ABBREVIATED PRELIMINARY ASSESSMENT

Sealevel Mine: Tidelands

This Abbreviated Preliminary Assessment (APA) for the Sealevel Mine: Tidelands located in Thorne Inlet on Revillagigedo Island, approximately 25 miles by boat and 20 miles by air from Ketchikan was conducted by the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Program (CSP) under the Environmental Protection Agency (EPA) Cooperative Agreement V-00J85601. APAs are intended to identify potential hazards at a site, identify sites that require immediate action, and to establish priorities for sites requiring in-depth investigations. This APA is based on readily available information about the site, a field visit, and limited environmental sampling and is not intended to be a full investigation or characterization of the site. This document is intended to meet the requirements of an APA under the Comprehensive, Environmental, Response, Compensation, and Liability Act (CERCLA) and also be in accordance with the Site Cleanup Rules of 18 Alaska Administrative Code (AAC) 75.325-.390.

Preparers:

Danielle Duncan Date: 7/17/17
Alaska Department of Environmental Conservation
Contaminated Sites Program
410 Willoughby Ave., Suite 303
Juneau, Alaska 99811
(907) 465-5207
Danielle.Duncan@Alaska.gov

Anne Marie Palmieri Date: 7/17/17
Alaska Department of Environmental Conservation
Contaminated Sites Program
PO Box 1542
Haines, Alaska 99827
(907) 766-3184
AnneMarie.Palmieri@Alaska.gov

Site Name: Sealevel Mine: Tidelands

Previous Names (aka): None

Site Owner: Alaska Department of Natural Resources (DNR)

Location: The Sealevel Mine: Tidelands are located in Thorne Inlet on Revillagigedo Island.

Township 75 South, Range 94 East, Sections 12 and 13, Copper River Meridian

Latitude: 55.222100°N **Longitude**: -131.115600°W
Datum: NAD83

Describe the release (or potential release) and its probable nature:
The Sealevel Mine area consists of the Sealevel, Goo Goo, and Gold Banner Mines, and the Keystone Trail which leads to Mesa Lake. The Sealevel Mine: Tidelands site consists of the tideland areas downgradient from the Sealevel Mine and Millsite and the Goo Goo Millsite. The Sealevel Mine and Millsite and Gold Banner Millsite are located on United States Forest Service (USFS) land and are included in the EPA Superfund Enterprise Management System (SEMS) database as AKN001002545. CSP requested access from the landowners of the Goo Goo Mine and Millsite and the Gold Banner Mine, but received no response.

The Sealevel Mine area extends from the eastern shoreline of Thorne Arm on Revillagigedo Island to an elevation of about 300 feet (Figures 1-3). Access to the Sealevel Mine area is possible by boat or float plane and is approximately 25 miles from Ketchikan. The area is a popular sport, recreation, commercial, and subsistence fishing area. The Ketchikan area is known for large amounts of rainfall: an average of 153 inches per year. The winters and summers are mild; the average low temperature is 39 degrees and the average high is 51 degrees. Snowfall is somewhat rare in the Ketchikan area.

Revillagigedo Island is the twelfth largest island in the United States and is over 1,000 square miles in area. The island is part of the Tongass National Forest which is a temperate rain forest characterized by Sitka Spruce, Western Redcedar, Western Hemlock, Alaska (yellow) cedar, and Devil's Club in addition to many mosses and ferns. The Misty Fjords National Monument and National Wilderness area are located nearby.

According to the Ketchikan Gateway Borough webpage, 96.5% of the lands on Revillagigedo Island are managed by the USFS, including the uplands of the Sealevel Mine area. The tidelands and other minor portions (1.3%) are owned and managed by the State of Alaska. Private ownership and local governments both account for 0.3% of the land holdings. Forestry, tourism, and fisheries (commercial, subsistence, and charter) are important economic drivers for the few communities on the island. The area supports all five species of Pacific Salmon in addition to black and brown bears, marine mammals, bald eagles, seabirds, deer, and others. The island is accessible by the many logging roads present on the island, however, many of these are in poor condition, and much of the access is limited to boats and float planes.

Site Ownership/History
The Sealevel Mine area contains five mining claims: Sealevel Alaska Resources Data File (ARDF) # KC095, Gold Banner # KC098, Seabreeze # KC094, Goo Goo # KC096, and Goo Goo Extension # KC097 (Figure 8). These are associated with US Mineral Surveys 423 (Sea Breeze Claim), 1598 (Goo Goo Claim and Goo Goo Extension No. 1 Claim), and 535 (Gold Banner Claim). The two Goo Goo Claims were staked in 1935 by Richard Nuckolls and Gunder Nygard. The Sea Breeze Lode was staked by The Sea Breeze Mining Company in 1901. According to the historical record, the Sealevel Mining and Milling Company were foreclosed on in 1906 (presumably aka. The Sea Breeze Mining Company). Attempts were made to reopen the mine until 1926 when the Peerless Consolidated Mining Company reopened the mine and conducted some work, however, short lived. There are no other ownership documents available for the Goo Goo and Seabreeze Claims in the DNR Recorder's Office until 1986 when The Trillium Corporation quit claimed the property to David and Kay Syre. Other mining claims in southeast Alaska were also included in this transaction.

In 1989, the Syres quit claimed the properties to Ketchikan Pulp Company who then granted the properties to Gateway Forest Products. A Notice of Default and Sale was recorded in 2002 for the Goo Goo Claims ultimately leading to the Ketchikan Gateway Borough receiving the land. The Goo Goo and Seabreeze Claims were granted by the Ketchikan Gateway Borough to Sea Level Enterprises LLC in 2004. The claims were sold by Sea Level Enterprises LLC in 2008 to Jerry and Candi Scudero who currently own them. In 2009, the Scuderos applied for a DNR land use permit in conjunction with the planned construction and operation of a commercial fishing lodge. Currently, two small cabins are located on this claim.

The Gold Banner mining claim was staked in 1901 by Joseph Hamblet. The claim was foreclosed in 1977 by the Ketchikan Gateway Borough. The next available document in the Alaska DNR Recorder's office is a quit claim deed whereby Houston Oil and Minerals Exploration Company sold the property to George Moerlein. In 2007, the Aloha Lumber Corporation sold the property to A&B Holdings, LLC who currently owns it.

The Sealevel Mine claims were staked in the early 20th century and exploration work commenced shortly thereafter. A 35-foot tunnel was advanced at the mine site and $10,000 in ore was recovered. By 1902, it was the most active mine in southern Alaska having 800 feet of workings, a camp, and a 30-stamp mill. The length of the workings at the Sealevel Mine was more than 1,200 feet and included a short tunnel with a winze that presumably adjoined the Goo Goo Claims with the Sea Breeze Claims. However, shortly after the mill started up, it was intermittently shut down for lack of ore. By 1913, the buildings were in a state of disrepair. Beginning in 1926, the Peerless Consolidated Mining Company reopened the mine and built a new camp, power plant, and a 50-ton mill. The Peerless Consolidated Mining Company processed about 300 tons of ore before ceasing operations and selling the claims for timber. The total amount of ore processed is unknown, however, it has been estimated that over 17,000 tons of ore were mined and milled before 1934.

Previous Investigations

The CSP became aware of potential contamination on the State-owned tidelands at the Sealevel Mine in 2002 following receipt of an Engineering Evaluation/Cost Analysis (EE/CA) conducted in the uplands by the USFS. The EE/CA identified the potential for contamination to be present in the tidelands due to upland contamination migrating to the tidelands, however, the USFS did not collect sediment samples on the tidelands. Annotated figures from the 2002 EE/CA are included in Figures 9-13.

April 2017 Site Visit

The Sealevel Mine: Tidelands site was investigated by the ADEC on April 18, 2017. A representative of ADNR, Division of Mining, Lands and Water also participated in the site visit. During the site visit, the ADEC observed the site via the water and by land. No obvious signs of contamination such as waste rock or tailings piles, derelict buildings or machinery, or any other items which would indicate contamination were present in the intertidal zone. In the forested uplands directly upgradient from the site, some ore buckets and piping were observed. According to the EE/CA, there are waste rock piles, adits, and trenches located in the uplands, but the CSP did not access these federally-owned areas.

All field and sampling activities were conducted according to the ADEC's Division of Spill Prevention and Response CSP *Field Sampling Guidance* dated March 2016, and the *Sampling and Analysis Plan* developed for the Sealevel Mine: Tidelands (Appendix 6). The sediment and surface water samples were analyzed for Resource Conservation and Recovery Act (RCRA)-8 metals and mercury using EPA Methods 6020A and 7471A, respectively. All analyses were completed at TestAmerica in Tacoma, Washington. The data met the data quality objectives of the Site Discovery Program Quality Assurance Project Plan (QAPP) dated April 2015. A CSP Data Review Checklist is included in Appendix 7 and the original laboratory data sheets can be found in Appendix 8.

For the purposes of this investigation, analytical sample results for sediments were compared to the National Oceanic and Atmospheric Administration's Screening Quick Reference Table (SQuiRTs) Threshold Effects Level (TEL) and sample results for water were compared to the ADEC Water Quality Criteria. All sample results were also compared to the EPA APA screening levels as defined by the HRS Final Rule. The appropriate APA screening level is: 1) equal to or greater than the sample's Sample Quantitation Limit (SQL); and 2) equal to or greater than the background sample's SQL when the background concentration is below detection limits; or 3) at least three times greater than the background concentration when the background concentration equals or exceeds the detection limits.

Part 1 – Superfund Eligibility Evaluation

If all answers are "no" go on to Part 2, otherwise proceed to Part 3.

		YES	NO
1.	Is the site currently in CERCLIS or an "alias" of another site?		X
2.	Is the site being addressed by some other remedial program (Federal, State, or Tribal)?		X
3.	Are the hazardous substances potentially released at the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the NRC, UMTRCA, or OSHA)?		X
4.	Are the hazardous substances potentially released at the site excluded by policy considerations (i.e., deferred to RCRA corrective action)?		X
5.	Is there sufficient documentation to demonstrate that no potential for a release that could cause adverse environmental or human health impacts exists (e.g., comprehensive remedial investigation equivalent data showing no release above ARARs, completed removal action, documentation showing that no hazardous substance releases have occurred, or an EPA approved risk assessment completed)?		X

Please explain all "yes" answer(s): N/A

Part 2 – Initial Site Evaluation

For Part 2, if information is not available to make a "yes" or "no" response, further investigation may be needed. In these cases, determine whether an APA is appropriate. Exhibit 1 parallels the questions in Part 2. Use Exhibit 1 to make decisions in Part 3.

		YES	NO
1.	Does the site have a release or a potential to release?	X	
2.	Does the site have uncontained sources containing CERCLA eligible substances?	X	
3.	Does the site have documented on-site, adjacent, or nearby targets?	X	

If the answers to questions 1, 2, and 3 above were all "yes" then answer the questions below before proceeding to Part 3.

		YES	NO
4.	Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?		X
5.	Is there an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site?	X	
6.	Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but there are nearby targets (e.g., targets within 1 mile)?		X
7.	Is there no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site?		X

Site Evaluation Information

Soil Exposure Pathway

No soil samples were collected at the Sealevel Mine: Tidelands site.

Surface Water Pathway

Surface Water Sample Results

Two primary samples, a duplicate, and a background surface water sample were collected at the Sealevel Mine: Tidelands site (Figures 4-6, Photos 1-12). Sample ST06WA and its duplicate were collected from a creek north of the rocky bluff downgradient from the Sealevel Millsite. ST11WA was collected from Gokachin Creek within the intertidal zone presumably downgradient from the Gold Banner Millsite which was situated on Gokachin Creek. ST12WA (background) was collected upgradient from the location of the millsite on Gokachin Creek.

There were no detections of RCRA-8 metals or mercury in any of the water samples, with the exception of copper and barium. The background sample had no detections of metals except for

barium at 0.0068 mg/L; therefore, with the exception of barium, the laboratory reporting limits were used for the APA screening values.

Copper was detected downgradient of the Sealevel Millsite in the primary sample ST06WA and its duplicate, ST07WA, at 0.004 milligrams per liter (mg/L) and 0.0033 mg/L, respectively. Both of these concentrations were below the APA screening level of 0.01 mg/L. Copper was not detected in sample ST11WA from the intertidal area of Gokachin Creek. When analyzed as dissolved metals, the copper concentrations were non-detect.

Barium was detected downgradient of the Sealevel Millsite in the primary sample ST06WA and its duplicate, ST07WA, at 0.037 mg/L and 0.039 mg/L, respectively. Both of these concentrations were above the APA screening level of 0.02 mg/L. Barium was detected in sample ST11WA, from the intertidal area of Gokachin Creek, at a concentration of 0.0068 mg/L, which is below the APA screening level. When analyzed as dissolved metals, the barium concentrations were consistent with the total metals results.

There was an insufficient sample volume for these samples for the laboratory to analyze the hardness of the water, thus, location-specific Water Quality Standards protective of ecological receptors could not be calculated. These samples met the State of Alaska Water Quality Standards which are protective of drinking water. The water samples had pH values ranging from 6.9-7.3.

Table 1: Surface Water Sample Analytical Results (Total metals)

Sample ID	Description	As	Ba	Cd	Cr	Cu	Pb	Se	Ag	Hg
ST06WA	Downgradient of Sealevel Millsite	ND (0.0050)	**0.037**	ND (0.0020)	ND (0.0020)	0.004	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)
ST07WA	Duplicate of ST06WA	ND (0.0050)	**0.039**	ND (0.0020)	ND (0.0020)	0.0033	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)
ST11WA	Gokachin Creek intertidal	ND (0.0050)	0.0039	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)
ST12WA	Gokachin Background	ND (0.0050)	0.0068	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)
APA screening level		0.0050	0.020	0.0020	0.0020	0.010	0.0040	0.040	0.0020	0.00030
AWQS: Drinking		0.01	2.0	0.0050	0.10	1.0	0.015	0.050	0.1	0.0020

Notes:

1. All sample results in mg/L.
2. Bolded values exceed APA screening levels of 3-times the background concentration for sample analytes greater than the sample quantification limit (SQL) or greater than the SQL for sample analytes not detected/concentrations below the SQL .
3. Italicized values exceed Alaska Water Quality Standards (AWQS) for drinking water.
4. "ND" = analyte not detected at the laboratory detection limit. The reporting limit is provided in parentheses.

Table 2: Surface Water Sample Analytical Results (Dissolved metals)

Sample ID	Description	As	Ba	Cd	Cr	Cu	Pb	Se	Ag	Hg	pH
ST06WA	Downgradient of Sealevel Millsite	ND (0.0050)	**0.039**	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)	7.3
ST07WA	Duplicate of ST06WA	ND (0.0050)	**0.040**	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)	7.3
ST11WA	Gokachin Creek intertidal	ND (0.0050)	0.0043	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)	7.3
ST12WA	Gokachin Background	ND (0.0050)	0.0068	ND (0.0020)	ND (0.0020)	ND (0.010)	ND (0.0040)	ND (0.040)	ND (0.0020)	ND (0.00030)	6.9
APA screening level		0.0050	0.020	0.0020	0.0020	0.010	0.0040	0.040	0.0020	0.00030	
AWQS: Drinking		0.01	2.0	0.0050	0.10	1.0	0.015	0.050	0.1	0.0020	

Notes:

1. All sample results in mg/L.
2. Bolded values exceed APA screening levels of 3-times the background concentration for sample analytes greater than the sample quantification limit (SQL) or greater than the SQL for sample analytes not detected/concentrations below the SQL .
3. "ND" = analyte not detected at the laboratory detection limit. The reporting limit is provided in parentheses.

Potential Targets

The surface water migration pathway 15-mile target distance limit (TDL) begins at the probable point of entry at the tidelands downgradient from the mine sites and extends to Thorne Inlet and Revillagigedo Channel (Figure 2-3).

Drinking Water Threat: There are no drinking water intakes located within 15-mile downstream of the site as the site is in the marine intertidal zone. The site does not lie within a State of Alaska Drinking Water Protection Zone according to the ADEC Drinking Water Protection web map accessed May 12, 2017.

Human Food Chain Threat: Fisheries (commercial, sport, and subsistence) that occur within the Ketchikan area are salmon, herring, halibut, rockfish, greenling, lingcod, Pacific cod, shrimp, crab, mussels, sea cucumbers, and clams. There are two anadromous streams, Gokachin and Sea Level Creeks, on site and numerous other anadromous streams within the 15-mile target distance limit. (Figure 7).

Environmental Threat: Sensitive environments within the 15-mile target distance limit are the Misty Fjords National Monument and National Wilderness area. The site is classified as an estuarine and marine wetland, according to the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory. The site is adjacent to freshwater forested/shrub wetlands. According to the USFWS, the following threatened or endangered species may occur in the area: Humpback Whale (*Megaptera novaeangliae*), Sperm Whale (*Physeter catodon (microcephalus*), Blue Whale (*Balaenoptera musculus*), North Pacific Right Whale (*Eubalaena japonica*), and Short-Tailed Albatross (*Phoebastria (diomedea) albatrus).*

Sediment Sample Results

Seven primary and one duplicate sediment samples were collected from the Sealevel Mine: Tidelands site. Samples ST02SD, ST03SD, ST04SD, and ST05SD were collected downgradient from the

Sealevel Millsite and samples ST08SD, ST09SD, and ST10SD were collected downgradient from the Goo Goo Millsite and cabins (Figures 4-6). The background sediment sample was collected approximately 0.1 mile from the Sealevel Millsite on the other side of a prominent rocky bluff.

The CSP sampling team used the previous sample results from the 2001 EE/CA to select sample locations downgradient from Sealevel Millsite. The 2001 EE/CA identified mercury contamination in soil at concentrations up to 160 mg/kg (Figures 9 and 10). The current investigation placed sample ST02SD at the highest point of DNR-managed lands and downgradient from the suspected area of previously-determined elevated mercury. At this location, sample results showed a mercury concentration of 0.16 milligrams per kilogram (mg/kg), which is above the APA screening level of 0.135 mg/kg and NOAA TEL of 0.13 mg/kg. This sample result also contained an elevated copper concentration of 33 mg/kg which exceeded the APA screening level of 27.3 mg/kg and the NOAA TEL of 19 mg/kg. Sample ST03SD and its duplicate ST04SD were located down the beach at the edge of the water line adjacent to some metal debris. This sample location was selected in order to determine if contamination had migrated extensively from the uplands. The primary sample result showed a chromium concentration of 13 mg/kg which exceeds the APA screening level of 9.6 mg/kg, but is lower than the NOAA TEL of 52 mg/kg. The duplicate sample result showed a chromium concentration of 6.9 mg/kg which is below both screening levels. The primary sample result showed a mercury concentration of 0.035 mg/kg and the duplicate result showed a concentration of 0.012 mg/kg; both results are below the screening levels. Sample ST05SD was located on the eastern side of the beach adjacent to the rock outcrop. The rock outcrop extended around the entire front of the site preventing access to any tidelands. None of the detected metals in this sample were found at concentrations exceeding either the APA screening level or NOAA TEL. Mercury was present in this sample at a concentration of 0.026 mg/kg.

Although elevated concentrations of lead were present in the uplands according to the EE/CA, the current data suggests that lead concentrations downgradient of the Sealevel Millsite are less than 10 mg/kg. Furthermore, the concentration of lead found in sample ST02SD was similar to that found in samples ST03SD and ST04SD.

Samples ST08SD, ST09SD, and ST10SD were collected downgradient of the Goo Goo Millsite, with samples ST08SD and ST09SD collected below the cabins and ST10SD located on a beach spit separated by a small expanse of water at low tide. Sample ST08SD contained a copper concentration of 25 mg/kg which exceeds the NOAA TEL of 19 mg/kg, but doesn't exceed the APA screening level of 27 mg/kg. Sample ST09SD contained a copper concentration of 52 mg/kg which exceeds both the NOAA TEL and APA screening level. Sample ST10SD contained an elevated concentration of chromium of 12 mg/kg as compared to the APA screening level of 9.6 mg/kg and the NOAA TEL of 52 mg/kg, and an elevated concentration of copper of 28 mg/kg which exceeded both the APA screening level and NOAA TEL. None of the other detected metals in these three samples were found at concentrations which exceeded either of the respective screening levels.

There were no exceedances of the APA screening levels or NOAA TEL values for arsenic, barium, cadmium, lead, selenium, or silver for any of the sediment samples collected on site, with one exception. The NOAA TEL value for arsenic was exceeded in one sample, ST04SD; although the arsenic result exceeded the TEL in the duplicate sample, the primary sample result itself didn't exceed it.

Table 3: Sediment Sample Analytical Results

Sample ID	Description	**As**	**Ba**	**Cd**	**Cr**	**Cu**	**Pb**	**Se**	**Ag**	**Hg**
ST02SD	Downgradient of Sealevel Millsite: south of camp creek - High intertidal	5.3	39	ND (0.45)	9.4	***33***	6.2	0.56	0.035	***0.16***
ST03SD	Downgradient of Sealevel Millsite: Downhill of ST02SD and near metal debris	5.3	35	ND (0.39)	**13**	12	7.5	0.28	ND (0.19)	0.035
ST04SD	Duplicate of ST03SD	*8.6*	26	0.12	6.9	14	5.7	0.34	0.033	0.012
ST05SD	Downgradient of Sealevel Millsite: East side of beach near rock bluff	3.4	21	ND (0.42)	8.8	14	2.0	ND (1.0)	ND (0.21)	0.026
ST08SD	Downgradient of the Goo Goo Millsite: In front of northern cabin	5.9	19	ND (0.36)	8.4	*25*	7.6	ND (0.90)	ND (0.18)	0.011
ST09SD	Downgradient of the Goo Goo Millsite: Below cabins	4.4	26	ND (0.44)	9.2	***52***	1.8	0.34	ND (0.22)	ND (0.032)
ST10SD	Downgradient of the Goo Goo Millsite: On low-tide spit	6.1	34	0.098	**12.0**	***28***	3.8	0.75	ND (0.24)	0.013
ST01SD	Background past/NW of Rocky Point	4.8	71	ND (0.44)	3.2	9.1	6.0	0.93	0.033	0.045
APA screening level		14.4	213	0.44	9.6	27.3	18	2.79	0.099	0.135
NOAA TEL		7.2	130	0.68	52	19	30	1,000	0.73	0.13

Notes:

1. All sample results in mg/kg.
2. All samples collected from 0-6" below ground surface.
3. Bolded values exceed APA screening levels of 3-times the background concentration for sample analytes greater than the sample quantification limit (SQL) or greater than the SQL for sample analytes not detected/concentrations below the SQL .
4. Italicized values exceed NOAA SQuiRTs marine water sediment threshold effect level (TEL).
5. NOAA screening value for selenium is based on the Apparent Effects Threshold (AET) as there is no TEL available.
6. "ND" = Not detected at the laboratory detection limit. The reporting limit is provided in parentheses.

Potential Targets

The Sealevel Mine: Tidelands site is accessible by boat or float plane. The only potential residences within the 1-mile TDL are the two cabin located on the Goo Goo Millsite. The frequency and type of use of these cabins is unknown. There is a well-maintained and marked trail in the uplands from the cabins to the Sealevel millsite, however the rocky outcrop and bluff prevent access by foot along the beach. Within the 4-mile TDL, there is a USFS cabin (Fish Creek Cabin) located approximately 1-1.5 miles from the site. The cabin is located on Thorne Arm and maintained trails provide access to Gochakin Lake and Low Lake; both trails lead away from the site. According to the online reservation system (www.recreation.gov), the cabin is available year-round and is currently reserved for 8 days in July, 16 days in August, and 13 days in September. It is possible that people could be exposed to elevated metals concentrations by harvesting wild food products, such as mussels or crab. A human health Conceptual Site Model is included in Appendix 3.

Environmental Threat: The intertidal sediments are contaminated with concentrations of several metals (chromium, copper, and mercury) above screening. These concentrations tend to be highest closest to the mining activity in the uplands and decrease with distance from the uplands. Potential intertidal targets are mussels, crab, and other marine intertidal organisms. In addition, the following threatened or endangered species occur in the area according to the USFWS: Humpback Whale (*Megaptera novaeangliae*), Sperm Whale (*Physeter catodon (microcephalus*), Blue Whale (*Balaenoptera musculus*), North Pacific Right Whale (*Eubalaena japonica*), and Short-Tailed Albatross (*Phoebastria (diomedea) albatrus)*. Terrestrial mammals such as bear, wolves, mink, marten, and others may be exposed to the contaminated sediments when accessing the marine water. It is unlikely that populations of these species are significantly affected by the metals contamination due the low levels of contamination and the sizes of their habitat ranges being far larger than the contaminated area. An ecological Conceptual Site Model is located in Appendix 4.

<u>Ground Water Pathway</u>

The Sealevel Mine: Tidelands site is located within the intertidal zone downgradient of the Sealevel Mine. Groundwater is not expected to be potable due to salt water infiltration. The water source for the recreational cabins at the Goo Goo Millsite is unknown. The State of Alaska does not require private persons to register their private drinking water wells, however the DNR maintains an online well inventory, Well Log Tracking System (WELTS). A search of WELTs for the Sealevel Mine: Tidelands areas found one registered well approximately 10 miles northwest of the site registered to the Coast Guard in support of a Loran site (Appendix 1, Figure 2). A human health Conceptual Site Model is included in Appendix 4.

Part 3 – ADEC Site Assessment Decision

When completing Part 3, use Part 2 and Exhibit 1 to select the appropriate decision. For example, if the answer to question 1 in Part 2 was "no," then an APA may be performed and the "NFRAP" box below should be checked. Additionally, if the answer to question 4 in Part 2 is "yes," then you have two options (as indicated in Exhibit 1): Option 1 -- conduct an APA and check the "Lower Priority SI" or "Higher Priority SI" box below; or Option 2 -- proceed with a combined PA/SI assessment.

Check the box that applies based on the conditions of the APA:

X	NFRAP		Refer to Removal Program – further site assessment needed
	Higher Priority SI		Refer to Removal Program - NFRAP
	Lower Priority SI		Site is being addressed as part of another CERCLIS site
	Defer to NRC		Other: Refer to State for further evaluation

The ADEC recommends the EPA make a determination that the Sealevel Mine: Tidelands is eligible for NFRAP under CERCLA.

ADEC Reviewers: Danielle Duncan and Anne Marie Palmieri

PLEASE EXPLAIN THE RATIONALE FOR YOUR DECISION:

A site inspection at the Sealevel Mine: Tidelands was conducted on April 18, 2016 by the ADEC. Direct observations and limited sample collection found low-level metals contamination within the State-owned inter-tidal zone downgradient from the USFS-managed Sealevel Mine (AKN001002545). It is likely that the metals contamination migrated from the uplands into the intertidal zone; however, sampling found that the metals contamination in the marine sediment appears to be discrete and limited in area. Three metals were found above APA screening levels: mercury, copper, and chromium. The mercury concentrations measured on site only exceeded the APA screening level at the location nearest the Sealevel mill site. Copper concentrations above APA screening levels were also located downgradient from both the Sealevel mill site and the Goo Goo mill site, however the highest of these was 52 mg/kg. Chromium concentrations slightly exceeded the APA screening levels in one sample at each of the Sealevel mill site and Goo Goo mill site, and the concentrations ranged from 6.9-13 mg/kg. While these metals concentrations are above APA screening levels, the ADEC does not believe that they present a significant threat to human health or the environment due to the low-levels and limited extent of the elevated levels. Additionally, the ADEC believes that when a cleanup occurs on the USFS-managed uplands the downgradient migration of metals and the environmental threat will be greatly reduced.

Appendix 1: Site maps

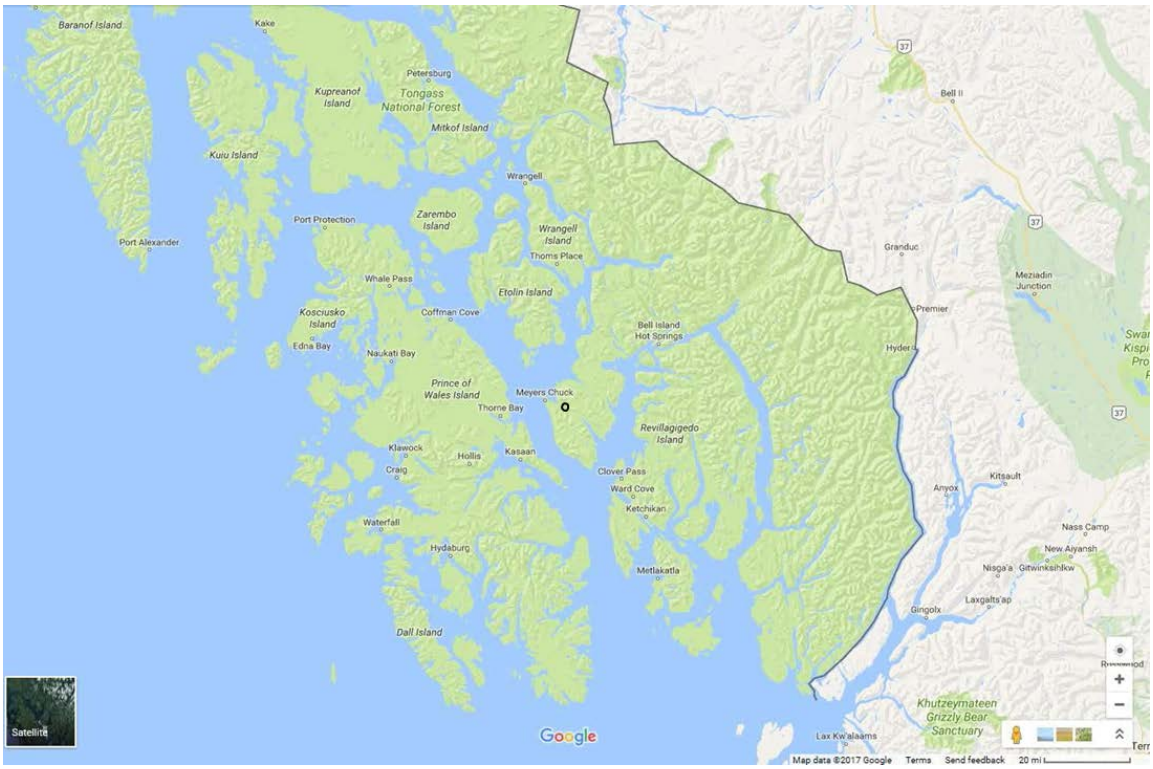


Figure 1: The location of the Sealevel Mine: Tidelands in Thorne Inlet, Alaska (circled in black). Figure copied from Google Maps

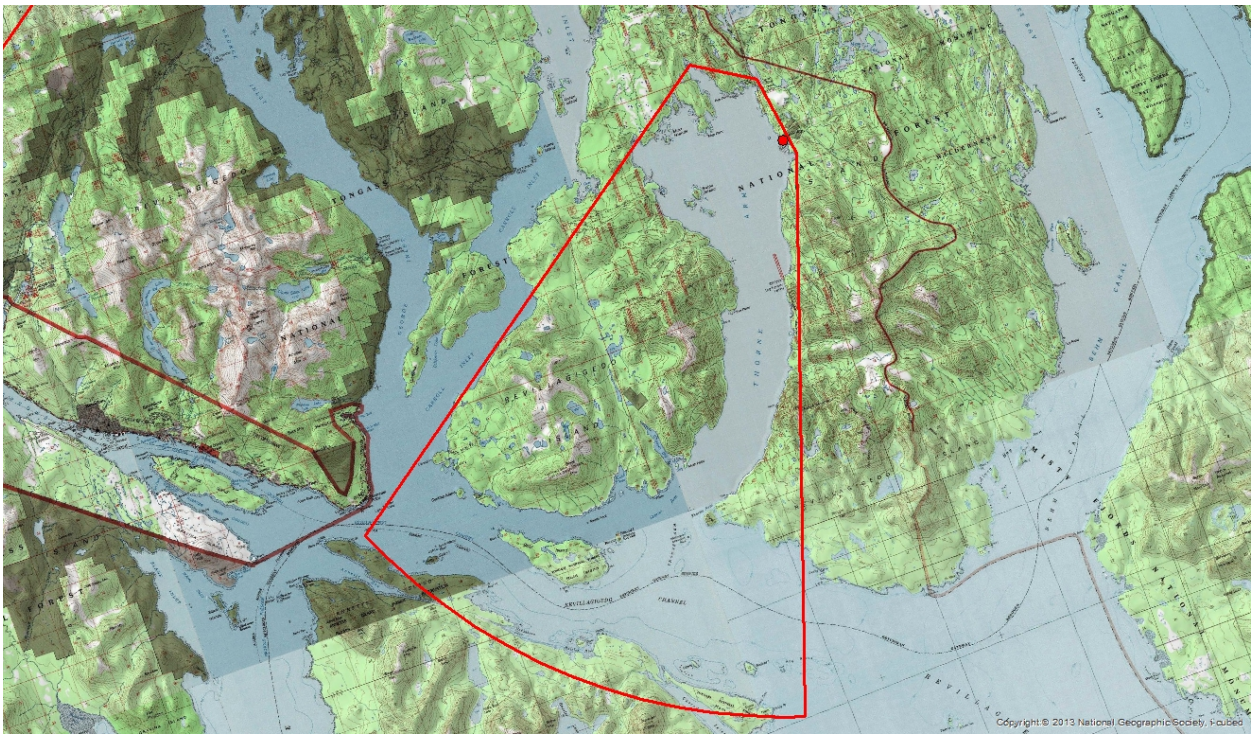


Figure 2: The location of the Sealevel Mine: Tidelands and 15 mile target distance limit.

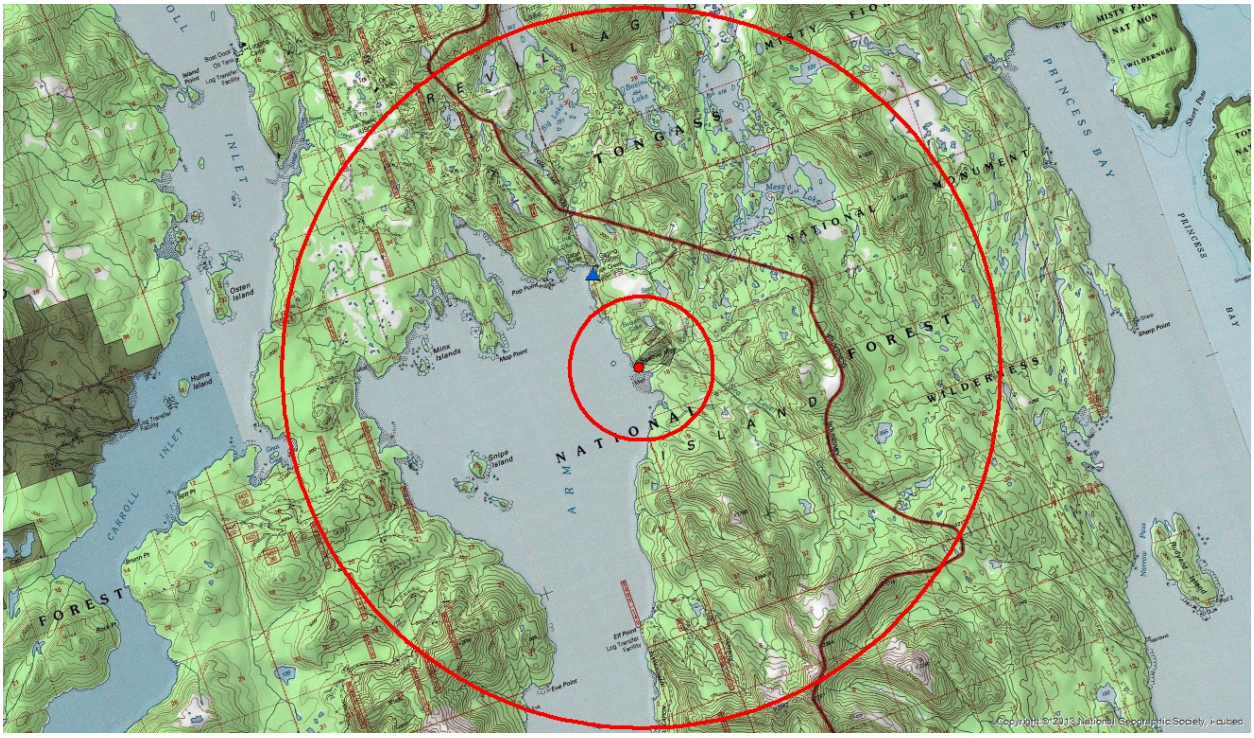


Figure 3: The one (1) and four (4) mile target distance limits for the Sealevel Mine: Tidelands. The USFS cabin is located north of the site and is denoted by a blue triangle.

Figure 4: Aerial view of sampling locations and overlaid mine claims and millsites. Note: the mine claims and millsite locations are approximate.

Figure 5: Topographic view of sampling locations and overlaid mine claims and millsites.

Figure 6: Zoomed aerial view of sampling locations downgradient of the Sealevel Millsite.

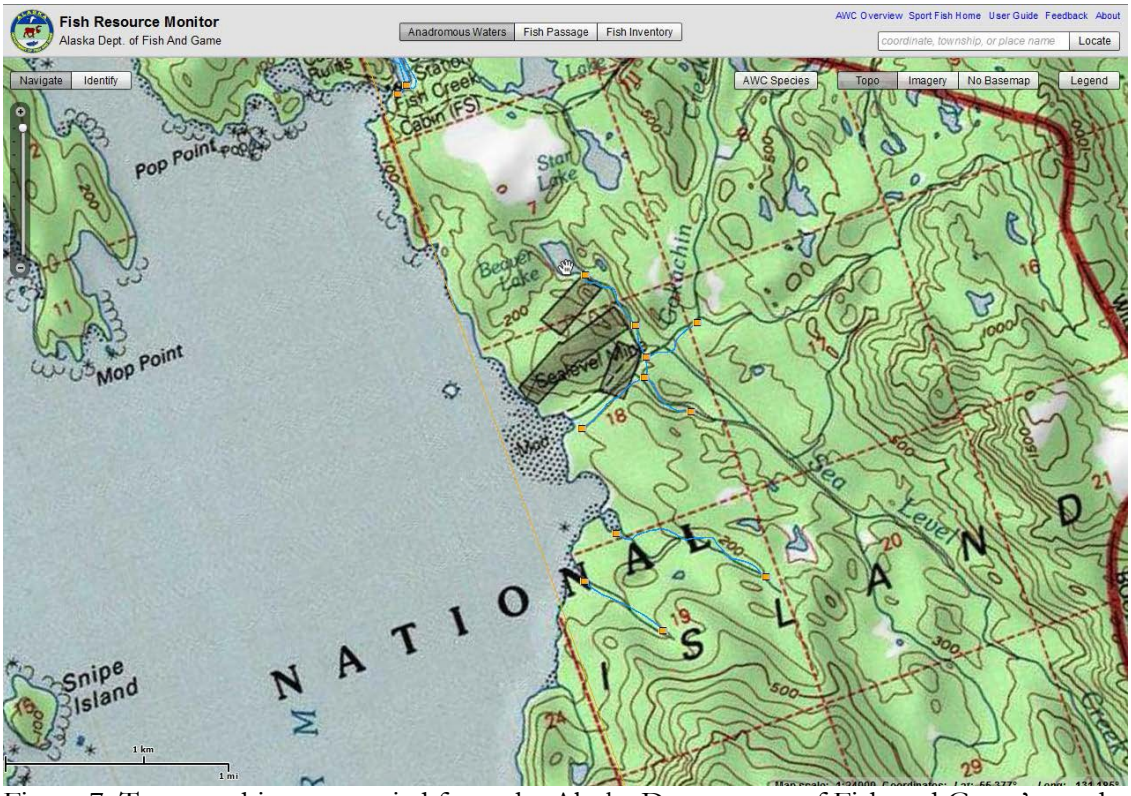


Figure 7: Topographic map copied from the Alaska Department of Fish and Game's anadromous stream web map showing the locations of the two anadromous streams (Gokachin and Sea Level Creeks) at the Sealevel Mine: Tidelands site. Orange squares denote anadromous points.

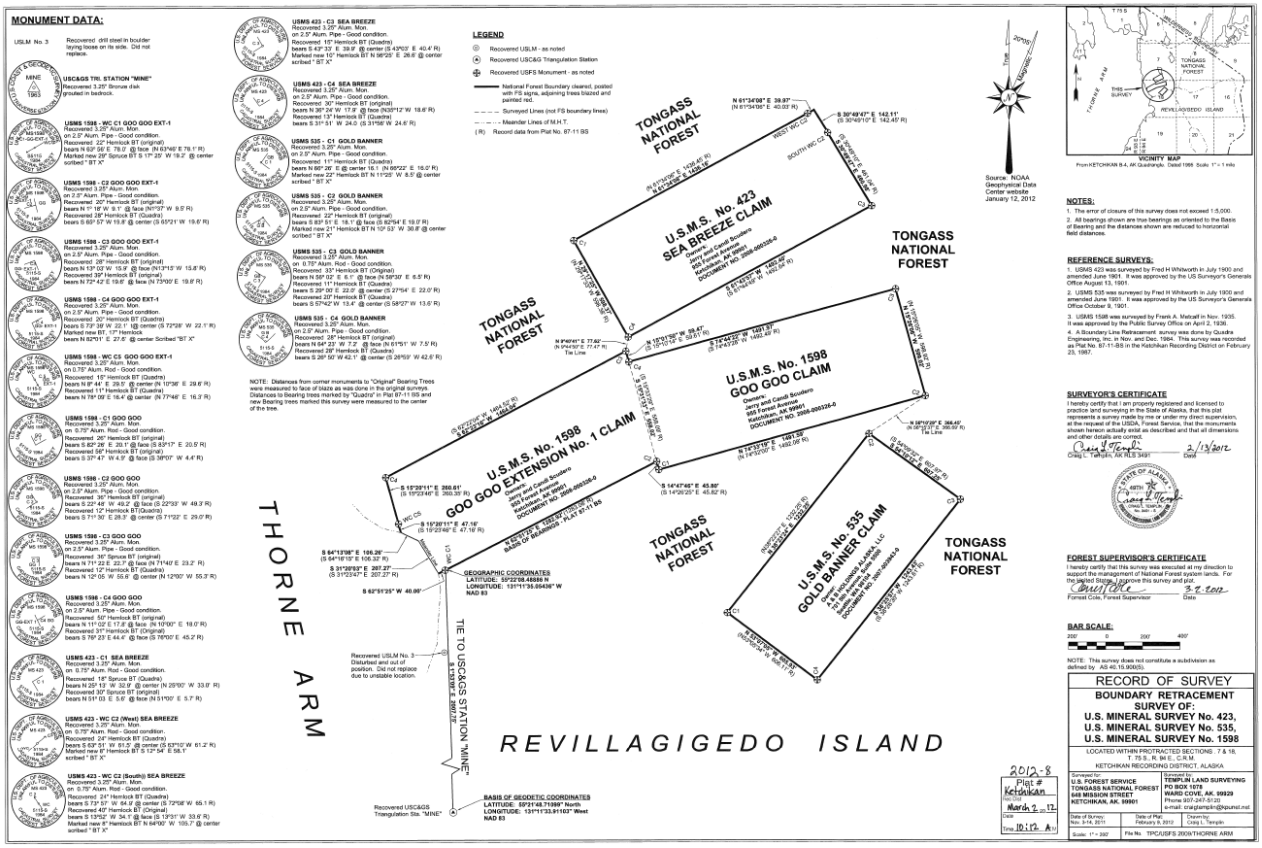


Figure 8: Mine claims map copied from the State of Alaska DNR Recorder's Office.

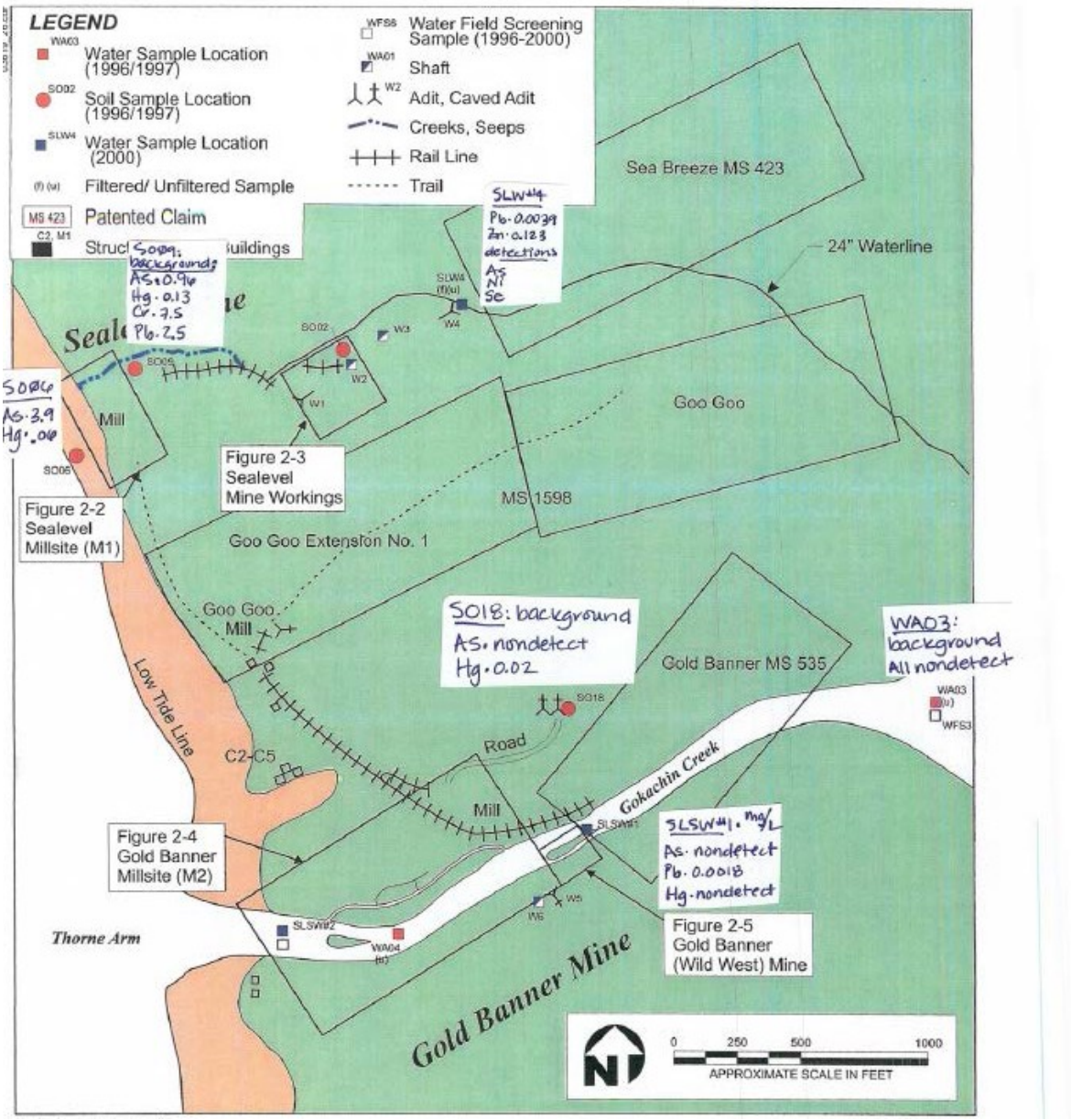


Figure 9: Sealevel mining area map. Figure copied from the USFS EE/CA (URS/Dames & Moore 2001). Sample results annotation by CSP.

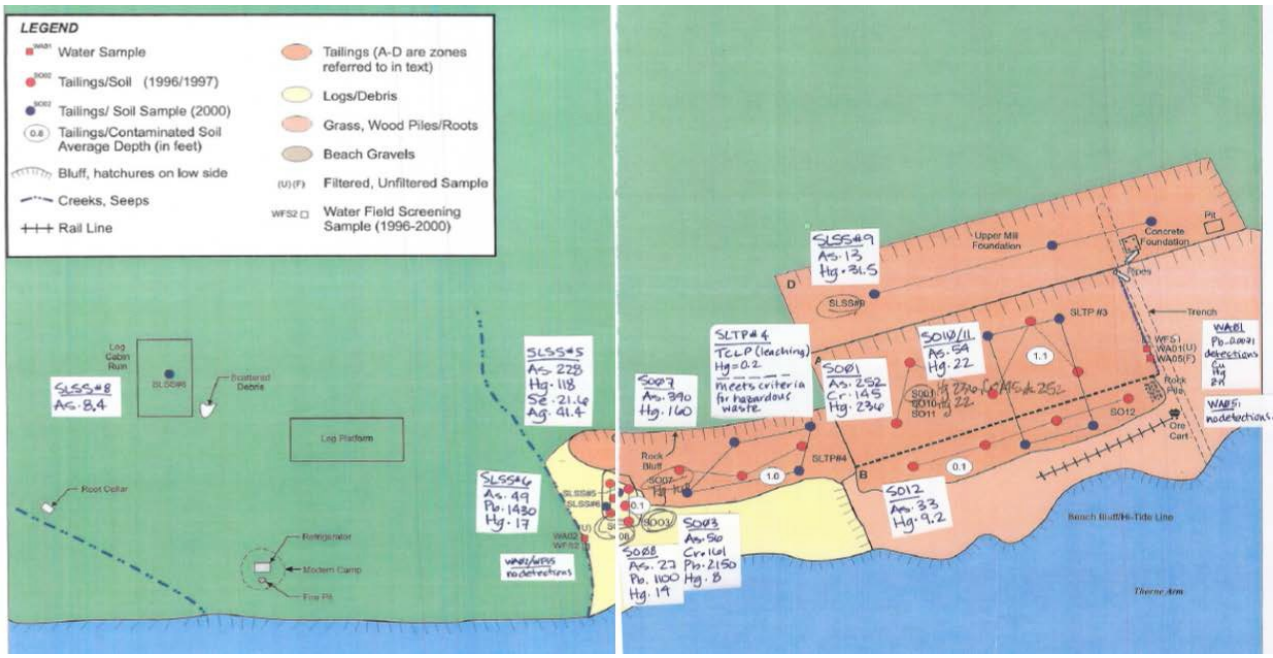


Figure 10: Sealevel Millsite sample locations. Figure copied from the USFS EE/CA (URS/Dames & Moore 2001). Sample results annotation by CSP.

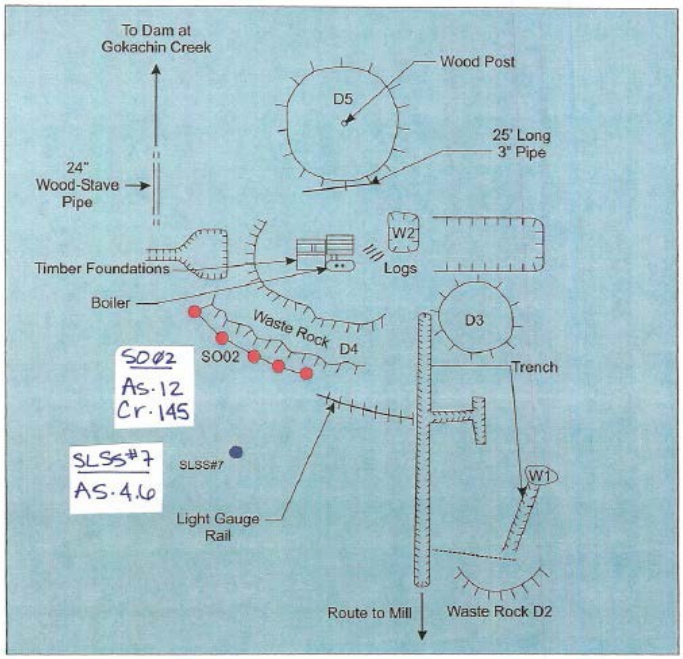


Figure 11: Sealevel mine upland area sample locations. Figure copied from the USFS EE/CA (URS/Dames & Moore 2001). Sample results annotation by CSP.

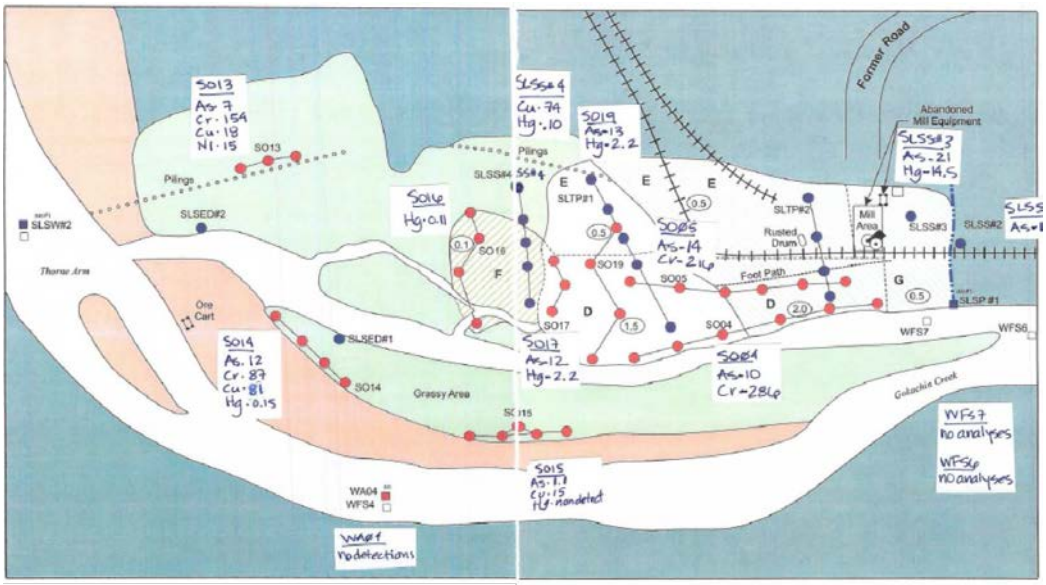


Figure 12: Gold Banner Millsite sample locations. Figure copied from the USFS EE/CA (URS/Dames & Moore 2001). Sample results annotation by CSP.

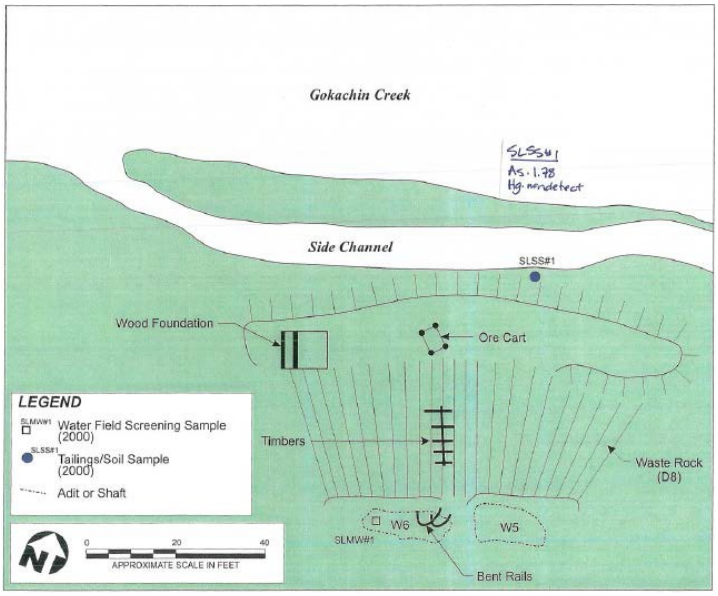


Figure 13: Gold Banner mine workings upland from the millsite. Figure copied from the USFS EE/CA (URS/Dames & Moore 2001). Sample results annotation by CSP.

Appendix 2: Site visit photos – all photos taken by ADEC staff

Photos 1: Sealevel Mine area.

Photo 2: Cabins at former Goo Goo mill site.

Photo 3: Sample ST01SD – northwest of rocky outcrop


Photos 4: Sample ST02SD – south of camp creek from the fines below the rocks.


Photos 5: Samples ST03SD and ST04SD (duplicate) collected near the metal debris on the beach.


Photos 6: Sample ST05SD collected at the corner next to a rocky bluff downgradient of the Sealevel Millsite.

Photo 7: Samples ST06WA and ST07WA (duplicate) collected from a creek north of the rocky bluff.

Photos 8: Sample ST08SD collected from in front of the northern cabin.

Photos 9: Sample ST09SD collected downgradient of the cabins.



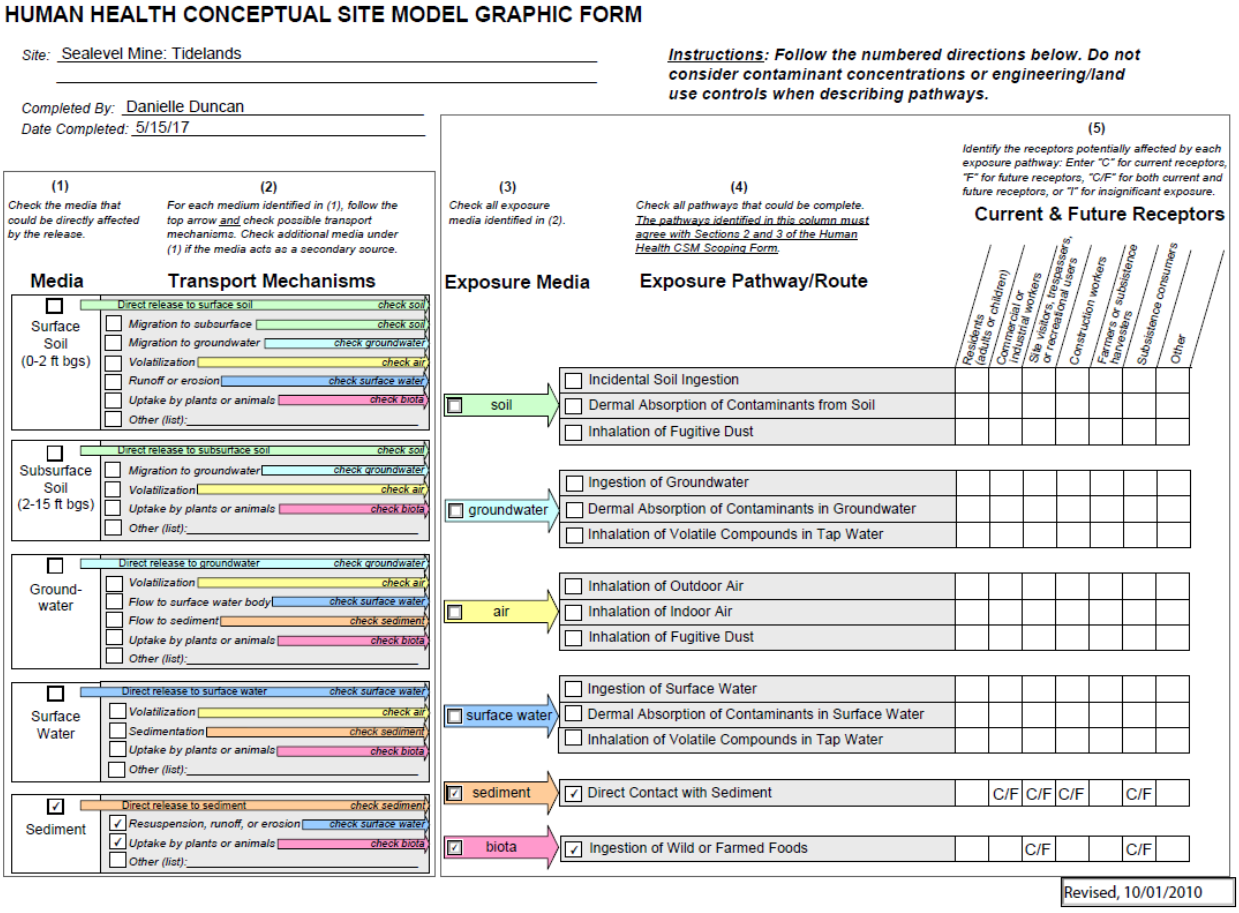
Photos 10: Sample ST10SD.



Photos 11: Sample ST11WA – Gokachin Creek near the dock pilings.


Photo 12: Sample ST12WA: background.

Appendix 3: Human health Conceptual Site Model



HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Sealevel Mine: Tidelands

Completed By: Danielle Duncan

Date Completed: 5/15/17

***Instructions:* Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media / **Transport Mechanisms**

- ☐ Surface Soil (0-2 ft bgs)
  - Direct release to surface soil → check soil
  - Migration to subsurface → check soil
  - Migration to groundwater → check groundwater
  - Volatilization → check air
  - Runoff or erosion → check surface water
  - Uptake by plants or animals → check biota
  - Other (list):
- ☐ Subsurface Soil (2-15 ft bgs)
  - Direct release to subsurface soil → check soil
  - Migration to groundwater → check groundwater
  - Volatilization → check air
  - Uptake by plants or animals → check biota
  - Other (list):
- ☐ Ground-water
  - Direct release to groundwater → check groundwater
  - Volatilization → check air
  - Flow to surface water body → check surface water
  - Flow to sediment → check sediment
  - Uptake by plants or animals → check biota
  - Other (list):
- ☐ Surface Water
  - Direct release to surface water → check surface water
  - Volatilization → check air
  - Sedimentation → check sediment
  - Uptake by plants or animals → check biota
  - Other (list):
- ☑ Sediment
  - ☑ Resuspension, runoff, or erosion → check surface water
  - ☑ Uptake by plants or animals → check biota
  - Other (list):

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☐ soil	☐ Incidental Soil Ingestion							
	☐ Dermal Absorption of Contaminants from Soil							
	☐ Inhalation of Fugitive Dust							
☐ groundwater	☐ Ingestion of Groundwater							
	☐ Dermal Absorption of Contaminants in Groundwater							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ air	☐ Inhalation of Outdoor Air							
	☐ Inhalation of Indoor Air							
	☐ Inhalation of Fugitive Dust							
☐ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☑ sediment	☑ Direct Contact with Sediment		C/F	C/F	C/F		C/F	
☑ biota	☑ Ingestion of Wild or Farmed Foods			C/F			C/F	

Revised, 10/01/2010

Appendix 4: ADEC Ecoscoping Guidance Form

Site Name: Sealevel Mine: Tidelands
Completed by: Danielle Duncan ADEC-CS EPS III
Date:5/22/17

Instructions: Follow the italicized instructions in each section below. "Off-ramps," where the evaluation ends before completing all of the sections, can be taken when indicated by the instructions. Comment boxes should be used to help support your answers.

1. Direct Visual Impacts and Acute Toxicity

Are direct impacts that may result from the site contaminants evident, or is acute toxicity from high contaminant concentrations suspected? C*heck the appropriate box.*

☐ Yes – D*escribe observations below and evaluate all of the remaining sections without taking any off-ramps.*
☒ No – *Go to next section.*

Comments:

2. Terrestrial and Aquatic Exposure Routes

Check each terrestrial and aquatic route that could occur at the site.

Terrestrial Exposure Routes

☐ Exposure to water-borne contaminants as a result of wading or swimming in contaminated waters or ingesting contaminated water.
☐ Contaminant uptake in terrestrial plants whose roots are in contact with contaminated surface water.
☐ Contaminant migration via saturated or unsaturated groundwater zones and discharge at upland "seep" locations (not associated with a wetland or waterbody).
☐ Contaminant uptake by terrestrial plants whose roots are in contact with soil moisture or groundwater present within the root zone (generally no more than 4 feet below ground surface.
☐ Particulates deposited on plants directly or from rain splash.
☐ Incidental ingestion and/or exposure while animals grub for food, burrow (up to 2 feet for small animals or 6 feet for large animals), or groom.

☐ Inhalation of fugitive dust or vapors disturbed by foraging or burrowing activities.

☐ Bioaccumulatives (other than PAHs, which bioaccumulate more readily in aquatic environments) taken up by soil invertebrates, which are in turn eaten by higher food chain organisms (see the *Policy Guidance on Developing Conceptual Site Models*).

☐ Other site-specific exposure pathways.

Aquatic Exposure Routes

☐ Contaminated surface runoff migration to water bodies through swales, drainage ditches, or overland flow.

☐ Aquatic receptors exposed through osmotic exchange, respiration, or ventilation of surface waters.

☐ Contaminant migration via saturated or unsaturated groundwater zones and discharge at "seep" locations along banks or directly to surface water.

☐ Deposition into sediments from upwelling of contaminated groundwater.

☐ Aquatic receptors may be exposed directly to contaminated sediments through foraging or burrowing, or indirectly exposed due to osmotic exchange, respiration, or ventilation of sediment pore water.

☐ Aquatic plants rooted in contaminated sediments.

☐ Bioaccumulatives (see the *Policy Guidance on Developing Conceptual Site Models*) taken up by sediment invertebrates, which are in turn eaten by higher food chain organisms.

☐ Other site-specific exposure pathways.

If any of the above boxes are checked, go on to the next section. If none are checked, end the evaluation and check the box below.

☒ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

Limited contamination in the marine sediments is present. There are < 60 mg/kg of chromium and copper that were above the APA screening levels, but not expected to create a significant hazard to wildlife. Additionally, mercury (< 0.25 mg/kg) was measured in the marine sediment in a single sample. Surface water on site is suitable for drinking as it met the ADEC drinking water standards.

3. Habitat

Check all that may apply. See Ecoscoping Guidance for additional help.

☐ Habitat that could be affected by the contamination supports valued species (i.e., species that are regulated, used for subsistence, have ceremonial importance, have commercial value, or provide recreational opportunity).

☐ Critical habitat or anadromous stream in an area that could be affected by the contamination.

☐ Habitat that is important to the region that could be affected by the contamination.

☐ Contamination is in a park, preserve, or wildlife refuge.

If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

4. Contaminant Quantity

Check all that may apply. See Ecoscoping Guidance for additional help.

☐ Endangered or threatened species are present.
☐ The aquatic environment is or could be affected.
☐ Non-petroleum contaminants may be present, or the total area of petroleum-contaminated surface soil exceeds one-half acre.

If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

5. Toxicity Determination

Check all that apply.

☐ Bioaccumulative chemicals are present (see *Policy Guidance on Developing Conceptual Site Models*).
☐ Contaminants exceed benchmark levels (see the Ecological Benchmark Tool in RAIS, available at: http://rais.ornl.gov/tools/eco_search.php).

If either box is checked, complete a detailed Ecological Conceptual Site Model (see DEC's Policy Guidance on Developing Conceptual Site Models*) and submit it with the form to your DEC project manager.*

If neither box is checked, check the box below and submit this form to your DEC project manager.

☐ OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

Appendix 5: Sample description table.

Field Sample ID	Laboratory Sample ID	Analyses Requested	Matrix	Sample Details	Latitude	Longitude
ST01SD	580-67779-1	RCRA-8 Metals + Hg	Sediment	Background past/NW of Rocky Point	55.3736	-131.1973
ST02SD	580-67779-2	RCRA-8 Metals + Hg	Sediment	Downgradient of Sealevel Millsite: south of camp creek - High intertidal	55.37236	-131.195916
ST03SD	580-67779-3	RCRA-8 Metals + Hg	Sediment	Downgradient of Sealevel Millsite: Downhill of ST02SD and near metal debris	55.372216	-131.195916
ST04SD	580-67779-4	RCRA-8 Metals + Hg	Sediment	Duplicate of ST03SD	55.372216	-131.195916
ST05SD	580-67779-5	RCRA-8 Metals + Hg	Sediment	Downgradient of Sealevel Millsite: Moving towards the cabin next to rocky bluff	55.37212	-131.19618
ST06WA	580-67779-6	RCRA-8 Metals + Hg + pH	Water	Downgradient of Sealevel Millsite	55.37203	-131.19546
ST07WA	580-67779-7	RCRA-8 Metals + Hg	Water	Duplicate of ST06WA	55.37203	-131.19546
ST08SD	580-67779-8	RCRA-8 Metals + Hg	Sediment	Downgradient of the Goo Goo Millsite: In front of northern cabin	55.36939	-131.19380
ST09SD	580-67779-9	RCRA-8 Metals + Hg	Sediment	Downgradient of the Goo Goo Millsite: Downgradient of cabins	55.36906	-131.19374
ST10SD	580-67779-10	RCRA-8 Metals + Hg	Sediment	Downgradient of the Goo Goo Millsite: The other side of a creek on a low-tide spit	55.36861	-131.19411
ST11WA	580-67779-11	RCRA-8 Metals + Hg	Water	Gokachin Creek intertidal	55.36754	-131.19261
ST12WA	580-67779-12	RCRA-8 Metals + Hg	Water	Gokachin Background	55.36769	-131.18657

Appendix 6: Sampling and Analysis Plan

Sampling and Analysis Plan

Sealevel Mine: Tidelands

March 29, 2017

Prepared by:

Alaska Department of Environmental Conservation
Contaminated Sites Program
Site Discovery Program

410 Willoughby Ave., Ste. 302
P.O. Box 111800
Juneau, AK 99811-1800

Distribution List

- Matthew York, United States Forest Service
- Lee Cole, Alaska Department of Natural Resources
- Patty Burns, Alaska Department of Natural Resources

Project/Task Organization

Individual assigned	Organization	Title	Responsible for:	Authorized to:	Phone	Email
Anne Marie Palmieri	ADEC	Environ Program Spec IV	Field work, reporting	Approve & draft reports, validate data	907-766-3184	annemarie.palmieri@alaska.gov
Danielle Duncan	ADEC	Environ Program Spec III	Field work, reporting	Approve & draft reports, validate data	907-465-5207	danielle.duncan@alaska.gov

Table of Contents

Preface

This Sampling and Analysis Plan (SAP) is a supplement to the Quality Assurance Project Plan (QAPP) for the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Program (CSP) Site Discovery Program (SDP). Information provided in the QAPP regarding Quality Assurance/Quality Control (QA/QC) procedures and sample collection methods are referenced, but not repeated herein.

Section 1 Introduction

The CSP is conducting this investigation at the Sealevel Mine: Tidelands as part of their Cooperative Agreement #V-00J85602 with the Environmental Protection Agency (EPA). The CSP will report the results of its investigation to the EPA as an Abbreviated Preliminary Assessment (APA) report, fulfilling the CSP's EPA grant responsibility. This document details the technical and analytical methods the CSP will employ during field work and is a supplement to the CSP QAPP which defines the quality assurance protocols and data analysis techniques that will be used.

Problem Definition

The objective of this project is to perform an investigation involving reviewing historical information, conducting a site visit, and collecting analytical soil, sediment, and/or surface water samples to determine if there is contamination present at the site, and if so, identifying potential and complete exposure pathways.

The CSP became aware of potential contamination on the State-owned tidelands at the Sealevel Mine in 2002 following receipt of an Engineering Evaluation/Cost Analysis (EE/CA) conducted in the uplands by the United States Forest Service (USFS). The EE/CA identified the presence of potentially contaminated sediments in the tidelands, however, the USFS did not collect samples off of lands they manage.

The Sealevel and Gold Banner mines and millsites are located on USFS land and are included in the EPA Superfund Enterprise Management System (SEMS) database as AKN001002545. That site is not included in this investigation.

This SAP is organized as follows:

- Section 1 Introduction
- Section 2 Site Description, Operational History, and Waste Characteristics
- Section 3 Previous Investigations
- Section 4 Sources and Targets
- Section 5 Sampling Process Design
- Section 6 Maps, Figures, and Photos
- Section 7 Data Quality Objectives
- Section 8 References

This SAP defines the objectives and scope for sampling activities at the Sealevel Mine: Tidelands site located in Thorne Inlet on Revillagigedo Island, approximately 25 miles by boat and 20 miles by air from Ketchikan, which will be performed by the CSP (Figures 1-4). This site includes only the State-owned tidelands; the USFS-managed lands and the privately-owned mine claims will not be investigated as part of this effort. CSP contacted the owners of the privately-owned claims adjacent to and near the tidelands and requested access to collect samples, however access was not granted.

Section 2 Site Description, Operational History, and Waste Characteristics

Site Location

The Sealevel Mine: Tidelands are located within Sections 12 and 13 of Township 75 South, Range 94 East of the Copper River Meridian at approximately 55.222100 north latitude and -131.115600 west longitude. The Sealevel Mine area is located on the eastern shoreline of Thorne Arm to an elevation of about 300 feet. Access to the Sealevel Mine is possible by boat or float plane and is approximately 25 miles from Ketchikan.

Site Name:	Sealevel Mine: Tidelands
EPA ID Number:	(pending)
Latitude:	N 55.222100
Longitude:	W -131.115600
Borough:	Ketchikan Gateway
Congressional District:	AK0
Site Owner(s):	Alaska Department of Natural Resources (tidelands)
Site Operator(s):	The Sea Breeze/Sea Level Mining Company, Peerless Consolidated Mining Company, and Jerry and Candi Scudero
ARDF #	KC094, KC095, KC096, KC097

Site Description

The Sealevel Mine area consists of the Sealevel, Goo Goo, and the Gold Banner Mines, the Keystone Trail which leads to Mesa Lake, and the tidelands. These areas extend from the eastern shoreline of Thorne Arm to an elevation of about 300 feet. Access to the Sealevel Mine area is possible by boat or float plane and is approximately 25 miles from Ketchikan. The area is a popular sport, recreation, commercial, and subsistence fishing area.

The Sealevel Mine: Tidelands site consists of the State-owned tidelands adjacent to mine claims/millsites. The Sealevel Mine, Goo Goo Mine, Gold Banner Mine, and Keystone Trail are all located in the upland area and are not part of this investigation.

Currently in the Sealevel Mine area, there are remnants of the old mining structures: log platform, mill foundation, ore cart, rock pile, pilings, light gauge rail, boiler, and piping. There is a modern camp site equipped with a fire pit. These artifacts are located on uplands property that is owned either by private parties or the USFS. Some of these relics may also be present on the State-owned tidelands which are the focus of the current investigation. There is also a recreational cabin which may or may not be used commercially.

Operational History and Waste Characteristics

The Sealevel Mine area consisted of United States Mineral Surveys 423 (Sea Breeze Claim), 1598 (Goo Goo Claim and Goo Goo Extension No. 1 Claim), and 535 (Gold Banner Claim). The two Goo Goo Claims were staked in 1935 by Richard Nuckolls and Gunder Nygard. The Sea Breeze Lode was staked by The Sea Breeze Mining Company in 1901. According to the historical record, the Sealevel Mining and Milling Company were foreclosed on in 1906 (presumably aka. The Sea Breeze Mining Company). Attempts were made to reopen the mine until 1926 when the Peerless

Consolidated Mining Company reopened the mine and conducted some work, however, short lived. There are no other ownership documents available for the Goo Goo and Sea breeze Claims in the DNR Recorder's Office until 1986 when The Trillium Corporation quit claimed the property to David and Kay Syre. Other mining claims in southeast Alaska were also included in this transaction. In 1989, the Syres quit claimed the properties to Ketchikan Pulp Company who then granted the properties to Gateway Forest Products. A Notice of Default and Sale was recorded in 2002 for the Goo Goo Claims ultimately leading to the Ketchikan Gateway Borough receiving the land. The Goo Goo and Sea Breeze Claims were granted by the Ketchikan Gateway Borough to Sea Level Enterprises LLC in 2004. The claims were sold by Sea Level Enterprises LLC in 2008 to Jerry and Candi Scudero who currently own them. In 2009, the Scuderos applied for a DNR land use permit in conjunction with the planned construction and operation of a commercial fishing lodge.

The Gold Banner mining claim was staked in 1901 by Joseph Hamblet. The claim was foreclosed in 1977 by the Ketchikan Gateway Borough. The next available document in the Alaska DNR Recorder's office is a quit claim deed whereby Houston Oil and Minerals Exploration Company sold the property to George Moerlein. In 2007, the Aloha Lumber Corporation sold the property to A&B Holdings LLC who currently owns it.

The Sealevel Mine claims were staked in the early 20th century and exploration work commenced shortly thereafter. A 35-foot tunnel was advanced at the mine site and $10,000 in ore was recovered. By 1902, it was the most active mine in southern Alaska having 800 feet of workings, a camp, and a 30-stamp mill. The length of the workings at the Sealevel Mine was more than 1,200 feet and included a short tunnel with winze that presumably adjoined the Goo Goo Claims with the Sea Breeze Claims. However, shortly after the mill started up, it was intermittently shut down for lack of ore. By 1913, the buildings were in a state of disrepair. Beginning in 1926, the Peerless Consolidated Mining Company reopened the mine and built a new camp, power plant, and a 50-ton mill. The Peerless Consolidated Mining Company processed about 300 tons of ore before ceasing operations and selling the claims for timber. The total amount of ore processed is unknown, however, it has been estimated that over 17,000 tons of ore were mined and milled before 1934.

Section 3 Previous Investigations

No previous investigations have been found for the State-owned tidelands portion of the Sealevel Mine.

In 2001, the USFS developed an Engineering Evaluation/Cost Analysis (EE/CA) for the Sealevel and Gold Banner mill sites which are on USFS managed land (Figures 5-9). In addition to the millsites, there are three adits, three shafts, and tailings and waste rock piles on USFS-managed land. According to the EE/CA, the primary sources of contamination are the tailings piles at the millsites. Although the State-owned intertidal zone and the privately owned claims were outside the scope of their investigation, those results can provide information regarding the potential nature of the contamination as well as locations where contamination may have migrated from the uplands onto the tidelands.

The Sealevel Mine mill site contains the remains of the mill foundation, the ruins of an assay shop, and miscellaneous debris. The mill site and assay shack are within 20 feet of the intertidal zone. Approximately 600 feet northeast of the mill site is the main mine shaft and a second shaft is located 200 feet northeast. At the time of the EE/CA, the shafts were open, but there was debris at depth. There were waste rock piles near the shafts. The total estimated volume of the tailings at the Sealevel mill site was 600 cubic yards (yd^3). In the report, the tailings were divided into various zones, however, these may be arbitrary and the tailings areas may be continuous. The area is reportedly capped by a 2- to 4-inch thick layer of organic-rich humus that supports alders and conifers. Analytical results of samples from the tailings showed elevated concentrations of arsenic, chromium, lead, and mercury.

The Gold Banner mill site is located on the north bank of Gokachin Creek and the creek runs through the Gold Banner claim. At the mill site, there was a dilapidated structure, numerous pieces of old equipment, and tailings piles. There were also multiple collapsed wooden structures located north of the mill site. The tailings pile at the Gold Banner mill site is larger than that of the Sealevel mill site encompassing approximately 2,565 yd^3. At the time of the investigation, no stressed vegetation or signs of acid mine drainage or metals leaching was observed at either mill site.

The Gold Banner mill site appeared less contaminated in comparison with the Sealevel mill site with lead concentrations less than 100 mg/kg and mercury less than 20 mg/kg. Analysis using the toxicity characteristic leaching procedure (TCLP) was conducted on tailings samples from both mill sites. The only metal which met or exceeded the regulatory TCLP standard was mercury. The intertidal sediments at the Gold Banner mill site were sampled and the results indicated that arsenic, chromium, copper, and mercury were all in concentrations exceeding the National Oceanic and Atmospheric Administration (NOAA) threshold effects level (TEL).

Surface water and seep samples were collected from the mill sites and the workings and the results indicated that there were concentrations of lead and zinc greater than NOAA freshwater screening levels for acute effects. The water and seeps sampled had pH values between 5.8 and 7.3.

Section 4 Sources and Targets

Potential Sources of Contamination

Potential sources of contamination within the scope of this investigation are mining wastes (tailings, waste rock, etc.) on State-owned tidelands and contamination which may have migrated from upgradient upland sources.

Targets

In the APA, CSP will evaluate potential targets in the groundwater, surface water, soil, and air pathways, as applicable. During the field investigation, the following information will be sought:

- Presence of mine tailings on the intertidal area and dimensions;
- Source of water supply for privately-owned cabin on the uplands;
- Presence of terrestrial or other sensitive environments (eel grass, etc.);
- Presence of historical mining equipment or other artifacts; and
- Potential upland sources that may have migrated.

A preliminary human health conceptual site model (CSM) will be completed and included in the APA. During the site visit, CSP will identify additional potential sources of contamination, potential receptors, and complete/incomplete exposure pathways.

Section 5 Sampling Process Design

A judgment-based sampling methodology will be used for sampling at the Sealevel Mine: Tidelands. Samples will be collected at locations having the highest probability of contamination. In addition, background samples will be taken from an unaffected area for comparison purposes and to calculate the 3-times EPA APA screening value. The sampling locations will be chosen based on field observations and x-ray fluorescence (XRF) screening results. All sampling activities will be done in accordance with the ADEC's *Field Sampling Guidance,* dated 2016.

Specific areas of potential contamination within State-owned tidelands are downgradient from the Sealevel and Goo Goo millsites where tailings piles are present. Gokachin Creek, where it intersects the intertidal area, is another potential zone of contamination because the Gold Banner mill is located upgradient. Additional areas of potential contamination include additional unidentified waste rock piles and the area downgradient where contamination may have migrated. The intertidal area will be visually inspected for the presence of mine tailings and contamination. If mine tailings are found, the dimensions of the area will be measured in order to calculate waste volumes.

Sampling Locations and Analytical Protocol

The CSP will walk the tidelands laterally in a north-south direction collecting samples at each of the locations listed below. Other locations may also be sampled based upon field observations.

Up to 7 freshwater samples will be collected from the site. At least 1 sample and a duplicate will be collected from Gokachin Creek. Any other water bodies and/or seeps may also be sampled.

Up to 25 sediment samples will be collected from the State-owned tidelands downstream of the following areas where metals contamination was located by the USFS:

1. Sealevel mill site (Figures 3-5)
2. Goo Goo mill site (Figure 4)
3. Gold Banner mill site (Figure 7)
4. Gokachin Creek outfall to Thorne Arm (Figure 7)

A XRF will be used to field screen and select samples for laboratory analysis. Quantities of samples to be collected and analytical methods are outlined in Table 1 below. All sample locations will be described in the field logbook and located on a site sketch. Photographs and GPS readings will be taken of the sample locations. The date and time each sample is collected will be recorded in the field logbook. Any specific potentially relevant information about the sample location or the sample itself will also be recorded in the logbook.

The exact number of samples that will be collected from each matrix will be determined in the field based upon site conditions. Due to the presence of metals at the Sealevel Mine, the samples collected will be analyzed for metals using EPA Methods 6010C or 6020A. Calcium and magnesium in water samples will be analyzed to calculate water hardness for comparison to State of Alaska water quality criteria. If the CSP identifies suspected co-located petroleum contamination, samples may be collected and analyzed for the Alaska series methods AK102 and AK103. A background sample of each matrix will be collected from a nearby area which is believed to be unaffected by site

activities. Water samples will be acid-preserved upon receipt by the laboratory. Metals in soil and sediments do not require preservation.

Table 1: Estimated numbers of samples and matrices.

Method	Matrices	Number
EPA 6020A (RCRA-8 metals + Cu) + EPA 7470A (Hg)	Soil and Sediment	25
EPA 6020A (RCRA-8 metals + Cu) + EPA 7470A (Hg)	Water	7
Hardness SM 2340 C	Water	7

Background Locations

One representative background soil/sediment sample will be collected from an unaffected area to be determined in the field. One representative background surface water sample will also be collected from a location to be determined in the field.

QA/QC Samples

QA/QC procedures are outlined in detail in the QAPP. Briefly, a duplicate sample will be taken for each set of 10 samples (or portion thereof) collected for each matrix and analytical test, with a minimum of 1 sample per matrix per sampling day. For metals analysis, trip and field blanks are not required. The analytical laboratory will follow standard QA/QC procedures as stated in the QAPP and individual method. The CSP will complete laboratory data checklists for each sample batch.

Sampling Methodologies

This section describes the sampling methods that will be employed for the investigation. All samples collected will be maintained under chain-of-custody and shipped in iced coolers as soon as possible to the laboratory. Further information regarding sample collection methodology can be found in the QAPP. The anticipated matrices to be sampled are sediment, soil, and surface water. Sampling locations are judgment based and will be determined prior to the investigation, but could be modified based on observations made once on-site. All field sampling will be performed by a Qualified Environmental Professional, in accordance with 18 AAC 75.333. Sampling efforts will be biased to target locations that are potential and/or known sources of COCs and locations and media potentially impacted by the migration of COCs. The objective of the sampling effort is to determine whether a release has occurred and to identify possible complete exposure pathways and media. Discrete sampling methods will be used and all sampling will comply with EPA SW-846 protocols for inorganics in addition to the ADEC's *Field Sampling Guidance*.

XRF Field Screening- A XRF will be used in the field to aid in sample selection. XRF samples having the highest concentrations of metals (particularly copper, lead, mercury, and arsenic) and/or judgement based will be selected for laboratory analysis. The XRF will be placed inside a 2-gallon Ziplock bag for weather protection if needed. Prior to field deployment, the XRF will be placed in the Ziplock bag and analytical standards including a blank will be tested to verify accurate calibration of the instrument. The XRF will be placed in direct contact with the soil or sediment to be tested and allowed to make a 30-second reading. The results will be tabulated in the field notebook as will the samples collected for laboratory analysis.

Sediment and soil- A fresh pair of gloves will be worn and changed before each analytical sample is taken. Samples will be taken from depths ranging from ground surface to 1 ft. below ground surface. A clean, plastic trowel and disposable plastic spoon will be used to collect sediment and soil

samples. If samples are heterogeneous, they will be placed into a disposable bowl and homogenized removing any rocks and/or organic litter prior to being placed into laboratory provided glass jars. A duplicate sample will be collected for every ten samples. Metals samples do not require special preservation; they need only to be maintained at < 6° C.

Surface water- A fresh pair of gloves will be worn while collecting water samples and changed before each sample is taken. Samples will be collected using a "grab" technique and laboratory-provided sample containers. A duplicate sample will be collected for every ten samples. Care will be taken to not to disturb any underlying sediment. Water samples will be acidified upon receipt at the laboratory.

Sample Handling and Custody

Sample containers may be labeled prior to field work commencing. The basic labeling strategy will be to use a prefix indicating the site it originated from, number the sample sequentially in the order collected, and add a suffix to indicate matrix type. The suffixes will be either 'SO' (soil), 'SD' (sediment), or 'WA' (water).

The samples will remain in the custody of the sample team until they are transferred to another person, under proper chain of custody rules. A chain of custody record will be completed for each batch of samples, and included in the sample cooler to be sent to the laboratory. A duplicate copy of the chain of custody will be made for CSP records. Minimum documentation of sample handling and custody included on the COC is the following:

- Sample identification and matrix type
- Latitude and longitude of the sample location
- Sample collection date and time
- Analytical method requested
- Initials of the person collecting the sample
- Date the sample was sent to the laboratory

The samples will be transported to TestAmerica, an ADEC approved lab via Alaska Airlines Goldstreak. The samples will be housed wrapped in bubble wrap inside coolers outfitted with blue ice under custody. Multiple gel packs will be frozen prior to the day of travel in order to ensure that the temperature of the samples remain < 6° C.

Supplies

Clean, plastic trowels
XRF screening device
Tablet
Black sharpie markers, pencils, pens
Sterile/clean latex gloves
Laboratory-provided sampling containers
Disposable plastic spoons
Disposable bowls
Coolers (2): 48 Quart and 16 Quart
Gel ice
Watch
Rite in the Rain notebook

Chain of custody forms
Fuji Finepix AX Camera
Garmin GPS 76
Packing tape
First Aid Kit
Outdoor survival kit
Bosch GLM 15 Distance
Finder Clipboards (2)
Disposal bags
Cooler bag
Backpacks
Shovel

Sampling Equipment Decontamination

Decontamination will not be required because only dedicated or disposable sampling equipment will be used.

Investigation-Derived Waste

Every effort will be made to minimize the generation of investigative-derived waste. Disposable sampling gear will be contained in a dedicated gallon Ziplock bag and disposed of at the local municipal landfill.

Logistics

The CSP plans on conducting the investigation at the Sealevel Mine in coordination with others during the first week of April 2017. On April 6, 2017, CSP staff will travel from Ketchikan to Sealevel Mine via chartered floatplane. The floatplane will return at the end of the day to transport the CSP staff to Ketchikan. The sampling team will have in their possession all of the supplies needed to complete the investigation.

Schedule

Field activities:	April 2017
Analytical results	10 days from submittal
Submit Draft Report to EPA	End of May 2017
Submit Final Report to EPA	By June 30, 2017

Section 6 Maps, figures, and photos

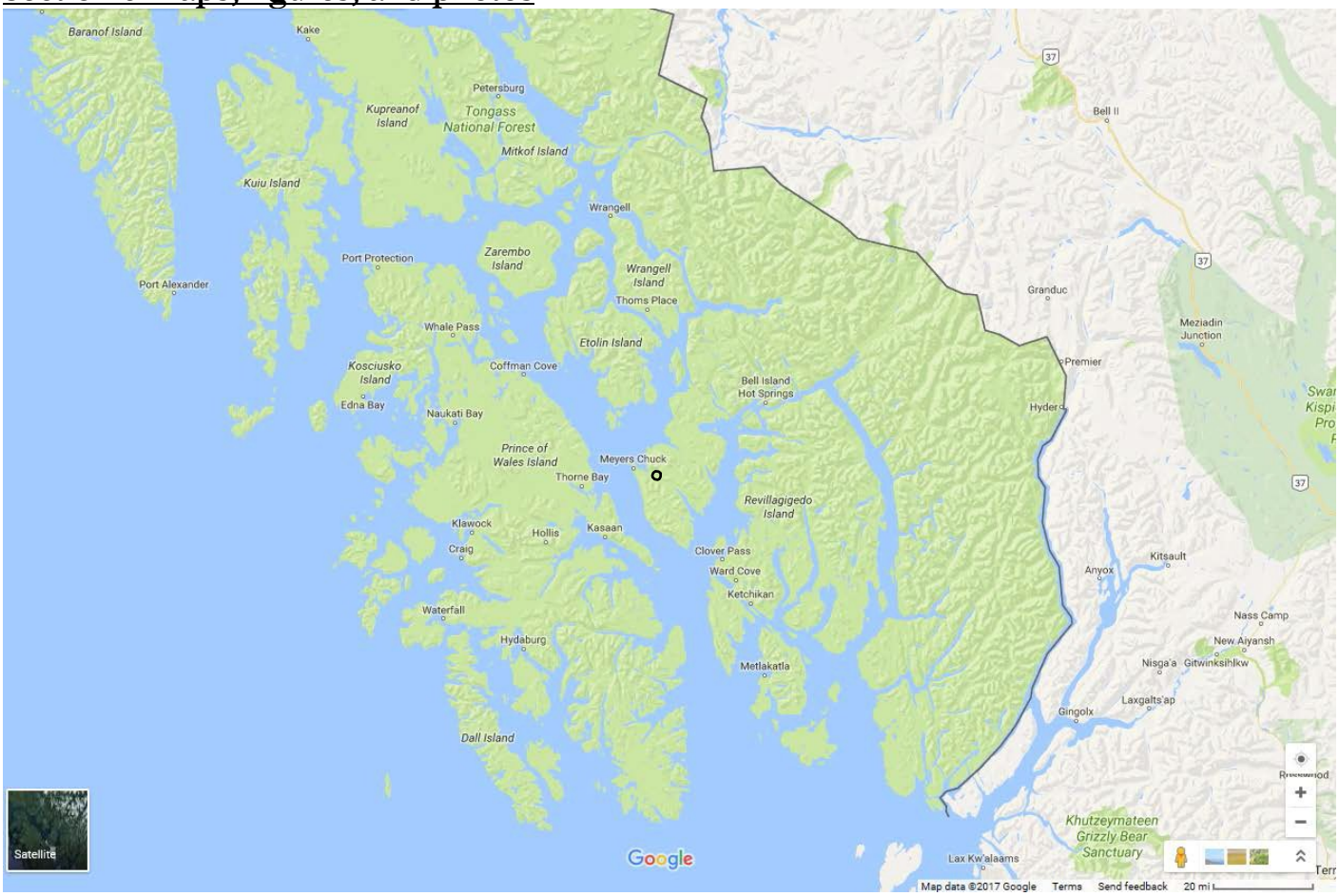


Figure 1: The location of the Sealevel Mine in Thorne Inlet, Alaska (circled in black). Figure copied from Google Maps.

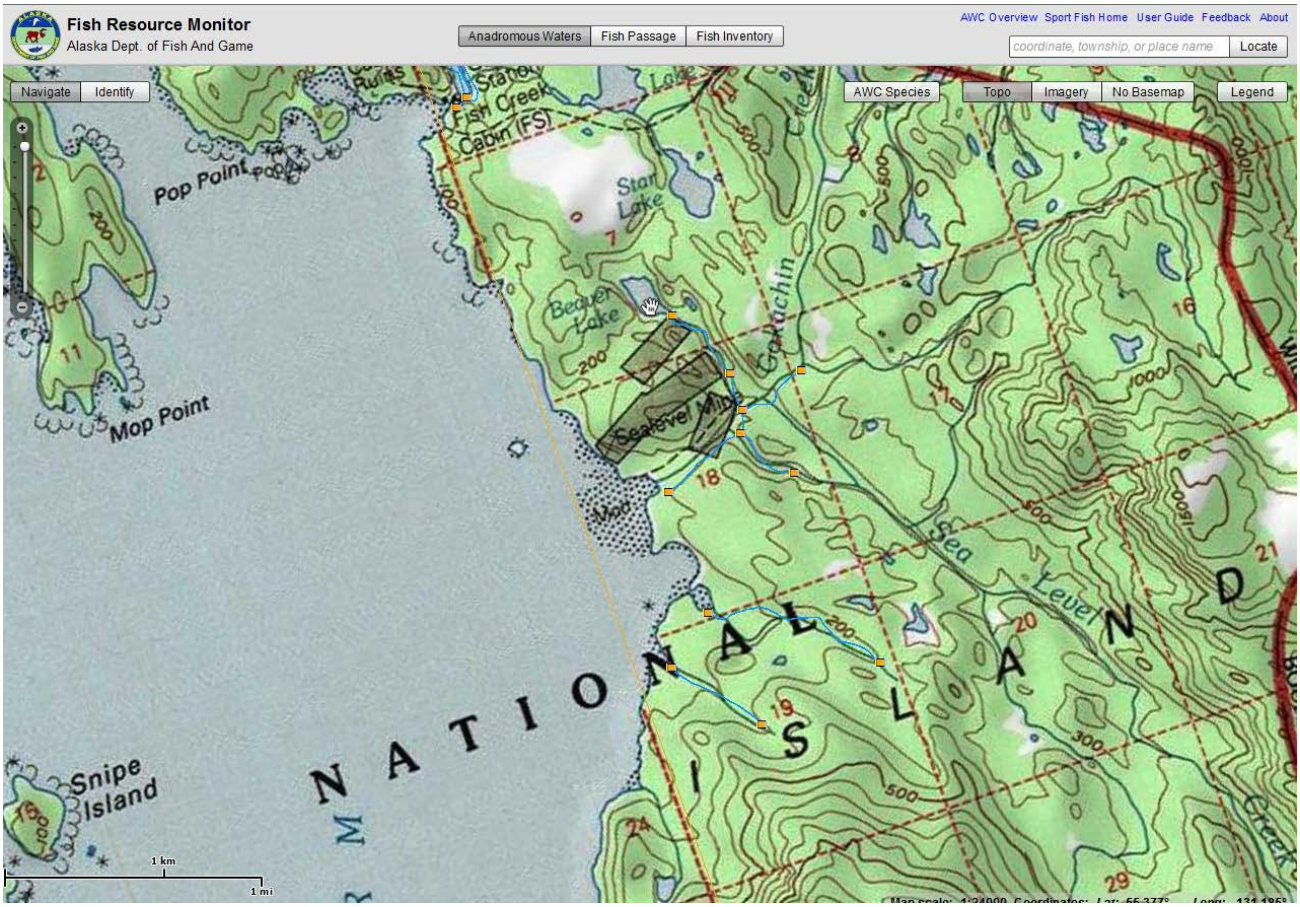


Figure 2: Topographic map copied from the Alaska Department of Fish and Game's anadromous web map showing the locations of the two anadromous streams (Gokachin and Sea Level Creeks) at the Sealevel Mine. Orange squares denote anadromous points.

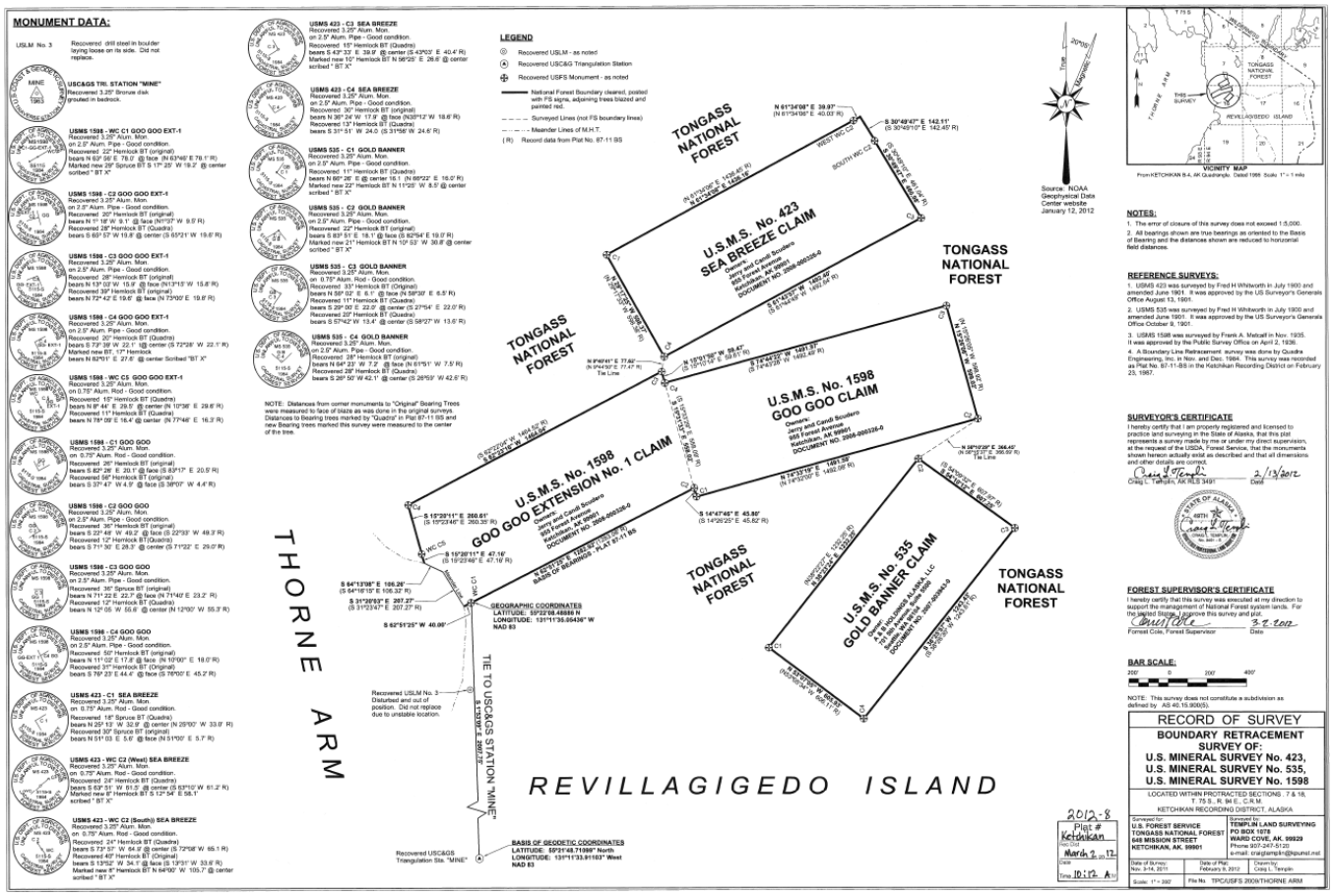


Figure 3: Mine claims map copied from the State of Alaska Department of Natural Resources Recorder's Office.

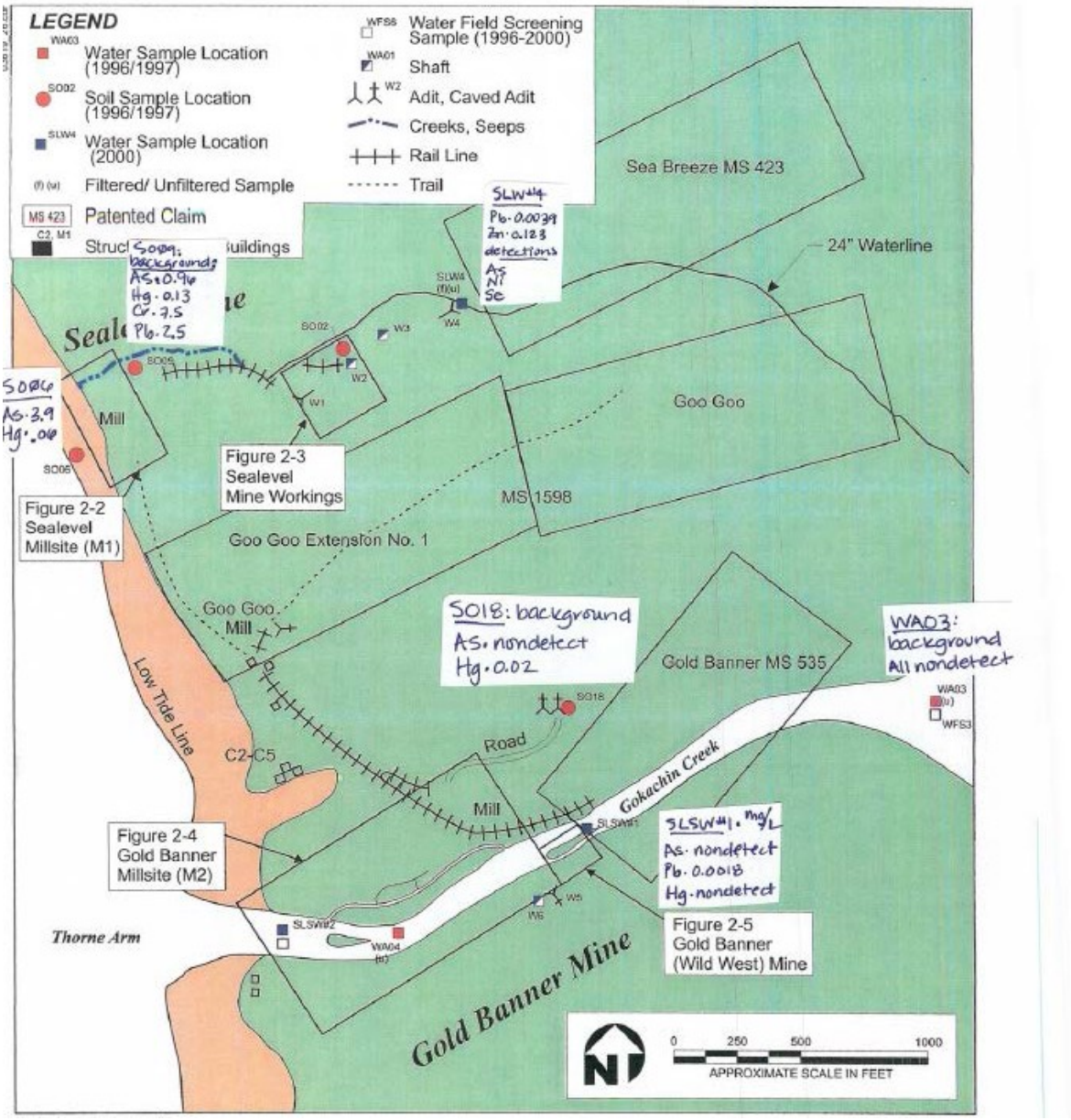


Figure 4: Sealevel mining area map. Figure copied from URS/Dames & Moore. 2001.

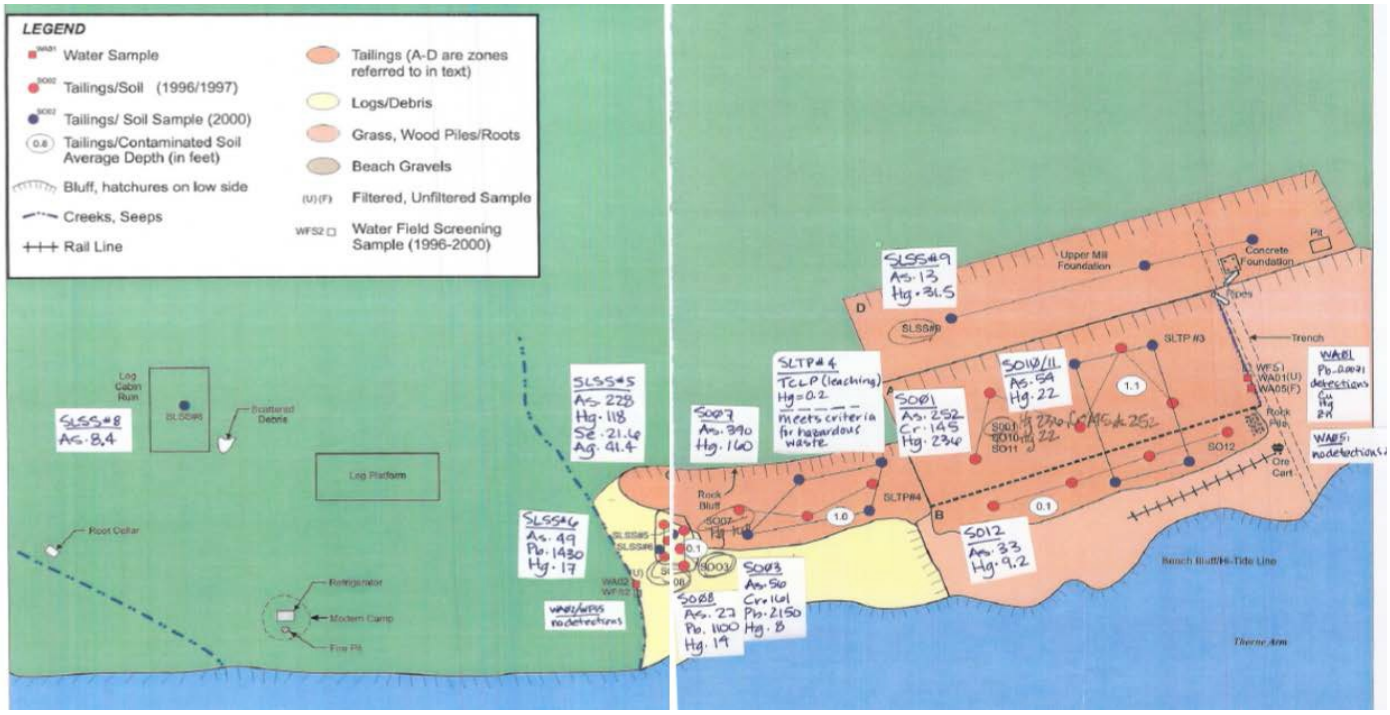


Figure 5: Sealevel millsite sample locations. Figure copied from URS/Dames & Moore 2001.

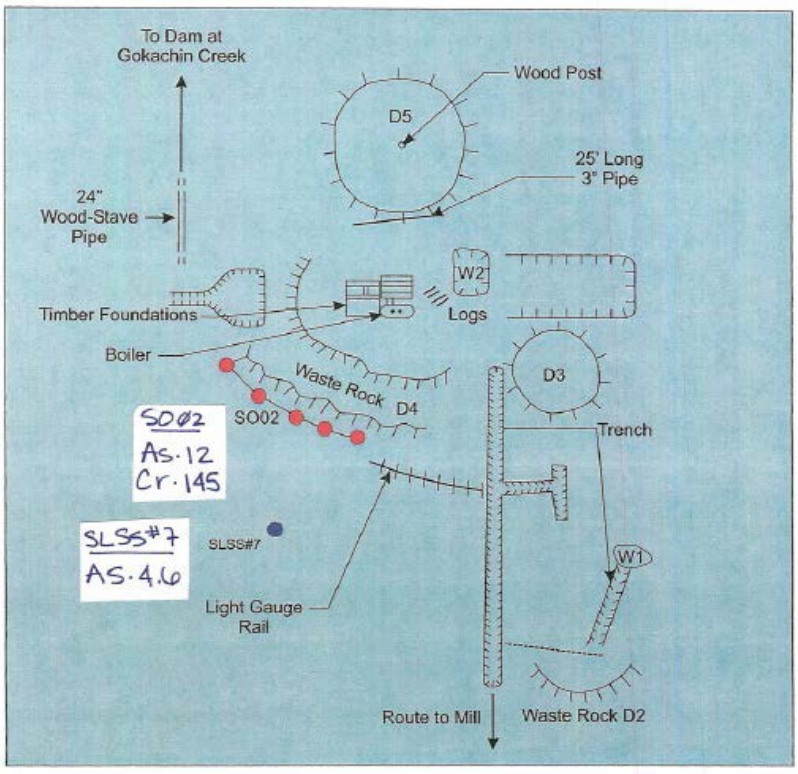


Figure 6: Sealevel mine upland area sample locations. Figure copied from URS/Dames & Moore 2001.

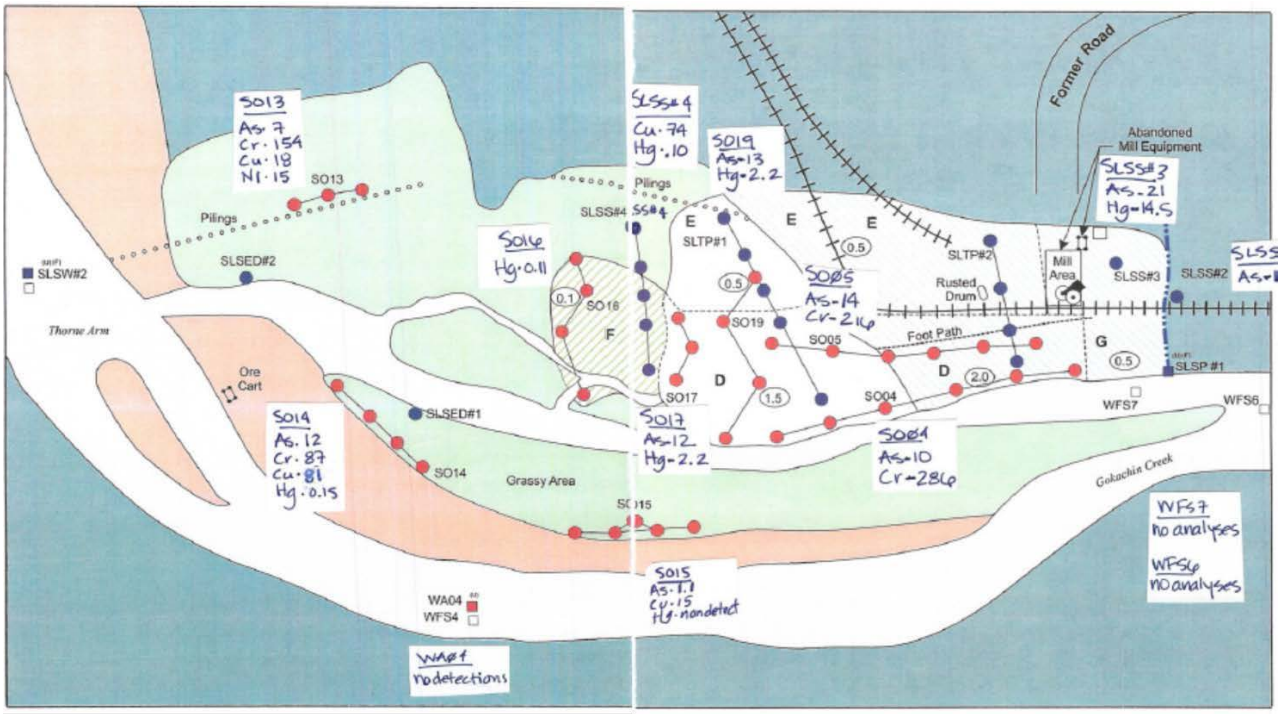


Figure 7: Gold Banner Millsite sample locations. Figure copied from URS/Dames & Moore 2001.

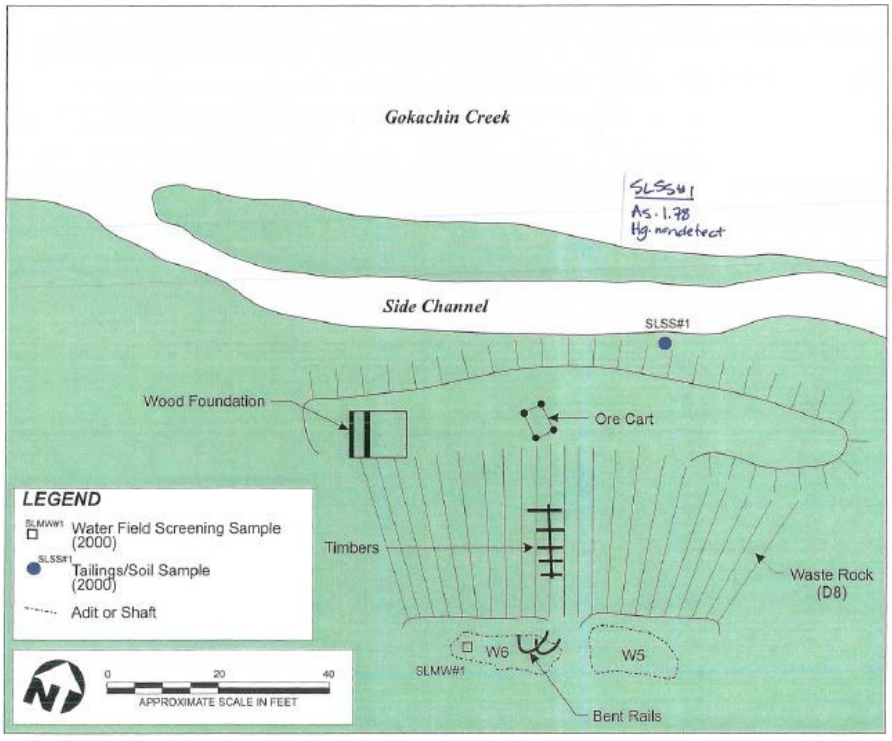


Figure 8: Gold Banner mine workings upland from the millsite. Figure copied from URS/Dames & Moore 2001.

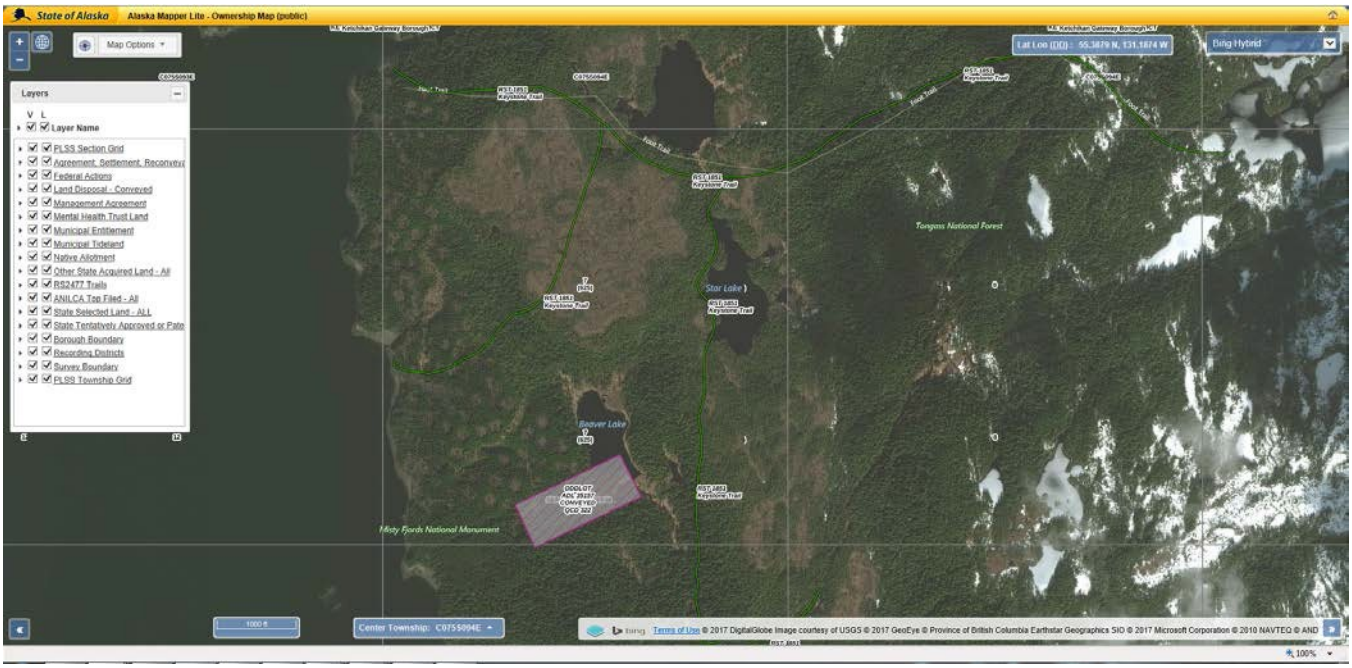


Figure 9: Sealevel mine upland private property. Figure copied from the DNR Land Mapper Application.

Photo 1: Gokachin Creek which is located within the Gold Banner Mine and Millsite. Photo copied from NOAA Shore Zone.

Photo 2: Photo of the Sealevel buoy. Photo copied from NOAA Shore Zone.

Photo 3: Mine tailings from the Goo Goo mill. Photo courtesy of the State of Alaska Department of Natural Resources.

Photo 4: The lodge at Sealevel Mine that was under construction in 2010. The material used as fill is likely mine tailings. Photo courtesy of the State of Alaska Department of Natural Resources.

Section 7 Data Quality Objectives

The Data Quality Objective (DQO) process is a system used to define project decisions, the data quality needed to support the decisions, the data types needed, and data collection requirements. It safeguards that the analytical techniques used in the investigation will generate the specified data quality (EPA 2000) and that the resources required to generate the data are justified. More information on data quality can be found in the QAPP.

There are seven steps and the output from each step influences the choices that will be made later in the process.
The DQO steps as defined by the EPA are as follows.
1. State the problem.
2. Identify the decision.
3. Identify the inputs to the decision.
4. Define the study boundaries.
5. Develop a decision rule.
6. Specify tolerable limits on decision errors.
7. Optimize the design.

Step 1: Problem Statement
The first step in the DQO process is to clearly state the problem to be addressed. The intent of this step is to clearly define the problem so that the focus of the sampling and analysis will be unambiguous.

Problem statement: Data are required to determine if there are hazardous concentrations of contaminants of concern (COCs), specifically metals associated with historical mining and milling at the site, and if so, does the contamination pose a risk or potential risk to human health and the environment, and if so, does site require listing on the CSP database and/or further investigation.

Step 2: Decision Statement
This step in the DQO process is used to identify the decisions and the potential actions that will be affected by the data collected. Crafting a decision statement is performed by specifying a principal study question, alternative actions that could result, and a resulting decision statement.

Analytical samples collected will be used to answer the following **Principal Study Questions:**

1. Are metals present in soil, sediment, and/or surface water at concentrations that exceed the respective DEC cleanup or screening levels?

2. Are metals present in soil, sediment, and/or surface water at concentrations that exceed the background by three times or more?

The Alternative Actions to be taken depending on the results are as follows:

- Alternative Action 1: If concentrations of COCs exceed the respective cleanup or screening levels to such an extent that the site poses an imminent and substantial risk to human health and the environment, immediate action may be taken, the site will

be included on the CSP database and referred to EPA for screening using the Hazard Ranking Score system to determine eligibility for the National Priorities List.

- Alternative Action 2: If concentrations of COCs exceed the respective cleanup or screening levels, then the site will be included on the CSP database and further investigation of the site may be required. A recommendation will be made to EPA that additional investigation and cleanup be managed by CSP, with no further action from EPA.

- Alternative Action 3: If concentrations of COCs do not exceed the respective cleanup or screening levels, then no further investigation will be required by CSP. A recommendation for no further action will be made to EPA.

Step 3: Decision Inputs
The purpose of this step is to identify informational inputs that are required to resolve the Decision Statement and to determine which inputs require measurement. The necessary inputs to address the Decision Statement are the concentrations of COCs present in various media. During this step of the DQO process, the basis for a screening level is established. The screening level is the threshold value that provides the criterion for choosing among Action Alternatives. The screening levels for this project are listed below.

Screening Levels
Soil
Maximum detected concentrations in soil will be compared to a calculated value of 3-times the respective results of the background soil sample. In addition, the soil sample results will also be compared to the ADEC Method 2 most stringent exposure pathway cleanup levels for migration to groundwater or human health for the over 40-inches of rainfall climate zone, as defined in 18 AAC 75.341(c), Table B1.

Surface Water
Maximum detected concentrations in surface water will be compared to a calculated value of 3-times the respective results of the background surface water sample. In addition, the surface water sample results will also be compared to the ADEC water quality criteria (18 AAC 70) and drinking water criteria (18 AAC 80), and 18 AAC 75.345(b) Table C groundwater cleanup levels.

Sediment
The ADEC does not have established sediment screening values, but instead relies on federal standards and guidelines outlined in the ADEC guidance document titled *Sediment Quality Guidelines* dated January 2013. Maximum detected concentrations in sediment will be compared to a calculated value of 3-times the respective results of the background sediment samples.

The sediment sample results will also be compared to the appropriate freshwater sediment or marine sediment Threshold Effects Level (TEL) and the Probable Effects Level (PEL) for marine sediments published in the US National Oceanic and Atmospheric Administration's (NOAA) Screening Quick Reference Tables (SQuiRTs). The TEL represents the concentration below which adverse effects are expected to occur only rarely and the PEL represents the concentration above which adverse effects are frequently expected.

Step 4: Study Boundaries
Step 4 in the DQO process defines the spatial and temporal boundaries of the study covered by the Decision Statement. The spatial boundaries define the physical extent of the study area and may be subdivided into specific areas of interest. The temporal boundaries define the duration of the study or specific parts of the study.

The spatial boundaries for sampling at the sites are the State-owned tidelands from 0-1 feet below ground surface and upland properties when permitted by the landowner(s).

The temporal boundaries of the study involves the timeframe in which the decision applies and determining when to collect data. The project schedule is defined below but may change due to weather and time constraints as necessary.

Table 2: Temporal Boundaries of the Study

Event	**Approximate date(s) of Completion**
Field Sampling	April 6, 2017
Sample Delivery to Laboratory	April 7, 2017
Laboratory Analyses Complete	April 2017
ADEC Laboratory Data Review	May 2017
ADEC PA Report Submitted to EPA	By June 30, 2017

Step 5: Decision Rule
The objective of this step is to define the parameter(s) of interest in the population being characterized and integrate previous DQO outputs into statements defining conditions that direct decision makers to choose among Action Alternatives.

If the concentration of at least one COC in the media sampled in an investigated area exceeds its cleanup or screening level, or if evidence of contamination is observed at the site outside of the sampling boundaries, then further evaluation of the site may be necessary.

If the concentrations of COCs in the media sampled do not exceed their cleanup or screening levels, and if no visual observation is made of contamination outside the sampling boundaries, then no further evaluation of the site will be required.

Step 6: Decision Error Limits
The purpose of this step is to minimize data uncertainty by specifying tolerable limits on decision errors that are used to establish performance goals for the data collection design. It is necessary to determine the possible range for the parameter of interest and to define both the types of decision errors and the potential consequences of the errors.

The two types of decision errors for the characterization of sample data are either (a) determining that the concentrations of all COCs for a sampled area are less than the corresponding screening levels when, in fact, at least one exceeds the screening level, or (b) determining that the concentration of at least one COC of a sampled area exceeds its screening level when, in fact, none of them do. The outcome of the first error is the determination that no further assessment is needed and the site does not pose a threat or potential threat to human health and/or the environment when it may. The second error type could result in further assessment and cost. The

least favorable of these errors is the first where a COC exceeding its screening level is overlooked and no further assessment is done based on the incorrect decision. In the second case, more assessment would occur and an appropriate decision would be made.

Step 7: Design Optimization
The purpose of design optimization in the DQO process is to identify the best sampling and analysis approach that satisfies all of the previous steps in the process. The activities involved in design optimization include:

- Reviewing the outputs of the first six steps and existing environmental data
- Developing general data collection design alternatives
- Selecting the most resource-effective data collection design that satisfies all of the DQOs.

Sample locations are identified based upon site history and information gathered prior and during the site visit. The sampling locations will be focused on the footprint of the former mine and the intertidal area. Additional samples may be collected from biased areas with the highest likelihood of contamination based on XRF screening results and field observations.

Section 8 References

Alaska Department of Environmental Conservation Drinking Water Protection map. https://dec.alaska.gov/eh/dw/DWP/protection_areas_map.html

Alaska Department of Environmental Conservation 18 AAC 75.325-.990

Alaska Department of Environmental Conservation Field Sampling Guidance 2016

Alaska Department of Natural Resources (DNR). Dnr.alaska.gov/mapAK/browser?map_select

Alaska Resource Data File (ARDF). Ardf.wr.usgs.gov

EPA (U.S. Environmental Protection Agency). 2000. Data Quality Objectives Process for Hazardous Waste Site Investigations. EPA QA/G-4HW. January.

United States Department of the Interior Bureau of Mines. 1995. Mineral Investigations in the Ketchikan Mining District Southeastern Alaska.

URS/Dames & Moore. 2001. EE/CA for Sealevel Mine – Final Report Tongass National Forest, Alaska.

Appendix 7: ADEC Data Review Checklist

Laboratory Data Review Checklist

Completed by:	Danielle Duncan		
Title:	EPSIII	Date:	May 22, 2017
CS Report Name:	Sea Level Tidelands	Report Date:	May 8, 2017
Consultant Firm:	n/a		
Laboratory Name:	TestAmerica	Laboratory Report Number:	580-67779-1
ADEC File Number:	n/a	ADEC RecKey Number:	n/a

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No ( ) NA (Please explain) Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The metals water samples were not preserved with acid until receipt at the lab, however, this is not expected to have significantly affected the results. The pH was not recorded until lab receipt due to remote nature of the sites, thus the holding time was exceeded. The resulting pH values are still acceptable.

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

No discrepancies

e. Data quality or usability affected? (Please explain)

Comments:

4. Case Narrative

a. Present and understandable?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Limited volume for some of the water samples resulted in less analyses (hardness was omitted and in some cases, total or dissolved metals). Waters were acidified by the lab and not in the field.

c. Were all corrective actions documented?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Method 6020A: The matrix spike/matrix spike duplicate (MS/MSD) %RPD was outside control limits for Copper in prep batch 580-244358 and analysis batch 580-244453. The MS/MSD and associated laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries met acceptance limits.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

( ) Yes (•) No ( ) NA (Please explain) Comments:

pH holding time was exceeded due to remoteness of sites.

c. All soils reported on a dry weight basis?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ○ NA (Please explain) Comments:

v. Data quality or usability affected? (Please explain) Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ○ NA (Please explain) Comments:

vii. Data quality or usability affected? (Please explain) Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

No organics analyzed.

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

○ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ○ NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No organics analyzed.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ○ NA (Please explain) Comments:

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

The CSP used clean or disposable sampling equipment.

i. All results less than PQL?

○ Yes ○ No ○ NA (Please explain) Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form

Appendix 8: Original laboratory reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-67779-1
Client Project/Site: Sea Level Tidelands

For:
Alaska Department of Env. Conservation
PO BOX 111800
Juneau, Alaska 99811-1800

Attn: Danielle Duncan

M. Elaine Walker

Authorized for release by:
5/8/2017 11:10:34 AM

Elaine Walker, Project Manager II
(253)248-4972
elaine.walker@testamericainc.com

Table of Contents

Job ID: 580-67779-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-67779-1

Comments
No additional comments.

Receipt
Twelve samples were received on 4/20/2017 10:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.0º C.

Receipt Exceptions

Container labels of all samples provide the sample ID only. The samples are logged in per chain of custody. ST 01 SD (580-67779-1), ST 01 SD (580-67779-1[MS]), ST 01 SD (580-67779-1[MSD]), ST 02 SD (580-67779-2), ST 03 SD (580-67779-3), ST 04 SD (580-67779-4), ST 05 SD (580-67779-5), ST 06 WA (580-67779-6), ST 07 WA (580-67779-7), ST 08 SD (580-67779-8), ST 09 SD (580-67779-9), ST 10 SD (580-67779-10), ST 11 WA (580-67779-11) and ST 12 WA (580-67779-12)

Very limited volume was received of the following samples. One unpreserved 250mL poly was received of each sample. Some of the containers were not completely fillled. The client is requesting hardness analysis on sample ST12WA but there will not be volume available for that analysis if metals and mercury analyses are performed. The sample is logged in for hardness, on hold. The client has requested matrix spike/matrix spike dup be performed on sample ST11WA but no adequate volume was not received. ST 01 SD (580-67779-1), ST 01 SD (580-67779-1[MS]), ST 01 SD (580-67779-1[MSD]), ST 02 SD (580-67779-2), ST 03 SD (580-67779-3), ST 04 SD (580-67779-4), ST 05 SD (580-67779-5), ST 06 WA (580-67779-6), ST 07 WA (580-67779-7), ST 08 SD (580-67779-8), ST 09 SD (580-67779-9), ST 10 SD (580-67779-10), ST 11 WA (580-67779-11) and ST 12 WA (580-67779-12)

The reference method (metals & mercury) requires samples to be preserved to a pH of 2 or less. The following samples were received unpreserved.: ST 01 SD (580-67779-1), ST 01 SD (580-67779-1[MS]), ST 01 SD (580-67779-1[MSD]), ST 02 SD (580-67779-2), ST 03 SD (580-67779-3), ST 04 SD (580-67779-4), ST 05 SD (580-67779-5), ST 06 WA (580-67779-6), ST 07 WA (580-67779-7), ST 08 SD (580-67779-8), ST 09 SD (580-67779-9), ST 10 SD (580-67779-10), ST 11 WA (580-67779-11) and ST 12 WA (580-67779-12). An aliquot (100mL) of each sample was preserved to the appropriate pH in the laboratory at 15:20 on 4/24/17 with HNO3 from lot 0000133393.

Metals
Method 6020A: The matrix spike/matrix spike duplicate (MS/MSD) %RPD was outside control limits for Copper in prep batch 580-244358 and analysis batch 580-244453. The MS/MSD and associated labotatory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries met acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Qualifiers

Metals

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 01 SD
Date Collected: 04/18/17 11:38
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-1
Matrix: Solid
Percent Solids: 86.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.8		0.55	0.11	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Barium	71		0.55	0.044	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Cadmium	ND		0.44	0.085	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Chromium	3.2		0.55	0.070	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Copper	9.1	F2	1.1	0.24	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Lead	6.0		0.55	0.053	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Selenium	0.93	J	1.1	0.24	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10
Silver	0.033	J	0.22	0.022	mg/Kg	☼	04/27/17 11:47	04/27/17 23:51	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.045		0.033	0.0099	mg/Kg	☼	04/26/17 13:20	04/27/17 07:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	86.7		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	13.3		0.1	0.1	%			04/27/17 14:18	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 02 SD
Date Collected: 04/18/17 12:15
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-2
Matrix: Solid
Percent Solids: 81.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3		0.56	0.11	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Barium	39		0.56	0.045	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Cadmium	ND		0.45	0.086	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Chromium	9.4		0.56	0.070	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Copper	33		1.1	0.25	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Lead	6.2		0.56	0.054	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Selenium	0.56	J	1.1	0.24	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10
Silver	0.035	J	0.22	0.022	mg/Kg	☼	04/25/17 15:17	04/26/17 20:11	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16		0.031	0.0092	mg/Kg	☼	04/26/17 13:20	04/27/17 07:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	81.2		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	18.8		0.1	0.1	%			04/27/17 14:18	1

Client Sample Results

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 03 SD
Date Collected: 04/18/17 12:21
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-3
Matrix: Solid
Percent Solids: 92.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3		0.48	0.097	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Barium	35		0.48	0.039	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Cadmium	ND		0.39	0.075	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Chromium	13		0.48	0.061	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Copper	12		0.97	0.21	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Lead	7.5		0.48	0.046	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Selenium	0.28	J	0.97	0.21	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10
Silver	ND		0.19	0.019	mg/Kg	☼	04/25/17 15:17	04/26/17 20:16	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.035		0.029	0.0087	mg/Kg	☼	04/26/17 13:20	04/27/17 08:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	92.4		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	7.6		0.1	0.1	%			04/27/17 14:18	1

Client Sample Results

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 04 SD
Date Collected: 04/18/17 12:25
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-4
Matrix: Solid
Percent Solids: 95.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.6		0.46	0.092	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Barium	26		0.46	0.037	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Cadmium	0.12	J	0.37	0.071	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Chromium	6.9		0.46	0.058	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Copper	14		0.92	0.20	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Lead	5.7		0.46	0.044	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Selenium	0.34	J	0.92	0.20	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10
Silver	0.033	J	0.18	0.018	mg/Kg	☼	04/25/17 15:17	04/26/17 20:20	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.012	J	0.027	0.0081	mg/Kg	☼	04/26/17 13:20	04/27/17 07:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	95.2		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	4.8		0.1	0.1	%			04/27/17 14:18	1

Client Sample ID: ST 05 SD
Date Collected: 04/18/17 12:33
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-5
Matrix: Solid
Percent Solids: 86.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.4**		0.52	0.10	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Barium	**21**		0.52	0.042	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Cadmium	ND		0.42	0.081	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Chromium	**8.8**		0.52	0.066	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Copper	**14**		1.0	0.23	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Lead	**2.0**		0.52	0.050	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Selenium	ND		1.0	0.23	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10
Silver	ND		0.21	0.021	mg/Kg	☼	04/25/17 15:17	04/26/17 20:24	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.026**	**J**	0.032	0.0097	mg/Kg	☼	04/26/17 13:20	04/27/17 08:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	**86.0**		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	**14.0**		0.1	0.1	%			04/27/17 14:18	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 06 WA
Date Collected: 04/18/17 12:40
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-6
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/25/17 15:00	04/26/17 15:22	5
Barium	**0.037**		0.0060	0.00027	mg/L		04/25/17 15:00	04/26/17 15:22	5
Cadmium	ND		0.0020	0.00050	mg/L		04/25/17 15:00	04/26/17 15:22	5
Chromium	ND		0.0020	0.00071	mg/L		04/25/17 15:00	04/26/17 15:22	5
Copper	**0.0040**	**J**	0.010	0.0030	mg/L		04/25/17 15:00	04/26/17 15:22	5
Lead	ND		0.0040	0.0010	mg/L		04/25/17 15:00	04/26/17 15:22	5
Selenium	ND		0.040	0.010	mg/L		04/25/17 15:00	04/26/17 15:22	5
Silver	ND		0.0020	0.00022	mg/L		04/25/17 15:00	04/26/17 15:22	5

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/27/17 16:36	04/28/17 13:18	5
Barium	**0.039**		0.0060	0.00027	mg/L		04/27/17 16:36	04/28/17 13:18	5
Cadmium	ND		0.0020	0.00050	mg/L		04/27/17 16:36	04/28/17 13:18	5
Chromium	ND		0.0020	0.00071	mg/L		04/27/17 16:36	04/28/17 13:18	5
Copper	ND		0.010	0.0030	mg/L		04/27/17 16:36	04/28/17 13:18	5
Lead	ND		0.0040	0.0010	mg/L		04/27/17 16:36	04/28/17 13:18	5
Selenium	ND		0.040	0.010	mg/L		04/27/17 16:36	04/28/17 13:18	5
Silver	ND		0.0020	0.00022	mg/L		04/27/17 16:36	04/28/17 13:18	5

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		04/27/17 09:23	04/27/17 13:36	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 11:51	05/01/17 16:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**			SU			05/01/17 10:00	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 07 WA
Date Collected: 04/18/17 12:45
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-7
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/25/17 15:00	04/26/17 15:26	5
Barium	**0.039**		0.0060	0.00027	mg/L		04/25/17 15:00	04/26/17 15:26	5
Cadmium	ND		0.0020	0.00050	mg/L		04/25/17 15:00	04/26/17 15:26	5
Chromium	ND		0.0020	0.00071	mg/L		04/25/17 15:00	04/26/17 15:26	5
Copper	**0.0033**	**J**	0.010	0.0030	mg/L		04/25/17 15:00	04/26/17 15:26	5
Lead	ND		0.0040	0.0010	mg/L		04/25/17 15:00	04/26/17 15:26	5
Selenium	ND		0.040	0.010	mg/L		04/25/17 15:00	04/26/17 15:26	5
Silver	ND		0.0020	0.00022	mg/L		04/25/17 15:00	04/26/17 15:26	5

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/27/17 16:36	04/28/17 13:05	5
Barium	**0.040**		0.0060	0.00027	mg/L		04/27/17 16:36	04/28/17 13:05	5
Cadmium	ND		0.0020	0.00050	mg/L		04/27/17 16:36	04/28/17 13:05	5
Chromium	ND		0.0020	0.00071	mg/L		04/27/17 16:36	04/28/17 13:05	5
Copper	ND		0.010	0.0030	mg/L		04/27/17 16:36	04/28/17 13:05	5
Lead	ND		0.0040	0.0010	mg/L		04/27/17 16:36	04/28/17 13:05	5
Selenium	ND		0.040	0.010	mg/L		04/27/17 16:36	04/28/17 13:05	5
Silver	ND		0.0020	0.00022	mg/L		04/27/17 16:36	04/28/17 13:05	5

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 09:07	05/01/17 12:50	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 11:51	05/01/17 16:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**			SU			05/01/17 10:02	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 08 SD
Date Collected: 04/18/17 13:25
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-8
Matrix: Solid
Percent Solids: 96.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.9		0.45	0.090	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Barium	19		0.45	0.036	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Cadmium	ND		0.36	0.069	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Chromium	8.4		0.45	0.057	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Copper	25		0.90	0.20	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Lead	7.6		0.45	0.043	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Selenium	ND		0.90	0.20	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10
Silver	ND		0.18	0.018	mg/Kg	☼	04/25/17 15:17	04/26/17 20:29	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.011	J	0.028	0.0085	mg/Kg	☼	04/26/17 13:20	04/27/17 08:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	96.3		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	3.7		0.1	0.1	%			04/27/17 14:18	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 09 SD
Date Collected: 04/18/17 13:36
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-9
Matrix: Solid
Percent Solids: 87.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.4		0.56	0.11	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Barium	26		0.56	0.044	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Cadmium	ND		0.44	0.086	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Chromium	9.2		0.56	0.070	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Copper	52		1.1	0.24	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Lead	1.8		0.56	0.053	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Selenium	0.34	J	1.1	0.24	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10
Silver	ND		0.22	0.022	mg/Kg	☼	04/27/17 10:34	04/28/17 03:28	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.032	0.0095	mg/Kg	☼	04/26/17 16:18	04/27/17 10:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	87.7		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	12.3		0.1	0.1	%			04/27/17 14:18	1

Client Sample Results

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 10 SD
Date Collected: 04/18/17 13:52
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-10
Matrix: Solid
Percent Solids: 78.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.1		0.60	0.12	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Barium	34		0.60	0.048	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Cadmium	0.098	J	0.48	0.092	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Chromium	12		0.60	0.075	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Copper	28		1.2	0.26	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Lead	3.8		0.60	0.057	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Selenium	0.75	J	1.2	0.26	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10
Silver	ND		0.24	0.024	mg/Kg	☼	04/27/17 10:34	04/28/17 03:32	10

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.013	J	0.033	0.0098	mg/Kg	☼	04/26/17 16:18	04/27/17 10:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.5		0.1	0.1	%			04/27/17 14:18	1
Percent Moisture	21.5		0.1	0.1	%			04/27/17 14:18	1

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 11 WA

Date Collected: 04/18/17 14:07
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-11

Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/25/17 15:00	04/26/17 15:31	5
Barium	**0.0039**	**J**	0.0060	0.00027	mg/L		04/25/17 15:00	04/26/17 15:31	5
Cadmium	ND		0.0020	0.00050	mg/L		04/25/17 15:00	04/26/17 15:31	5
Chromium	ND		0.0020	0.00071	mg/L		04/25/17 15:00	04/26/17 15:31	5
Copper	ND		0.010	0.0030	mg/L		04/25/17 15:00	04/26/17 15:31	5
Lead	ND		0.0040	0.0010	mg/L		04/25/17 15:00	04/26/17 15:31	5
Selenium	ND		0.040	0.010	mg/L		04/25/17 15:00	04/26/17 15:31	5
Silver	ND		0.0020	0.00022	mg/L		04/25/17 15:00	04/26/17 15:31	5

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/27/17 16:36	04/28/17 13:10	5
Barium	**0.0043**	**J**	0.0060	0.00027	mg/L		04/27/17 16:36	04/28/17 13:10	5
Cadmium	ND		0.0020	0.00050	mg/L		04/27/17 16:36	04/28/17 13:10	5
Chromium	ND		0.0020	0.00071	mg/L		04/27/17 16:36	04/28/17 13:10	5
Copper	ND		0.010	0.0030	mg/L		04/27/17 16:36	04/28/17 13:10	5
Lead	ND		0.0040	0.0010	mg/L		04/27/17 16:36	04/28/17 13:10	5
Selenium	ND		0.040	0.010	mg/L		04/27/17 16:36	04/28/17 13:10	5
Silver	ND		0.0020	0.00022	mg/L		04/27/17 16:36	04/28/17 13:10	5

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 09:07	05/01/17 12:52	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 11:51	05/01/17 16:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**			SU			05/01/17 10:04	1

Client Sample ID: ST 12 WA

Date Collected: 04/18/17 14:47
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-12

Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/25/17 15:00	04/26/17 15:35	5
Barium	**0.0068**		0.0060	0.00027	mg/L		04/25/17 15:00	04/26/17 15:35	5
Cadmium	ND		0.0020	0.00050	mg/L		04/25/17 15:00	04/26/17 15:35	5
Chromium	ND		0.0020	0.00071	mg/L		04/25/17 15:00	04/26/17 15:35	5
Copper	ND		0.010	0.0030	mg/L		04/25/17 15:00	04/26/17 15:35	5
Lead	ND		0.0040	0.0010	mg/L		04/25/17 15:00	04/26/17 15:35	5
Selenium	ND		0.040	0.010	mg/L		04/25/17 15:00	04/26/17 15:35	5
Silver	ND		0.0020	0.00022	mg/L		04/25/17 15:00	04/26/17 15:35	5

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/27/17 16:36	04/28/17 13:14	5
Barium	**0.0068**		0.0060	0.00027	mg/L		04/27/17 16:36	04/28/17 13:14	5
Cadmium	ND		0.0020	0.00050	mg/L		04/27/17 16:36	04/28/17 13:14	5
Chromium	ND		0.0020	0.00071	mg/L		04/27/17 16:36	04/28/17 13:14	5
Copper	ND		0.010	0.0030	mg/L		04/27/17 16:36	04/28/17 13:14	5
Lead	ND		0.0040	0.0010	mg/L		04/27/17 16:36	04/28/17 13:14	5
Selenium	ND		0.040	0.010	mg/L		04/27/17 16:36	04/28/17 13:14	5
Silver	ND		0.0020	0.00022	mg/L		04/27/17 16:36	04/28/17 13:14	5

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 09:07	05/01/17 12:59	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 11:51	05/01/17 16:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.9**	**HF**			SU			05/01/17 10:06	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-244112/22-A
Matrix: Water
Analysis Batch: 244331

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244112

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/25/17 15:00	04/26/17 18:11	5
Barium	ND		0.0060	0.00027	mg/L		04/25/17 15:00	04/26/17 18:11	5
Cadmium	ND		0.0020	0.00050	mg/L		04/25/17 15:00	04/26/17 18:11	5
Chromium	ND		0.0020	0.00071	mg/L		04/25/17 15:00	04/26/17 18:11	5
Copper	ND		0.010	0.0030	mg/L		04/25/17 15:00	04/26/17 18:11	5
Lead	ND		0.0040	0.0010	mg/L		04/25/17 15:00	04/26/17 18:11	5
Selenium	ND		0.040	0.010	mg/L		04/25/17 15:00	04/26/17 18:11	5
Silver	ND		0.0020	0.00022	mg/L		04/25/17 15:00	04/26/17 18:11	5

Lab Sample ID: LCS 580-244112/23-A
Matrix: Water
Analysis Batch: 244331

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244112

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	3.95		mg/L		99	80 - 120
Barium	4.00	3.89		mg/L		97	80 - 120
Cadmium	0.100	0.0982		mg/L		98	80 - 120
Chromium	0.400	0.395		mg/L		99	80 - 120
Copper	0.500	0.481		mg/L		96	80 - 120
Lead	1.00	0.983		mg/L		98	80 - 120
Selenium	4.00	3.96		mg/L		99	80 - 120
Silver	0.600	0.586		mg/L		98	80 - 120

Lab Sample ID: LCSD 580-244112/24-A
Matrix: Water
Analysis Batch: 244331

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244112

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.00	3.93		mg/L		98	80 - 120	0	20
Barium	4.00	3.89		mg/L		97	80 - 120	0	20
Cadmium	0.100	0.0982		mg/L		98	80 - 120	0	20
Chromium	0.400	0.401		mg/L		100	80 - 120	1	20
Copper	0.500	0.513		mg/L		103	80 - 120	6	20
Lead	1.00	0.976		mg/L		98	80 - 120	1	20
Selenium	4.00	3.94		mg/L		98	80 - 120	0	20
Silver	0.600	0.586		mg/L		98	80 - 120	0	20

Lab Sample ID: MB 580-244152/22-A
Matrix: Solid
Analysis Batch: 244331

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244152

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.10	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Barium	ND		0.50	0.040	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Cadmium	ND		0.40	0.077	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Chromium	ND		0.50	0.063	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Copper	ND		1.0	0.22	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Lead	ND		0.50	0.048	mg/Kg		04/25/17 15:17	04/26/17 19:04	10
Selenium	ND		1.0	0.22	mg/Kg		04/25/17 15:17	04/26/17 19:04	10

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-244152/22-A
Matrix: Solid
Analysis Batch: 244331

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244152

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.20	0.020	mg/Kg		04/25/17 15:17	04/26/17 19:04	10

Lab Sample ID: LCS 580-244152/23-A
Matrix: Solid
Analysis Batch: 244331

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	202		mg/Kg		101	80 - 120
Barium	200	196		mg/Kg		98	80 - 120
Cadmium	5.00	4.92		mg/Kg		98	80 - 120
Chromium	20.0	20.2		mg/Kg		101	80 - 120
Copper	25.0	24.7		mg/Kg		99	80 - 120
Lead	50.0	50.1		mg/Kg		100	80 - 120
Selenium	200	200		mg/Kg		100	80 - 120
Silver	30.0	29.6		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 580-244152/24-A
Matrix: Solid
Analysis Batch: 244331

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244152

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	198		mg/Kg		99	80 - 120	2	20
Barium	200	196		mg/Kg		98	80 - 120	0	20
Cadmium	5.00	5.11		mg/Kg		102	80 - 120	4	20
Chromium	20.0	19.9		mg/Kg		99	80 - 120	2	20
Copper	25.0	23.7		mg/Kg		95	80 - 120	4	20
Lead	50.0	49.6		mg/Kg		99	80 - 120	1	20
Selenium	200	198		mg/Kg		99	80 - 120	1	20
Silver	30.0	29.4		mg/Kg		98	80 - 120	1	20

Lab Sample ID: MB 580-244352/22-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244352

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.10	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Barium	ND		0.50	0.040	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Cadmium	ND		0.40	0.077	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Chromium	ND		0.50	0.063	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Copper	ND		1.0	0.22	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Lead	ND		0.50	0.048	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Selenium	ND		1.0	0.22	mg/Kg		04/27/17 10:34	04/28/17 01:16	10
Silver	ND		0.20	0.020	mg/Kg		04/27/17 10:34	04/28/17 01:16	10

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-244352/23-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244352

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	196		mg/Kg		98	80 - 120
Barium	200	192		mg/Kg		96	80 - 120
Cadmium	5.00	4.86		mg/Kg		97	80 - 120
Chromium	20.0	20.0		mg/Kg		100	80 - 120
Copper	25.0	24.8		mg/Kg		99	80 - 120
Lead	50.0	46.1		mg/Kg		92	80 - 120
Selenium	200	194		mg/Kg		97	80 - 120
Silver	30.0	28.9		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 580-244352/24-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244352

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	196		mg/Kg		98	80 - 120	0	20
Barium	200	192		mg/Kg		96	80 - 120	0	20
Cadmium	5.00	4.91		mg/Kg		98	80 - 120	1	20
Chromium	20.0	19.9		mg/Kg		100	80 - 120	1	20
Copper	25.0	25.0		mg/Kg		100	80 - 120	1	20
Lead	50.0	46.4		mg/Kg		93	80 - 120	1	20
Selenium	200	194		mg/Kg		97	80 - 120	0	20
Silver	30.0	29.1		mg/Kg		97	80 - 120	1	20

Lab Sample ID: MB 580-244358/19-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244358

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.10	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Barium	ND		0.50	0.040	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Cadmium	ND		0.40	0.077	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Chromium	ND		0.50	0.063	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Copper	ND		1.0	0.22	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Lead	ND		0.50	0.048	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Selenium	ND		1.0	0.22	mg/Kg		04/27/17 11:49	04/27/17 22:47	10
Silver	ND		0.20	0.020	mg/Kg		04/27/17 11:49	04/27/17 22:47	10

Lab Sample ID: LCS 580-244358/20-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244358

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	192		mg/Kg		96	80 - 120
Barium	200	189		mg/Kg		94	80 - 120
Cadmium	5.00	4.99		mg/Kg		100	80 - 120
Chromium	20.0	19.9		mg/Kg		100	80 - 120
Copper	25.0	24.7		mg/Kg		99	80 - 120
Lead	50.0	45.6		mg/Kg		91	80 - 120
Selenium	200	187		mg/Kg		93	80 - 120

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-244358/20-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244358

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	30.0	29.0		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-244358/21-A
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244358

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	192		mg/Kg		96	80 - 120	0	20
Barium	200	187		mg/Kg		93	80 - 120	1	20
Cadmium	5.00	4.79		mg/Kg		96	80 - 120	4	20
Chromium	20.0	19.7		mg/Kg		98	80 - 120	1	20
Copper	25.0	25.1		mg/Kg		101	80 - 120	2	20
Lead	50.0	45.6		mg/Kg		91	80 - 120	0	20
Selenium	200	191		mg/Kg		96	80 - 120	2	20
Silver	30.0	28.9		mg/Kg		96	80 - 120	0	20

Lab Sample ID: 580-67779-1 MS
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: ST 01 SD
Prep Type: Total/NA
Prep Batch: 244358

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.8		223	212		mg/Kg	☼	93	80 - 120
Barium	71		223	254		mg/Kg	☼	82	80 - 120
Cadmium	ND		5.57	5.26		mg/Kg	☼	94	80 - 120
Chromium	3.2		22.3	24.6		mg/Kg	☼	96	80 - 120
Copper	9.1	F2	27.9	40.7		mg/Kg	☼	113	80 - 120
Lead	6.0		55.7	53.6		mg/Kg	☼	85	80 - 120
Selenium	0.93	J	223	205		mg/Kg	☼	92	80 - 120
Silver	0.033	J	33.4	31.4		mg/Kg	☼	94	80 - 120

Lab Sample ID: 580-67779-1 MSD
Matrix: Solid
Analysis Batch: 244453

Client Sample ID: ST 01 SD
Prep Type: Total/NA
Prep Batch: 244358

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.8		196	197		mg/Kg	☼	98	80 - 120	7	20
Barium	71		196	239		mg/Kg	☼	85	80 - 120	6	20
Cadmium	ND		4.90	4.87		mg/Kg	☼	99	80 - 120	8	20
Chromium	3.2		19.6	22.1		mg/Kg	☼	96	80 - 120	11	20
Copper	9.1	F2	24.5	28.7	F2	mg/Kg	☼	80	80 - 120	35	20
Lead	6.0		49.0	49.5		mg/Kg	☼	89	80 - 120	8	20
Selenium	0.93	J	196	193		mg/Kg	☼	98	80 - 120	6	20
Silver	0.033	J	29.4	28.7		mg/Kg	☼	98	80 - 120	9	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-244414/6-A
Matrix: Water
Analysis Batch: 244526

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 244414

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.03		mg/L		101	80 - 120
Barium	4.00	3.98		mg/L		99	80 - 120
Cadmium	0.100	0.101		mg/L		101	80 - 120
Chromium	0.400	0.402		mg/L		101	80 - 120
Copper	0.500	0.486		mg/L		97	80 - 120
Lead	1.00	0.938		mg/L		94	80 - 120
Selenium	4.00	3.95		mg/L		99	80 - 120
Silver	0.600	0.589		mg/L		98	80 - 120

Lab Sample ID: LCSD 580-244414/7-A
Matrix: Water
Analysis Batch: 244526

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 244414

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.00	3.98		mg/L		99	80 - 120	1	20
Barium	4.00	3.91		mg/L		98	80 - 120	2	20
Cadmium	0.100	0.0950		mg/L		95	80 - 120	6	20
Chromium	0.400	0.401		mg/L		100	80 - 120	0	20
Copper	0.500	0.487		mg/L		97	80 - 120	0	20
Lead	1.00	0.940		mg/L		94	80 - 120	0	20
Selenium	4.00	3.94		mg/L		99	80 - 120	0	20
Silver	0.600	0.568		mg/L		95	80 - 120	4	20

Lab Sample ID: MB 580-244049/5-B
Matrix: Water
Analysis Batch: 244526

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 244414

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.0014	mg/L		04/27/17 16:36	04/28/17 12:52	5
Barium	ND		0.0060	0.00027	mg/L		04/27/17 16:36	04/28/17 12:52	5
Cadmium	ND		0.0020	0.00050	mg/L		04/27/17 16:36	04/28/17 12:52	5
Chromium	ND		0.0020	0.00071	mg/L		04/27/17 16:36	04/28/17 12:52	5
Copper	ND		0.010	0.0030	mg/L		04/27/17 16:36	04/28/17 12:52	5
Lead	ND		0.0040	0.0010	mg/L		04/27/17 16:36	04/28/17 12:52	5
Selenium	ND		0.040	0.010	mg/L		04/27/17 16:36	04/28/17 12:52	5
Silver	ND		0.0020	0.00022	mg/L		04/27/17 16:36	04/28/17 12:52	5

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-244340/20-A
Matrix: Water
Analysis Batch: 244389

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244340

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		04/27/17 09:23	04/27/17 12:40	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 580-244340/21-A
Matrix: Water
Analysis Batch: 244389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244340

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00201		mg/L		100	80 - 120

Lab Sample ID: LCSD 580-244340/22-A
Matrix: Water
Analysis Batch: 244389

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244340

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.00200	0.00200		mg/L		100	80 - 120	0	20

Lab Sample ID: MB 580-244567/20-A
Matrix: Water
Analysis Batch: 244643

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244567

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 09:07	05/01/17 12:05	1

Lab Sample ID: LCS 580-244567/21-A
Matrix: Water
Analysis Batch: 244643

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244567

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00208		mg/L		104	80 - 120

Lab Sample ID: LCSD 580-244567/22-A
Matrix: Water
Analysis Batch: 244643

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244567

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.00200	0.00209		mg/L		105	80 - 120	1	20

Lab Sample ID: LCS 580-244605/6-A
Matrix: Water
Analysis Batch: 244677

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244605

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00194		mg/L		97	80 - 120

Lab Sample ID: LCSD 580-244605/7-A
Matrix: Water
Analysis Batch: 244677

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244605

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.00200	0.00187		mg/L		94	80 - 120	4	20

Lab Sample ID: MB 580-244049/5-C
Matrix: Water
Analysis Batch: 244677

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 244605

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		05/01/17 11:51	05/01/17 16:01	1

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-244264/22-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244264

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		04/26/17 13:20	04/27/17 07:36	1

Lab Sample ID: LCS 580-244264/23-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244264

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.159		mg/Kg		95	80 - 120

Lab Sample ID: LCSD 580-244264/24-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244264

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.167	0.153		mg/Kg		92	80 - 120	3	20

Lab Sample ID: 580-67779-1 MS
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: ST 01 SD
Prep Type: Total/NA
Prep Batch: 244264

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.045		0.189	0.253		mg/Kg	☼	110	80 - 120

Lab Sample ID: 580-67779-1 MSD
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: ST 01 SD
Prep Type: Total/NA
Prep Batch: 244264

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.045		0.186	0.253		mg/Kg	☼	112	80 - 120	0	20

Lab Sample ID: 580-67779-1 DU
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: ST 01 SD
Prep Type: Total/NA
Prep Batch: 244264

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.045		0.0454		mg/Kg	☼	1	20

Lab Sample ID: MB 580-244309/22-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 244309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		04/26/17 16:18	04/27/17 09:45	1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 580-244309/23-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 244309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.144		mg/Kg		87	80 - 120

Lab Sample ID: LCSD 580-244309/24-A
Matrix: Solid
Analysis Batch: 244353

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 244309

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.167	0.138		mg/Kg		83	80 - 120	5	20

Client Sample ID: ST 01 SD — **Lab Sample ID: 580-67779-1**
Date Collected: 04/18/17 11:38 — **Matrix: Solid**
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 01 SD — **Lab Sample ID: 580-67779-1**
Date Collected: 04/18/17 11:38 — **Matrix: Solid**
Date Received: 04/20/17 10:35 — **Percent Solids: 86.7**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244358	04/27/17 11:47	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244453	04/27/17 23:51	FCW	TAL SEA
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 07:43	FCW	TAL SEA

Client Sample ID: ST 02 SD — **Lab Sample ID: 580-67779-2**
Date Collected: 04/18/17 12:15 — **Matrix: Solid**
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 02 SD — **Lab Sample ID: 580-67779-2**
Date Collected: 04/18/17 12:15 — **Matrix: Solid**
Date Received: 04/20/17 10:35 — **Percent Solids: 81.2**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244152	04/25/17 15:17	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244331	04/26/17 20:11	FCW	TAL SEA
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 07:54	FCW	TAL SEA

Client Sample ID: ST 03 SD — **Lab Sample ID: 580-67779-3**
Date Collected: 04/18/17 12:21 — **Matrix: Solid**
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 03 SD — **Lab Sample ID: 580-67779-3**
Date Collected: 04/18/17 12:21 — **Matrix: Solid**
Date Received: 04/20/17 10:35 — **Percent Solids: 92.4**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244152	04/25/17 15:17	ADB	TAL SEA

Client Sample ID: ST 03 SD

Lab Sample ID: 580-67779-3
Date Collected: 04/18/17 12:21
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		10	244331	04/26/17 20:16	FCW	TAL SEA
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 08:14	FCW	TAL SEA

Client Sample ID: ST 04 SD

Lab Sample ID: 580-67779-4
Date Collected: 04/18/17 12:25
Matrix: Solid
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 04 SD

Lab Sample ID: 580-67779-4
Date Collected: 04/18/17 12:25
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 95.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244152	04/25/17 15:17	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244331	04/26/17 20:20	FCW	TAL SEA
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 07:56	FCW	TAL SEA

Client Sample ID: ST 05 SD

Lab Sample ID: 580-67779-5
Date Collected: 04/18/17 12:33
Matrix: Solid
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 05 SD

Lab Sample ID: 580-67779-5
Date Collected: 04/18/17 12:33
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 86.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244152	04/25/17 15:17	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244331	04/26/17 20:24	FCW	TAL SEA
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 08:03	FCW	TAL SEA

Client Sample ID: ST 06 WA

Lab Sample ID: 580-67779-6

Date Collected: 04/18/17 12:40

Matrix: Water

Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	3005A			244414	04/27/17 16:36	PAB	TAL SEA
Dissolved	Analysis	6020A		5	244526	04/28/17 13:18	FCW	TAL SEA
Total/NA	Prep	3010A			244112	04/25/17 15:00	PAB	TAL SEA
Total/NA	Analysis	6020A		5	244331	04/26/17 15:22	FCW	TAL SEA
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	7470A			244605	05/01/17 11:51	PAB	TAL SEA
Dissolved	Analysis	7470A		1	244677	05/01/17 16:07	FCW	TAL SEA
Total/NA	Prep	7470A			244340	04/27/17 09:23	ADB	TAL SEA
Total/NA	Analysis	7470A		1	244389	04/27/17 13:36	FCW	TAL SEA
Total/NA	Analysis	9040B		1	244575	05/01/17 10:00	MMM	TAL SEA

Client Sample ID: ST 07 WA

Lab Sample ID: 580-67779-7

Date Collected: 04/18/17 12:45

Matrix: Water

Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	3005A			244414	04/27/17 16:36	PAB	TAL SEA
Dissolved	Analysis	6020A		5	244526	04/28/17 13:05	FCW	TAL SEA
Total/NA	Prep	3010A			244112	04/25/17 15:00	PAB	TAL SEA
Total/NA	Analysis	6020A		5	244331	04/26/17 15:26	FCW	TAL SEA
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	7470A			244605	05/01/17 11:51	PAB	TAL SEA
Dissolved	Analysis	7470A		1	244677	05/01/17 16:10	FCW	TAL SEA
Total/NA	Prep	7470A			244567	05/01/17 09:07	ADB	TAL SEA
Total/NA	Analysis	7470A		1	244643	05/01/17 12:50	FCW	TAL SEA
Total/NA	Analysis	9040B		1	244575	05/01/17 10:02	MMM	TAL SEA

Client Sample ID: ST 08 SD

Lab Sample ID: 580-67779-8

Date Collected: 04/18/17 13:25

Matrix: Solid

Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 08 SD

Lab Sample ID: 580-67779-8

Date Collected: 04/18/17 13:25

Matrix: Solid

Date Received: 04/20/17 10:35

Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244152	04/25/17 15:17	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244331	04/26/17 20:29	FCW	TAL SEA

Lab Chronicle

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 08 SD
Lab Sample ID: 580-67779-8
Date Collected: 04/18/17 13:25
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			244264	04/26/17 13:20	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 08:05	FCW	TAL SEA

Client Sample ID: ST 09 SD
Lab Sample ID: 580-67779-9
Date Collected: 04/18/17 13:36
Matrix: Solid
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 09 SD
Lab Sample ID: 580-67779-9
Date Collected: 04/18/17 13:36
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244352	04/27/17 10:34	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244453	04/28/17 03:28	FCW	TAL SEA
Total/NA	Prep	7471A			244309	04/26/17 16:18	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 10:44	FCW	TAL SEA

Client Sample ID: ST 10 SD
Lab Sample ID: 580-67779-10
Date Collected: 04/18/17 13:52
Matrix: Solid
Date Received: 04/20/17 10:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	244396	04/27/17 14:18	MRG	TAL SEA

Client Sample ID: ST 10 SD
Lab Sample ID: 580-67779-10
Date Collected: 04/18/17 13:52
Matrix: Solid
Date Received: 04/20/17 10:35
Percent Solids: 78.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			244352	04/27/17 10:34	ADB	TAL SEA
Total/NA	Analysis	6020A		10	244453	04/28/17 03:32	FCW	TAL SEA
Total/NA	Prep	7471A			244309	04/26/17 16:18	ADB	TAL SEA
Total/NA	Analysis	7471A		1	244353	04/27/17 10:47	FCW	TAL SEA

Lab Chronicle

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Client Sample ID: ST 11 WA

Date Collected: 04/18/17 14:07
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	3005A			244414	04/27/17 16:36	PAB	TAL SEA
Dissolved	Analysis	6020A		5	244526	04/28/17 13:10	FCW	TAL SEA
Total/NA	Prep	3010A			244112	04/25/17 15:00	PAB	TAL SEA
Total/NA	Analysis	6020A		5	244331	04/26/17 15:31	FCW	TAL SEA
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	7470A			244605	05/01/17 11:51	PAB	TAL SEA
Dissolved	Analysis	7470A		1	244677	05/01/17 16:12	FCW	TAL SEA
Total/NA	Prep	7470A			244567	05/01/17 09:07	ADB	TAL SEA
Total/NA	Analysis	7470A		1	244643	05/01/17 12:52	FCW	TAL SEA
Total/NA	Analysis	9040B		1	244575	05/01/17 10:04	MMM	TAL SEA

Client Sample ID: ST 12 WA

Date Collected: 04/18/17 14:47
Date Received: 04/20/17 10:35

Lab Sample ID: 580-67779-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	3005A			244414	04/27/17 16:36	PAB	TAL SEA
Dissolved	Analysis	6020A		5	244526	04/28/17 13:14	FCW	TAL SEA
Total/NA	Prep	3010A			244112	04/25/17 15:00	PAB	TAL SEA
Total/NA	Analysis	6020A		5	244331	04/26/17 15:35	FCW	TAL SEA
Dissolved	Filtration	FILTRATION			244049	04/24/17 17:41	PAB	TAL SEA
Dissolved	Prep	7470A			244605	05/01/17 11:51	PAB	TAL SEA
Dissolved	Analysis	7470A		1	244677	05/01/17 16:14	FCW	TAL SEA
Total/NA	Prep	7470A			244567	05/01/17 09:07	ADB	TAL SEA
Total/NA	Analysis	7470A		1	244643	05/01/17 12:59	FCW	TAL SEA
Total/NA	Analysis	9040B		1	244575	05/01/17 10:06	MMM	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6020A	3005A	Water	Copper
6020A	3005A	Water	Selenium
6020A	3005A	Water	Silver
6020A	3010A	Water	Copper
6020A	3010A	Water	Selenium
6020A	3010A	Water	Silver
6020A	3050B	Solid	Copper
6020A	3050B	Solid	Selenium
6020A	3050B	Solid	Silver
7470A	7470A	Water	Mercury
7471A	7471A	Solid	Mercury
9040B		Water	pH
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Sample Summary

Client: Alaska Department of Env. Conservation
Project/Site: Sea Level Tidelands

TestAmerica Job ID: 580-67779-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-67779-1	ST 01 SD	Solid	04/18/17 11:38	04/20/17 10:35
580-67779-2	ST 02 SD	Solid	04/18/17 12:15	04/20/17 10:35
580-67779-3	ST 03 SD	Solid	04/18/17 12:21	04/20/17 10:35
580-67779-4	ST 04 SD	Solid	04/18/17 12:25	04/20/17 10:35
580-67779-5	ST 05 SD	Solid	04/18/17 12:33	04/20/17 10:35
580-67779-6	ST 06 WA	Water	04/18/17 12:40	04/20/17 10:35
580-67779-7	ST 07 WA	Water	04/18/17 12:45	04/20/17 10:35
580-67779-8	ST 08 SD	Solid	04/18/17 13:25	04/20/17 10:35
580-67779-9	ST 09 SD	Solid	04/18/17 13:36	04/20/17 10:35
580-67779-10	ST 10 SD	Solid	04/18/17 13:52	04/20/17 10:35
580-67779-11	ST 11 WA	Water	04/18/17 14:07	04/20/17 10:35
580-67779-12	ST 12 WA	Water	04/18/17 14:47	04/20/17 10:35

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

67779

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: D Duncan	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-24026-7932.1
Client Contact: Danielle Duncan	Phone:	E-Mail: elaine.walker@testamericainc.com		Page: Page _ of _
Company: Alaska Department of Env. Conservation				Job #:
Address: PO BOX 111800	Due Date Requested:			
City: Juneau	TAT Requested (days):			
State, Zip: AK, 99811-1800				
Phone: 907-465-5207(Tel)	PO #: 170016332			
Email: danielle.duncan@alaska.gov	WO #:			
Project Name: Sealevel Tidelands	Project #: 58010995			
Site:	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Dissolved 6020A, 7471A (waters Lab filtered)	AK102/AK103 - DRO/RRO	6020A, 7470A (Soils)	2340C - Hardness	pH	Total 6020 + 7471	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	N	N	D				
ST 01 SD	4-18-17	11:38	G	S		X			X					
ST 02 SD		12:15		S					X					
ST 03 SD		12:21		S					X					
ST 04 SD		12:25		S					X					
ST 05 SD		12:33		S					X					
ST 06 WA		12:40		W			X				X	X		unpreserved
ST 07 WA		12:45		W			X				X	X		unpreserved
ST 08 SD		13:25		S					X					
ST 09 SD		13:36		S					X					
ST 10 SD		13:52		S					X					
ST 11 WA		14:07		W		X	X		X		X	X		unpreserved

TB A7 Cooler___ Cor 5.0° Unc 5.2°
Cooler Dsc Lg Blue/white @Lab —
~~Wet~~/Packs Packing Bubble
w/ice

Possible Hazard Identification
☐ Non-Hazard ☑ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)
Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:	
Relinquished by: DD	Date/Time: 4-18-17	Company	Received by: [signature]	Date/Time: 4/18/17 5:45 PM	Company: AS
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 4/20/17 1035	Company: TASEA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Cooler Temperature(s) °C and Other Remarks:

580-67779 Chain of Custody

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

67779

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-24026-7932.1
Client Contact: Danielle Duncan	Phone:	E-Mail: elaine.walker@testamericainc.com		Page: Page _ of _
Company: Alaska Department of Env. Conservation				Job #:
Address: PO BOX 111800	Due Date Requested:			
City: Juneau	TAT Requested (days):			
State, Zip: AK, 99811-1800				
Phone: 907-465-5207(Tel)	PO #: 170016332			
Email: danielle.duncan@alaska.gov	WO #:			
Project Name:	Project #: 58010995			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Dissolved 6020A, 7471A (waters Lab filtered)	AK102/AK103 - DRO/RRO	6020A, 7470A (Soils)	2340C - Hardness	pH	6020A, 7471A	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D				
ST 12 WA	4-18-17	14:47	G	W			X			X	X	X		unpreserved

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 4-19-17	Company	Received by:	Date/Time: 4/18/17 5:45	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4/20/17 1035	Company TA-SEA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Alaska Department of Env. Conservation

Job Number: 580-67779-1

Login Number: 67779
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	False	containers have ID only.
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Only unpreserved volume received.
Sample bottles are completely filled.	False	The 250mL polys were less than full.
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	False	Insufficient volume received for MS/MSD.
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Splitting was required.
Residual Chlorine Checked.	N/A	