	168°56'44.74130"W	7022650.6960	602906.4000	3406246.972	1813751.475	78.919	24.055	GB1	8/3/2018 9:19
10265	10265	63°19'04.18336"N	168°56'44.84007"W	63°19'04.19885"N	168°56'44.75426"W	7022650.5980	602906.2230	3406246.66	1813750.889	78.768	24.008	MP flag	8/3/2018 9:19
10266	10266	63°19'04.13099"N	168°56'44.68051"W	63°19'04.14648"N	168°56'44.59470"W	7022649.0490	602908.4950	3406241.461	1813758.263	78.839	24.03	GB1	8/3/2018 9:19
10267	10267	63°19'04.06415"N	168°56'44.76027"W	63°19'04.07964"N	168°56'44.67447"W	7022646.9460	602907.4510	3406234.613	1813754.732	78.612	23.961	GB1	8/3/2018 9:20
10268	10268	63°19'03.98515"N	168°56'44.84659"W	63°19'04.00064"N	168°56'44.76077"W	7022644.4630	602906.3290	3406226.524	1813750.922	78.75	24.003	GB1 C	8/3/2018 9:20
10269	10269	63°19'03.96159"N	168°56'44.74646"W	63°19'03.97708"N	168°56'44.66064"W	7022643.7790	602907.7450	3406224.207	1813755.534	78.624	23.965	GS	8/3/2018 9:20
10270	10270	63°19'03.90457"N	168°56'44.61436"W	63°19'03.92007"N	168°56'44.52855"W	7022642.0740	602909.6400	3406218.515	1813761.662	78.626	23.965	GS	8/3/2018 9:20
10271	10271	63°19'03.82616"N	168°56'44.80360"W	63°19'03.84165"N	168°56'44.71777"W	7022639.5630	602907.0850	3406210.409	1813753.151	78.57	23.948	GS	8/3/2018 9:20

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10272	10272	63°19'03.88251"N	168°56'44.95823"W	63°19'03.89800"N	168°56'44.87241"W	7022641.2380	602904.8780	3406216.016	1813745.995	78.754	24.004	GS	8/3/2018 9:21
10273	10273	63°19'03.83647"N	168°56'45.11109"W	63°19'03.85196"N	168°56'45.02527"W	7022639.7450	602902.7970	3406211.225	1813739.091	78.804	24.02	GS	8/3/2018 9:21
10274	10274	63°19'03.73951"N	168°56'45.03221"W	63°19'03.75500"N	168°56'44.94639"W	7022636.7800	602903.9900	3406201.437	1813742.855	78.554	23.943	GS	8/3/2018 9:21
10275	10275	63°19'03.70275"N	168°56'45.22384"W	63°19'03.71825"N	168°56'45.13803"W	7022635.5580	602901.3610	3406197.56	1813734.165	78.449	23.911	GS	8/3/2018 9:21
10276	10276	63°19'03.78452"N	168°56'45.35372"W	63°19'03.80002"N	168°56'45.26790"W	7022638.0300	602899.4730	3406205.767	1813728.097	78.674	23.98	GS	8/3/2018 9:21
10277	10277	63°19'03.74284"N	168°56'45.54847"W	63°19'03.75833"N	168°56'45.46264"W	7022636.6530	602896.8050	3406201.387	1813719.273	78.628	23.966	GS	8/3/2018 9:22
10278	10278	63°19'03.64623"N	168°56'45.47078"W	63°19'03.66172"N	168°56'45.38496"W	7022633.6990	602897.9820	3406191.634	1813722.982	78.271	23.857	GS	8/3/2018 9:22
10279	10279	63°19'03.61143"N	168°56'45.67870"W	63°19'03.62692"N	168°56'45.59288"W	7022632.5300	602895.1240	3406187.943	1813713.545	78.223	23.843	GS	8/3/2018 9:22
10280	10280	63°19'03.71888"N	168°56'45.73540"W	63°19'03.73437"N	168°56'45.64958"W	7022635.8290	602894.2280	3406198.814	1813710.776	78.476	23.919	GS	8/3/2018 9:22
10281	10281	63°19'03.79124"N	168°56'45.81373"W	63°19'03.80673"N	168°56'45.72791"W	7022638.0320	602893.0670	3406206.104	1813707.078	78.596	23.956	GS	8/3/2018 9:22
10282	10282	63°19'03.78599"N	168°56'45.99100"W	63°19'03.80148"N	168°56'45.90519"W	7022637.7910	602890.6060	3406205.438	1813698.991	78.391	23.894	GS	8/3/2018 9:23
10283	10283	63°19'03.69110"N	168°56'45.98672"W	63°19'03.70659"N	168°56'45.90091"W	7022634.8570	602890.7590	3406195.804	1813699.345	78.52	23.933	GS	8/3/2018 9:23
10284	10284	63°19'03.60705"N	168°56'45.90128"W	63°19'03.62254"N	168°56'45.81546"W	7022632.2950	602892.0320	3406187.331	1813703.387	78.368	23.887	GS	8/3/2018 9:23
10285	10285	63°19'03.55392"N	168°56'46.09318"W	63°19'03.56941"N	168°56'46.00736"W	7022630.5660	602889.4140	3406181.791	1813694.712	78.453	23.913	GS	8/3/2018 9:23
10286	10286	63°19'03.68405"N	168°56'46.19436"W	63°19'03.69954"N	168°56'46.10854"W	7022634.5470	602887.8780	3406194.932	1813689.874	78.655	23.974	GS	8/3/2018 9:23
10287	10287	63°19'03.77351"N	168°56'46.23953"W	63°19'03.78901"N	168°56'46.15371"W	7022637.2940	602887.1610	3406203.984	1813687.662	78.584	23.952	GS	8/3/2018 9:23
10288	10288	63°19'03.78609"N	168°56'46.38455"W	63°19'03.80158"N	168°56'46.29874"W	7022637.6190	602885.1310	3406205.153	1813681.018	78.336	23.877	GS	8/3/2018 9:24
10289	10289	63°19'03.68617"N	168°56'46.39530"W	63°19'03.70166"N	168°56'46.30947"W	7022634.5230	602885.0800	3406194.996	1813680.694	78.396	23.895	GS	8/3/2018 9:24
10290	10290	63°19'03.59693"N	168°56'46.43802"W	63°19'03.61242"N	168°56'46.35220"W	7022631.7430	602884.5750	3406185.901	1813678.892	78.347	23.88	GS	8/3/2018 9:24
10291	10291	63°19'03.61741"N	168°56'46.69224"W	63°19'03.63290"N	168°56'46.60642"W	7022632.2630	602881.0180	3406187.79	1813667.248	78.087	23.801	GS	8/3/2018 9:24
10292	10292	63°19'03.70814"N	168°56'46.75354"W	63°19'03.72363"N	168°56'46.66773"W	7022635.0430	602880.0750	3406196.959	1813664.297	78.204	23.837	GS	8/3/2018 9:24
10293	10293	63°19'03.75324"N	168°56'46.55495"W	63°19'03.76873"N	168°56'46.46914"W	7022636.5270	602882.7930	3406201.688	1813673.291	78.493	23.925	GS	8/3/2018 9:24
10294	10294	63°19'03.87082"N	168°56'46.60741"W	63°19'03.88631"N	168°56'46.52160"W	7022640.1410	602881.9460	3406213.591	1813670.699	78.237	23.847	GS	8/3/2018 9:25
10295	10295	63°19'03.82299"N	168°56'46.79850"W	63°19'03.83849"N	168°56'46.71269"W	7022638.5760	602879.3350	3406208.59	1813662.052	78.293	23.864	GS	8/3/2018 9:25
10296	10296	63°19'03.86835"N	168°56'46.91662"W	63°19'03.88385"N	168°56'46.83081"W	7022639.9270	602877.6470	3406213.108	1813656.582	77.774	23.706	GS	8/3/2018 9:25
10297	10297	63°19'03.95060"N	168°56'47.03105"W	63°19'03.96609"N	168°56'46.94523"W	7022642.4200	602875.9740	3406221.376	1813651.219	77.641	23.665	GS	8/3/2018 9:25
10298	10298	63°19'03.75631"N	168°56'47.01404"W	63°19'03.77181"N	168°56'46.92822"W	7022636.4170	602876.4030	3406201.656	1813652.32	77.843	23.727	GS	8/3/2018 9:26
10299	10299	63°19'04.05066"N	168°56'47.14001"W	63°19'04.06615"N	168°56'47.05419"W	7022645.4670	602874.3590	3406231.456	1813646.076	77.613	23.657	GS	8/3/2018 9:26
10300	10300	63°19'04.07247"N	168°56'46.89889"W	63°19'04.08796"N	168°56'46.81307"W	7022646.2500	602877.6920	3406233.852	1813657.051	78.122	23.812	GS	8/3/2018 9:26
10301	10301	63°19'03.98317"N	168°56'46.75774"W	63°19'03.99867"N	168°56'46.67193"W	7022643.5500	602879.7440	3406224.889	1813663.646	78.044	23.788	GS	8/3/2018 9:26
10302	10302	63°19'03.90587"N	168°56'46.70985"W	63°19'03.92136"N	168°56'46.62404"W	7022641.1800	602880.4870	3406217.074	1813665.962	78.142	23.818	GS	8/3/2018 9:27
10303	10303	63°19'04.03820"N	168°56'46.58728"W	63°19'04.05369"N	168°56'46.50145"W	7022645.3280	602882.0610	3406230.606	1813671.339	78.404	23.898	GS	8/3/2018 9:27
10304	10304	63°19'04.11622"N	168°56'46.76291"W	63°19'04.13171"N	168°56'46.67708"W	7022647.6640	602879.5400	3406238.398	1813663.188	78.506	23.929	GS	8/3/2018 9:28
10305	10305	63°19'04.17686"N	168°56'46.54507"W	63°19'04.19235"N	168°56'46.45926"W	7022649.6370	602882.5100	3406244.72	1813673.035	78.928	24.057	GS	8/3/2018 9:28
10306	10306	63°19'04.07862"N	168°56'46.43572"W	63°19'04.09411"N	168°56'46.34991"W	7022646.6470	602884.1290	3406234.825	1813678.193	78.797	24.017	GS	8/3/2018 9:28
10307	10307	63°19'04.10814"N	168°56'46.20468"W	63°19'04.12363"N	168°56'46.11886"W	7022647.6630	602887.3140	3406237.996	1813688.695	79.277	24.164	GS	8/3/2018 9:28
10308	10308	63°19'04.20876"N	168°56'46.28990"W	63°19'04.22425"N	168°56'46.20408"W	7022650.7380	602886.0290	3406248.152	1813684.635	79.186	24.136	GS	8/3/2018 9:28
10309	10309	63°19'04.25421"N	168°56'46.10446"W	63°19'04.26971"N	168°56'46.01863"W	7022652.2270	602888.5630	3406252.907	1813693.028	79.641	24.275	GS	8/3/2018 9:29
10310	10310	63°19'04.16473"N	168°56'45.94797"W	63°19'04.18021"N	168°56'45.86214"W	7022649.5280	602890.8290	3406243.936	1813700.324	79.439	24.213	GS	8/3/2018 9:29
10311	10311	63°19'04.16579"N	168°56'45.71376"W	63°19'04.18128"N	168°56'45.62794"W	7022649.6650	602894.0860	3406244.22	1813711.018	79.398	24.201	GS	8/3/2018 9:29
10312	10312	63°19'04.25592"N	168°56'45.79396"W	63°19'04.27141"N	168°56'45.70813"W	7022652.4180	602892.8810	3406253.314	1813707.205	79.536	24.243	GS	8/3/2018 9:29
10313	10313	63°19'04.28388"N	168°56'45.96641"W	63°19'04.29937"N	168°56'45.88058"W	7022653.2060	602890.4540	3406256.024	1813699.283	79.63	24.271	GS	8/3/2018 9:30
10314	10314	63°19'04.30268"N	168°56'45.60470"W	63°19'04.31817"N	168°56'45.51889"W	7022653.9490	602895.4680	3406258.205	1813715.77	79.648	24.277	GS	8/3/2018 9:30
10315	10315	63°19'04.23852"N	168°56'45.57232"W	63°19'04.25402"N	168°56'45.48649"W	7022651.9790	602895.9820	3406251.713	1813717.356	79.565	24.251	GS	8/3/2018 9:30

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10316	10316	63°19'04.20507"N	168°56'45.51558"W	63°19'04.22056"N	168°56'45.42977"W	7022650.9690	602896.8040	3406248.358	1813720.003	79.712	24.296	GS	8/3/2018 9:30
10317	10317	63°19'04.24671"N	168°56'45.32073"W	63°19'04.26220"N	168°56'45.23492"W	7022652.3440	602899.4740	3406252.733	1813728.832	79.439	24.213	GS	8/3/2018 9:30
10318	10318	63°19'04.34976"N	168°56'45.33288"W	63°19'04.36526"N	168°56'45.24706"W	7022655.5270	602899.2020	3406263.191	1813728.105	79.609	24.265	GS	8/3/2018 9:32
10319	10319	63°19'04.27433"N	168°56'45.09872"W	63°19'04.28981"N	168°56'45.01289"W	7022653.2970	602902.5350	3406255.705	1813738.925	79.348	24.185	GS	8/3/2018 9:32
10320	10320	63°19'04.35162"N	168°56'45.00462"W	63°19'04.36711"N	168°56'44.91880"W	7022655.7310	602903.7670	3406263.626	1813743.093	79.317	24.176	GS	8/3/2018 9:33
10321	10321	63°19'04.29215"N	168°56'44.74719"W	63°19'04.30764"N	168°56'44.66136"W	7022654.0060	602907.4080	3406257.779	1813754.949	79.122	24.116	GS	8/3/2018 9:33
10322	10322	63°19'04.21913"N	168°56'44.85525"W	63°19'04.23463"N	168°56'44.76942"W	7022651.6980	602905.9770	3406250.282	1813750.136	79.019	24.085	GS	8/3/2018 9:33
10323	10323	63°19'04.18904"N	168°56'44.69328"W	63°19'04.20452"N	168°56'44.60746"W	7022650.8390	602908.2600	3406247.347	1813757.583	79.045	24.093	GS	8/3/2018 9:34
10324	10324	63°19'04.20228"N	168°56'44.47615"W	63°19'04.21777"N	168°56'44.39032"W	7022651.3460	602911.2670	3406248.855	1813767.477	79.104	24.111	GS	8/3/2018 9:34
10325	10325	63°19'03.97782"N	168°56'44.46911"W	63°19'03.99331"N	168°56'44.38330"W	7022644.4050	602911.5880	3406226.063	1813768.173	78.743	24.001	GS	8/3/2018 9:34
10326	10326	63°19'04.04278"N	168°56'44.69368"W	63°19'04.05826"N	168°56'44.60787"W	7022646.3140	602908.3990	3406232.492	1813757.809	78.598	23.957	GS	8/3/2018 9:35
10327	10327	63°19'04.13631"N	168°56'44.58853"W	63°19'04.15181"N	168°56'44.50270"W	7022649.2550	602909.7690	3406242.071	1813762.455	78.877	24.042	GS	8/3/2018 9:35
10328	10328	63°19'04.09294"N	168°56'44.27992"W	63°19'04.10843"N	168°56'44.19410"W	7022648.0510	602914.1060	3406237.898	1813776.621	78.876	24.041	GS	8/3/2018 9:35
10329	10329	63°19'04.06673"N	168°56'44.97291"W	63°19'04.08222"N	168°56'44.88708"W	7022646.9310	602904.4910	3406234.715	1813745.017	77.686	23.679	GB2	8/3/2018 9:35
10330	10330	63°19'04.02722"N	168°56'44.98900"W	63°19'04.04271"N	168°56'44.90319"W	7022645.7010	602904.3060	3406230.69	1813744.348	77.701	23.683	GB2	8/3/2018 9:36
10331	10331	63°19'03.99165"N	168°56'45.05459"W	63°19'04.00713"N	168°56'44.96878"W	7022644.5710	602903.4290	3406227.028	1813741.412	77.806	23.715	GB2	8/3/2018 9:36
10332	10332	63°19'03.93332"N	168°56'45.23900"W	63°19'03.94882"N	168°56'45.15317"W	7022642.6850	602900.9220	3406220.966	1813733.088	77.966	23.764	GB2	8/3/2018 9:36
10333	10333	63°19'03.90299"N	168°56'45.40845"W	63°19'03.91848"N	168°56'45.32263"W	7022641.6710	602898.5940	3406217.758	1813725.4	78.167	23.825	GB2	8/3/2018 9:36
10334	10334	63°19'03.87375"N	168°56'45.51313"W	63°19'03.88924"N	168°56'45.42732"W	7022640.7190	602897.1670	3406214.71	1813720.668	78.151	23.82	GB2	8/3/2018 9:36
10335	10335	63°19'03.85733"N	168°56'45.63506"W	63°19'03.87282"N	168°56'45.54924"W	7022640.1570	602895.4870	3406212.951	1813715.127	78.173	23.827	GB2	8/3/2018 9:37
10336	10336	63°19'03.87845"N	168°56'45.82613"W	63°19'03.89394"N	168°56'45.74032"W	7022640.7250	602892.8080	3406214.952	1813706.366	78.533	23.937	GB2	8/3/2018 9:38
10337	10337	63°19'03.86318"N	168°56'46.00773"W	63°19'03.87867"N	168°56'45.92193"W	7022640.1720	602890.2960	3406213.265	1813698.098	78.414	23.901	GB2	8/3/2018 9:38
10338	10338	63°19'03.84891"N	168°56'46.21295"W	63°19'03.86440"N	168°56'46.12714"W	7022639.6390	602887.4560	3406211.662	1813688.75	78.091	23.802	GB2	8/3/2018 9:38
10339	10339	63°19'03.88009"N	168°56'46.35580"W	63°19'03.89558"N	168°56'46.26998"W	7022640.5400	602885.4380	3406214.721	1813682.174	77.998	23.774	GB2	8/3/2018 9:38
10340	10340	63°19'03.94410"N	168°56'46.42255"W	63°19'03.95959"N	168°56'46.33673"W	7022642.4900	602884.4460	3406221.172	1813679.019	77.889	23.741	GB2	8/3/2018 9:38
10341	10341	63°19'03.97268"N	168°56'46.37197"W	63°19'03.98817"N	168°56'46.28616"W	7022643.3970	602885.1210	3406224.113	1813681.281	77.688	23.679	GB2	8/3/2018 9:39
10342	10342	63°19'03.96124"N	168°56'46.30098"W	63°19'03.97673"N	168°56'46.21516"W	7022643.0750	602886.1200	3406223.004	1813684.542	77.821	23.72	GB2	8/3/2018 9:39
10343	10343	63°19'03.98206"N	168°56'46.14979"W	63°19'03.99755"N	168°56'46.06397"W	7022643.7860	602888.2030	3406225.232	1813691.412	78.104	23.806	GB2	8/3/2018 9:39
10344	10344	63°19'04.01295"N	168°56'46.02155"W	63°19'04.02845"N	168°56'45.93572"W	7022644.8000	602889.9560	3406228.466	1813697.217	78.564	23.946	GB2	8/3/2018 9:39
10345	10345	63°19'04.03692"N	168°56'45.80904"W	63°19'04.05241"N	168°56'45.72321"W	7022645.6360	602892.8890	3406231.06	1813706.882	78.719	23.994	GB2	8/3/2018 9:39
10346	10346	63°19'04.05402"N	168°56'45.60815"W	63°19'04.06951"N	168°56'45.52232"W	7022646.2540	602895.6660	3406232.947	1813716.028	78.662	23.976	GB2	8/3/2018 9:39
10347	10347	63°19'04.05397"N	168°56'45.47002"W	63°19'04.06946"N	168°56'45.38420"W	7022646.3140	602897.5880	3406233.046	1813722.336	78.406	23.898	GB2	8/3/2018 9:40
10348	10348	63°19'04.10567"N	168°56'45.35547"W	63°19'04.12117"N	168°56'45.26966"W	7022647.9650	602899.1300	3406238.383	1813727.481	78.308	23.868	GB2	8/3/2018 9:40
10349	10349	63°19'04.15191"N	168°56'45.24710"W	63°19'04.16740"N	168°56'45.16129"W	7022649.4440	602900.5920	3406243.161	1813732.353	78.148	23.819	GB2	8/3/2018 9:41
10350	10350	63°19'04.13485"N	168°56'45.11133"W	63°19'04.15034"N	168°56'45.02552"W	7022648.9770	602902.4980	3406241.53	1813738.582	77.973	23.766	GB2	8/3/2018 9:42
10351	10351	63°19'04.08523"N	168°56'45.02851"W	63°19'04.10072"N	168°56'44.94269"W	7022647.4780	602903.6990	3406236.552	1813742.447	77.786	23.709	GB2 C	8/3/2018 9:42
10352	10352	63°19'04.11028"N	168°56'44.90512"W	63°19'04.12577"N	168°56'44.81929"W	7022648.3080	602905.3910	3406239.189	1813748.04	78.325	23.874	GS	8/3/2018 9:43
10353	10353	63°19'04.18012"N	168°56'45.00962"W	63°19'04.19561"N	168°56'44.92380"W	7022650.4220	602903.8680	3406246.204	1813743.151	78.599	23.957	GS	8/3/2018 9:43
10354	10354	63°19'04.07932"N	168°56'45.28054"W	63°19'04.09481"N	168°56'45.19472"W	7022647.1830	602900.1990	3406235.763	1813730.947	78.246	23.849	GB3	8/3/2018 9:44
10355	10355	63°19'04.03852"N	168°56'45.45013"W	63°19'04.05401"N	168°56'45.36431"W	7022645.8450	602897.8800	3406231.492	1813723.27	78.468	23.917	GB3	8/3/2018 9:45
10356	10356	63°19'04.00224"N	168°56'45.65289"W	63°19'04.01774"N	168°56'45.56706"W	7022644.6330	602895.0950	3406227.655	1813714.071	78.703	23.989	GB3	8/3/2018 9:45
10357	10357	63°19'03.98663"N	168°56'45.86045"W	63°19'04.00213"N	168°56'45.77464"W	7022644.0570	602892.2230	3406225.914	1813704.618	78.739	24	GB3	8/3/2018 9:45
10358	10358	63°19'03.97463"N	168°56'46.05678"W	63°19'03.99011"N	168°56'45.97095"W	7022643.5980	602889.5040	3406224.547	1813695.672	78.471	23.918	GB3	8/3/2018 9:45
10359	10359	63°19'03.94680"N	168°56'46.16477"W	63°19'03.96230"N	168°56'46.07894"W	7022642.6890	602888.0290	3406221.64	1813690.787	78.198	23.835	GB3	8/3/2018 9:46

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10360	10360	63°19'03.90457"N	168°56'46.08396"W	63°19'03.92006"N	168°56'45.99814"W	7022641.4180	602889.1950	3406217.411	1813694.548	78.246	23.849	GB3	8/3/2018 9:46
10361	10361	63°19'03.90406"N	168°56'45.90713"W	63°19'03.91955"N	168°56'45.82132"W	7022641.4810	602891.6560	3406217.492	1813702.624	78.505	23.928	GB3	8/3/2018 9:46
10362	10362	63°19'03.93150"N	168°56'45.69533"W	63°19'03.94699"N	168°56'45.60950"W	7022642.4250	602894.5750	3406220.438	1813712.251	78.69	23.985	GB3	8/3/2018 9:46
10363	10363	63°19'03.95445"N	168°56'45.56860"W	63°19'03.96994"N	168°56'45.48278"W	7022643.1910	602896.3150	3406222.864	1813718	78.662	23.976	GB3	8/3/2018 9:47
10364	10364	63°19'03.98052"N	168°56'45.43441"W	63°19'03.99601"N	168°56'45.34859"W	7022644.0580	602898.1560	3406225.613	1813724.085	78.334	23.876	GB3	8/3/2018 9:47
10365	10365	63°19'04.02404"N	168°56'45.29360"W	63°19'04.03954"N	168°56'45.20777"W	7022645.4670	602900.0720	3406230.139	1813730.443	78.208	23.838	GB3 C	8/3/2018 9:47
10366	10366	63°19'04.04084"N	168°56'44.91318"W	63°19'04.05634"N	168°56'44.82736"W	7022646.1570	602905.3480	3406232.131	1813747.788	78.207	23.838	GS	8/3/2018 9:47
10367	10367	63°19'04.08175"N	168°56'45.11868"W	63°19'04.09724"N	168°56'45.03286"W	7022647.3300	602902.4480	3406236.131	1813738.335	78.085	23.8	GS	8/3/2018 9:48
10368	10368	63°19'04.17168"N	168°56'45.20532"W	63°19'04.18717"N	168°56'45.11950"W	7022650.0740	602901.1540	3406245.2	1813734.228	78.321	23.872	GS	8/3/2018 9:48
10369	10369	63°19'04.13318"N	168°56'45.35011"W	63°19'04.14867"N	168°56'45.26428"W	7022648.8190	602899.1780	3406241.181	1813727.68	78.499	23.927	GS	8/3/2018 9:48
10370	10370	63°19'04.15362"N	168°56'45.46506"W	63°19'04.16912"N	168°56'45.37925"W	7022649.4000	602897.5580	3406243.171	1813722.396	79.165	24.13	GS	8/3/2018 9:49
10371	10371	63°19'04.06787"N	168°56'45.34763"W	63°19'04.08337"N	168°56'45.26181"W	7022646.7990	602899.2770	3406234.55	1813727.902	78.376	23.889	GS	8/3/2018 9:49
10372	10372	63°19'03.95839"N	168°56'45.25562"W	63°19'03.97388"N	168°56'45.16980"W	7022643.4530	602900.6650	3406223.499	1813732.287	78.001	23.775	GS	8/3/2018 9:49
10373	10373	63°19'03.89654"N	168°56'45.51545"W	63°19'03.91203"N	168°56'45.42964"W	7022641.4230	602897.1120	3406217.023	1813720.524	78.186	23.831	GS	8/3/2018 9:49
10374	10374	63°19'03.93759"N	168°56'45.56944"W	63°19'03.95308"N	168°56'45.48361"W	7022642.6690	602896.3200	3406221.151	1813717.99	78.501	23.927	GS	8/3/2018 9:50
10375	10375	63°19'03.98062"N	168°56'45.61694"W	63°19'03.99611"N	168°56'45.53112"W	7022643.9800	602895.6170	3406225.486	1813715.749	78.687	23.984	GS	8/3/2018 9:50
10376	10376	63°19'04.01047"N	168°56'45.42607"W	63°19'04.02596"N	168°56'45.34024"W	7022644.9880	602898.2430	3406228.661	1813724.416	78.367	23.886	GS	8/3/2018 9:50
10377	10377	63°19'04.04259"N	168°56'45.31860"W	63°19'04.05808"N	168°56'45.23277"W	7022646.0300	602899.7060	3406232.004	1813729.27	78.238	23.847	GS	8/3/2018 9:50
10378	10378	63°19'04.06943"N	168°56'45.68998"W	63°19'04.08492"N	168°56'45.60416"W	7022646.6950	602894.5130	3406234.451	1813712.265	78.768	24.009	GS	8/3/2018 9:51
10379	10379	63°19'04.04753"N	168°56'45.93574"W	63°19'04.06302"N	168°56'45.84993"W	7022645.9080	602891.1150	3406232.042	1813701.078	78.808	24.021	GS	8/3/2018 9:51
10380	10380	63°19'03.94264"N	168°56'45.86127"W	63°19'03.95813"N	168°56'45.77545"W	7022642.6950	602892.2550	3406221.445	1813704.654	78.614	23.962	GS	8/3/2018 9:51
10381	10381	63°19'03.94503"N	168°56'46.03588"W	63°19'03.96052"N	168°56'45.95006"W	7022642.6920	602889.8240	3406221.557	1813696.676	78.473	23.919	GS	8/3/2018 9:52
10382	10382	63°19'04.01050"N	168°56'46.32857"W	63°19'04.02599"N	168°56'46.24275"W	7022644.5870	602885.6870	3406227.986	1813683.2	78.381	23.891	GS	8/3/2018 9:52
10383	10383	63°19'04.03888"N	168°56'46.13699"W	63°19'04.05438"N	168°56'46.05116"W	7022645.5500	602888.3240	3406231.013	1813691.902	78.686	23.983	GS	8/3/2018 9:52
10384	10384	63°19'03.88162"N	168°56'46.44866"W	63°19'03.89711"N	168°56'46.36284"W	7022640.5460	602884.1440	3406214.807	1813677.931	78.229	23.844	GS	8/3/2018 9:53
10385	10385	63°19'03.92804"N	168°56'46.30321"W	63°19'03.94353"N	168°56'46.21739"W	7022642.0470	602886.1220	3406219.631	1813684.496	77.842	23.726	GS	8/3/2018 9:53
10386	10386	63°19'03.88477"N	168°56'46.24247"W	63°19'03.90025"N	168°56'46.15666"W	7022640.7350	602887.0090	3406215.281	1813687.342	77.935	23.755	GS	8/3/2018 9:53
10387	10387	63°19'03.91851"N	168°56'46.20734"W	63°19'03.93400"N	168°56'46.12151"W	7022641.7950	602887.4650	3406218.735	1813688.89	77.924	23.751	GS	8/3/2018 9:53
10388	10388	63°19'03.88770"N	168°56'46.17308"W	63°19'03.90319"N	168°56'46.08727"W	7022640.8570	602887.9720	3406215.631	1813690.506	78.021	23.781	GS	8/3/2018 9:53
10389	10389	63°19'04.58919"N	168°56'45.45067"W	63°19'04.60468"N	168°56'45.36485"W	7022662.8820	602897.3260	3406287.42	1813722.326	79.388	24.197	GB4	8/3/2018 9:54
10390	10390	63°19'04.59384"N	168°56'45.45475"W	63°19'04.60933"N	168°56'45.36894"W	7022663.0240	602897.2650	3406287.889	1813722.132	79.515	24.236	MP flag	8/3/2018 9:55
10391	10391	63°19'04.64916"N	168°56'45.48095"W	63°19'04.66466"N	168°56'45.39514"W	7022664.7240	602896.8460	3406293.488	1813720.843	79.637	24.273	GB4	8/3/2018 9:55
10392	10392	63°19'04.72074"N	168°56'45.46018"W	63°19'04.73623"N	168°56'45.37436"W	7022666.9480	602897.0640	3406300.773	1813721.672	79.373	24.193	GB4	8/3/2018 9:55
10393	10393	63°19'04.76049"N	168°56'45.35573"W	63°19'04.77598"N	168°56'45.26991"W	7022668.2240	602898.4770	3406304.889	1813726.376	79.13	24.119	GB4	8/3/2018 9:55
10394	10394	63°19'04.77052"N	168°56'45.25292"W	63°19'04.78601"N	168°56'45.16710"W	7022668.5800	602899.8980	3406305.985	1813731.054	79.121	24.116	GB4	8/3/2018 9:56
10395	10395	63°19'04.77004"N	168°56'45.26280"W	63°19'04.78553"N	168°56'45.17698"W	7022668.5610	602899.7610	3406305.928	1813730.604	79.188	24.137	MP flag	8/3/2018 9:56
10396	10396	63°19'04.79411"N	168°56'45.14779"W	63°19'04.80960"N	168°56'45.06196"W	7022669.3570	602901.3370	3406308.459	1813735.816	79.336	24.182	GB4	8/3/2018 9:56
10397	10397	63°19'04.79143"N	168°56'45.00354"W	63°19'04.80693"N	168°56'44.91771"W	7022669.3390	602903.3460	3406308.296	1813742.408	79.064	24.099	GB4	8/3/2018 9:56
10398	10398	63°19'04.78398"N	168°56'45.01610"W	63°19'04.79947"N	168°56'44.93028"W	7022669.1020	602903.1790	3406307.529	1813741.847	78.891	24.046	MP flag	8/3/2018 9:57
10399	10399	63°19'04.73521"N	168°56'44.91012"W	63°19'04.75070"N	168°56'44.82430"W	7022667.6410	602904.7020	3406302.656	1813746.768	79.245	24.154	GB4	8/3/2018 9:57
10400	10400	63°19'04.67390"N	168°56'44.81968"W	63°19'04.68940"N	168°56'44.73385"W	7022665.7840	602906.0210	3406296.497	1813751.001	79.371	24.192	GB4	8/3/2018 9:57
10401	10401	63°19'04.59719"N	168°56'44.80698"W	63°19'04.61267"N	168°56'44.72116"W	7022663.4160	602906.2730	3406288.715	1813751.709	79.36	24.189	GB4	8/3/2018 9:57
10402	10402	63°19'04.52729"N	168°56'44.79502"W	63°19'04.54278"N	168°56'44.70921"W	7022661.2590	602906.5090	3406281.625	1813752.372	79.225	24.148	GB4	8/3/2018 9:57
10403	10403	63°19'04.46304"N	168°56'44.81254"W	63°19'04.47852"N	168°56'44.72673"W	7022659.2630	602906.3290	3406275.086	1813751.679	79.157	24.127	GB4	8/3/2018 9:58

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10404	10404	63°19'04.43327"N	168°56'44.86014"W	63°19'04.44876"N	168°56'44.77432"W	7022658.3210	602905.6960	3406272.027	1813749.555	79.031	24.089	GB4	8/3/2018 9:58
10405	10405	63°19'04.43063"N	168°56'44.86875"W	63°19'04.44612"N	168°56'44.78294"W	7022658.2360	602905.5790	3406271.752	1813749.166	78.903	24.05	MP flag	8/3/2018 9:58
10406	10406	63°19'04.42646"N	168°56'44.99672"W	63°19'04.44195"N	168°56'44.91091"W	7022658.0500	602903.8030	3406271.233	1813743.329	79.205	24.142	GB4	8/3/2018 9:59
10407	10407	63°19'04.45591"N	168°56'45.10526"W	63°19'04.47140"N	168°56'45.01944"W	7022658.9120	602902.2640	3406274.142	1813738.323	79.463	24.22	GB4	8/3/2018 9:59
10408	10408	63°19'04.49171"N	168°56'45.21906"W	63°19'04.50720"N	168°56'45.13324"W	7022659.9690	602900.6450	3406277.693	1813733.066	79.484	24.227	GB4	8/3/2018 9:59
10409	10409	63°19'04.52917"N	168°56'45.32908"W	63°19'04.54466"N	168°56'45.24327"W	7022661.0790	602899.0770	3406281.415	1813727.979	79.46	24.219	GB4	8/3/2018 9:59
10410	10410	63°19'04.56626"N	168°56'45.41972"W	63°19'04.58175"N	168°56'45.33389"W	7022662.1860	602897.7800	3406285.114	1813723.778	79.416	24.206	GB4 C	8/3/2018 10:00
10411	10411	63°19'04.52428"N	168°56'45.47216"W	63°19'04.53977"N	168°56'45.38634"W	7022660.8640	602897.0920	3406280.811	1813721.453	79.488	24.228	GS	8/3/2018 10:00
10412	10412	63°19'04.44767"N	168°56'45.53614"W	63°19'04.46316"N	168°56'45.45031"W	7022658.4650	602896.2780	3406272.982	1813718.659	79.679	24.286	GS	8/3/2018 10:00
10413	10413	63°19'04.35775"N	168°56'45.55577"W	63°19'04.37325"N	168°56'45.46995"W	7022655.6750	602896.0940	3406263.835	1813717.913	79.703	24.294	GS	8/3/2018 10:00
10414	10414	63°19'04.43310"N	168°56'45.34146"W	63°19'04.44859"N	168°56'45.25564"W	7022658.1010	602899.0010	3406271.648	1813727.574	79.748	24.307	GS	8/3/2018 10:01
10415	10415	63°19'04.48066"N	168°56'45.26946"W	63°19'04.49615"N	168°56'45.18363"W	7022659.6050	602899.9550	3406276.533	1813730.783	79.413	24.205	GS	8/3/2018 10:01
10416	10416	63°19'04.41405"N	168°56'45.11132"W	63°19'04.42954"N	168°56'45.02549"W	7022657.6150	602902.2210	3406269.886	1813738.116	79.542	24.244	GS	8/3/2018 10:01
10417	10417	63°19'04.33336"N	168°56'45.14418"W	63°19'04.34886"N	168°56'45.05837"W	7022655.1040	602901.8440	3406261.667	1813736.75	79.468	24.222	GS	8/3/2018 10:01
10418	10418	63°19'04.26876"N	168°56'44.87380"W	63°19'04.28425"N	168°56'44.78797"W	7022653.2260	602905.6700	3406255.309	1813749.206	79.102	24.11	GS	8/3/2018 10:02
10419	10419	63°19'04.37321"N	168°56'44.70989"W	63°19'04.38870"N	168°56'44.62406"W	7022656.5300	602907.8460	3406266.04	1813756.517	79.2	24.14	GS	8/3/2018 10:02
10420	10420	63°19'04.30089"N	168°56'44.45301"W	63°19'04.31638"N	168°56'44.36719"W	7022654.4070	602911.4910	3406258.888	1813768.369	79.095	24.108	GS	8/3/2018 10:02
10421	10421	63°19'04.39456"N	168°56'44.37925"W	63°19'04.41005"N	168°56'44.29343"W	7022657.3380	602912.4250	3406268.457	1813771.581	79.278	24.164	GS	8/3/2018 10:02
10422	10422	63°19'04.42420"N	168°56'44.53880"W	63°19'04.43969"N	168°56'44.45298"W	7022658.1840	602910.1760	3406271.347	1813764.245	79.276	24.163	GS	8/3/2018 10:03
10423	10423	63°19'04.45650"N	168°56'44.71696"W	63°19'04.47199"N	168°56'44.63113"W	7022659.1040	602907.6650	3406274.494	1813756.055	79.235	24.151	GS	8/3/2018 10:03
10424	10424	63°19'04.58577"N	168°56'44.66548"W	63°19'04.60127"N	168°56'44.57966"W	7022663.1260	602908.2530	3406287.662	1813758.19	79.455	24.218	GS	8/3/2018 10:03
10425	10425	63°19'04.54682"N	168°56'44.49740"W	63°19'04.56231"N	168°56'44.41157"W	7022661.9960	602910.6300	3406283.832	1813765.931	79.174	24.132	GS	8/3/2018 10:03
10426	10426	63°19'04.45821"N	168°56'44.57329"W	63°19'04.47370"N	168°56'44.48748"W	7022659.2210	602909.6620	3406274.775	1813762.613	79.218	24.146	GS	8/3/2018 10:04
10427	10427	63°19'04.55463"N	168°56'44.30836"W	63°19'04.57012"N	168°56'44.22255"W	7022662.3220	602913.2520	3406284.767	1813774.551	79.222	24.147	GS	8/3/2018 10:04
10428	10428	63°19'04.68249"N	168°56'44.30189"W	63°19'04.69798"N	168°56'44.21607"W	7022666.2810	602913.2150	3406297.758	1813774.633	79.253	24.156	GS	8/3/2018 10:04
10429	10429	63°19'04.64284"N	168°56'44.51747"W	63°19'04.65833"N	168°56'44.43164"W	7022664.9580	602910.2560	3406293.569	1813764.854	79.308	24.173	GS	8/3/2018 10:04
10430	10430	63°19'04.61985"N	168°56'44.67385"W	63°19'04.63535"N	168°56'44.58803"W	7022664.1770	602908.1030	3406291.117	1813757.751	79.393	24.199	GS	8/3/2018 10:05
10431	10431	63°19'04.74147"N	168°56'44.76868"W	63°19'04.75696"N	168°56'44.68287"W	7022667.8980	602906.6630	3406303.398	1813753.217	79.558	24.249	GS	8/3/2018 10:05
10432	10432	63°19'04.78292"N	168°56'44.58818"W	63°19'04.79841"N	168°56'44.50236"W	7022669.2600	602909.1330	3406307.743	1813761.391	79.332	24.18	GS	8/3/2018 10:05
10433	10433	63°19'04.78962"N	168°56'44.35026"W	63°19'04.80511"N	168°56'44.26445"W	7022669.5740	602912.4360	3406308.602	1813772.245	79.222	24.147	GS	8/3/2018 10:05
10434	10434	63°19'04.90533"N	168°56'44.40723"W	63°19'04.92082"N	168°56'44.32142"W	7022673.1280	602911.5290	3406320.311	1813769.45	78.809	24.021	GS	8/3/2018 10:05
10435	10435	63°19'04.84174"N	168°56'44.66446"W	63°19'04.85723"N	168°56'44.57864"W	7022671.0460	602908.0130	3406313.66	1813757.809	79.247	24.155	GS	8/3/2018 10:06
10436	10436	63°19'04.79426"N	168°56'44.83384"W	63°19'04.80975"N	168°56'44.74803"W	7022669.5020	602905.7040	3406308.71	1813750.153	79.261	24.159	GS	8/3/2018 10:06
10437	10437	63°19'04.83907"N	168°56'45.02488"W	63°19'04.85456"N	168°56'44.93905"W	7022670.8030	602903.0020	3406313.118	1813741.354	79.037	24.091	GS	8/3/2018 10:06
10438	10438	63°19'04.90617"N	168°56'44.84302"W	63°19'04.92166"N	168°56'44.75719"W	7022672.9600	602905.4660	3406320.07	1813749.547	78.991	24.077	GS	8/3/2018 10:06
10439	10439	63°19'04.98379"N	168°56'44.63544"W	63°19'04.99928"N	168°56'44.54963"W	7022675.4540	602908.2760	3406328.109	1813758.897	78.594	23.955	GS	8/3/2018 10:06
10440	10440	63°19'05.06213"N	168°56'44.76140"W	63°19'05.07763"N	168°56'44.67558"W	7022677.8220	602906.4460	3406335.971	1813753.014	78.205	23.837	GS	8/3/2018 10:07
10441	10441	63°19'05.10284"N	168°56'45.04482"W	63°19'05.11834"N	168°56'44.95900"W	7022678.9550	602902.4630	3406339.893	1813740.003	78.012	23.778	GS	8/3/2018 10:07
10442	10442	63°19'04.97243"N	168°56'44.97113"W	63°19'04.98792"N	168°56'44.88531"W	7022674.9530	602903.6180	3406326.703	1813743.586	78.495	23.925	GS	8/3/2018 10:07
10443	10443	63°19'04.84999"N	168°56'45.15034"W	63°19'04.86548"N	168°56'45.06452"W	7022671.0850	602901.2460	3406314.133	1813735.606	79.048	24.094	GS	8/3/2018 10:07
10444	10444	63°19'04.81602"N	168°56'45.35002"W	63°19'04.83151"N	168°56'45.26419"W	7022669.9450	602898.5020	3406310.533	1813726.544	79.125	24.117	GS	8/3/2018 10:07
10445	10445	63°19'04.90374"N	168°56'45.43409"W	63°19'04.91924"N	168°56'45.34828"W	7022672.6210	602897.2450	3406319.379	1813722.558	78.986	24.075	GS	8/3/2018 10:08
10446	10446	63°19'05.00672"N	168°56'45.58030"W	63°19'05.02221"N	168°56'45.49448"W	7022675.7420	602895.1090	3406329.728	1813715.709	78.871	24.04	GS	8/3/2018 10:08
10447	10447	63°19'05.10195"N	168°56'45.34342"W	63°19'05.11744"N	168°56'45.25760"W	7022678.7940	602898.3100	3406339.578	1813726.368	78.068	23.795	GS	8/3/2018 10:08

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10448	10448	63°19'04.96689"N	168°56'45.17425"W	63°19'04.98238"N	168°56'45.08843"W	7022674.6910	602900.7970	3406325.988	1813734.319	78.549	23.942	GS	8/3/2018 10:08
10449	10449	63°19'04.75161"N	168°56'45.46882"W	63°19'04.76710"N	168°56'45.38300"W	7022667.8990	602896.9130	3406303.902	1813721.226	79.417	24.206	GS	8/3/2018 10:09
10450	10450	63°19'04.79717"N	168°56'45.62405"W	63°19'04.81266"N	168°56'45.53822"W	7022669.2390	602894.7080	3406308.413	1813714.061	79.483	24.227	GS	8/3/2018 10:09
10451	10451	63°19'04.86479"N	168°56'45.84545"W	63°19'04.88028"N	168°56'45.75963"W	7022671.2330	602891.5610	3406315.114	1813703.837	79.148	24.124	GS	8/3/2018 10:09
10452	10452	63°19'04.96323"N	168°56'45.71310"W	63°19'04.97873"N	168°56'45.62728"W	7022674.3380	602893.3050	3406325.212	1813709.717	78.91	24.052	GS	8/3/2018 10:10
10453	10453	63°19'04.81024"N	168°56'46.02446"W	63°19'04.82572"N	168°56'45.93864"W	7022669.4650	602889.1250	3406309.439	1813695.753	79.126	24.118	GS	8/3/2018 10:10
10454	10454	63°19'04.72969"N	168°56'45.84949"W	63°19'04.74518"N	168°56'45.76367"W	7022667.0510	602891.6390	3406301.39	1813703.878	79.423	24.208	GS	8/3/2018 10:10
10455	10455	63°19'04.68144"N	168°56'45.62894"W	63°19'04.69693"N	168°56'45.54311"W	7022665.6570	602894.7550	3406296.655	1813714.031	79.591	24.259	GS	8/3/2018 10:10
10456	10456	63°19'04.55963"N	168°56'45.59531"W	63°19'04.57513"N	168°56'45.50949"W	7022661.9030	602895.3440	3406284.309	1813715.77	79.56	24.25	GS	8/3/2018 10:11
10457	10457	63°19'04.61030"N	168°56'45.79982"W	63°19'04.62578"N	168°56'45.71401"W	7022663.3790	602892.4480	3406289.301	1813706.346	79.476	24.224	GS	8/3/2018 10:11
10458	10458	63°19'04.66708"N	168°56'46.02989"W	63°19'04.68258"N	168°56'45.94406"W	7022665.0340	602889.1910	3406294.896	1813695.744	79.31	24.174	GS	8/3/2018 10:11
10459	10459	63°19'04.53515"N	168°56'46.07901"W	63°19'04.55063"N	168°56'45.99319"W	7022660.9300	602888.6390	3406281.459	1813693.721	79.295	24.169	GS	8/3/2018 10:11
10460	10460	63°19'04.52636"N	168°56'45.80026"W	63°19'04.54185"N	168°56'45.71443"W	7022660.7820	602892.5250	3406280.776	1813706.466	79.541	24.244	GS	8/3/2018 10:12
10461	10461	63°19'04.40496"N	168°56'45.63462"W	63°19'04.42045"N	168°56'45.54879"W	7022657.1000	602894.9500	3406268.57	1813714.233	79.564	24.251	GS	8/3/2018 10:12
10462	10462	63°19'04.35103"N	168°56'45.79156"W	63°19'04.36652"N	168°56'45.70574"W	7022655.3620	602892.8200	3406262.975	1813707.156	79.455	24.218	GS	8/3/2018 10:13
10463	10463	63°19'04.45045"N	168°56'45.98681"W	63°19'04.46594"N	168°56'45.90099"W	7022658.3500	602890.0050	3406272.926	1813698.073	79.427	24.209	GS	8/3/2018 10:13
10464	10464	63°19'04.34818"N	168°56'46.06796"W	63°19'04.36367"N	168°56'45.98214"W	7022655.1500	602888.9780	3406262.478	1813694.538	79.394	24.199	GS	8/3/2018 10:13
10465	10465	63°19'04.73224"N	168°56'45.06089"W	63°19'04.74773"N	168°56'44.97507"W	7022667.4820	602902.6070	3406302.241	1813739.888	78.089	23.802	GB5	8/3/2018 10:14
10466	10466	63°19'04.73527"N	168°56'45.14287"W	63°19'04.75076"N	168°56'45.05704"W	7022667.5390	602901.4640	3406302.487	1813736.139	78.508	23.929	GB5	8/3/2018 10:14
10467	10467	63°19'04.71761"N	168°56'45.25635"W	63°19'04.73310"N	168°56'45.17054"W	7022666.9420	602899.9020	3406300.608	1813730.986	78.676	23.98	GB5	8/3/2018 10:15
10468	10468	63°19'04.64429"N	168°56'45.32601"W	63°19'04.65978"N	168°56'45.24019"W	7022664.6420	602899.0060	3406293.109	1813727.927	78.697	23.987	GB5	8/3/2018 10:16
10469	10469	63°19'04.60041"N	168°56'45.27999"W	63°19'04.61590"N	168°56'45.19417"W	7022663.3050	602899.6900	3406288.687	1813730.102	78.999	24.079	GB5	8/3/2018 10:17
10470	10470	63°19'04.54654"N	168°56'45.12084"W	63°19'04.56203"N	168°56'45.03503"W	7022661.7090	602901.9570	3406283.335	1813737.46	78.637	23.969	GB5	8/3/2018 10:17
10471	10471	63°19'04.49747"N	168°56'44.97954"W	63°19'04.51296"N	168°56'44.89371"W	7022660.2540	602903.9720	3406278.458	1813743.995	78.384	23.892	GB5	8/3/2018 10:17
10472	10472	63°19'04.49058"N	168°56'44.93939"W	63°19'04.50607"N	168°56'44.85357"W	7022660.0590	602904.5370	3406277.788	1813745.84	78.431	23.906	GB5	8/3/2018 10:17
10473	10473	63°19'04.51434"N	168°56'44.94813"W	63°19'04.52984"N	168°56'44.86232"W	7022660.7910	602904.3920	3406280.195	1813745.401	78.477	23.92	GB5	8/3/2018 10:17
10474	10474	63°19'04.56546"N	168°56'44.90930"W	63°19'04.58095"N	168°56'44.82348"W	7022662.3890	602904.8810	3406285.416	1813747.089	78.675	23.98	GB5	8/3/2018 10:17
10475	10475	63°19'04.62938"N	168°56'44.90445"W	63°19'04.64487"N	168°56'44.81863"W	7022664.3690	602904.8850	3406291.911	1813747.204	78.542	23.94	GB5	8/3/2018 10:17
10476	10476	63°19'04.69238"N	168°56'44.96291"W	63°19'04.70786"N	168°56'44.87709"W	7022666.2920	602904.0100	3406298.266	1813744.429	78.514	23.931	GB5 C	8/3/2018 10:18
10477	10477	63°19'04.71992"N	168°56'45.09271"W	63°19'04.73541"N	168°56'45.00689"W	7022667.0860	602902.1770	3406300.966	1813738.455	78.02	23.78	GS	8/3/2018 10:18
10478	10478	63°19'04.68033"N	168°56'45.05884"W	63°19'04.69581"N	168°56'44.97303"W	7022665.8760	602902.6870	3406296.97	1813740.068	78.548	23.942	GS	8/3/2018 10:18
10479	10479	63°19'04.63981"N	168°56'45.04546"W	63°19'04.65530"N	168°56'44.95964"W	7022664.6290	602902.9130	3406292.865	1813740.747	78.885	24.044	GS	8/3/2018 10:18
10480	10480	63°19'04.59567"N	168°56'44.96958"W	63°19'04.61117"N	168°56'44.88376"W	7022663.2970	602904.0130	3406288.439	1813744.286	78.709	23.99	GS	8/3/2018 10:19
10481	10481	63°19'04.56125"N	168°56'45.01314"W	63°19'04.57674"N	168°56'44.92731"W	7022662.2130	602903.4410	3406284.91	1813742.354	78.459	23.914	GS	8/3/2018 10:19
10482	10482	63°19'04.58224"N	168°56'45.08673"W	63°19'04.59773"N	168°56'45.00091"W	7022662.8290	602902.3960	3406286.987	1813738.958	78.776	24.011	GS	8/3/2018 10:19
10483	10483	63°19'04.63026"N	168°56'45.17375"W	63°19'04.64575"N	168°56'45.08794"W	7022664.2760	602901.1380	3406291.799	1813734.904	78.962	24.068	GS	8/3/2018 10:19
10484	10484	63°19'04.69127"N	168°56'45.17034"W	63°19'04.70676"N	168°56'45.08452"W	7022666.1650	602901.1250	3406297.998	1813734.958	78.482	23.921	GS	8/3/2018 10:20
10485	10485	63°19'04.72905"N	168°56'45.31356"W	63°19'04.74453"N	168°56'45.22775"W	7022667.2700	602899.0950	3406301.727	1813728.354	78.981	24.073	GS	8/3/2018 10:20
10486	10486	63°19'04.66504"N	168°56'45.36272"W	63°19'04.68053"N	168°56'45.27690"W	7022665.2680	602898.4750	3406295.189	1813726.216	78.84	24.03	GS	8/3/2018 10:20
10487	10487	63°19'04.60824"N	168°56'45.37380"W	63°19'04.62373"N	168°56'45.28797"W	7022663.5060	602898.3770	3406289.412	1813725.805	79.255	24.157	GS	8/3/2018 10:20
10488	10488	63°19'04.55825"N	168°56'45.24256"W	63°19'04.57373"N	168°56'45.15674"W	7022662.0170	602900.2520	3406284.433	1813731.882	79.016	24.084	GS	8/3/2018 10:20
10489	10489	63°19'04.51771"N	168°56'45.11147"W	63°19'04.53320"N	168°56'45.02566"W	7022660.8220	602902.1160	3406280.414	1813737.936	78.917	24.054	GS	8/3/2018 10:21
10490	10490	63°19'04.46472"N	168°56'44.99004"W	63°19'04.48021"N	168°56'44.90422"W	7022659.2360	602903.8580	3406275.124	1813743.57	78.698	23.987	GS	8/3/2018 10:21
10491	10491	63°19'04.49211"N	168°56'44.87101"W	63°19'04.50760"N	168°56'44.78519"W	7022660.1370	602905.4870	3406277.995	1813748.96	78.832	24.028	GS	8/3/2018 10:21

**2018 Northeast Cape Five-Year Review
Survey Table**

Field Survey Point ID	Feature Location ID	Latitude (WGS84)	Longitude (WGS84)	Latitude (NAD 83 (2011))	Longitude (NAD 83 (2011))	Northing (UTM Zone 2N)	Easting (UTM Zone 2N)	Northing - Alaska State Plane Zone 9, U.S. Survey Feet	Easting - Alaska State Plane Zone 9, U.S. Survey Feet	Elevation (NAVD88, GEOID12B, U.S. Survey Feet)	Elevation (NAVD88, GEOID12B, Meters)	Text Descriptor	Measurement Date/Time
10492	10492	63°19'04.55176"N	168°56'44.86763"W	63°19'04.56725"N	168°56'44.78181"W	7022661.9840	602905.4750	3406284.056	1813749.015	78.95	24.064	GS	8/3/2018 10:21
10493	10493	63°19'04.63756"N	168°56'44.85733"W	63°19'04.65305"N	168°56'44.77151"W	7022664.6430	602905.5330	3406292.778	1813749.342	78.964	24.068	GS	8/3/2018 10:21
10494	10494	63°19'04.70277"N	168°56'44.91280"W	63°19'04.71826"N	168°56'44.82697"W	7022666.6360	602904.6970	3406299.359	1813746.7	78.906	24.051	GS	8/3/2018 10:22
10495	10495	63°19'04.75941"N	168°56'45.03418"W	63°19'04.77490"N	168°56'44.94837"W	7022668.3340	602902.9520	3406305.02	1813741.062	78.761	24.006	GS	8/3/2018 10:22
10496	10496	63°19'04.76055"N	168°56'45.13126"W	63°19'04.77604"N	168°56'45.04545"W	7022668.3260	602901.6000	3406305.063	1813736.627	78.852	24.034	GS	8/3/2018 10:22
10497	10497	63°19'04.69053"N	168°56'43.71022"W	63°19'04.70602"N	168°56'43.62440"W	7022666.7930	602921.4380	3406299.019	1813801.64	78.234	23.846	GS	8/3/2018 10:24
10498	10498	63°19'04.68217"N	168°56'44.06502"W	63°19'04.69765"N	168°56'43.97920"W	7022666.3760	602916.5110	3406297.903	1813785.451	79.093	24.108	GS	8/3/2018 10:24
10499	10499	63°19'04.69604"N	168°56'44.42176"W	63°19'04.71153"N	168°56'44.33593"W	7022666.6470	602911.5340	3406299.044	1813769.136	79.269	24.161	GS	8/3/2018 10:24
10500	10500	63°19'04.69521"N	168°56'44.72813"W	63°19'04.71070"N	168°56'44.64232"W	7022666.4840	602907.2730	3406298.73	1813755.146	79.582	24.257	GS	8/3/2018 10:25
10501	10501	63°19'04.69642"N	168°56'44.85108"W	63°19'04.71191"N	168°56'44.76526"W	7022666.4670	602905.5610	3406298.76	1813749.529	79.311	24.174	GS	8/3/2018 10:25
10502	10502	63°19'04.69017"N	168°56'44.95933"W	63°19'04.70566"N	168°56'44.87352"W	7022666.2250	602904.0620	3406298.044	1813744.596	78.428	23.905	GS	8/3/2018 10:26
10503	10503	63°19'04.69211"N	168°56'45.04300"W	63°19'04.70761"N	168°56'44.95718"W	7022666.2480	602902.8960	3406298.179	1813740.772	78.158	23.822	GS	8/3/2018 10:26
10504	10504	63°19'04.68867"N	168°56'45.11934"W	63°19'04.70416"N	168°56'45.03353"W	7022666.1070	602901.8370	3406297.772	1813737.291	78.485	23.922	GS	8/3/2018 10:26
10505	10505	63°19'04.68816"N	168°56'45.21615"W	63°19'04.70365"N	168°56'45.13033"W	7022666.0480	602900.4910	3406297.647	1813732.871	78.782	24.013	GS	8/3/2018 10:27
10506	10506	63°19'04.69322"N	168°56'45.33292"W	63°19'04.70872"N	168°56'45.24711"W	7022666.1530	602898.8610	3406298.074	1813727.53	78.876	24.041	GS	8/3/2018 10:27
10507	10507	63°19'04.69532"N	168°56'45.45496"W	63°19'04.71081"N	168°56'45.36914"W	7022666.1630	602897.1610	3406298.195	1813721.953	79.416	24.206	GS	8/3/2018 10:27
10508	10508	63°19'04.69497"N	168°56'45.54379"W	63°19'04.71046"N	168°56'45.45797"W	7022666.1130	602895.9260	3406298.093	1813717.897	79.608	24.265	GS	8/3/2018 10:28
10509	10509	63°19'04.68899"N	168°56'45.76221"W	63°19'04.70449"N	168°56'45.67640"W	7022665.8310	602892.8930	3406297.322	1813707.932	79.578	24.256	GS	8/3/2018 10:28
10510	10510	63°19'04.71763"N	168°56'46.09161"W	63°19'04.73312"N	168°56'46.00580"W	7022666.5700	602888.2830	3406299.983	1813692.841	79.373	24.193	GS	8/3/2018 10:28
10511	10511	63°19'04.71669"N	168°56'46.44513"W	63°19'04.73217"N	168°56'46.35932"W	7022666.3830	602883.3650	3406299.622	1813676.698	79.166	24.13	GS	8/3/2018 10:29
10512	10512	63°19'04.72902"N	168°56'46.79828"W	63°19'04.74451"N	168°56'46.71245"W	7022666.6070	602878.4410	3406300.61	1813660.55	78.697	23.987	GS	8/3/2018 10:29
10513	10513	63°19'04.73495"N	168°56'47.08574"W	63°19'04.75044"N	168°56'46.99993"W	7022666.6630	602874.4350	3406300.996	1813647.412	78.654	23.974	GS	8/3/2018 10:29
10514	10514	63°19'04.73586"N	168°56'47.48483"W	63°19'04.75134"N	168°56'47.39902"W	7022666.5130	602868.8830	3406300.789	1813629.185	77.648	23.667	GS	8/3/2018 10:29
10515	10515	63°19'04.75306"N	168°56'47.84270"W	63°19'04.76855"N	168°56'47.75689"W	7022666.8860	602863.8870	3406302.268	1813612.813	77.347	23.575	GS	8/3/2018 10:30
10516	10516	63°19'04.73474"N	168°56'48.32327"W	63°19'04.75023"N	168°56'48.23745"W	7022666.1050	602857.2200	3406300.046	1813590.897	76.467	23.307	GS	8/3/2018 10:30
10517	10517	63°19'04.73242"N	168°56'48.75475"W	63°19'04.74791"N	168°56'48.66893"W	7022665.8410	602851.2190	3406299.487	1813571.196	75.41	22.985	GS	8/3/2018 10:30
10518	10518	63°19'04.74052"N	168°56'49.10209"W	63°19'04.75601"N	168°56'49.01628"W	7022665.9370	602846.3790	3406300.049	1813555.32	75.106	22.892	GS	8/3/2018 10:30
10519	10519	63°19'05.77838"N	168°56'49.31114"W	63°19'05.79388"N	168°56'49.22532"W	7022697.9540	602842.4430	3406405.302	1813544.042	72.067	21.966	CHK 0 HV	8/3/2018 10:32
10520	10520	63°18'42.73270"N	168°57'29.95010"W	63°18'42.74820"N	168°57'29.86431"W	7021966.8890	602299.8070	3404034.372	1811726.18	73.044	22.264	CHK 0 HV	8/3/2018 12:41

Attachment 4

Logbook

2018 - MISC - 3



Rite in the Rain®
ALL-WEATHER
CROSS SECTION
FIELD BOOK
№ 370-6F

2018 - MISC - 3



INDEX

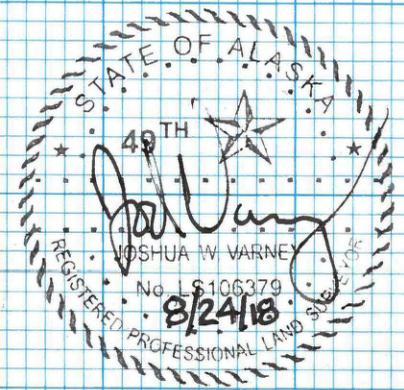
PGA	DATE	W/O	DESC
1-3	6/19/18	18-030	CORDOVA ASBUILT
4-13	7/26/18 - 7/27/18	18-027	JBFR MON. WELLS
14-24	7/31/18 - 8/4/18	18-002	ECC N.E. CAPE

PROJECT DESCRIPTION

- PURPOSE OF SURVEY IS TO PROVIDE SURVEY SUPPORT TO ECC/JACOBS @ N.E. CAPE.
- SURVEY GOALS:
 - TIE INTO EXISTING SURVEY CONTROL & SUPPLEMENT AS NECESSARY
 - 2x CROSS SECTIONS & MICRO-TOPO @ SITE #17
 - STAKE 90 SAMPLE SPOTS @ SITE #8
 - STAKE ~ 51 SAMPLE SPOTS @ SITE #28
 - SURVEY EDGE-OF-WATER @ SITE #28

SURVEYOR'S CERTIFICATE

I, JOSHUA W. VARNEY, DO HEREBY CERTIFY THAT I WAS IN RESPONSIBLE CHARGE OF ALL FIELD ACTIVITIES FROM 7/31/18 - 8/4/18.



EQUIPMENT LIST

TOPCON GR-5 RECEIVERS :

- | | |
|--------------|-------------|
| 1117 - 21270 | 715 - 10021 |
| 1117 - 21371 | 715 - 10053 |
| 1117 - 21369 | 1117 - 2004 |

TOPCON FC-5000 DATA COLLECTORS : P/N = 1010086-01
S/N = 22908A
180294.

WO# 18-002

NE CAPE - ECC
PRIMARY CONTROL

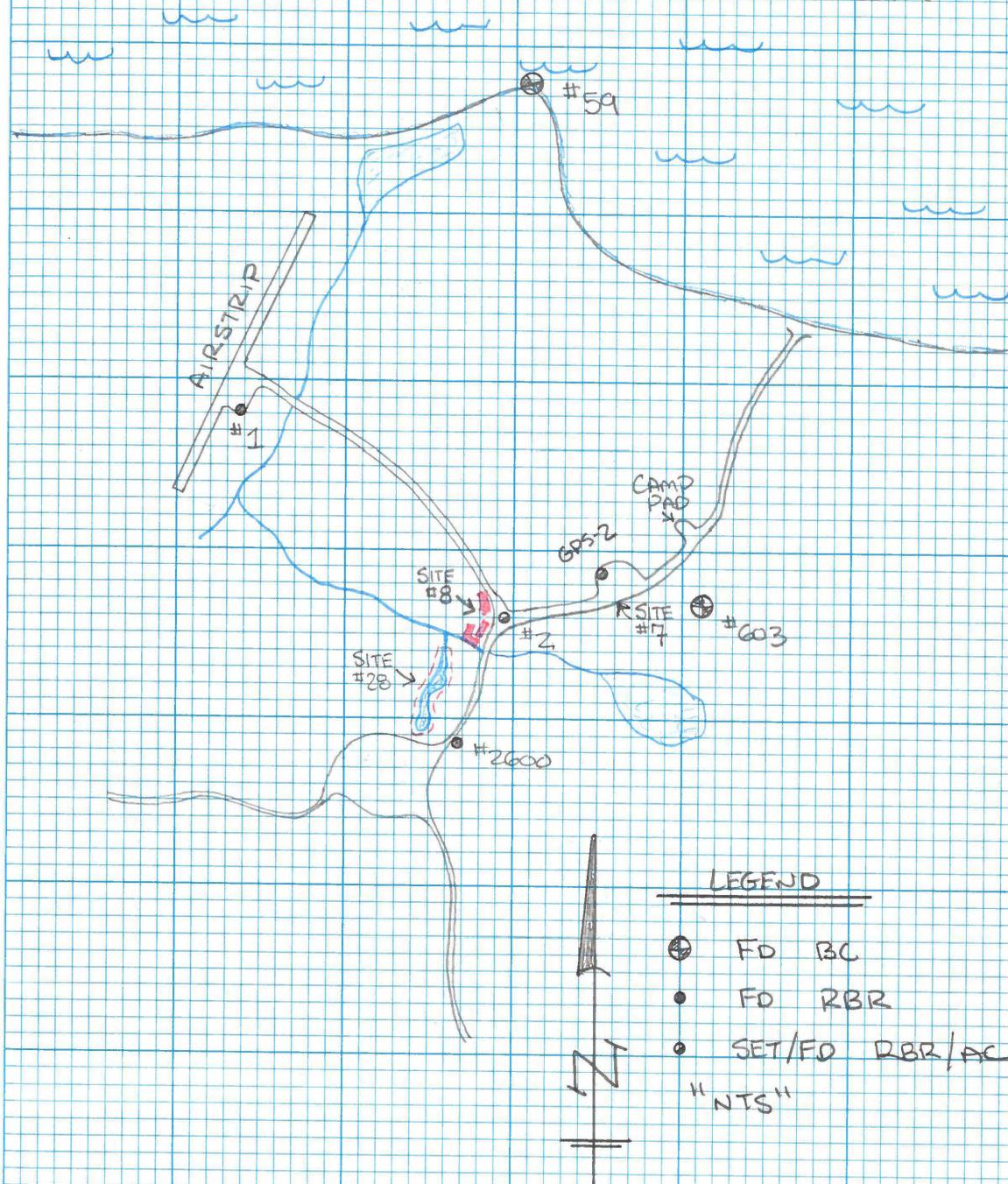
PRIMARY CONTROL NOTES:

- RECORD COORDINATES RECEIVED FROM JACOBS ON 04-18-18 WERE DERIVED FROM "ECO-LAND" SURVEYS, R. SCOTT McCLINTOCK 8904-S
- COORDINATES LISTED AS "AK STATE PLANE ZONE 4", BUT INITIAL FIELD CHECKS FOUND THIS TO BE WRONG.
- ROTATION OF $+0.87^\circ$ IS LISTED IN THE "BASIS-OF SURVEY DATUM REPORT" BUT THERE IS NO MENTION OF A SCALE FACTOR.
- USING STATIC DATA ON #1 & #2600, WE WERE ABLE TO LOCALIZE INTO OLD SYSTEM.
- ALL OTHER 8904-SET CONTROL WAS FOUND TO BE TOO SLOPPY TO USE.
- FURTHERMORE, OUR OPUS SOLUTION ON #1 DIFFERS FROM "ECO-LAND" POSITION BY 0.7'
- HOLDING OUR OPUS SOLUTION ON #1 MATCHES THE PUBLISHED POSITION OF #59 BY 0.08'.
- ★ ALL FIELD PROCESSING HOLDS OUR SP29 POSITION OF #1 DERIVED BY OPUS (NOT ECO-LAND'S POSITION)

J. JARNEY
ECERNEY

FB 18-MISC-3

JUL AUGUST 15th, 2018
 $\pm 50^\circ$ O'CAST
10 MPH WIND



WD# 18-002

FCC N.E. CAPE
STATIC CONTROL

RTK/STATIC@
BASE

603

UNIT: 10053

START: 0848

Hi: 1.109m
3.638'
SLANT

STOP:

FILE: 603.20180801-0848

RTK/STATIC@
BASE

1

UNIT: 21371

START: 1019

Hi: 1.50m
4.92'
VERT

STOP: 1828

FILE: 1.20180801.1019

STATIC
BASE

@

59

UNIT: 21270

START: 1133

Hi: 1.500m
4.921'
VERT

STOP: 1811

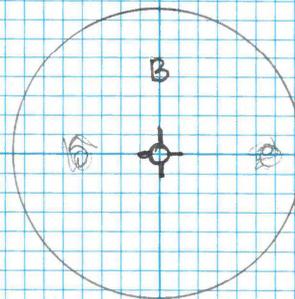
FILE: 59.20180801-1133

SAME CREW

FB 18-MISC-3

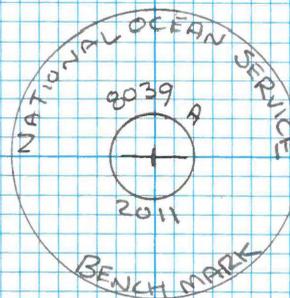
AUG. 1ST, 2018
SAME WK

★ SKETCH P.15 ★



- Fd 3/4" BC ↑ 1 1/2" ON 1" O/D I.P.
- GOOD STABILITY / CONDITION
- PID = UW 3430 "BM B"
- Tx @ 461.10 / LOG @ 5 SEC / 10° MASK

- Fd 3/4" RBR @ GRADE
- FENCE POST BEARS 1° EASTERLY
- EXCELLENT STABILITY
- PRIMARY CP FROM 2012 EGO-LAND SURVEY
- Tx @ 464.70 / LOG @ 5 SEC / 10° MASK



- Fd 3/4" BC FLUSH W/ROCK
- EXC. STABILITY / CONDITION
- LOG @ 5 SEC / 10° MASK

WD# 18-002

ECC N.E. CAPE
STATIC CONTROL

STATIC
BASE @

2600

UNIT: 21309

START: 1507

HI: 1.546m

STOP: 1835

SLANT
5.075'

FILE: 2600-20180801-1507

STATIC
BASE @

2

UNIT: 20041

START: 1634

HI: 1.650m

STOP: 1837

5.413'
VERT

FILE: 2-20180801-1634

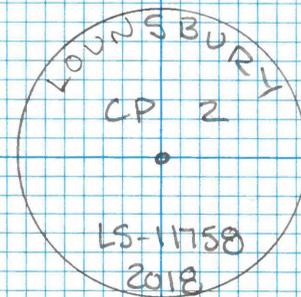
SAME CREW

FB 18-MISC-3

AUG. 1ST, 2018
SAME WX

* SEE VICINITY SKETCH P.15 *

- FO 5/8" RBR @ GRADE
- GOOD STABILITY
- LOG @ 5 SEC / 10° MASK
- 2ND CP FROM "ECO-LAND" SURVEY



- SET 2" AC ON 5/8" x 30" RBR
- ~~FLUSH W/GROUND~~ ↓ 0.5
- LOG @ 5 SEC / 10° MASK
- LOCATED @ Q OF INTERSECTION OF AIRSTRIP / CAMP / MOC ROADS

WO# 18-002 ECC N.E. CAPE
RTK CHK'S

ROVER JOB "18-002-JV1"

PT#	CODE	DESC	HI
5001	CHK @	"STOKE" RM 2	1.500m VT
5002	CHK @	59 $\Delta H: 0.66$ $\Delta V: 0.19$	"
5003	CHK @	"8039-B" (#59 RM#1)	$\pm 5.42'$ VT
5004	CHK @	"8039-C" (#59 RM#2)	"
5005	CHK @	34009 $\Delta H: 0.16$ $\Delta V: 0.54$	"
5006	CHK @	2600 $\Delta H: 0.03$ $\Delta V: 0.03$	"
5007	CHK @	34006 $\Delta H: 0.08$ $\Delta V: 0.41$	"
5008	CHK @	34008 $\Delta H: 0.09$ $\Delta V: 0.83$	"

SAME CREW

FB 18-MISC-3

AUG. 1ST, 2018
SAME WP

NOTE:

- CHECK SHOT COORDINATES DERIVED @ END OF DAY WITH POST-PROCESSED STATIC COORDINATES FOR # 1, 59, 2600.
- #34006/8/9 ARE McCLINTOCK COORDS. THAT I "LOCALIZED" INTO SP29 BY:
 - TRANSLATING TO OPUS # 1
 - ROTATING TO #2600
 - SCALING TO #2600
- NEW JOBS START 8/2 W/ POST-PROCESSED COORDS.

NO# 18-002

ECC N.E. CAPE
STATIC CONTROL

PT#	UNIT	FILE/START	STOP	HI
603	10053	603-2018-0802-0827	1401	3.64' SLANT
1	21371	1-20180802- 0915 ⁰⁸⁵⁵	1100	1.500m 4.92' VERT
2600	21369	2600-20180802-0915	1239	5.07' SLANT
2	20041	2-20180802-0931	1248	5.415' VERT
59	21270	59-20180802-0953	1428	1.500m 4.92' VERT
2600	21369	2600-20180802-1245	1526	1.720m 5.643' SLANT

J. VARNEY
E. CERNEY

FB 18-MISC-3

AUGUST 2ND, 2018
± 50° RAIN
CALM

DESC
CBC • REF. P.16
CRB • REF. P.16
CRB • REF. P.17
CRBC • REF. P.17
CBC • REF. P.16
CRB • 2 ND OBS.

WO # 18-002

N.E. CAPE - ECC
STATIC CONTROL

PTH	UNIT	FILE/START	STOP	HI
(2)	20041	2-20180802-1253	1643	1.492m 4.894' VERT
(603)	10053	603-20180802- 1464 ¹⁴⁰⁵		1.067m 3.500' SLANT
(59)	21270	59-20180802-1437	18:30	1.300m 4.265' VERT
(1)	21371	1-20180802-1631	18:50	1.800m 5.905' VERT
(603)	10053	603-20180802-1700	19:01	3.26' SLANT

SAME CREW

FB 18-MISC-3

AUG. 2ND, 2018
SAME Wx

DESC	
CRBC	• 2 ND OBS.
CBC	• 2 ND OBS.
CBC	• 2 ND OBS.
CRB	• 2 ND OBS.
CBC	• 2 ND OBS.

Wb# 18-002 ———— FCC N.E. CAPE ————
RTK TOPO

ROVER JOB "18-002 JV2"

PTH	CODE	DESC	HI
5009	CHK @	1	ΔH: 0.01 ΔV: 0.02 4.921' VT
5010 -5113	HEW	@ SITE 28	4.71' VT
5114	CHK @	2600	ΔH: 0.02 ΔV: 0.02 4.71' VT
5115	CHK @	59	ΔH: 0.04 ΔV: 0.02 "
5116 -5227	HEW	@ SITE 28	"
5228	CHK @	1	ΔH: 0.01 ΔV: 0.01 5.905' VT
5229	CHK @	2	ΔH: 0.03 ΔV: 0.01 5.42' VT
-	LAYOUT	FLAGS WITHIN SITE 8	
	DV-B:		
		B2 2182 B24 2204	
		B6 2186 -B44 -2224	
		B8 2188	
		B12 2192	
		B13 2193	
		B16 2196	
		B17 2197	
		B18 2198	
		B20 2200	
		B23 2203	

SAME CREW

FB 18-MISC-3

AUG. 2ND, 2018
SAME Wx

ROVER JOB "18-002 EC2"

PTH	CODE	DESC	HI
10001	CHK @	1	ΔH: 0.01' ΔV: 0.02' 4.921' VT
10002	CHK @	2600	ΔH: 0.02' ΔV: 0.01' 5.07' SLANT
10003	CHK @	2	ΔH: 0.02' ΔV: 0.01' 5.415' VT
10004	CHK @	59	ΔH: 0.01' ΔV: 0.01' 4.921' VT
10005- 10055	HEW	@ SITE 28	5.43' VT
10056	MP	WATER INFALL @ POND @ SITE 28	"
10057- 10134	HEW	@ SITE 28	"
10135	CHK @	2	ΔH: 0.01' ΔV: 0.03' "
10136	CHK @	59	ΔH: 0.01' ΔV: 0.01' 4.265' VT
10137- 10233	HEW	@ SITE 28	5.43' VT
10234	CHK @	2	ΔH: 0.02' ΔV: 0.01' 5.43' VT
10235	CHK @	2	ΔH: 0.04' ΔV: 0.01' 5.43' VT
-	LAYOUT	FLAGS WITHIN SITE 8	
		2007 - A7	
		2008 - A8	
		2011 - A11	
		2012 - A12 (A10 NOT SET)	
		2014 - A14	
		2016 - A16	
		2020 - A20	
		2020 - A20 2033 - A33	
		2022 - A22 2036 - A36	
		2023 - A23 2038 - A38	
		2027 - A27	
		2029 - A29	
		2030 - A30	
		2031 - A31	

WO# 18-002

ECC NE CAPE
RTK TOPO

RTK/STATIC@
BASE

603

UNIT: 10053

START: 0849
~~0827~~

HI: ~~1.70m~~ 1.170m
3.84'
SLANT

STOP:

FILE: 603-20180803-~~0827~~
0849

NOTES:

- Tx @ 461.10 / LOG @ 5 SEC / 10° MASK
- REF. P.16

RTK/STATIC@
BASE

2600

UNIT: 10021

START: 1714

HI: 1.719m
5.64'
SLANT

STOP: 1836

FILE: 2600-20180803-1714

J. VARNEY
E. CERNEY

FB 18-MISC-3

AUGUST 3RD, 2018
± 50° CALM
FOGGY

ROVER JOB "18-002-JV2"

PT#	CODE	DESC	HI
5231	CHK @ 2	ΔHI: 0.03 ΔV: 0.01	5.46'
5232	-	* SITE #7 X-SECT #1	↓
- 5313		- FULL WIDTH -	
5314	-	* SITE #7 X-SECT #2	
- 5373		- PERPENDICULAR FULL WIDTH	
5374	HEW	* ADD'L HEW @ SITE # 28	5.46'
- 5386			
5387	CHK @ 2600	ΔHI: 0.05 ΔV: 0.03	5.42' VT
	- STAKE #	@ SITE 28	↓
	(INSTALL LATH @ ALL POINTS)		
5388	MP	SW Ø3	
5389	MP	SW Ø1	
5390	MP	SW Ø2	
5391	CHK @	"GPS 2" FD 2" AC	
5392	CHK @ 2	ΔHI: 0.02 ΔV: 0.01	5.42'
	- FINISH ALL SITE #8	LAYOUT (C-1 → C-30)	
		(A1-A24, 27, 29-31, 33, 36, 38)	
5393	CHK @ 2	ΔHI: 0.03 ΔV: 0.01	5.42'

WO # 18-002

ECC NE CAPE
RTK TOPO

ROVER JOB "18-002.EC2"

PT. #	CODE	DESC.	HI
10236	CHK	@ 2 $\Delta H: 0.03'$ $\Delta V: 0.01'$	5.43' VT
10237- 10496	-	TOPO @ SITE #7	11
10497- 10518	-	SITE #7 X-SECTION	11
10519	CHK	@ GPS-2	11
10520	CHK	@ 2600 $\Delta H: 0.03'$ $\Delta V: 0.01'$	11

J. VARNEY
E. CERNEY

FB 18-MISC-3

AUGUST 3RD, 2018
± 50° CALM
FOGGY

WO # 18-002

ECC N.E. CAPE
RTK TOPO

RTK/STATIC
BASE @

2600

UNIT: 10053

START: 0749

Hi: 1.720m

STOP: 1154

5.643'

FILE: 2600-20180804-0749

SLANT

NOTES:

• Tx @ 46110 / LOG @ 5 SEC / 10° MASK

STATIC
BASE @

1

UNIT: 20041

START: 0922

Hi: 1.800m

STOP: 1201

5.905'

FILE: 1-20180804-0922

VERT

J. VARNEY
E. CERNEY

FB 18-MISC-3

AUGUST 4TH, 2018
± 50° O'CAST
CALM

ROVER JOB "18-002-JV2"

PTH	CODE	DESC	HI
5394	CHK @ 2	ΔH: 0.04 ΔV: 0.01	5.43' VT
5395 -541A	-	LAYOUT LATH @ CARDINAL DIRECTIONS AROUND STANDING H ₂ O @ SLY END SITE #20	↓
5415	EPP	BASE ONLY	
5416/7	ML(1)	SUBMERGED PP	
5418/19	ML(2)	PARTIALLY SUBMERGED PP	
5420	CHK @ 2	ΔH: 0.03 ΔV: 0.02	5.43' VT
5421	CHK @ 1	ΔH: 0.01 ΔV: 0.05	1.80m VT

STATIC
BASE @ GPS-2

UNIT: 20 10021

START: 0933

Hi: 5.43'

STOP: 1143

VERT

FILE: GPS2-20180804-0933

AAG9-S

GPS2

2001

- Fd 2" AC 10³
- OK STABILITY

APPENDIX G
Response to Comments



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

Spill Prevention and Response
Contaminated Sites

555 Cordova Street
Anchorage, Alaska 99501
Main: 907-269-7528
Fax: 907-269-7687

ADEC File Number: 475.38.013

August 18, 2020

US Army Corps of Engineers USACE, AK District
Attention: Mr. Robert Glascott
CEPOA-PM-ESP
P.O. Box 6898
JBER, AK 99506-0898

Re: **ADEC Review Determinations of Responses to Comments (RTCs) on the Draft 2019 Northeast Cape (NEC) Site 7 Second CERCLA Periodic Review (PR) Report**

Dear Mr. Glascott:

Thank you for providing the Alaska Department of Environmental Conservation's Contaminated Sites Program (ADEC) with additional RTCs on the draft 2019 NEC Site 7 Second CERCLA PR Report. ADEC submitted its initial comments on January 7, 2020 and received the initial RTCs from the Army Corps of Engineers (USACE) on June 1, 2020. ADEC received a second round of RTCs on July 21 and participated in a comment resolution meeting with USACE on July 27, 2020; after which ADEC received additional post-resolution RTCs from USACE on August 4, 2020. ADEC previously completed its review of the additional RTCs and had transmitted its review determinations to USACE via email on August 6, 2020. This letter is a follow up to provide a written transmittal of ADEC's final RTC review determinations, which are notated as accepted in the template that is enclosed with this letter for USACE's review and records. This letter serves as ADEC's approval of the accepted RTCs and subsequent revisions to the report, and also serves as ADEC's approval for USACE to finalize the document accordingly.

Please contact me at curtis.dunkin@alaska.gov or at (907)269-3053 if you have any questions regarding ADEC's comments and/or this letter.

Sincerely,

Curtis Dunkin

Curtis Dunkin
Environmental Program Specialist

Enclosures: 1) ADEC Comment Template (MSWord 62 pages) Dated August 6, 2020

Cc: 1) Melinda Brunner – ADEC (via email)
2) Jennifer Currie – ALAW (via email)

Alaska Department of Environmental Conservation (ADEC)
Contaminated Sites Program

Document Reviewed: Draft April 2019 Northeast Cape Site 7 Five-Year Review

Commenters: Curtis Dunkin-ADEC Project Manager

Date Submitted: January 7, 2020

ADEC Received Responses to Comments (RTCs) from USACE on June 1, 2020 and Submitted Review Determinations on July 2, 2020

July 27, 2020 USACE, ADEC, ECC and Jacobs participated in a review meeting of 2nd round ADEC comments. Participants were: Robert Glascott, Aaron Shewman, Lisa Geist, (USACE), Curtis Dunkin (ADEC), Andy Larson, (ECC) and Haley Huff, Cynthia Trapp (Jacobs)

ADEC Received Revised Final Redline and Final Post-Resolution RTCs on August 4 and Submitted Review Determinations on August 6, 2020

#	Page #	Section	ADEC Comment	Response
1.	ES-1	Executive Summary	With re: to discussion about protectiveness in the last paragraph on this page, and elsewhere throughout the document where applicable, ADEC perceives the ongoing lack of completed deed notices and formally recorded LUCs as affecting both short- and long-term protectiveness. This should be better emphasized and discussed in more detail in association with respective references to protectiveness and LUCs throughout the document.	Accepted. Unsigned Environmental Covenants will be added as an issue that affects short-term and long-term protectiveness. The last sentence of the paragraph will be removed. The second sentence will be revised to state: “The results of this Periodic Review identified issues that affect the short-term and long-term protectiveness of the remedy, which will be addressed by fully implementing the remedy, specifically the land use controls” ADEC-Accepted July 2, 2020 Similar changes will be made throughout the document to indicate that short-term and long-term protectiveness is affected. ADEC-Accepted July 2, 2020
2.	S-2		The discussions and references associated with ‘Deed Notice’ and ‘LUCs’ throughout the document should be amended in order to	Accepted.

#	Page #	Section	ADEC Comment	Response
		Issues/ Recommendations	specify the requirements associated with the Universal Environmental Covenant Act (UECA), which was promulgated by the State of Alaska in 2018.	References to the future implementation of Deed Notices will be revised to Environmental Covenants in accordance with UECA. ADEC-Accepted July 2, 2020 In addition, the following issue and recommendation have been added. Issue: Clarification for components of the Site 7 Remedy is needed due to a newly promulgated ADEC regulation and site conditions. ADEC-Accepted July 2, 2020 Recommendation: The change from LUC and deed notices to UECA and Environmental Covenants, as well as, documentation that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth should be addressed in an ESD document. ADEC-Accepted July 2, 2020
			With re: to ADEC's comment in the Exec. Summary above re: protectiveness issues associated with the outstanding Deed Notice and formalized LUCs, ADEC notes the milestone date of 2018 listed here, and subsequently the affects to current protectiveness should be selected as 'yes' and further referenced and discussed from this perspective throughout the document.	Accepted. As formalized LUCs and an environmental covenant have not been recorded, the lack of LUCs and an environmental covenant will be noted as affecting current, as well as, future protectiveness. ADEC-Accepted July 2, 2020
			Further, with re: to the listed Milestone Dates of 2018, please clarify if this is intended to reflect the Issue or the Recommendation, or both; noting that the date of 2018 affects the current protectiveness for the	Accepted.

#	Page #	Section	ADEC Comment	Response
			<p>Remedy Completion for both the Issue and the Recommendation, and if applying a similar rationale to the Remedy Implementation, would affect the Recommendation to maintenance the landfill cap.</p>	<p>The milestone date is intended to indicate the date by which the recommendation was planned to have been completed. ADEC-Accepted July 2, 2020 The first Issue/Recommendation Milestone Date will be updated to 2021, as the Environmental Covenants are currently in-progress. ADEC-Accepted July 2, 2020 The second and third Issue/Recommendation Milestone Date will be updated to five years from the date this Periodic Review is finalized. ADEC-Accepted July 2, 2020 The triggering action date of the next Periodic Review is the finalization date of this Second Periodic Review Report. The date of the next Periodic Review will be approximately five years following the completion date of this Second Periodic Review Report. This will also be updated in Sections 9.0 and 11.0. ADEC-Accepted July 2, 2020</p>
			<p>In addition to the recommendation to add fill to settled areas of the cap, further consideration needs to evaluate whether or not potential improvements are feasible that would improve established vegetation on the cap and adjacent areas. Please see additional related comments below. ADEC-Accepted July 2, 2020; ADEC agrees with the RTC and both acknowledges and concurs with the described site conditions. However, lack of an organic and/or vegetative cover make the cap more</p>	<p>Noted. Areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth. Except for the two limited areas of settling that have occurred near the top of the cap, the annual inspections, 2015 Periodic Review, and this</p>

#	Page #	Section	ADEC Comment	Response
			<p>susceptible to future erosion and should be evaluated and monitored further. Further resolution necessary. ADEC-Accepted August 6, 2020; per July 27, 2020 resolution meeting and additional responses.</p>	<p>Periodic Review all indicate the cap is stable and not eroding. The remedy is functioning as intended. The USACE will develop a plan for placing backfill in the areas of the cap that have settled. ADEC-Accepted July 2, 2020; please see additional response on the left.</p> <p>Noted with Clarification.</p> <p>The results of this Periodic Review indicate future reviews and visual monitoring are still necessary at this site. The continued visual monitoring events will ensure the lack of vegetative cover on the cap is not causing erosion of the landfill cap. If erosion of the cap is noted, then cap maintenance would occur. ADEC- Accepted August 6, 2020</p> <p>Section 7.0, System Operations and Maintenance states, “An additional Periodic Review is also recommended to monitor the area of settling that occurred near the top of the landfill cap.”</p> <p>ADEC- Accepted August 6, 2020</p> <p>Section 11.0 will be revised as follows: “Future Periodic Reviews, including visual monitoring of the capped area for settlement and erosion, for Site 7 are necessary to evaluate remedy protectiveness and completion. These reviews should be completed under one cover on a five-year</p>

#	Page #	Section	ADEC Comment	Response
				<p>periodic basis. The triggering action date of the next Periodic Review is the completion date of this Periodic Review. The due date of the next Periodic Review is five years following the triggering action (i.e. completion) date of this Periodic Review.</p> <p>ADEC- Accepted August 6, 2020</p>
3.	1-1	1.1	<p>Please amend the last sentence of this section to expand the discussion in order to clarify that there are uncharacterized areas, including soil and groundwater, in association with the Site 7 Landfill. This issue needs to be better emphasized throughout the document when the site model, exposure pathways, available data, etc. are referenced and discussed in order to be very clear that the limits of characterization preclude making definitive statements re: residual contamination remaining in the landfill; and instead, definitive statements re: the site model and protectiveness should be limited to e.g. 1) the contamination being contained within what is considered the limits/boundary of the landfill, and 2) that prior analysis data from downgradient sediment and surface water locations indicate those areas are not impacted/contaminated.</p>	<p>Clarification.</p> <p>Section 1.1 presents the purpose of the Periodic Review. Further detail will be added to Section 3 to convey the extents/limits of previous data. ADEC-Accepted July 2, 2020</p> <p>The following text will be added to Section 3.2.1 to state: At the time of Site 7 DD development (USACE 2009b), the dump contained a variety of unknown materials. <u>Since the development of the Site 7 DD, removal actions have removed a substantial volume of waste, and subsequent sampling has provided additional characterization of the area surrounding the landfill.</u>” ADEC-Accepted July 2, 2020</p> <p>And</p> <p>“... groundwater samples <u>primarily around the perimeter of the landfill, and in a limited amount of soil within the landfill boundary, to determine if landfill contents were migrating.</u>” ADEC-Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p>Further it needs to be inversely emphasized that although several attempts have been made to access and sample groundwater over the years that site conditions and refusal have not allowed for definitive characterization of site groundwater. ADEC-Partially Accepted July 2, 2020; noting that this may be considered generally representative of the shallow site conditions, however is not representative of groundwater. This should be clarified and emphasized in respective applicable sections and references e.g. include in section 6.5.4 and reference as needed throughout the report. ADEC-Accepted August 6, 2020; per July 27, 2020 resolution meeting and additional responses.</p>	<p>Clarification. Historical surface water samples collected at Site 7 are considered representative of shallow groundwater in the area due to the numerous failed attempts to encounter shallow groundwater at the site. ADEC-Partially Accepted July 2, 2020; please see additional response on the left. Accepted. In the respective applicable sections where surface water is discussed, additional text will be added to state the surface water is considered representative of groundwater and used to monitor groundwater conditions and potential contaminant migration due to the lack of accessible groundwater at the site. In addition, Sections 6.5.4 and 6.5.3 will be revised so the discussion of groundwater precedes the discussion of surface water. ADEC- Accepted August 6, 2020</p> <hr/> <p>Attempts to characterize groundwater are described in Section 6.5.4. ADEC-Accepted July 2, 2020</p>
4.	1-1	1.2	<p>The discussion in the second paragraph of this section needs to be expanded in order to provide the appropriate context and perspective; noting that as currently presented it is potentially misleading to the reader. The CERCLA laws and processes are applicable to Site 7 as a result of 1) CERCLA contaminants being identified during the CON-</p>	<p>Clarification. No CERCLA contaminants were identified during remedy implementation or as a result of monitoring following removal actions and construction of the landfill cap. Previous</p>

#	Page #	Section	ADEC Comment	Response
			<p>HTRW removal activities, 2) soil and groundwater associated with the landfill not having been entirely characterized, and 3) confirmation sampling having not been conducted in all areas where CERCLA contaminants were identified and/or where limited/focused removal actions were conducted (e.g. removal limited to visually stained/grossly contaminated soil during test pitting).</p> <p>ADEC-Noted July 2, 2020; further resolution discussion is necessary to address the issues discussed in ADEC's comment and RTC. ADEC does not necessarily disagree with much of the RTC however the context is not accurate/appropriate. ADEC- Accepted/Noted August 6, 2020; noting per the July 27, 2020 resolution discussion, USACE and ADEC agreed that the parties continue to potentially disagree going forward on the subject of whether prior investigation activities were adequate enough to make definitive determinations re: whether or not CERCLA contaminants continue to be present in the landfill.</p>	<p>sources of contamination have been removed, and the remedy is functioning as intended. The Site 7 Cargo Beach Road Landfill DD states the project has followed the CERCLA process as a matter of administrative consistency.</p> <p>ADEC-Noted July 2, 2020; please see additional comment on the left.</p> <p>Noted with Clarification.</p> <p>The 2009 DD did not include groundwater as a media of concern because site groundwater is not a current or reasonably expected potential future drinking water source.</p> <p>ADEC- Accepted/Noted August 6, 2020</p>
5.	1-2	1.2	<p>ADEC disagrees with the statement in the first sentence on this page, as well as the general context of the discussion in the same paragraph that follows; based upon several related issues already identified in comments made above and elsewhere that CERCLA contaminants (e.g. metals, PCBs, VOCs including chlorinated solvents), were previously identified and that areas were left uncharacterized and/or not confirmation sampled.</p> <p>Please revise/amend the second sentence of the first paragraph on this page to better differentiate between historical releases at Site 7 versus a future release; the latter of which is what appears to be the intent of the statement.</p>	<p>Please see response to comment 4.</p> <p>ADEC-Noted July 2, 2020; please see response to RTC #4 above.</p> <p>Noted. ADEC- Accepted/Noted August 6, 2020; noting per the July 27, 2020 resolution discussion, USACE and ADEC agreed that the parties continue to potentially disagree going forward on the subject of whether prior investigation activities were adequate enough to make definitive determinations re: whether or not CERCLA contaminants continue to be present in the landfill.</p>

#	Page #	Section	ADEC Comment	Response
			<p>Similar and in relation to numerous comments made above, ADEC generally disagrees with the perspective as currently presented that the current FUDS activities associated with Site 7 are not CERCLA-based. This needs to be better clarified in all respective discussions and references throughout the document.</p>	
6.	2-1	2.0	<p><u>Table 2-1:</u> It would be helpful to include table notes and additional references to better clarify what is actually considered ‘NEC’ with re: to acreage, withdraw boundary, etc.; e.g. reference and expand section 3.2 to provide a more detailed description of the withdraw parcel.</p>	<p>Accepted with clarification. The following text will be added to section 3.2: The NEC site <u>totaled 4,880 acres and</u> included areas for housing site personnel, power plant facilities, fuel storage tanks, distribution lines, maintenance shops, waste water treatment facilities, and landfills. ADEC-Accepted July 2, 2020 Section 2.0 will be revised to state: “Important events, the associated document reference for each event, and relevant dates for the NEC FUDS are shown in Table 2-1. Sample locations and other important Site 7 features are presented on Figure A-4.” Please note that Figure A-4 is the former Figure A-3. ADEC-Accepted July 2, 2020 Additional events/references will be added to Table 2-1 including the Long-Term Management Plan and 2017 publications from Agency for Toxic Substances and Disease Registry. ADEC-Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p>Are there any specific dates that are known re: additional events associated with the occupancy and operations that are specific to Site 7; e.g. did the initial construction and/or use of the Site 7 landfill occur in association with the first occupancy in 1951 or later, was use of the landfill terminated in 1972 or later, etc.? ADEC notes that section 3.2.1 states the years range of use from 1965-74, however this does not account for the timeframe starting with the initial AC&WS construction that is listed as 1951-52.</p>	<p>Clarification. The Final Phase II Remedial Investigation Report Addendum (June 2000) indicates that solid waste disposal occurred at Site 7 from 1965 to 1974. No additional events associated with the occupancy and operations specific to the Site 7 landfill are known. ADEC-Accepted July 2, 2020 Two lines detailing the dates of solid waste disposal activities have been added to Table 2-1. ADEC-Accepted July 2, 2020</p>
7.	3-4	3.2.1	<p>Pertaining to prior comments associated with uncharacterized areas of the landfill and previously identified CERCLA contaminants, ADEC notes the reference in the latter part of the first paragraph of this section that states “The dump contains a variety of unknown materials.”</p>	<p>Clarification. As per comment 3, the referenced statement will be revised to state: “The dump contained a variety of unknown materials at the time of the Site 7 DD (USACE 2009b). Since the time of the Site 7 DD, removal actions have removed a substantial volume of waste, and subsequent sampling has provided additional characterization of the area in and around the landfill”. ADEC-Accepted July 2, 2020 Significant information regarding the characterization of landfill contents is provided in Site 7 Landfill Cap Construction Complete (USACE 2010) report when 72 test pits were advanced at the site. 100 tons</p>

#	Page #	Section	ADEC Comment	Response
				of stained soil was removed in addition to drum contents. ADEC-Accepted July 2, 2020
			The discussion in the second paragraph of this section should be revised/amended in association with prior similar/related comments that the current presentation of information is somewhat misleading with re: to the limited extent of prior investigation, characterization, and/or confirmation sampling and analysis that were conducted. The discussion and related statements make inappropriate inference that the site was thoroughly characterized and that decisions were made based upon analytical results. Whereas in reality, the majority of all sampling and analysis that was conducted in conjunction with Site 7 were intended only for waste characterization and disposal decisions; with only limited/focused analysis results associated with downgradient sediment, surface water, and groundwater. ADEC-Partially Accepted July 2, 2020; ADEC does not necessarily disagree with the RTC, however it is expanded out of context and does not accurately present the conditions/status of the site, noting that the determination of whether offsite migration is not definitively conclusive, nor is it accurate to state that the contents of the landfill have been thoroughly characterized. Further resolution discussion necessary. ADEC-Accepted/Noted August 6, 2020	Clarification. As per comment 3, the first sentence of the second paragraph in this section will be revised to state: “Environmental sampling activities at Site 7 have included the collection of soil, sediment, and surface and shallow groundwater samples around the perimeter of the landfill to determine if landfill contents were migrating.” ADEC-Partially Accepted July 2, 2020; please see additional comment on the left. Noted. ADEC-Accepted/Noted August 6, 2020
				Significant information regarding the characterization of landfill contents is provided in Site 7 Landfill Cap Construction Complete report, when 72 test pits were advanced at the site. One hundred tons of stained soil were removed in addition to drum contents. ADEC-Accepted July 2, 2020
			Further related to the comment in the paragraph immediately above, the discussion in the last paragraph on this page should be revised/amended in order to better clarify that the stated POL contaminant concentrations in soil are not the only COCs confirmed	Accepted with clarification. The referenced paragraph presents the list of contaminants exceeding action level identified during the phased RIs. However,

#	Page #	Section	ADEC Comment	Response
			<p>and/or suspected to be present at Site 7, and as a result will require ICs, Deed Notice/UECA, CERCLA Periodic Reviews every five years for up to 30 years or as otherwise determined/approved to be appropriate by the agencies (per the remedy/DD), and potentially additional LTM&M as determined necessary to evaluate and maintain protectiveness. These clarifications and revisions/amendments should be applied to discussions and references throughout the document where applicable.</p>	<p>the following text will be added to the referenced paragraph to state: “The Site 7 COCs identified in the DD include DRO, RRO, PCBs and arsenic in soil along with total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), and sheen in surface water.” ADEC- Accepted July 2, 2020 Additionally, the full list of remedy components will be included in appropriate sections throughout the report. ADEC- Accepted July 2, 2020</p>
8.	3-5	3.2.1	<p>Please see and apply comments above related to the presentation of information in order to avoid misrepresenting the site conditions; e.g. the stated PCB confirmation analysis results are only applicable to the referenced four locations and not the entire landfill – noting that the last sentence of the first paragraph on this page states that PCB contamination may remain beneath the cap.</p>	<p>Accepted. The text in Section 3.2.1 will be revised to state: “In 2005, six locations with PCBs concentrations greater than 1 mg/kg were excavated and disposed offsite. Confirmation sampling results <u>from 2005</u> demonstrated that PCBs were successfully removed to concentrations below 1 mg/kg at four of the six locations <u>where PCB contaminated soil was excavated and disposed offsite.</u>” ADEC- Accepted July 2, 2020 Additional historical results and excavation extents will be added to Figure A-4 (former Figure A-3) to provide a more complete</p>

#	Page #	Section	ADEC Comment	Response
				<p>depiction of historical activities at Site 7. Reference to Figure A-4 added to section. ADEC- Accepted July 2, 2020</p>
			<p>Please amend the first sentence of the second paragraph on this page (and other similar statements throughout the document) to specify the current status of confirmed contaminant concentrations that exceeded respective cleanup levels; e.g. in this instance whether or not contaminated sediment was removed.</p>	<p>Accepted. The referenced paragraph will be revised to include the following sentence: “As shown on Figure A-4, the surveyed location of the landfill cap extends beyond all soil sample locations that exhibited COCs at concentrations greater than DD cleanup levels.” ADEC- Accepted July 2, 2020 Please note the data presented in the draft version of this document contained a projection error, which presented the location of sediment sample SD103 outside of the landfill cap boundary. ADEC- Accepted July 2, 2020 The following steps were taken to correct the location of SD103 and the other samples associated with Site 7: 1) A GIS specialist exported an image of the historical sample locations from the data source used to create the original DD figure. ADEC- Accepted July 2, 2020 2) Ten control points were used along the road which crosses Site 7 from SW to NE to georeference the sample locations. A first-</p>

#	Page #	Section	ADEC Comment	Response
				<p>order polynomial (affine, or linear) transformation was used.</p> <p>ADEC- Accepted July 2, 2020</p> <p>3) For consistency, all of the historical sample locations were re-projected to match this data transformation. This caused a shift in the data appearing on Figure A-4. The sample locations are now accurate.</p> <p>ADEC- Accepted July 2, 2020</p>
9.	3-6	3.2.1	<p>Please expand the discussion re: groundwater in this section and elsewhere throughout the document where applicable, to provide more site-specific detail re: groundwater conditions that are confirmed and/or not confirmed at the site; noting that prior attempts to install groundwater monitoring/sampling points at Site 7 have largely been unsuccessful.</p>	<p>Accepted.</p> <p>The following text will be added to the second to final paragraph of Section 3.2.1 to state:</p> <p>“Multiple attempts to characterize groundwater conditions at Site 7 have been performed but many have been unsuccessful and characterization of groundwater at the site has been limited by poor groundwater availability.” ADEC- Accepted July 2, 2020</p> <p>Details regarding attempts to characterize groundwater completed after the Site 7 DD are presented in Section 6.5.4.</p> <p>ADEC- Accepted July 2, 2020</p> <p>The first sentence of the second paragraph will be revised to state:</p> <p>“Historically, sampling groundwater at Site 7 has been difficult <u>and largely unsuccessful</u>”</p> <p>ADEC- Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p>Further, it needs to be better emphasized that the contaminant migration pathway to surface water, that is potentially hydrologically connected to the landfill, has the potential to be complete and therefore the exposure pathway via surface water consumption is potentially complete. ADEC- Partially Accepted July 2, 2020; ADEC does not necessarily disagree with the RTC however some of the stated information is out of context and does not entirely capture the issues addressed in ADEC's comment (and related comments throughout). Further resolution necessary. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.</p>	<p>Clarification. The exposure pathway via surface water consumption is not complete as it is not a potential drinking water source. ADEC has concurred that shallow subsurface groundwater in the immediate vicinity of the landfill is not a current or reasonably expected potential future drinking water source through a letter dated 24 May 2007 from ADEC regarding the Northeast Cape 350 (ADEC 2007). Determination. The letter stated 'It is very unlikely that groundwater from these sources will be transported to a source that is a potential drinking water source'. A mitigation measure, in the form of signage recommending water at Site 7 not be used as a drinking water source, is in place to prevent the referenced exposure pathway. ADEC- Partially Accepted July 2, 2020; please see additional comment on the left. Noted. ADEC-Accepted/Noted August 6, 2020</p> <p>In the last paragraph of Section 3.2.1, additional text will be added to state: The surface water at Site 7 is also not considered a potential drinking water source. A mitigation measure, in the form of signage recommending water at Site 7 not be used as</p>

#	Page #	Section	ADEC Comment	Response
				a drinking water source, is in place to prevent the referenced exposure pathway. ADEC-Accepted July 2, 2020
			Additionally and similarly, the previously referenced exceedances in sediment should be considered and discussed.	See response to comment 8, additional text will be added to describe the previous exceedance in sediment. ADEC-Accepted July 2, 2020
10.	4-1	4.0	Please add a clarification statement to this section to specify whether or not the narrative discussion and/or reference statements are presented verbatim from the Decision Document (DD).	Accepted. Section 4.1.1 will be revised to state: “Specific response action alternatives were developed and evaluated for Site 7. The RAOs, as specified in the Site 7 DD (USACE 2009b), include:” ADEC-Accepted July 2, 2020
11.	4-1	4.1.1	ADEC disagrees with the current wording and presentation of information in this section and throughout the document pertaining to the discussion of ‘cleanup levels for identified COCs’; noting that the current presentation and discussions of e.g. surface water cleanup levels are not consistent. ADEC’s position has consistently been that all of the applicable cleanup criteria for all site COCs apply to all respective matrices at all sites, and not just e.g. POL contaminants. This and other related issues likely require additional resolution discussion between the agencies to determine whether or not the DD should be revised/amended. This issue needs to be reconciled throughout the entire document.	Clarification. The following sentence will be added to Section 4.1.1, prior to Table 4-1: The described surface water criteria are applicable to Site 7, as surface water is not considered a potential drinking water source. ADEC-Accepted July 2, 2020 Please also see response to comment 7. ADEC-Accepted July 2, 2020; per response(s) to RTC #7. The following text will be added to Section 3.2.1 to present the Site 7 DD-specified COCs earlier in the document and state:

#	Page #	Section	ADEC Comment	Response
				<p>“The Site 7 COCs identified by the DD include DRO, RRO, PCBs, and arsenic in soil along with total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), and sheen in surface water.”</p> <p>ADEC-Accepted July 2, 2020</p>
12.	4-2	4.1.2	<p>Please revise/amend the discussion in the latter part of this section (and elsewhere throughout the document where applicable), in order to adequately emphasize the ‘incidental’ component(s) of the selected remedy for Site 7; otherwise, the current presentation is misleading to the reader whether or not all of the contaminated soil was removed versus the residual contamination that was left in place.</p>	<p>Accepted. The following text will be added to Section 4.1.2 to state:</p> <p>“...removal action and incidental removal of contaminated soil <u>associated with identified drums.</u>” ADEC-Accepted July 2, 2020</p> <p>The first sentence of Section 4.2.1 will be revised to state:</p> <p>“..., remove or drain near-surface drums, <u>remove incidental contaminated soil associated with identified drums,</u> install a landfill cap...”.</p> <p>ADEC-Accepted July 2, 2020</p> <p>The following text will be added to Section 6.5 to state:</p> <p>“...remove identified drums and <u>the associated incidental contaminated soil,</u> ...”</p> <p>ADEC-Accepted July 2, 2020</p> <p>Elsewhere throughout the document, ‘incidental contaminated soil removal’ is described when presenting components of the selected remedy</p> <p>ADEC-Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
13.	4-3	4.1.2	<p>Section 2.13.1 of the DD 'Selected Remedy' states that "...additional visual monitoring, up to 30 years, may be conducted if deemed necessary based on the results of the site inspections.". This component needs to be consistently incorporated into all related discussions and references throughout the document; noting that the current version of the report does not mention this component at all.</p>	<p>Accepted. The following remedy component will be added to the text where remedy components are discussed to state: "additional visual monitoring up to 30 years if deemed necessary based on the results of the site inspections" or similar. ADEC-Accepted July 2, 2020</p>
			<p>Further, resolution discussions between the agencies (USACE and ADEC) during the first periodic review effort resulted in assurances from USACE that future periodic reviews would be scheduled and implemented at a minimum on a 5-year basis, and that site inspections, and LTM&M would be conducted as determined necessary. These components of the remedy, including prior resolved issues and agreements on the paths forward need to be detailed in applicable sections and discussions throughout the document where applicable with re: to the need to prioritize and implement in future years.</p>	<p>Clarification. The Site 7 DD does not indicate the frequency for future Periodic Reviews, does not indicate the frequency for site inspections, and does not select long-term monitoring as part of the remedy. The most recent correspondence regarding this topic appears to be the response to ADEC's comments on the Site 7 First Five-Year Review, discussed in a meeting held 21 January 2015, in which a final resolution was not determined. ADEC-Noted July 2, 2020; further resolution discussion necessary. Accepted. The following text will be added to Section 11.0: "Future Periodic Reviews, <u>including visual monitoring of the capped area for settlement and erosion</u>, for Site 7 are necessary...". ADEC-Accepted August 6, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p><u>Table 4-3</u>: Please amend the information in the status column for ‘Re-vegetate the site.’ to clarify whether this has been accomplished and/or completed. ADEC’s current position is that the ‘tasks’ to conduct revegetation have been completed in the past, however that revegetation is not complete and/or adequate.</p>	<p>Accepted. The status column for ‘revegetate the site’ will be updated with the following as the final sentence: Areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth. Despite the lack of vegetation on areas of the cap, the cap is stable and not eroding. The remedy is functioning as intended. ADEC-Accepted July 2, 2020</p>
			<p>Also, ‘Re-vegetate’ should be revised to ‘Revegetate’.</p>	<p>Accepted. “Revegetate” will replace “Re-vegetate”. ADEC-Accepted July 2, 2020</p>
			<p>Table notes and amendments as needed should be added to clarify the UECA requirements in association with Deed Notice. Further, ADEC emphasizes that this is now 10 years outstanding and impacts the protectiveness (as previously commented above). ADEC requests that this be completed as soon as possible within a reasonable time frame within the next five years well in advance of the next Periodic Review.</p>	<p>The “Deed notation” and “Implement LUCs...” portions of the “Remedial Component” column in Table 4-2 will be updated to reflect that the remedy will be implemented as an environmental covenant in accordance with UECA. ADEC-Accepted July 2, 2020 USACE is currently preparing environmental covenants for Site 7. ADEC-Accepted July 2, 2020</p>
			<p>The visual monitoring component should be amended to state ‘Periodic Inspections, Reviews, and LTM&M as necessary’,</p>	<p>Accepted with clarification. The “Remedial Component” in the last row of Table 4-2 will be revised to state:</p>

#	Page #	Section	ADEC Comment	Response
				<p>“Visual monitoring of the cap for settlement and erosion over a period of five years, with visual monitoring included in Periodic Reviews for up to 30 years, if deemed necessary.” ADEC-Accepted July 2, 2020</p> <p>LTM&M is not part of the selected remedy presented in the Site 7 DD. ADEC-Noted July 2, 2020; ADEC acknowledges the selected remedy as identified in the DD, however further resolution discussion is necessary to further address this issue.</p> <p>Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.</p>
			and the Status column should be updated to include the prior ‘Periodic’ inspection events in association with the first periodic review in 2013 and the current second review in 2018.	<p>Accepted.</p> <p>The “Status” in the last row of Table 4-2 will be revised to state:</p> <p>“... First Periodic Review conducted in 2013 (USACE 2015b). Visual monitoring for the Second Periodic Review was performed during 2018, the results of which are included in this Second Periodic Review Report.” ADEC-Accepted July 2, 2020</p>
14.	4-4	4.2.1	The discussion re: the drums in the second to last paragraph on this page (and elsewhere throughout the document where applicable) requires additional information and clarification. The current presentation of information and respective references here and elsewhere throughout the document are not clear and may be potentially conflicting.	<p>Accepted.</p> <p>Section 4.2.1 will be revised to include more detail, as stated below:</p> <p>At the end of the 2009 field season, approximately 136 tons of nonhazardous waste, 2.7 tons of hazardous waste, and 182</p>

#	Page #	Section	ADEC Comment	Response
				<p>waste-containing drums were removed from the landfill (USACE 2010). After being emptied, cleaned, and crushed, 50 of the drums were transported offsite and 132 of the waste containing drums were returned to the landfill. More than 1,000 empty drums that were encountered during the excavation were cleaned, crushed, and returned to the landfill.</p> <p>ADEC-Accepted July 2, 2020</p> <p>Please also see related response to comment 20. ADEC-Accepted July 2, 2020; per responses to RTC #20</p>
			<p>What is meant by ‘filled drums’ with re: to what appears to be varying uses of the term in association with different groups of drums; e.g. the stated ‘182 filled drums’ versus the ‘fifty of the filled drums’ – and subsequently what was the fate of the remaining 132 filled drums? Better clarify the relationship (if any) between the ‘more than 1000 empty drums’ and the ‘132 remaining drums’ mentioned above. Were the 182 ‘filled drums’ partially filled, and was it the combined total fluids of which that represented 50 filled drums that were disposed offsite?</p>	<p>Accepted.</p> <p>See response to comment above. The total quantity of liquid wastes found in the 182 waste containing drums was recorded as 24 drums worth of liquid contents (USACE 2010). Contents from these drums were containerized and disposed offsite.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>The discussions re: the waste streams that were identified and removed from the landfill that follow in the next couple of paragraphs and on to page 4-5 (and elsewhere throughout the document where applicable), need to identify and emphasize all of the contaminants and/or hazardous materials that were identified in the waste characterization analyses that was associated with all removed materials (including waste fluids, solid wastes, soil, etc.), as well as any characterization and/or confirmation sampling results. ADEC-Accepted July 2, 2020;</p>	<p>Clarification.</p> <p>Most sampling performed in relation to the drum removal/landfill cap construction activities were intended for waste characterization purposes. Details about the results of waste characterization analyses associated with all removed materials were presented in the “Site 7 Landfill Cap</p>

#	Page #	Section	ADEC Comment	Response
			<p>please include the RTC in the respective applicable narrative sections of the document, per associated comments related to the Agencies' respective positions re: the status of overall site characterization. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional responses.</p>	<p>Construction Completion Report" dated May 2010. Additionally, soil samples were collected at the hazardous waste accumulation point to monitor soil quality before and after drum removal/landfill cap construction activities; these soil samples do not replace characterization or confirmation sampling results of the Site 7 landfill area. ADEC-Accepted July 2, 2020; please see and apply additional response on the left. Accepted. The second and third paragraph of Section 4.2.1. will be revised as follows: Remedy implementation was initiated in 2009. Metallic anomalies identified by geophysical investigation in 2007 were located by survey and investigated during 2009. The top one foot of soil was uncovered to locate drums within the shallow subsurface. Excavations included 73 shallow "potholes" across the surface of the landfill, 10 test pits (at least an area of 100 square feet and a depth of 4 feet), and previously delineated magnetic anomaly areas covering approximately 129,000 square feet (USACE 2010). Excavation efforts encountered and disposed of approximately 201 pounds of PCB light ballasts, 350 pounds of lead</p>

#	Page #	Section	ADEC Comment	Response
				<p>batteries, 4,100 pounds of lead debris, and approximately 10 gallons of antifreeze. Contents recovered from drums at Site 7 (approximately 2,150 gallons) were containerized and shipped offsite for disposal. Approximately 100 tons of petroleum stained soil encountered during excavation efforts was excavated and containerized for offsite disposal.</p> <p>ADEC-Accepted August 6, 2020</p> <p>At the end of the 2009 field season, approximately 136 tons of nonhazardous waste, 2.7 tons of hazardous waste, and 182 waste-containing drums were removed from the landfill (USACE 2010). <u>The total quantity of liquid wastes found in the 182 waste containing drums was recorded as approximately 2,150 gallons worth of liquid contents (USACE 2010). Contents from these drums were containerized, characterized, and disposed of offsite. After being emptied, cleaned, and crushed, 50 of the drums were transported offsite and 132 of the emptied, cleaned, and crushed drums were returned to the landfill. More than 1,000 empty drums that were encountered during the excavation were cleaned, crushed, and returned to the landfill. Approximately</u></p>

#	Page #	Section	ADEC Comment	Response
				<p><u>100 tons of petroleum-stained soil encountered during excavation efforts was excavated, characterized, and containerized for offsite disposal.</u></p> <p>ADEC-Accepted August 6, 2020</p>
15.	5-1	5.0	<p>Please revise the first sentence of the second paragraph of this section; instead of saying that the signage was ‘not required by the DD’, better clarify that the signage was not listed as a specified remedy component in the DD, and that the signage was incorporated by USACE to facilitate proper implementation of LUCs in order to reduce/eliminate unacceptable risk exposure by providing awareness to site visitors and users.</p>	<p>Accepted.</p> <p>The paragraph will be revised to state: “Signs were installed along Cargo Beach Road and at the north end of the runway to inform site visitors against using groundwater as drinking water in the vicinity of Site 7 and identify landfill areas where ground disturbing activities or construction are not recommended. The installation of signage was not a required element of the selected remedy, but was completed by the USACE based on community requests.”</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>The previous related subsections of 4.0 and this section 5.0 should briefly discuss the 2018 visual inspection and survey efforts and also reference related/supporting appendices and attachments here and in respective related discussions throughout the document.</p>	<p>Accepted.</p> <p>Information about the visual inspection performed in 2018 will be added.</p> <p>ADEC-Accepted July 2, 2020</p> <p>Table 2-1 will be updated to state: “Site inspection and visual monitoring conducted at Site 7”.</p> <p>ADEC-Accepted July 2, 2020</p> <p>The last paragraph in Section 4.2.1 will be revised to state:</p>

#	Page #	Section	ADEC Comment	Response
				<p>“In August 2018, both a site inspection and visual monitoring were performed and signs were installed to inform site visitors about Site 7 LUCs. Findings of the site inspection and visual monitoring identified that two areas of the landfill cap had experienced settlement and vegetation on the landfill cap was sparse. Along Cargo Beach Road and at the north end of the runway, signs were installed to inform site visitors against...”</p> <p>ADEC-Accepted July 2, 2020</p> <p>The following text will be added to Section 5.0 to state:</p> <p>“A site inspection and visual monitoring were performed in 2018. Areas of settlement were identified in two locations on the landfill cap. Additionally, vegetation regrowth on the landfill cap was sparse.”</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>The electronic bookmark as well as the written title and reference pages for Appendix C and other related attachments should be amended to include the date ‘2018’.</p>	<p>Accepted.</p> <p>Revisions will be made as requested.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>The references to ‘are not recommended’ as used and associated in the last sentence of this section should be revised to ‘are prohibited’ and further amend to specify why; e.g. the LUC and IC requirements of the DD. Please apply this to all related/similar references throughout the document where applicable. ADEC-Accepted July 2, 2020; ADEC does not disagree with the RTC however further resolution discussion is</p>	<p>Clarification.</p> <p>The language “are not recommended” is consistent with language in the Site 7 DD and the signs installed on-site in 2018.</p> <p>ADEC-Accepted July 2, 2020; please see additional response on the left.</p>

#	Page #	Section	ADEC Comment	Response
			<p>recommended by ADEC to ensure concurrence on how this will be addressed going forward. ADEC-Accepted August 6, 2020; per July 27, 2020 resolution meeting and additional response.</p>	<p>Noted with Clarification. An Environmental Covenant for Site 7 is currently in progress. During this process, USACE will seek landowner concurrence on the USACE's recommendations for the soil and groundwater use at the site. ADEC-Accepted/Noted August 6, 2020</p>
16.	6-1	6.0	<p>ADEC categorically disagrees with the statement in the first sentence of this section that 'this site is not regulated under CERCLA' and further resolution is necessary to better clarify and reconcile this issue moving forward. This statement (and other similar and/or related statements and discussions throughout the document), should be revised based upon prospective resolution between the agencies.</p> <p>Similarly, ADEC also does not agree with the perspective as stated that the Periodic Review is being conducted in accordance with CERCLA guidelines merely for the reason of maintaining 'administrative consistency'; noting that 1) CERCLA contaminants have been confirmed to be present in the landfill, and 2) neither full extent characterization or definitive confirmation sampling were conducted.</p>	<p>Clarification. The Site 7 Cargo Beach Road Landfill DD states the project has followed the CERCLA process as a matter of administrative consistency. There were no additional CERCLA contaminants identified at Site 7 during remedy implementation which pose a current or future risk. Previous sources of contamination have been removed and disposed offsite or were covered by the landfill cap. Subsequent surface water sampling has indicated residual contamination beneath the landfill cap is not migrating. ADEC-Partially Accepted July 2, 2020; per related comments, RTCs, and additional responses on this subject. Further resolution necessary. Noted. ADEC-Accepted/Noted August 6, 2020</p>

#	Page #	Section	ADEC Comment	Response
17.	6-2	6.3	<p>Please revise/amend the respective applicable statements and discussion in this section to address the following: 1) better clarify 'individuals' (is this meant to represent 'individual people' or also include entities e.g. ADEC?); 2) it should also be clarified throughout this document where applicable/appropriate, as well as in all three respective Five-year and Periodic reviews that although there are three separate review documents for this five-year/periodic review period, that the public meetings, notices, interviews, etc. were all collected and presented 'comprehensively' at one time for all sites for all three reviews (instead of e.g. separate comment requests for each of the review documents); and 3) the last sentence on this page directly contradicts statements on page 6-3 with re: to whether or not comments were received, and should be revised/amended for consistency and clarity.</p>	<p>1) Clarification. This statement is inaccurate and will be deleted. ADEC-Accepted July 2, 2020</p> <p>2) Accepted. The new sentence will be added to Section 6.1 to state: "This notification was in conjunction with the notification of the concurrent Five-Year Review and Periodic Review for other NEC sites." ADEC-Accepted July 2, 2020 The first sentence of the third paragraph in Section 6.2 will be revised to state: "Community interviews for this Periodic Review (and concurrent Five-Year Review and Periodic Review for other NEC sites) were conducted during a community meeting..." ADEC-Accepted July 2, 2020 The first sentence of the second paragraph in Section 6.3 will be revised to state: "...Periodic Review and concurrent Five-Year Review and Periodic Review for other NEC sites could be submitted ..." ADEC-Accepted July 2, 2020</p> <p>3) Clarification. This statement is inaccurate and will be deleted. ADEC-Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p>ADEC’s comments that were submitted for the draft Sites 21 and 28 FYR and the Multisite Periodic Review, that are both generally and/or specifically applicable to Northeast Cape and/or Site 7 respectively should be applied to this document.</p>	<p>Attempts will be made to provide consistency between the Sites 21 and 28 FYR, the Multi-Site Periodic Review, and this Site 7 Periodic Review. Comments directed or deemed to be applicable to multiple documents will be applied wherever possible. However, due to varied document distribution dates this may not be possible in all cases. ADEC-Accepted July 2, 2020</p> <p>A paragraph has been added to the “Periodic Review Summary Form” section. This additional paragraph provides references to the following sections which describe the data review performed for this report and the history of remedial actions taken at the site. This paragraph will be consistently applied between the Multisite Periodic Review Report and the Site 7 Periodic Review Report. ADEC-Accepted August 6, 2020</p> <p>A sentence has been added to the protectiveness statement to identify an estimated date at which the respective remedy currently affecting protectiveness will be implemented. ADEC-Accepted August 6, 2020</p>

#	Page #	Section	ADEC Comment	Response
18.	6-3	6.3	The references and discussion in the last narrative paragraph on this page (preceding the bullet ‘Concern over adequacy’), should be revised/amended as well as possibly relocated since the current presentation and swapping back and forth between review and comment periods is difficult for the reader to follow.	Accepted. The last narrative paragraph and the associated bullets will be relocated to the beginning of Section 6.3. ADEC-Accepted July 2, 2020
			Also, the references to ‘first five-year review period’ for Site 7 should be revised throughout the document since both the 2015 review report and the current document are titled and intended to be Periodic Reviews and not FYRs.	Accepted. References to the ‘First Five-Year Review period’ will be revised to “First Periodic Review period”. ADEC-Accepted July 2, 2020
19.	6-4	6.5	The first sentence of this section should be revised/rephrased since the RAO was to disturb the upper 1 foot by exposing underlying drum/debris, and not the inverse as currently implied; and amended since it is not known whether ‘all underlying debris’ was actually accessible and/or accessed during the investigation and/or removal actions.	Clarification. The text in the beginning of the first sentence is from the first bullet in Section 2.13.2 Description of the Selected Remedy in the Site 7 DD. ADEC-Accepted July 2, 2020
			Please revise the statements and discussion in the last two sentences of this section on this page since the information and perspective as currently presented are inaccurate and misleading; noting that 1) what is being called ‘characterization samples’ in this instance were actually waste characterization samples and not extent characterization, and 2) the last sentence on this page that carries on to page 6-5 should be amended and elaborated in order to be very clear that the stated sampling was limited characterization of focused locations only and was not intended to be nor extensive enough to achieve complete extent characterization (neither presence/absence or the stated ‘remaining contamination’) of Site 7. These and other similar	1) Accepted. The text will be revised to clarify that “waste characterization” samples were collected. ADEC-Accepted July 2, 2020 2) Accepted. The referenced sentence will be revised to state: “Soil, surface water, and groundwater samples were primarily collected to characterize the perimeter of the landfill to determine if landfill COCs were migrating.” ADEC-Accepted July 2, 2020

#	Page #	Section	ADEC Comment	Response
			statements are out of context and potentially misleading, and in association with similar prior comments these issues need to be reconciled throughout the entire document.	
20.	6-5	6.5.1	Please see and apply prior comment re: potential discrepancies and lack of clarity re: the liquid drums; noting the prior section stated 182 liquid containing, of which 50 were disposed offsite – versus the 24 liquid-containing drums mentioned here.	Accepted. Text will be added to clarify that the 24 liquid-containing drums “...resulted from drum removal and emptying activities at Site 7 (USACE 2010). Each liquid-containing accumulation drum...”. ADEC-Accepted July 2, 2020 Additionally, the following edits will be made: Table 4-2 will be revised to indicate that 182 drums were “...crushed before disposal offsite or burial under the Landfill Cap”. ADEC-Accepted July 2, 2020 Text in Section 4.2.1 will be revised to state “After being emptied, cleaned, and crushed, 50 of the waste containing drums were transported offsite and 132 of the waste containing drums were returned to the landfill. More than 1,000 empty drums that were encountered during the excavation were cleaned, crushed, and returned to the landfill.” ADEC-Accepted July 2, 2020
			Discussion in this section should be amended and expanded to better clarify the relationships/correlations between screening results and the fixed laboratory results. For example, discussion mentions the C-D-T field screening kits but doesn’t specify whether the 1,000 ppm is	Accepted. CHLOR-D-TECT was used to field screen for chlorinated compounds. The contents of three drums had CHLOR-D-TECT results

#	Page #	Section	ADEC Comment	Response
			intended to relate to PCBs, but then states 200 mg/kg for lead in the next sentence.	<p>greater than 1,000 ppm. One primary and duplicate composite sample of contents from the same three drums was submitted to the laboratory.</p> <p>The second sentence of the paragraph will be revised to state “Each liquid-containing accumulation drum was field screened for chlorinated compounds using CHLOR-D-TECT test kits and results greater than 1,000 parts per million required fixed laboratory analysis. Three drums had CHLOR-D-TECT results greater than 1,000 parts per million, and one primary and one duplicate sample were composited from the three drums for laboratory analysis.”</p> <p>ADEC-Accepted July 2, 2020</p>
			Further, it is unclear whether field screening results and fixed laboratory results were based upon materials sampled from the same source. For example, was field screening conducted on material at discrete locations as it was discovered, and were fixed lab samples collected from that location or from diluted/mixed waste streams? Noting that the discussion in the first paragraph states 1000 mg/kg in reference to what appears to be multiple contaminants however the sludge results are later referenced as having only up to 2.4 mg/kg PCBs.	<p>Clarification.</p> <p>The field screening (as described in the first paragraph) was performed on liquid waste accumulation drums (containing wastes drained from drums removed from the landfill). The second paragraph describes results from samples collected from oil sludge and oil-contaminated absorbents.</p> <p>ADEC-Accepted July 2, 2020</p>
21.	6-6	6.5.2	<u>Table 6-1</u> : The information and presentation in this table needs to be better clarified. What were the dates and ranges of maximum	Accepted with clarification.

#	Page #	Section	ADEC Comment	Response
			<p>concentrations observed in excavated soil as well as those indicated for the DD? The term 'excavated soil' needs to be clarified whether this concentration is reflective of what was present e.g. at discrete locations or lifts, or whether the listed concentrations represent mixed volumes of excavated soil. Please clarify what is meant by the '>0.5' that is listed for PCBs.</p>	<p>The table presents the maximum detected concentrations in soil, not the range of concentrations.</p> <p>ADEC-Accepted July 2, 2020</p> <p>The following notes will be added to Table 6-1 to state: "DD maximum concentration found in 1994." "DD maximum concentration found in 2001." "DD maximum concentration found in 2005." "Results collected using EnSys PCB field-screening kits (calibrated to 0.5 mg/kg of Aroclor 1260) indicated the PCB concentrations in soil remained above 0.5 mg/kg." "Maximum concentration in excavated soil is from samples collected from bulk soil containers in 2009 prior to offsite transportation and disposal."</p> <p>ADEC-Accepted July 2, 2020; regarding all of the above note amendments.</p>
22.	6-6	6.5.3	<p>The discussion and presentation of information re: surface water COCs and applicable respective cleanup levels needs to be expanded and better clarified in this section and throughout the document where applicable. Applicable COCs for surface water should be considered as all of those contaminants that have been previously detected in surface and groundwater at Site 7. ADEC does not agree with what is</p>	<p>Clarification.</p> <p>Pages 33 through 34 of the Decision Document states the following with regard to surface water criteria: Surface water must meet water quality standards as promulgated by the State of</p>

#	Page #	Section	ADEC Comment	Response
			<p>being presented as ‘TAH/TAqH and sheen’ as being the only ‘surface water criteria’ since all applicable surface water criteria apply to all sites as an ARAR regardless of whether or not it was specified and/or how this is specified in the DD. Any detections of contaminants in surface water are a concern and should be evaluated based on fate and transport and not just whether or not a concentration exceeded respective cleanup levels or criteria. Specific cleanup level concentrations for surface water are based upon exposure risk, whereas detections are a point of concern to evaluate whether or not offsite migration is occurring. ADEC-Partially Accepted July 2, 2020; ADEC does not necessarily disagree with the RTC, however further resolution discussion is necessary, also in relation to other related comments/RTCs on this subject and other related issues. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional response.</p>	<p>Alaska in 18 AAC 70. <i>The water quality criteria for petroleum hydrocarbons, oil, and grease are set out in regulation at 18 AAC 70.020(b) and stipulate these compounds may not cause a visible sheen upon the surface of the water. In addition, the regulations contain surface water quality levels of 0.010 milligrams per Liter (mg/L) total aromatic hydrocarbons (TAH) and 0.015 mg/L total aqueous hydrocarbons (TAqH).</i> TAH is the sum of concentrations of benzene, toluene, ethylbenzene, and xylenes, commonly called BTEX. TAqH is the sum of concentrations of TAH (BTEX) plus the polycyclic aromatic hydrocarbons (PAHs). ADEC-Noted July 2, 2020 The <i>italicized</i> text above describes the applicable surface water criteria within the DD for non-drinking water sources at Site 7, of which are considered protective of human health and the environment. ADEC-Partially Accepted July 2, 2020; please see additional comment on the left. Noted with Clarification. Additional revisions with regard to the discussion of surface water and groundwater will be made to the document. ADEC-Accepted/Noted August 6, 2020</p>
			<p>What are the ‘screening criteria for drinking water’ that are stated in the last sentence on this page?</p>	<p>Clarification.</p>

#	Page #	Section	ADEC Comment	Response
				<p>This statement was made in error. Results from the surface water sampling performed in 2013 were screened against 18 AAC 75, Table C Groundwater Cleanup Levels.</p> <p>ADEC-Accepted July 2, 2020</p> <p>The sentence will be revised to state: “Furthermore, the surface water results for <u>BTEX</u>, PAHs, PCBs, and metals did not exceed any screening criteria for <u>groundwater</u> (USACE 2014).”</p> <p>ADEC-Accepted July 2, 2020</p>
23.	6-7	6.5.4	<p>The discussion should be expanded to provide more appropriate context and perspective re: the selected remedy at Site 7 and applicable groundwater cleanup levels. 18AAC75 Table C groundwater cleanup levels still apply to all groundwater. However the DD did not specify cleanup levels or a remedy for groundwater since the selected remedy involved capping and managing uncharacterized areas and residual contamination in place and subsequently LUCs to prohibit use of Site 7 groundwater; regardless of the status of groundwater contamination and/or the limited extent to which groundwater was not accessible during prior investigations. The resulting primary objective was to demonstrate whether or not contamination in the landfill was migrating offsite, primarily via the migration to groundwater and migration to hydrologically connected surface water pathways.</p>	<p>Clarification. The intent of this section is to provide a summary of historical activities at Site 7. ADEC-Noted July 2, 2020; please note the nature and intent of ADEC’s comment was to amend the narrative in order to provide historical context and perspective on the relevant and applicable regulatory criteria for surface water associated with Site 7. Related to other comments on this subject, potential additional resolution discussion is necessary.</p> <p>Noted, with clarification.</p> <p>Additional revisions with regard to the discussion of surface water and groundwater will be made to the document.</p> <p>Sections 6.5.3 and 6.5.4. will be revised to explain why the DD criteria for surface water</p>

#	Page #	Section	ADEC Comment	Response
				is applicable, as the water at Site 7 is not a current or reasonably expected potential future drinking water source. ADEC-Accepted/Noted August 6, 2020
24.	7-1	7.1	<u>Remedial Action Performance</u> : Please amend references to ‘drum removal’ throughout the document to e.g. ‘limited/focused drum removal’ since it is not known whether all of the drums were removed from the landfill and that was not the objective of the focused and limited removal action.	Accepted. In locations where the text does not already clarify that the drum removal may not have encompassed all remaining drums at Site 7, references to historical drum removal will be revised to “limited”. ADEC-Accepted July 2, 2020
			<u>System O and M</u> : Additional evaluation of the vegetative cover and possible/feasible improvements should be included in the ongoing O&M as well as reasons that support conducting an additional periodic review. Issues involving the vegetative cover should also be included and evaluated in other sections as applicable throughout the document as it relates to and/or impacts the remedy, e.g. protectiveness, functionality, stability, etc. ADEC-Partially Accepted July 2, 2020; ADEC does not disagree with the majority of the RTC, however ADEC does disagree with the last statement, since the waste sources that were discarded at Site 7 are not documented nor have they been entirely characterized; noting further that hazardous materials, both in the form of source/free product and contaminant concentrations in soil and water have been confirmed – none of which would currently be considered appropriate (environmentally or regulatory), or approved for monofill disposal. Further resolution necessary. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional response.	Accepted with clarification. Conducting maintenance of the landfill cap by adding fill to areas that have settled is presented as a recommendation. See response to comment 13. ADEC-Accepted July 2, 2020; per also RTC #13. Capping is a proven remedial technology that is considered protective of human health and the environment. The ADEC solid waste regulations for inert waste monofills specify construction of a final cover of soil material at least 24 inches thick, graded to promote drainage without erosion, and revegetated. ADEC-Partially Accepted July 2, 2020; please see additional response on the left. Accepted.

#	Page #	Section	ADEC Comment	Response
				<p>USACE maintains the position that capping is an appropriate remedial alternative which is protective of human health and the environment. Components of the remedy that also mitigate potential future exposure to landfill contents include periodic visual monitoring of the landfill cap for settlement and erosion, as well as implementation of land use controls to limit groundwater use and prevent construction of buildings on top of the landfill.</p> <p>ADEC-Accepted August 6, 2020</p>
			<p><u>System O and M</u>: Additional attempts to characterize and monitor groundwater, including follow on surface water and sediment sampling should be considered as actions to be implemented in the next five-year/periodic review period. This would provide valuable data to update and support the site model and make definitive determinations and decisions re: the status of fate and transport 10+years after remedy construction. ADEC-Not Accepted July 2, 2020; the available data only confirms that shallow groundwater was not previously accessible via the investigation and well installation methods that were used to date. The data is neither thorough nor definitive enough to make the determination statement that contamination is not migrating from the landfill. Further resolution necessary. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional response.</p>	<p>Disagree.</p> <p>Additional attempts to characterize and monitor groundwater at Site 7 will not be recommended. The surface water data that has already been collected adjacent to the landfill indicates that contamination is not migrating from the landfill.</p> <p>ADEC-Not Accepted July 2, 2020; please see additional comment on the left.</p> <p>Noted.</p> <p>The data collected from the previous monitoring efforts indicate the remedy is functioning as intended and there is no migration of contaminants from the landfill.</p> <p>ADEC-Accepted/Noted August 6, 2020</p>

#	Page #	Section	ADEC Comment	Response
25.	7-2	7.1	<u>Implementation of ICs...</u> : Please replace the phrase ‘are not recommended’ to ‘are prohibited’ throughout the document. This could also be worded e.g. ‘In order to remain protective, the remedy requires the prohibition of...’.	Clarification. The language “are not recommended” is consistent with language in the Site 7 DD and the signs installed on-site in 2018. ADEC-Noted July 2, 2020; potential further resolution may be necessary on addressing this subject in the future. Noted. ADEC-Accepted/Noted August 6, 2020
			Please amend/revise the last sentence of this subsection to specify the new requirements under UECA, and also specify that the NEC is required by the DD/remedy however has not been completed at the time of this review.	Accepted. The last sentence of this section will be revised to state: A deed notice to specify LUCs has not been recorded. It is also recommended the change from LUC and deed notices to UECA and Environmental Covenants, as well as, documentation that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth should be addressed in an ESD document. ADEC-Accepted July 2, 2020
26.	7-3	7.2	<u>Changes in Standards and TBC</u> : ADEC disagrees with the stated COCs, since these should also include other metals and chlorinated contaminants that have been identified (detection confirming presence), in association with different sampling and analysis efforts over the years.	Clarification. The COCs presented throughout this document are the COCs presented in the Site 7 DD. ADEC- Noted/Not Accepted July 2, 2020; ADEC acknowledges the RTC as well as likely divergence on the interpretation of this issue between the agencies, however further resolution is necessary to develop consensus

#	Page #	Section	ADEC Comment	Response
				<p>and understanding on this and other related issue for the purpose of this periodic review and also going forward.</p> <p>Accepted.</p> <p>The following sentence will be added to Section 7.2:</p> <p>Although ethylene glycol and chlorinated paraffins were identified in product accumulated from liquid-containing drums during remedial actions that included offsite disposal of these liquids (see Section 6.5.1 and 6.5.2), these analytes have not been added to the list of Site 7 COCs. These analytes do not present current risk at the site because the liquid was removed and disposed of off-site and any potentially affected soil not removed as part of the previous remedial action exists beneath the landfill cap.</p> <p>ADEC-Accepted August 6, 2020</p>
27.	8-1	8.0	<p><u>Table 8-1</u>: The identified issues which impact future protectiveness have the same/similar impact on current protectiveness and should be presented and discussed accordingly throughout the document.</p>	<p>Accepted.</p> <p>See response to comment 2.</p> <p>ADEC-Accepted July 2, 2020; per also response to RTC #2.</p>
28.	8-1 – 8-2	8.1	<p>This section should include a clarification re: how the ‘Community Issues’ which are listed and discussed in this section relate to those that are included in Appendix E, and vice versa.</p>	<p>Clarification.</p> <p>The community issues presented in Section 8.1 will be moved to Appendix E so that all community issues are presented in the same location. ADEC-Accepted July 2, 2020</p>

#	Page #	Section	ADEC Comment	Response
			<p><u>Uncertainty over site status...</u>: ADEC disagrees with the statement at the bottom of this page that ‘full implementation of LUCs’ is the outstanding issue limiting closure. Please clarify whether ‘closure’ in this context is intended to refer to the FUDS authorization, ADEC site closure, or both. The response to this specific community issue, as well as related discussions throughout the document, should be revised and amended in order to be very clear about the definitions and processes of site closure. It should be noted that ADEC’s site status designation will require and include institutional controls in perpetuity so long as residual contamination and/or uncharacterized areas remain at the site. The remedy also specifies that periodic reviews will be conducted every five years up to 30 years and/or as determined and approved by the agencies. Achieving remedy completion also requires demonstrating that the remedy is both functioning and protective in addition to construction completion.</p>	<p>Accepted. The referenced text will be revised to state: The Site 7 Landfill project is open under the FUDS program and is currently in the remedial action operations phase (i.e., ongoing Periodic Reviews and implementation of land use controls). The primary DD requirement limiting FUDS program closure of the project is full implementation of land use controls. Periodic reviews will continue at the Site 7 Landfill until LUCs are fully implemented. When LUCs are fully implemented, then the site will have met DD requirements. Once DD requirements are met, the site will be closed in accordance with FUDS program project closeout procedures and monitoring will cease. Should new information become available that indicates the presence of FUDS-eligible contamination may pose an unacceptable risk, or an imminent and substantial endangerment to human health or the environment exists, then a new project may be opened, and a preliminary assessment completed. ADEC-Accepted July 2, 2020</p>
			<p>The last sentence of this first response related to the comment immediately above, that continues on to the top of page 8-2 should be</p>	<p>Clarification.</p>

#	Page #	Section	ADEC Comment	Response
			<p>revised in conjunction with similar prior comments above related to the CERCLA process. ADEC's position is since CERCLA contaminants remain at Site 7, and since there are uncharacterized areas remaining, that five-year CERCLA reviews will be necessary to evaluate and maintain the functionability and protectiveness of the remedy.</p>	<p>The Site 7 DD states the project has followed the CERCLA process as a matter of administrative consistency. There were no additional CERCLA contaminants identified at Site 7 during remedy implementation which pose a current or future risk. ADEC-Noted/Not Accepted July 2, 2020; further discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional response.</p>
29.	9-1	9.0	<p><u>Table 9-1</u>: Please revise the table per prior related comments re: current and future protectiveness. The list of follow up actions should include an inspection and additional O&M to occur within the next five years to support the next periodic review.</p> <p>ADEC understands the purpose of notating the Milestone Date five years out from the last 2018 trigger date, however, ADEC requests that Issues No. 1 and 2 in the table be completed in 2020-21. Please amend the table and/or add notes to clarify/specify this.</p>	<p>Accepted with clarification. See response to comment 2. ADEC-Accepted July 2, 2020; per also responses to RTC#2.</p>
			<p><u>Table 9-1</u>: The list of follow up actions should include an inspection and additional O&M to occur within the next five years to support the next periodic review. ADEC-Partially Accepted July 2, 2020; ADEC agrees with the RTC. However ADEC's position is that the stated recommendations for the ESD are not sufficient given ADEC's disagreement on whether or not the entirety of the landfill and associated exposure pathways have all been definitively characterized.</p>	<p>Clarification. Inspection of the landfill cap is a component of the remedy and is therefore not mentioned in this section. ADEC-Noted/Not Accepted July 2, 2020; additional O&M needs should be identified, and further resolution is necessary.</p>

#	Page #	Section	ADEC Comment	Response
			Further resolution is necessary. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional response.	An ESD to document the 2018 ADEC change from LUCs and deed notices to UECA and ECs, and document that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth is recommended. Despite the lack of vegetation on areas of the cap, the cap is stable and not eroding. The remedy is functioning as intended. ADEC-Partially Accepted July 2, 2020; please see additional comment on the left. Noted. ADEC-Accepted/Noted August 6, 2020
			Table 9-1: ADEC understands the purpose of notating the Milestone Date five years out from the last 2018 trigger date, however, ADEC requests that Issues No. 1 and 2 in the table be completed in 2020-21. Please amend the table and/or add notes to clarify/specify this.	Accepted with clarification. See response to comment 2. ADEC-Accepted July 2, 2020; per also responses to RTC#2.
30.	11-1	11.0	Please amend the first sentence to include ‘evaluate remedy functionability and protectiveness’ along with ‘remedy completion’ as reasons warranting future periodic reviews.	Partially accepted. The sentence will be revised to state: “Future Periodic Reviews for Site 7 are necessary to evaluate remedy protectiveness and completion.” ADEC-Accepted July 2, 2020
31.		Figures General	An additional figure should be included in the document that depicts and labels all of the NEC FUDS sites.	Accepted. A figure depicting and labeling the NEC FUDS sites will be inserted as Figure A-2. ADEC-Accepted July 2, 2020

#	Page #	Section	ADEC Comment	Response
32.		Figure A-2	This and other applicable figures should identify and label all significant site features and landmarks e.g. cargo beach, the bay, Suqi River and Site 28 drainage, estuary, airstrip, tram, former antennae array, landfills, etc.	Accepted. Most of the requested site features and landmarks will be identified/labeled on the new Figure A-2. Natural features (i.e., the bay, Suqi River, and estuary) will be labeled on the new Figure A-3. ADEC-Accepted July 2, 2020
			The landfill boundaries would be better depicted with a different color instead of the bold black.	Accepted. The landfill boundary symbol will be revised to a dashed orange/black line. ADEC-Accepted July 2, 2020 Note, this will now be Figure A-3. ADEC-Accepted July 2, 2020
			Recommend changing the red boundary that depicts the AOI for Site 7 to a different color to be more discernible/different than the 'site location' boundary depiction in the bottom left of the figure.	Clarification. The red boundary around Site 7 will be removed as it is not relevant to this figure. ADEC-Accepted July 2, 2020 Note, this will now be Figure A-3. ADEC-Accepted July 2, 2020
			Please add a figure note that clarifies whether there is any significance to the placement and proximity associated with the red boundary around the Site 7 landfill as it is currently depicted on the figure.	Clarification. The red boundary around Site 7 will be removed as it is not relevant to this figure. ADEC-Accepted July 2, 2020 Note, this will now be Figure A-3. ADEC-Accepted July 2, 2020
33.		Figure A-3	Please depict the known and/or inferred flow directions for groundwater, surface water, and/or ephemeral water with respect to the	Accepted.

#	Page #	Section	ADEC Comment	Response
			<p>known and/or inferred gradients (up, down, and cross); on this as well as Figure A-4, and A-6 (if relevant to the specific depicted view of cross section D-D’).</p>	<p>A symbol will be added to the figures to show “Inferred groundwater flow direction”.</p> <p>ADEC-Accepted July 2, 2020</p> <p>A note will be added to the figures to state: “Expected regional groundwater flow direction based on the topography and geology of the NEC site. However, if any groundwater exists, permafrost and frozen soils are a key factor influencing seasonal groundwater flow.”</p> <p>ADEC-Accepted July 2, 2020</p> <p>Note, these will now be Figure A-4, A-5, and A-7. ADEC-Accepted July 2, 2020</p>
			<p>Please add a figure note to clarify whether all of the former 1994 and 2001 monitoring well locations yielded groundwater, and whether the wells were decommissioned or demolished and if then what year (if known). The respective applicable narrative sections should discuss and emphasize detections in groundwater, sediment, and surface water, and not be limited only to whether or not a respective cleanup level was exceeded.</p> <p>ADEC-Noted July 2, 2020; please note this was the nature and intent of ADEC’s comment in order to provide historical context and perspective on the relevant and applicable regulatory criteria for surface water associated with Site 7. Related to other comments on this subject, potential additional resolution discussion is necessary.</p> <p>ADEC-Accepted August 6, 2020; per July 27, 2020 resolution meeting and additional response.</p>	<p>Accepted with clarification.</p> <p>A figure note will be added to describe if the former monitoring well locations yielded groundwater. Decommissioning information will be stated as available in the historical documents. ADEC-Accepted July 2, 2020</p> <p>The discussion of contaminant detections is limited in this report to those which have the potential to pose unacceptable risk at the site due to changing toxicity information and/or assumed exposure scenarios. Further information about detections prior to the DD can be found in the RI reports, monitoring reports which included additional sampling, and remedial action reports.</p>

#	Page #	Section	ADEC Comment	Response
				<p>ADEC-Noted July 2, 2020; please see additional comment on the left.</p> <p>Accepted.</p> <p>Further discussion will be added to the narrative sections to describe the applicability of the DD surface water criteria to Site 7 due to the lack of potential use of surface water as a future drinking water source. ADEC-Accepted August 6, 2020</p> <p>Additionally, in the respective applicable sections where surface water is discussed, additional text will be added to state the surface water is considered representative of groundwater and used to monitor groundwater conditions due to the lack of accessible groundwater at the site and the potential migration of contamination from the landfill. In addition, Sections 6.5.3 and 6.5.4 will be revised so the discussion of groundwater precedes the discussion of surface water.</p> <p>ADEC-Accepted August 6, 2020</p>

#	Page #	Section	ADEC Comment	Response
			'Benthonite' is misspelled in the figure call out. Please also amend the legend entry to include the date which the observation occurred.	Accepted. The spelling error will be corrected to state "Bentonite". The year "2015" will be added to the legend. ADEC-Accepted July 2, 2020 Note, this will now be Figure A-4. ADEC-Accepted July 2, 2020
			Please revise the legend title entry for 'land cap' to 'Landfill Cap Boundary' to be consistent with all other references.	Accepted. The Legend will be revised to state "Landfill Cap Boundary". ADEC-Accepted July 2, 2020 Note, this will now be Figure A-4. ADEC-Accepted July 2, 2020
34.		Figure A-4	Please change the color of the landfill cap boundary depiction to make it a more discernible feature from the other site features, AOI callout, etc.	Accepted. The landfill boundary symbol will be revised to a dashed orange/black line. ADEC-Accepted July 2, 2020 Note, this will now be Figure A-5. ADEC-Accepted July 2, 2020
			Please include a figure note that references the source and date of the survey data, presuming 2018.	Accepted. A note will be added to state: "Survey transects were collected during the 2018 site inspection and were conducted as a component of the Periodic Review." ADEC-Accepted July 2, 2020 Note, this will now be Figure A-5. ADEC-Accepted July 2, 2020

#	Page #	Section	ADEC Comment	Response
			<p>Are the darker blackened areas which are depicted within the AOI call out area intended to be the areas where subsidence was observed? Please add figure notes and/or call-outs to specify this.</p>	<p>Accepted. The darker blackened areas depicted within the AOI call out depict the areas where subsidence was observed. A note will be added to the inset to state: "Darker blackened areas depict locations where subsidence was observed in 2018". ADEC-Accepted July 2, 2020 Note, this will now be Figure A-5. ADEC-Accepted July 2, 2020</p>
35.		Figure A-6	<p>More information and their sources are necessary with re: to the geological profiles, their thicknesses, and slopes. A relative boundary should be depicted for what is known and/or estimated re: the thickness and extent of the bedrock versus the extent(s) of the landfill.</p>	<p>Clarification. The intention of this cross-section is to provide a conceptual site model for Site 7, displaying the location of the remaining landfill material/debris. The thicknesses of units are estimated as noted on the figure, as the cross-section is not to scale. ADEC-Accepted July 2, 2020; please ensure this is adequately specified/clarified in figure notes and/or respective applicable narratives. Accepted. The last paragraph of Section 6.6 will be revised as follows: The Figure A-7 conceptual cross section includes tundra vegetative mat, tundra soil, permafrost, landfill material, landfill cap, and a surface water pond adjacent to the cap; this figure is a visual supplement to the</p>

#	Page #	Section	ADEC Comment	Response
				<p>conceptual site model provided in the DD. <u>The thicknesses of lithologic units displayed in the figure are estimated and the conceptual cross-section is not to scale. The sloping upward topography on each side of the mounded feature is assumed, as the area is a topographic high and the features are likely to follow the same slope as the bedrock feature.</u> ADEC-Accepted August 6, 2020</p> <p>Please note this figure is now A-7. ADEC-Accepted July 2, 2020</p>
			<p>Are the four call out lines that are depicted for debris removal areas actually representative of the approximate locations where debris was removed and/or were there other removal locations? Is it known that the vegetative mat, tundra soil, and permafrost layers slope upward as depicted in the figure; e.g. was this verified by soil borings?</p>	<p>Clarification. The four call out lines are representative of the approximate locations where debris was removed. Please note that the debris removal areas have been added to Figure A-4 (formerly Figure A-3) for reference. The sloping upward topography is assumed as the area is a topographic high and the features are assumed to follow the same slope as the bedrock feature. ADEC-Accepted July 2, 2020; please ensure this is adequately specified/clarified in figure notes and/or respective applicable narratives. Accepted. The last paragraph of Section 6.6 will be revised as follows:</p>

#	Page #	Section	ADEC Comment	Response
				<p>The Figure A-7 conceptual cross section includes tundra vegetative mat, tundra soil, permafrost, landfill material, landfill cap, and a surface water pond adjacent to the cap; this figure is a visual supplement to the conceptual site model provided in the DD. <u>The thicknesses of lithologic units displayed in the figure are estimated and the conceptual cross-section is not to scale. The sloping upward topography on each side of the mounded feature is assumed, as the area is a topographic high and the features are likely to follow the same slope as the bedrock feature.</u> ADEC-Accepted August 6, 2020</p> <p>Please note this figure is now A-7. ADEC-Accepted July 2, 2020</p>
			<p>Please revise/amend the call out for ‘Remaining Landfill Material/Debris’ to clarify 1) what this material is, and 2) avoid misrepresenting the site conditions since debris is known to remain throughout the landfill.</p>	<p>Accepted. “Material” is misleading and will be deleted from the figure. The callout will state “Remaining Landfill Debris” ADEC-Accepted July 2, 2020</p> <p>A note will be added that states, “Other areas of landfill debris exist beneath the landfill cap, but the locations are not known so are not depicted on this conceptual cross-section.” ADEC-Accepted July 2, 2020</p> <p>Please note this figure is now A-7.</p>

#	Page #	Section	ADEC Comment	Response
36.		Appendix B	Please see and apply prior comments above related to the differences between the cleanup levels that the DD did or did not specify for specific contaminants, versus the cleanup levels and ARARs that apply for all confirmed site COCs in respective matrices. ADEC does not necessarily disagree with the conclusions and/or protectiveness determinations, however the current presentation of information causes some lack of clarity and potential ambiguities. This requires better presentation and clarification throughout the document, and further resolution is necessary with re: to how these issues need to be presented in this document so that they are appropriately and accurately carried forward.	<p>ADEC-Accepted July 2, 2020</p> <p>Accepted.</p> <p>The media specific COCs presented in the DD will be clarified in the text.</p> <p>ADEC-Accepted July 2, 2020</p> <p>The following text will be added to state: “For those compounds listed as COCs (<u>diesel-range organics [DRO]</u>, <u>residual range organics [RRO]</u>, <u>arsenic</u>, and <u>polychlorinated biphenyls [PCB]</u>), only the arsenic cleanup level has changed since the time of the last review. The arsenic human health...”</p> <p>ADEC-Accepted July 2, 2020</p> <p>and</p> <p>“There are no newly promulgated standards in 18 AAC 70 for the Site 7 surface water COCs (<u>total aromatic hydrocarbon [TAH]</u>, <u>total aqueous hydrocarbon [TAqH]</u>, and <u>sheen</u>).” ADEC-Accepted July 2, 2020</p>
37.		Appendix C	<u>Five-year Review SI Checklist:</u> <u>I.Remedy Includes:</u> this should also include periodic reviews and ICs.	<p>Noted.</p> <p>“Periodic Reviews” was inadvertently not included as a portion of the remedy because it was not included as a check-box in the EPA standard form. Institutional controls should have also been checked on this form. Section V, C, 1 included information on ICs and a statement regarding a Periodic Review frequency of 5-years. Although USACE</p>

#	Page #	Section	ADEC Comment	Response
				agrees Periodic Reviews and ICs are components of the remedy, the field documentation cannot be amended or revised. ADEC-Accepted July 2, 2020
			<p><u>Five-year Review SI Checklist:</u></p> <p><u>IV.O&M Cost Records:</u> did the original cost estimate include 6 periodic reviews over the ‘up to 30 years’ as identified in the DD?</p>	<p>Clarification.</p> <p>The original cost estimate includes the following for Periodic Reviews, as stated on page 39 of the DD:</p> <p>“After the cap is constructed, periodic visual monitoring, for settlement and erosion, will be conducted over a period of 5 years immediately following the closure. Additional visual monitoring, up to 30 years, may be conducted if deemed necessary based on the results of the site inspections.”</p> <p>ADEC-Accepted July 2, 2020</p> <p>The cost assumes additional visual monitoring but does not specify 6 Periodic Reviews within the 30-year period.</p> <p>ADEC-Accepted July 2, 2020; please ensure the responses above are adequately specified in the checklists and notes.</p> <p>Accepted.</p> <p>Although the field documentation cannot be modified, the following text will be added to Section 4.2.2, Operations and Maintenance:</p>

#	Page #	Section	ADEC Comment	Response
				The estimated cost included in the DD for the response action at Site 7 is \$4.6 million (USACE 2009b). Periodic Reviews, which include additional visual monitoring, constituted \$300,000 of the estimated amount. The number of periodic reviews within the 30-year period specified in the remedy is not defined but is to be performed as necessary. ADEC-Accepted August 6, 2020
			<p><u>Five-year Review SI Checklist:</u> VII. Landfill Covers, 5. Vegetative Covers: Based upon ADEC’s visual estimation (both during the August 2018 site walk and from the photos), less than 70% of the surface has no more than 50% vegetative cover established. Large areas of the cap have little to no vegetative cover at all and this should be evaluated as a construction completion criteria in this review as well as evaluated during the next five-year period to determine if short-term improvements are feasible; and if so, implemented prior to 2023.</p>	<p>Response. The second issue identified in this Periodic Review will not be modified. See response to comments 13 and 29.” ADEC July 2, 2020; per respective applicable responses to RTC numbers 13 and 29. ADEC-Accepted/Noted August 6, 2020; per additional responses to RTC numbers 13 and 29 above and others, as well as the July 27, 2020 resolution meeting.</p>
			<p><u>Five-year Review SI Checklist:</u> XI. Overall Observations, A: ADEC notes that while there appears to be no debris ‘protruding’ out of the cap, that there are numerous misc. debris objects lying on the surface at different random locations across the cap. This debris doesn’t appear to have protruded out or migrated out from underneath the cap and appears to have ‘ended up’ there during construction, however this should be accurately described;</p>	<p>Clarification. Based on the 2018 visual inspection, numerous miscellaneous debris were not identified lying on the surface at different random locations across the cap. Minor debris, at the edges of the cap, were noted and described in this section.</p>

#	Page #	Section	ADEC Comment	Response
			noting that there are numerous locations and not just the one near the pond as currently described.	<p>ADEC-Accepted July 2, 2020</p> <p>The described observations could be improved by stating “observed protruding from or strewn across the cap.” This edit will not be made, as the field documentation cannot be amended or revised.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p><u>Five-year Review SI Checklist:</u></p> <p>XI. Overall Observations, A: Further, ADEC notes that the statement ‘grass appears sparse in some areas’ is a significant understatement, per prior related comments.</p>	<p>Noted.</p> <p>An ESD is recommended to document the 2018 ADEC change from LUCs and deed notices to UECA and ECs, and document that areas of the gravel cap do not contain sufficient fine-grained soil material to support robust plant growth.</p> <p>ADEC-Accepted July 2, 2020</p> <p>Despite the lack of vegetation on areas of the cap, the cap is stable and not eroding. The remedy is functioning as intended.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p><u>Five-year Review SI Checklist:</u></p> <p><u>Cap Inspection Form:</u></p> <p>Please include a narrative clarification on the preceding title page that the 2014 event was the fifth of five inspections, and further clarify why only the 2014 inspection form is included to provide context; e.g. only one of the five events that occurred within the current five-year review period.</p>	<p>Accepted.</p> <p>The following text will be added to the title page: In 2014, the fifth annual cap inspection was performed. Also in 2014, cap maintenance occurred when fill material was added to a small area where settling was noted during the inspection. The 2014 cap maintenance was documented on the USACE 2014 Site 7 landfill cap inspection form.</p>

#	Page #	Section	ADEC Comment	Response
				<p>Unfortunately, this form was erroneously omitted from Appendix E of the 2015 Landfill Periodic Visual Inspection Report (USACE 2016). The cap inspection form is included below.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p><u>Five-year Review SI Checklist:</u> <u>Cap Inspection Form:</u> The information listed for the revegetation and estimated percent cover need to also be discussed in the narrative clarification requested above in conjunction with ADEC's prior comments related to assessing the vegetative cover. How were the 70% and 40% values for the estimated percent cover determined? Clarify in the additional narrative whether or not the hand removal of debris and/or additional capping as noted/recommended in the general comments was completed. ADEC-Partially Accepted July 2, 2020; ADEC concurs with all of the RTC clarifications provided on the right for this comment, however the photo descriptions do not specify all of the information ADEC's comment clarification request, and should be included in respective narrative sections and/or the checklist, photo descriptions, etc. ADEC-Accepted August 6, 2020</p>	<p>Clarification. ADEC-Partially Accepted July 2, 2020; please see additional response on the left. Accepted.</p> <p>Although the Cap Inspection Form cannot be modified, as it is the official record of documentation collected in the field, the following text will be added to the second paragraph of Section 4.2.2: Please note the percent vegetative cover values noted in the inspection form were determined through qualitative visual inspection of the cap and were not quantitatively measured.</p> <p>ADEC-Accepted August 6, 2020</p> <p>The 70% and 40% values for the estimated percent cover were determined through visual inspection of the cap and were not measured values. Hand removal of debris and additional capping is discussed in the subsequent photo log, following the cap inspection form. Photo 11 and Photo 12 address the referenced clarification:</p>

#	Page #	Section	ADEC Comment	Response
				<p>Photo 11: Cap maintenance: A depression near the top of the cap on the west side of the road was filled with clean fine-grained soil material from the borrow area, compacted, fertilized, and seeded, facing NW.</p> <p>ADEC-Accepted July 2, 2020</p> <p>Photo 12: Cap maintenance: Surface debris, mostly metal and cable, was removed primarily from the landfill cap on the east side of the road. Photo shows workers and an excavator removing only visible surface debris, facing NW.</p> <p>ADEC-Accepted July 2, 2020</p>
38.		Appendix E	<p>There are additional ADEC comments that were submitted for the draft 2019 Site 21 and 28 FYR, as well as comments that are forthcoming for the draft 2019 Multisite PR which are generally applicable to this document, and vice versa; please see and apply those applicable comments in order to ensure consistency.</p> <p><u>Community Issues:</u> Page 2 of 12 first response: Please revise/amend the last sentence of first paragraph of the first response that states “The ADEC concurred with the adequacy of the investigations.”; in order to provide a more accurate and appropriate context. This statement and related</p>	<p>Clarification. Attempts will be made to provide consistency between the Sites 21 and 28 FYR, the Multi-Site Periodic Review, and this Site 7 Periodic Review. Comments directed or deemed to be applicable to multiple documents will be applied wherever possible. However, due to varied document distribution dates this may not be possible in all cases. ADEC-Accepted July 2, 2020</p> <p>Accepted. The response will be revised to: The ADEC concurred with the adequacy of the investigations, provided that the remedy is properly implemented and the CERCLA</p>

#	Page #	Section	ADEC Comment	Response
			<p>discussion (and other similar statements throughout the document) should be revised/amended in order to provide the accurate and adequate context. ADEC notes and emphasizes that its concurrence with the limited and focused extents of investigation and site characterization is conditional based upon areas and pathways that remain uncharacterized as well as confirmation sampling not having been conducted during removal actions. Similarly, while ADEC concurs with the Corps' position re: its implementation of the CERCLA process, ADEC has consistently noted and emphasized its positions that much of this concurrence is conditional to ongoing and continued work e.g. LTM, additional site characterization as needed, LUCs and ICs, FYRs and periodic reviews, etc. in order to continue evaluating site conductions and remedy functionability as needed in order to achieve and/or maintain protectiveness. Please apply this to all similar statements in this as well as the other draft FYR and PR documents.</p>	<p>process continues to be followed in order to maintain protectiveness. ADEC-Accepted July 2, 2020</p>
			<p>Pages 2-3 of 12, first response at the top of page 3: Please revise/expand the discussion in this response (and other responses as applicable) to be more specific to the issues surrounding Site 7. It should state that remedies are still being implemented, evaluated and monitored for functionability and protectiveness but also improvements and/or additional LTM, characterization, O&M as needed; and emphasize that development and implementation of LUCs and UECA (in place of the NEC) have not yet occurred but are in progress.</p>	<p>Accepted. The referenced response will include the following additional text: Remedy components specific to Site 7 that have been completed to date include the removal of identified metallic debris (e.g., drums) and drum liquid contents, and associated contaminated soil, installation of a 2-foot thick gravel landfill cap, and revegetation of the site. Remedy components that are currently in progress include the implementation of LUCs, which will limit the</p>

#	Page #	Section	ADEC Comment	Response
				use of groundwater and prevent soil disturbance or construction of buildings at the site. These LUCs will eliminate the potential for exposure to contamination within the landfill. Periodic Reviews with visual inspections are currently ongoing to confirm that no settlement or erosion has occurred on the landfill cap and that the remedy remains protective. ADEC-Accepted July 2, 2020
			Second response in the middle of page 3 of 12: Please replace the phrase ‘are not recommended’ in association with LUCs that are intended to prohibit activity e.g. groundwater use, land disturbance, soil relocation, etc.; please see and apply related prior comments above and apply this consistently throughout the document.	Clarification. The language “are not recommended” is consistent with language in the Site 7 DD and the signs installed on-site in 2018. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020
			Please amend this response further (e.g. the last sentence) to include UECA, ICs, Periodic Reviews for up to 30 years, inspections, LTM and O&M as determined necessary, etc.	Accepted. The following sentence will be added to the response: Periodic Reviews with visual inspections are currently ongoing, and will continue as necessary up to 30 years, to confirm that no settlement or erosion has occurred on the landfill cap and that the cap remains protective. ADEC-Accepted July 2, 2020

#	Page #	Section	ADEC Comment	Response
			<p>Page 6 of 12: Related to comments above re: site-specific comments and responses versus those which are generally included in all three of the Northeast Cape review documents, the last sentence at the bottom of this page states five-year review report when this is actually a periodic review. These should be revised and reconciled throughout all three documents for accuracy, relevancy, and consistency.</p>	<p>Accepted. References to “five-year” reviews will be updated to “periodic” reviews in this document, as applicable. ADEC-Accepted July 2, 2020</p>
			<p>The second response on page 7 of 12: 1) replace references to ‘not recommended’ with ‘prohibited’;</p>	<p>Clarification. The language “are not recommended” is consistent with language in the Site 7 DD and the signs installed on-site in 2018. ADEC-Noted July 2, 2020</p>
			<p>2) further discussion and resolution is necessary with re: to the issues surrounding the potential disagreements, misinterpretations, etc. with re: to the applicability of CERCLA, FYRs vs. PRs, the need for additional LTM and/or O&M, etc. ADEC does not disagree with what is specified in the DD, however ADEC does have concern going forward whether or not the residual contamination at Site 7 will be adequately and appropriately managed to maintain protectiveness.</p>	<p>Clarification. The USACE is bound to that which is stated in the DD, with the exception of new information regarding updated toxicity of known contaminants, previously unidentified exposure pathways, or identification of contamination that was not known at the time of the DD. The primary method by which this information is brought forth is through the Periodic Review process, in which issues and recommendations are determined to maintain protectiveness of the remedy. Issues and recommendations have been identified during this Periodic Review process based upon the findings of this review period. ADEC-Noted July 2, 2020; per</p>

#	Page #	Section	ADEC Comment	Response
				<p>prior related responses to RTCs above, further resolution discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.</p>
			<p>3) the discussion in the response and other references/discussions throughout the document re: groundwater availability should be amended to be very clear that groundwater characterization, from the perspective of contamination extent investigation as well as understanding the hydrogeological dynamic, is very limited and not entirely understood at Site 7; and that while it has been demonstrated via surface water sampling and analysis within the past ten years that Site 7 contamination appears to not be migrating to surface water, it has yet to be demonstrated whether or not infiltration water and/or seasonal groundwater are in communication with residual contamination at Site 7;</p>	<p>Disagree. Additional statements as requested regarding the definitive determination of whether or not Site 7 contamination is in communication with groundwater will not be made. The conceptual site model for the site is that the shallow, seasonal groundwater is slow to recharge, with poor conductivity and transmissivity. The same factors by which the groundwater is a poor drinking water source is also prohibitive of contaminant migration to ‘deeper’ groundwater, which was not identified nor encountered during the RI phase. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary. Noted with Clarification. Additional revisions, as stated in previous comments, will be included in the final version of this document to more clearly demonstrate the lack of available groundwater data and the use of surface water for the evaluation of contaminant migration from the landfill.</p>

#	Page #	Section	ADEC Comment	Response
			<p>and 4) ADEC disagrees with the statement ‘There are no uncharacterized areas of concern that require CERCLA five-year reviews’ and further resolution is necessary to reconcile this issue going forward.</p>	<p>Noted. As previously described above, if new information regarding the site comes to light, USACE will take appropriate action within the bounds of the DD to address the issue. To maintain protectiveness of the remedy, further action has been recommended for issues identified during this review period. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.</p>
			<p>Page 9 of 12: Re: the first sentence of the subsection titled ‘Suggestions...’, it would be helpful to either identify the submitter(s) of each suggestion (e.g. note whether it was a specific or multiple entities), or e.g. revise the opening sentence by omitting ‘the community and ADEC provided’ and simply state e.g. ‘The following suggestions were received...’. This same approach would be helpful to apply to the Issues and responses sections.</p>	<p>Accepted. The sentence following the subsection titled “Suggestions...” will be updated to: The following suggestions were received for the future operation, maintenance, and monitoring at NEC: ADEC-Noted July 2, 2020 No change will be made to the Issues and Responses section, as the introduction to this section is meant to provide a general overview of how the feedback was solicited. The records from interviews conducted and the meeting minutes from the public meeting initiating the start of the review process are included in this appendix for reference to</p>

#	Page #	Section	ADEC Comment	Response
				where the issues were documented and/or originated. ADEC-Noted July 2, 2020
			Last response on this page 9 that continues on to page 10 of 12: ADEC generally does not disagree with the responses discussed in association with the suggestion for LTM at landfill sites as it pertains to the selected remedy. However, ADEC disagrees with the general statement that the LTM is not warranted based on not having been included in the remedy; noting that the suggestion was made based on concerns that additional monitoring may be determined necessary in the short term, and/or in future years. This should be clarified in the responses.	Noted. The USACE is bound to the remedy as stated in the DD unless new information is identified which indicates the selected remedy is not protective. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.
			Further, similar to the evaluations and recommendations that were presented and discussed in the draft 2019 Sites 21 and 28 FYR re: potential amendments/revisions to the DD, and/or a memorandum, ESD, etc.; the same consideration should be applied to considerations for Site 7 going forward, especially with re: to the potential disparity related to residual contamination of both CERCLA and non-CERCLA COCs having been left in place and the remedy specifying PRs instead of FYRs, and due to uncharacterized soil and groundwater issues.	Noted. The USACE is bound to the contaminants of concern, impacted media, and applicable remedies as stated in the DD unless new information is identified which indicates the selected remedy is not protective. There are no uncharacterized areas of concern that require CERCLA Five-Year Reviews. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting.
			Please revise/amend references to groundwater to specify whether shallow or deeper groundwater is implied, and also make the clear	Partially accepted.

#	Page #	Section	ADEC Comment	Response
			<p>distinction that the pathway is not definitively determined with re: to whether or not Site 7 contamination is in communication with shallow and/or deeper groundwater; and further, that the pathway is intended to be controlled via implementing and maintaining UECA/LUCs including restrictions/prohibitions on groundwater use, site disturbance, etc. It is otherwise inappropriate and inaccurate to imply that the groundwater pathway is incomplete due to lack of groundwater. Please apply this rationale throughout the document where applicable.</p>	<p>References to groundwater will be revised to state “shallow” groundwater, where appropriate.</p> <p>Additional statements as requested regarding the definitive determination of whether or not Site 7 contamination is in communication with groundwater will not be made. The conceptual site model for the site is that the shallow, seasonal groundwater is slow to recharge, with poor conductivity and transmissivity. The same factors by which the groundwater is a poor drinking water source is also prohibitive of contaminant migration to ‘deeper’ groundwater, which was not identified nor encountered during the RI phase. ADEC-Noted July 2, 2020; per prior related responses to RTCs above, further resolution discussion necessary.</p> <p>Noted with Clarification.</p> <p>Additional revisions, as stated in previous comments, will be included in the final version of this document to more clearly demonstrate the lack of available groundwater data and the use of surface water for the evaluation of contaminant migration from the landfill. ADEC-Accepted/Noted August 6, 2020; per July 27,</p>

#	Page #	Section	ADEC Comment	Response
				2020 resolution meeting and additional responses.
			First response on page 7 of 12: Please see and apply prior comments above re: the surface water criteria. Further resolution is necessary in order to reconcile this issue moving forward.	Clarification. Please see response to comment 22. ADEC-Noted/Partially Accepted July 2, 2020; per response to RTC#22 and other related comments. Further resolution necessary. Noted. ADEC-Accepted/Noted August 6, 2020; per July 27, 2020 resolution meeting and additional responses.
			<u>Meeting Minutes</u> : Please revise the typos throughout for ‘Duncan’ to Dunkin, and ‘FUDs’ to ‘FUDS’.	Accepted. Changes will be made as requested. ADEC-Accepted July 2, 2020
			Please add an amendment clarification to the USACE Response at the bottom of page 2 of 4 that states ‘The USACE cannot test animals or fish at the NE Cape Site’. ADEC followed up and discussed this issue with USACE after the April 2018 public meeting to clarify that this statement was not necessarily accurate and that the intent of USACE’s response may have been misrepresented and/or misunderstood. The DoD has previously authorized tissue sampling at other FUDS sites to characterize and evaluate effects thresholds and exposure risk(s) to flora and fauna as well as human consumption; and also for the purposes of conducting monitoring. The amendment clarification here and/or in an additional narrative location should emphasize that the remedies for the Northeast Cape sites were based upon whether or not species were present and/or whether or not they are consumed at that time, and finally based upon the results of the prior risk assessment.	The following clarification will be added to the meeting minutes: The USACE representative present at the meeting was incorrect. Fish tissue sampling was performed at Northeast Cape during 1999 and 2001. During these events, fish were collected from the Site 28 Drainage Basin, Suqi River and control streams/rivers using electrofishing techniques, traps, seines, gillnets, dipnets, and angling. The fish were sorted by species, measured, photographed, counted, and visually inspected for deformities and disease. During 1999, captured fish species from the Site 28 Drainage Basin and Suqi River included Dolly Varden char and Alaska Blackfish,

#	Page #	Section	ADEC Comment	Response
			<p>While this issue does not have current direct correlation and/or impacts to the Site 7 remedy, it does for many of the other sites, including e.g. 28, and MOC sites; and since the same meeting minutes are included in all three FYR and PR documents, clarification and discussion re: this issue should be applied to the meeting minutes and respective related responses in all three documents.</p>	<p>ninespine stickleback, and fourhorn sculpin. During 2001, Dolly Varden char were collected from the Suqi River, and Alaska Blackfish were collected from Site 28 Drainage Basin in order to assess toxicity and compare with previous sample results. Fish tissue samples were submitted for laboratory analysis of PAHs, PCBs, metals, and total lipids.</p> <p>A draft Health Consultation prepared by the Agency for Toxic Substances and Disease Registry (ATSDR) dated July 2017 concluded eating fish from Northeast Cape in the summer (3 months) is not expected to harm people's health.</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>Page 3 of 4: the stated cleanup level for PCBs in sediment (0.93 ppm) appears to be incorrect. Table 1 on page 9 of section 1.3 of the DD states that the site-specific cleanup level for PCBs in sediment is 0.7 mg/kg. Please clarify.</p>	<p>Accepted.</p> <p>The bullet will be revised to state: “Congeners do not have a regulatory cleanup level and the DD remedial action objective was to cleanup total PCBs to 1 ppm. Note: This was a mis-statement. The PCB cleanup level presented in the DD and applicable to Site 29 Suqi River sediment is 0.7 mg/kg.”</p> <p>ADEC-Accepted July 2, 2020</p>
			<p>End of ADEC Comments</p>	