



PEBBLE PROJECT

2016 Reclamation Report

MLUP No. 6118

**PREPARED BY:
PEBBLE LIMITED PARTNERSHIP**

DECEMBER 31, 2016

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1.0 INTRODUCTION

This report summarizes care and maintenance activities conducted during the 2016 field season at the Pebble Project, a mineral exploration and development project operated by the Pebble Limited Partnership (PLP). PLP is a U.S. company wholly owned by Northern Dynasty Minerals Ltd. of Vancouver, Canada, conducting exploration-related activities on state mineral claims leased to the Pebble East Claims Corporation, Pebble West Claims Corporation, and U5 Resources, Inc. These activities are authorized by Miscellaneous Land Use Permit (MLUP) No. 6118 issued by the Alaska Department of Natural Resources, Division of Mining, Land and Water (ADNR-MLW). The MLUP expires on 12/31/2016.¹

During 2016, PLP operated the Pebble Project in care and maintenance status. No exploration or other land-disturbing activities occurred during the calendar year. All previous exploration sites have been fully reclaimed in accordance with AS 27.19 and 11 AAC 97.

1.1 LOCATION

The Pebble Project is located in the Lake and Peninsula Borough in southwest Alaska. The main deposit is centered approximately 200 miles SW of Anchorage, 60 miles W of Cook Inlet and 17 miles NW of Iliamna (Figure 1). The Pebble Project comprises 2,402 Alaska state mineral claims, and contains one of the world's most significant undeveloped deposits of copper, gold, and molybdenum (Figure 2).

1.2 RECLAMATION OBJECTIVES AND REQUIREMENTS

Alaska statute (AS 27.19) and regulation (11 AAC 97) require mining operators to reclaim any disturbed land to a "stable condition", which means rehabilitation to a state that allows for the reestablishment of a vegetative cover within a reasonable period of time. MLUP No. 6118 further stipulates that:

- Surface disturbance shall be held to a minimum, and will be reclaimed by backfilling, contouring, and spreading of organic rich overburden to promote stabilization and natural revegetation.
- The area reclaimed shall be reshaped and recontoured to blend with surrounding physiography using strippings and overburden, and then stabilized to a condition that shall retain sufficient moisture to allow for natural revegetation.
- Upon completion of drilling activities, drill pads shall be reclaimed as necessary, including reseeding, to encourage natural revegetation of the sites and protect them from erosion. Trenches shall be backfilled with material excavated and mounded slightly.
- All exploration trenches shall be reclaimed before the end of the exploration season in which they are constructed, unless they are specifically approved to remain open by the Division of Mining, Land & Water.

¹ PLP submitted an APMA to renew MLUP #6118 on October 13, 2016. A renewed permit is expected by December 31, 2016.

MLUP No. 6118 also requires the filing of this reclamation report and Annual Reclamation Statement by December 31 of each year the permit is in effect. The Annual Reclamation Statement is included as Appendix D.

1.3 WORK SUMMARY

Work conducted during the 2016 field season included routine maintenance of existing field installations, minor enhancements to previously reclaimed areas, and visual inspection of more than 400 project drill sites to verify closure and reclamation status.

Maintenance activities for 2016 are summarized in Table 1 and shown on Figure 3. Details for each location are provided in Section 3.4. Inspections and results are discussed in Section 3.6. Representative photographs are included in Appendix A.

Table 1. 2016 Drill Site Maintenance Summary

BOREHOLE ID	INITIAL DRILL DATE	ADL CLAIM NO.	LONGITUDE (WGS84)	LATITUDE (WGS84)	ACTIVITY
0051	1991	516818	-155.29289	59.90138	Spread topsoil; re-seeded
0112	1997	516873	-155.29859	59.89371	Backfilled hole with bentonite pellets; spread topsoil; re-seeded
3072	2003	516818	-155.29283	59.90137	Spread topsoil; re-seeded
3127	2003	516873	-155.29856	59.89376	Removed Margo plug; backfilled hole with bentonite pellets; spread topsoil; re-seeded
4190	2004	516811	-155.296	59.89687	Spread topsoil; re-seeded
4215	2004	516818	-155.29199	59.89902	Spread topsoil; re-seeded
5332	2005	540426	-155.26113	59.90077	Backfilled hole with bentonite pellets
8433M	2008	516874	-155.29727	59.8946	Backfilled hole with bentonite pellets; spread topsoil and re-seeded
GH06-072	2006	524808	-155.28773	59.87123	Replaced Margo plug
GH11-292S	2011	524715	-155.24842	59.89527	Removed cables; re-sealed plate; replaced water valve
SRK-5D	2004	516867	-155.29853	59.89042	Installed new Margo plug

1.4 OTHER PERMITS AND REGULATORY REQUIREMENTS

Activities conducted during 2016 did not require any other permits.

2.0 PROJECT DESCRIPTION

2.1 SITE ACCESS

Field operations are based out of PLP's office at the Iliamna Airport in Iliamna, AK. Access to all worksites within the Pebble deposit is by helicopter only. PLP does not use ground vehicles to access the deposit area or travel between worksites. As a result, the deposit area remains free of temporary roads and tracks.

2.2 ENVIRONMENTAL CONTROLS

2.2.1 Vegetation and Tundra Preservation

PLP's standard field work procedures require the use of wooden tundra pads and platforms for all heavy equipment and materials to minimize vegetation impacts. Individual worksites are also organized to have as small a footprint as possible, with mobilization and demobilization occurring within the shortest time frame to limit duration impacts. When a surface disturbance is necessary, groundcover, including vegetation, is removed and stockpiled for later use in reclaiming the site. Once the activity is complete, excavated areas are backfilled and re-covered with reserved tundra. Disturbed areas are also revegetated with native seed or an approved seed mixture as appropriate.

2.2.2 Fuel Management and Spill Prevention

PLP uses double-walled, welded aluminum fly tanks to transport and store all fuel for field operations. Tanks are filled at PLP's Iliamna location to no more than 80 percent of the total capacity. (Most tanks used have a total capacity of 110 gallons, meaning each will contain no more than 88 gallons.) Each tank is visually inspected for leaks or spills prior to transport by helicopter.

All active fuel tanks are placed in welded aluminum secondary containments sized to hold 110 percent of the tank's maximum capacity. Containments are placed on level ground at least 100 feet from any surface water.

Each tank location is stocked with a spill containment and cleanup kit. All field staff have been trained in the proper response and reporting protocols as part of PLP's SPCC Plan. PLP also maintains a contract with Alaska Chadux Corporation to provide 24-hour spill response, if necessary. After each worksite is demobilized, the area is inspected to ensure no leaks or spills occurred.

2.2.3 Erosion and Sediment Control

Weed-free straw was used in conjunction with re-seeding efforts at boreholes 0051, 0112, 3072, 3127, 4190, 4215, and 8433M to minimize wind and water erosion.

2.3 MATERIAL & EQUIPMENT STAGING

2.3.1 Main Supply Depot

The Main Supply Depot (MSD) was initially constructed in 2004 and serves as the primary storage and staging area for field operations. The site occupies approximately 2.5 acres of a gravel bluff in the West Deposit area (SE1/4 SE1/4 of Sec 21, T3S R35W and the NE1/4 NE1/4 of Sec 28, T3S, R35W) (ADL Nos. 516811 and 516874).

Multiple temporary wood frame buildings and platform tents provide sheltered storage for machinery, drilling equipment, environmental supplies, and variety of small parts and tools. Small quantities of drilling fluids, motor oils, and antifreeze are stored in sealed, original packaging inside weather-proof shelters. All temporary structures are constructed on elevated platforms or placed on tundra pads.

Other items such as drill rods, lumber, tundra pads, outhouses, fuel containments, rig supports, are stored within the MSD yard on racks or elevated platforms. These items represent equipment consolidated at the MSD from multiple field locations when exploration activities ceased in 2013. A categorized inventory of field equipment and supplies was provided to DNR with the APMA renewal application in October 2016.

New high-strength adhesive patches designed for all-weather exposure were used to repair vandalism damage to the main supply tent (Photo 1).

2.3.2 Fuel Storage

Three 110-gallon fuel tanks containing approximately 250 gallons of Jet A fuel were transported to the field during June 2016 to support maintenance activities. Tanks were stored in aluminum containments at the MSD to refuel helicopters. All tanks were removed to Iliamna after five days.

No fuel or other petroleum product spills were identified or reported during the 2016 field season.

2.3.3 Watershed

The Watershed site is located approximately 0.75 miles east of the MSD in the SW1/4 SE1/4 of Sec 22, T3S, R35W (ADL No. 524712). The site consists of three temporary buildings constructed on elevated platforms: one Quonset-style building with a corrugated metal roof (14' x 16') that served as a light machine shop, and two wood frame buildings (9' x 38'; 10' x 16') used to store hoses, miscellaneous hand tools and field supplies. A small generator shed is attached to the Quonset hut. One 110-gallon fuel tank (empty) is kept in an aluminum containment next to the shed.

PLP continues to use the Watershed site as a storage location for field equipment.

2.3.4 West Bay 1 and 3

Each West Bay location consists of two temporary wooden structures (an 8' x 12' emergency shelter and a smaller generator shack). These structures are used to provide shelter for monitoring crews during data collection. West Bay 1 is located in the SW1/4 SW1/4 of Sec 23, T3S, R35W

(ADL No. 524714). West Bay 3 is located in the NE1/4 SW1/4 of Sec 33, T3S, R36W (ADL No. 642412).

PLP continues to use both West Bay locations to store field equipment.

2.3.5 Meteorological and Communications

The Pebble 1 meteorological station is located in the SW1/4 NE1/4 of Sec 20, T3S, R35W (ADL No. 524829). The small site consists of a temporary fiberglass structure (approximately 8 x 8 ft) and associated equipment.

The Koptuli Mountain radio repeater is located in the NE1/4 SW1/4 of Sec 36, T3S, R35W (ADL No. 646608). The small site consists of a temporary metal structure (approximately 8 x 8 ft) and associated equipment. During 2016, steel cables were replaced and tightened to stabilize the transmission tower during high winds.

PLP continues to use the Pebble 1 met station to collect basic meteorological data, while the Koptuli Mountain repeater remains the primary means of communication with helicopters and field crews.

2.3.6 Acid Rock Drainage Test Location

The ARD site is located in the SE 1/4 SE 1/4 of Section 22, T3S, R35W (ADL No. 524713). It was set up to evaluate real time weathering and acid generation potential in area rock. The site consists of 12 large plastic barrels filled half way with rock fragments. Barrels are racked on wood tundra pads.

ARD testing is no longer active. Each barrel has been covered with a 40-mil HDPE tarp to prevent water intrusion. Drainage tubes are also sealed to prevent leakage. In August 2016 PLP installed aluminum plates on top of each barrel to guard against wind and wildlife damage. Aluminum plates are either 3/8-inch or 1/4-inch thick and secured with ratchet straps (Photo 2).

2.4 FIELD STAFF AND LOGISTICS

All work crews are based out of Iliamna and ferried to the work site by helicopter each day work is being performed. All waste is removed from the field and properly disposed in Iliamna.

3.0 MAINTENANCE ACTIVITIES

3.1 PLANNED VS. ACTUAL ACTIVITY

PLP has operated the Pebble Project in a care and maintenance status since 2014. No exploration activities or land disturbances were planned for the 2016 field season, nor did any occur. Maintenance activities for individual sites are described in Section 3.4.

3.2 SURFACE DISTURBANCE AND RECLAMATION

Surface disturbances during the 2016 field season totaled 0.0 acres; 0.0 acres remain to be reclaimed.

3.3 CONSUMPTIVE WATER USE

Water was not used for any maintenance activity conducted during 2016; permit coverage was not required.

3.4 2016 MAINTENANCE DETAILS

Maintenance activities were conducted during the 2016 field season (May – September). The locations of the eleven maintenance sites are shown on Figure 3. Representative photos are provided in Appendix A.

All 2016 maintenance sites will be inspected during the 2017 field season to document vegetation growth and evaluate repair success.

3.4.1 Boreholes 0051 and 3072

These sites are located 15 feet apart in the West Deposit area approximately one-half mile north of the MSD. A wood marker indicates the location of Borehole 3072. Neither site has any permanent surface structures in place. Upwellings have never been observed or indicated from either borehole.

Soils at this site are known to be naturally high in iron oxide and can be seen in the large areas of rust-colored soil and rock nearby. The site is also located in a relatively flat area with a shallow water table that allows surface water to pond easily during spring runoff or heavy rain events. Although the site is stable, surface iron oxide is more prevalent within the initial disturbed area, which has impeded growth of natural vegetation.

PLP applied approximately five cubic yards of topsoil (hailed from Iliamna) over a 350-square foot area at an average depth of five inches. A certified seed mixture² was hand-cast over the topsoil and covered with straw (Photo 3). Fertilizer was not applied. Subsequent inspection showed germination and growth within five weeks of seeding (Photo 4).

² The certified seed mixture is based on recommendations published by the Alaska DNR Division of Agriculture (Plant Materials Center) for revegetation projects in south-central Alaska (“A Revegetation Manual for Alaska”, Stoney Wright, ANDR-AG, August 2008). The mixture contains ‘Norcoast’ Bering hairgrass, ‘Arctared’ red fescue, ‘Boreal’ red fescue, and ‘Nortran’ tufted hairgrass.

3.4.2 Borehole 0112

This site was drilled by Cominco in 1997 and is located one-quarter mile southwest of the MSD in the West Deposit. A wood marker indicates the borehole location. There are no surface structures present. Minor flow (less than 0.5 gallons per minute [gpm]) was observed at the site in May 2016, with characteristics similar to a groundwater seep. Water pooled in a small area around the borehole before dissipating into the surrounding vegetation.

PLP probed the borehole to a depth of approximately seven feet. Pel-Plug™ time-release bentonite pellets³ (1/4-inch) were added to the hole to within three feet of the surface; the remaining depth was filled with 1/2-inch pellets. All water flow was cut off.

The small area where water had pooled was filled with topsoil, re-seeded and covered with straw (Photo 5). Subsequent inspection five weeks later showed the bentonite seal in place and no evidence of water. Germination and growth were also observed in the re-seeded area.

3.4.3 Borehole 3127

This site is located one-quarter mile southwest of the MSD in the West Deposit. A wood marker indicates the borehole location. Steel casing extends three inches aboveground at an angle of 49 degrees and was fitted with a Margo plug. A small amount of ponded water was observed in October 2015. A follow-up inspection showed no leaks from the plugged casing. Instead, water was upwelling a few feet from the casing at a rate of approximately 1 gpm.

PLP removed the Margo plug from the casing, which immediately caused the upwelling to stop and all surface water to drain below ground. The casing was allowed to sit open for approximately 45 minutes, during which time no water flow was observed. The Margo plug was not re-installed. Instead, the casing was packed with 1/4-inch time-release bentonite pellets to a depth of approximately one foot below the surface. The small surrounding area was covered with topsoil, re-seeded and covered with straw (Photo 6). Subsequent inspection five weeks afterward showed the bentonite seal in place and no evidence of water. Germination and growth were also observed in the re-seeded area.

3.4.4 Borehole 4190

This site is located approximately 800 feet northwest of the MSD in the West Deposit. A wood marker indicates the borehole location. There are no surface structures present. An inspection in October 2015 showed bare patches around the borehole (approximately 15 square feet) and small quantities of ponded water. A subsequent inspection in May 2016 showed that surface water was pooling in a small depression around the borehole, with no evidence of upwelling or flowing water.

PLP applied topsoil to an average depth of six inches over the bare areas, re-seeded, and covered the area with straw (Photo 7). Subsequent inspection showed the site has remained dry, with germination and growth visible within five weeks of seeding.

³ Pel-Plug™ is a brand name of sodium bentonite with a high swell factor. Time-release pellets have a thin biodegradable coating.

3.4.5 Borehole 4215

This site is located approximately one-quarter mile north of the MSD in the West Deposit. A wood marker indicates the borehole location. There are no surface structures present. An inspection in October 2015 showed small areas of mud around the drill site (approximately 20 square feet) with little vegetation. Water was not observed at the time. A subsequent inspection in May 2016 did not indicate upwelling. Instead, surface water was pooling in a small depression around the borehole.

PLP applied topsoil to a depth of six inches over the bare areas, re-seeded, and covered the area with straw (Photo 8). Subsequent inspection showed germination and growth within five weeks of seeding.

3.4.6 Borehole 5332

This site is located approximately one mile northeast of the MSD in the East Deposit. A wood marker indicates the borehole location. There are no surface structures present. The surrounding area is relatively flat and lies below a prominent ridge to the west. As a result, the area remains wet throughout much of the year with surface water volumes that vary with precipitation. Vegetation is well established around the drill site.

Ponded surface water was observed at the borehole in May 2016. A subsequent ground inspection in June 2016 was able to delineate a hole to a depth of approximately eight feet. PLP backfilled the hole with ¼-inch time-release bentonite pellets to the surface. Water flow appeared to stop, but could not be conclusively determined because the area was flooded at the time. A subsequent inspection in July 2016 showed surface water volume had noticeably diminished (Photo 9).

3.4.7 Borehole 8433M

This site is located approximately 800 feet southwest of the MSD in the West Deposit. No surface structures are present. A wood marker indicates the borehole location.

A potential upwelling from the site was observed in October 2015 and confirmed in May 2016. Water flows consistently at a rate of 1-2 gpm and dissipates into the tundra 12-15 feet away from the borehole. Water runs clear but the presence of iron-fixing microorganisms contributes to the formation of rust-colored mats in the outflow channel.

PLP identified a discrete hole to a depth of eight feet, although the staff person suspects the hole may be deeper. Bentonite pellets were backfilled into the hole and allowed to set. After 30 minutes all water flow stopped (Photo 10). Final reclamation was postponed until the seal integrity could be confirmed at a later date.

A follow up inspection in July 2016 showed that the bentonite pellets did not form a competent seal in the borehole. Water had resumed flowing at the same rate prior to the repair effort (Photo 11).

Prior to the 2017 field season, PLP will submit a work plan to DNR outlining the inspection, monitoring, and maintenance activities for this location.

3.4.8 Monitoring Well GH06-072

This site is located 1.7 miles south of the MSD in a wet area north of Frying Pan Lake. The monitoring well is known to have moderate artesian pressure and is fitted with a Margo plug. An inspection in July 2016 showed that a small volume of water (less than 0.5 gpm) was welling up inside the PVC casing, suggesting the Margo plug had cracked. PLP installed a new Margo plug in August 2016 and cut off all water flow (Photo 12).

3.4.9 Monitoring Well GH11-292S

This site is located 1.5 miles east of the MSD in the East Deposit and is used for piezometric monitoring. A steel plate with a water valve is bolted to the casing, rising approximately six inches above the surface. Moderate artesian pressure has been documented at this monitoring well.

During a May 2016 inspection, water was observed leaking from between the steel plate and casing at a rate of approximately 2-3 gpm. Piezometer cables running through the gasket created a gap allowing water to flow out of the casing (Photo 13). PLP removed the cables, cleaned the gasket, replaced the water valve with a threaded plug, and re-bolted the steel plate to ensure a proper seal (Photo 14). All water flow was stopped. Water did not adversely affect surrounding vegetation; no additional reclamation required. A subsequent inspection in July 2016 showed that the repairs remain intact and the site remains dry.

3.4.10 Monitoring Well SRK-5D

This site is located 0.4 miles southwest of the MSD in the West Deposit. High artesian pressure has been documented at this monitoring well. An inspection in October 2015 showed water flowing due to a failed plug. PLP installed a new Margo plug in June 2016 to cut off all water flow (Photo 15). Subsequent inspection in July 2016 showed the site remained dry with the plug intact (Photo 16). Revegetation was not needed.

3.5 STATE INSPECTION

DNR staff conducted a two-day inspection of the Pebble Project on July 26 and 27, 2016. In addition to sites mentioned in Section 3.4, DNR requested additional information for the following sites identified during the inspection:

3.5.1 Borehole 3132

This site is located one-quarter mile southwest of the MSD and adjacent to Borehole 3131 by approximately three inches. Borehole 3131 was successfully repaired in 2015 by drilling and grouting the original borehole. A post-repair inspection did not find evidence of additional upwellings at the time.

Inspections by PLP and DNR in 2016 observed a small, diffuse upwelling several feet from the 2015 repair location. A consistent flow is visible but too small to quantify. Water dissipates into the surrounding ground within a few feet (Photo 17). The water source has not been determined but may be related to 2015 repair activities. For reporting purposes, inspection and maintenance activity for this upwelling are recorded under Borehole 3132.

PLP will continue to investigate the water source and potential repair options. Prior to the 2017 field season, PLP will submit a work plan to DNR outlining the inspection, monitoring, and maintenance activities for this location.

3.5.2 Borehole 4279

The DNR inspection report notes the presence of ponded surface water but does not identify a source. PLP has inspected this site on multiple occasions and has determined that ponded water is not attributable to the borehole.

The site is located on the edge of wide, flat area north of the MSD that acts as a natural flood plain to an ephemeral stream. Seasonal precipitation routinely causes surface water to pond across the area. Photo 18 was taken during early summer when the area is typically driest. No water is visible in the photo, although the extent of previous flooding is evident by the growth of mosses and lichens. Photo 19 shows how the area floods following late season rains.

PLP will periodically inspect this site to confirm these findings. No repairs are planned at this time.

3.5.3 Borehole 9475

This site is known to have moderate artesian pressure. Repairs in 2015—re-drilling and grouting the casing exterior to the surface—were initially successful. Follow-up inspections in 2016 showed that water had flushed some grout from the borehole and had resumed flowing at a similar rate (2-3 gpm). Water flows downhill approximately 130 feet before dissipating.

PLP will continue to investigate potential repair options. Prior to the 2017 field season, PLP will submit a work plan to DNR outlining the inspection, monitoring, and maintenance activities for this location.

3.5.4 Borehole 12561

This site is located one mile west of the MSD in the West Deposit. A circular depression approximately 20 inches deep is visible around the wood marker. It is not clear if the depression is the result of ongoing subsidence or natural settling following initial reclamation in 2013. The depression is dry apart from occasional precipitation.

PLP will continue to monitor the site during 2017 by taking periodic measurements and compare any changes to the baseline. If subsidence is documented, PLP will remediate the site as appropriate in consultation with DNR staff.

3.5.5 Monitoring Well GH08-156

This monitoring well is located in the valley north of Kaskanak Mountain. A small volume of water (less than 0.5 gpm) flows from around the casing before dissipating approximately 10 feet away. Water has not been observed inside the casing; artesian conditions are not evident. PLP suspects that the site's location on a hillside with a large upgradient area may cause shallow groundwater to daylight around the casing.

PLP will continue to investigate this site in 2017 to determine the possible causes. If necessary, maintenance and repairs will be conducted in consultation with DNR staff.

3.5.6 Monitoring Well GH11-236

This site is located 2.25 miles northwest of the MSD. A circular depression approximately 12 inches deep is visible around the well casing. This condition was first observed by field crews in 2012, who noted the depression was about one foot below the surrounding ground. Subsequent inspections in 2013 and 2016 have made the same measurement, suggesting that the depression is the result of ground settling immediately after well installation in 2011 rather than ongoing subsidence.

PLP will continue to monitor the site during 2017 by taking periodic measurements and compare any changes to the baseline. If subsidence is documented, PLP will remediate the site as appropriate in consultation with DNR staff.

3.6 INTERNAL INSPECTIONS

PLP conducts routine inspections of project drill sites during each field season to ensure compliance with all permit and regulatory requirements. Information is summarized and provided to DNR, including current status, repair or maintenance needs, presence of above ground structures, reclamation status, safety markings, and abandonment method, if applicable.

3.6.1 Drill Site Status Summary

PLP assigns an alpha-numeric code to each drill site following inspection to more easily characterize each location and plan future maintenance and inspection needs. Numerals (1-3) describe the borehole operating status (e.g., active or potential use for monitoring or future drilling) while letters (A-E) describe the surface condition, including reclamation status and maintenance needs, if any. A detailed explanation of each code is provided in Appendix B.

For the 2016 field season, PLP planned to update inspection records for all drill sites such that the most recent inspection for any one site was not older than five years. PLP conducted 429 individual borehole inspections to bring all records current to within three years. The status of each project borehole is provided in Appendix C.

As shown in Table 2, nearly all sites (99 percent) are in stable condition and require no further action (D and E). Six sites require follow up inspection or maintenance (C), while an additional six require repairs to control minor upwellings (B). None of the project drill sites require major repairs (A) or otherwise pose a notable risk of causing adverse impact.

Table 2. Borehole Inspection Summary

		Surface Condition					Total ^[a]
		A	B	C	D	E	
		Major Repairs	Stable/ Minor Repairs	Maintenance or Follow-up	Stable/ Monitored	Stable/ No Action	
Borehole Status	1 Active	0	2	1	27	582	612
	2 Inactive	0	0	0	10	147	157
	3 Closed	0	4	5	15	553	577
Total		0	6	6	52	1282	1346

^[a] Includes drill sites within the active claim boundary only.

3.6.2 Identified Sites

Internal inspections identified three additional boreholes where water was either flowing or present. Each of these sites (Table 3) is stable in its current condition and does not present a notable risk of causing adverse impact. PLP will continue to monitor each site and investigate possible causes and maintenance options. A detailed work plan will be provided to DNR prior to the start of the 2017 field season.

Table 3. Additional Sites

Drill Site	Location	Description	Photo No.
7386	East Deposit	Clear water was observed bubbling up from the borehole location. Water flows continuously downhill for approximately 20 feet before dissipating, creating a defined channel and supporting stronger vegetation growth. Some algae growth is noted, but iron-fixing microorganisms were not observed. Flow appears consistent at less than 1 gpm.	20, 21
11538	Sharp Mtn	Minor upwelling observed at base of marker. Water flows clear at a rate of 0.5-1 gpm continuously. No other water sources observed. Outflow channel is poorly defined, but discrete flow pattern observed. Supports stronger vegetation growth. Iron-fixing microorganisms were not observed, with only minimal algae growth.	22, 23
12550	Sharp Mtn	Water ponded in depression near borehole location. No upwelling observed. May be ponded precipitation, but no inflow or outflow channels observed. Stronger vegetation growth around edge suggests continual presence of water. Biofilm suggests water is relatively stagnant with no flushing.	24

3.6.3 2017 Inspection Program

Internal inspection protocols are routinely updated and refined based on current information. For the 2017 field season, PLP will continue to inspect and monitor drill sites as appropriate. At a minimum, all sites requiring specific monitoring or additional investigation will be inspected at least once during the season (all sites rated “B” or “C” in Table 2).

Additional locations will be inspected depending on general project activity and need. These sites will be selected based on various criteria, including repair history, potential for maintenance issues, site usage, and age of most recent inspection. Inspection details will be provided to DNR prior to the start of the 2017 field season.

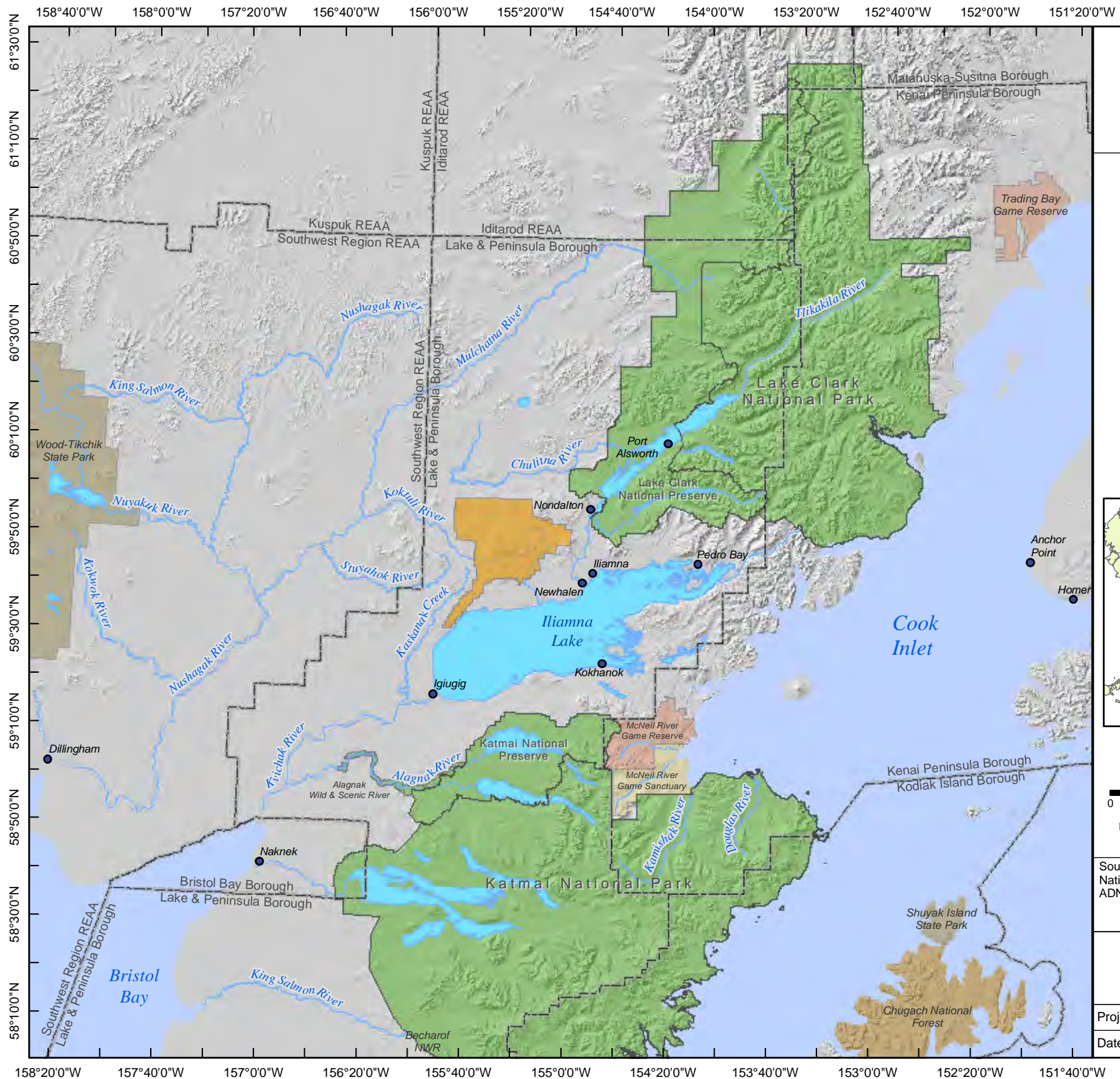
4.0 SIGNATURE

This report, prepared by Tim Havey, PLP Environmental Manager, is dated December 31, 2016 and satisfies the annual reporting requirements of MLUP No. 6118.

Signed,

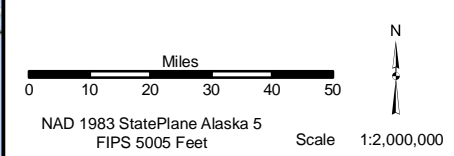
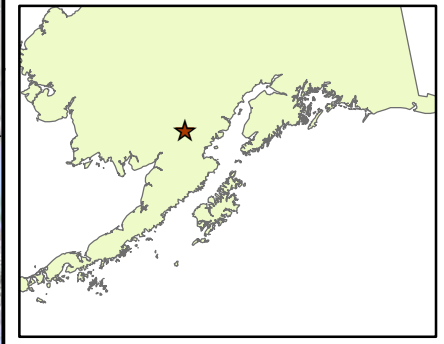
The image shows a handwritten signature in black ink over a printed logo. The logo consists of three stacked squares (red, black, red) to the left of the word "pebble" in a lowercase, sans-serif font. Above "pebble" is the word "THE" in a smaller font, and below it is the word "PARTNERSHIP" in a smaller font. The signature "Tim Havey" is written in a cursive style across the logo.

Tim Havey
Environmental Manager, PLP



Legend

-  Pebble Project Mineral Claims
-  National Forest Service
-  National Park Service
-  State Game Refuge
-  State Game Sanctuary
-  State Park



Source(s):
National Map, USGS
ADNR Mineral Claims, 2016





Figure
1

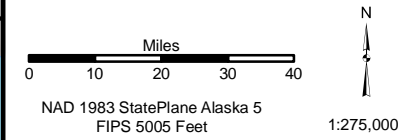
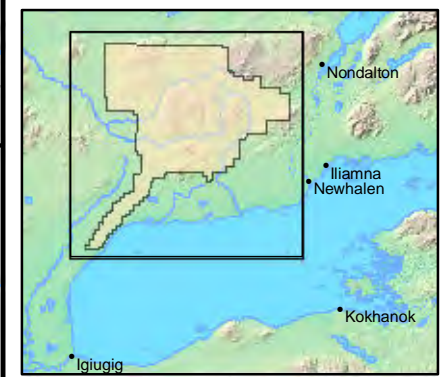
**Pebble Project
Vicinity Map**

Project: 2016 Annual Reclamation Report
Date: 12/20/2016 Author: TH/PLP



Legend

-  Pebble East Claims Corp.
-  Pebble West Claims Corp.
-  U5 Resources Inc
-  Township



Source(s):
ADNR, Alaska Mining Claims,
9/2016

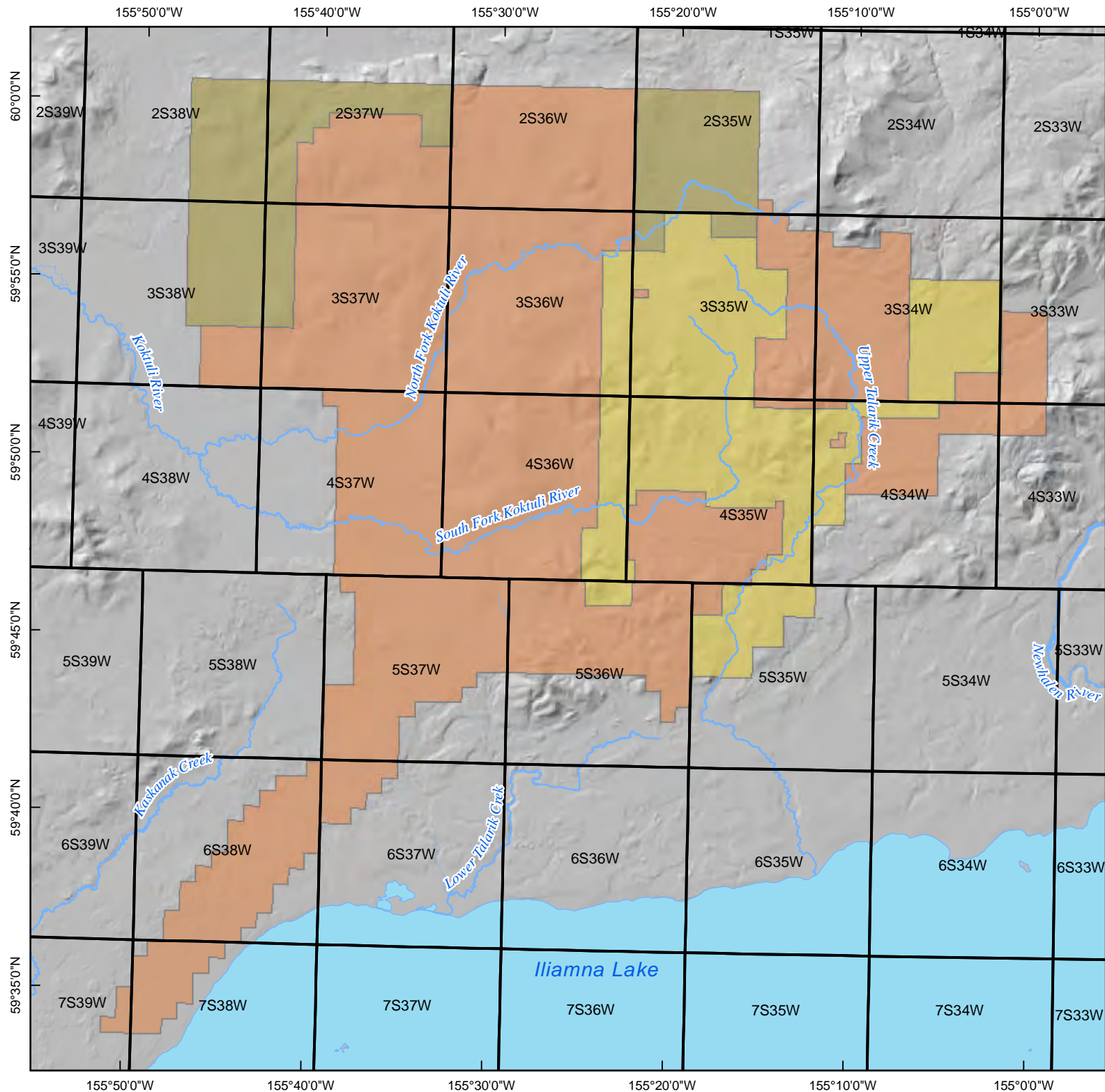
Figure 2

Mineral Claims: Overview

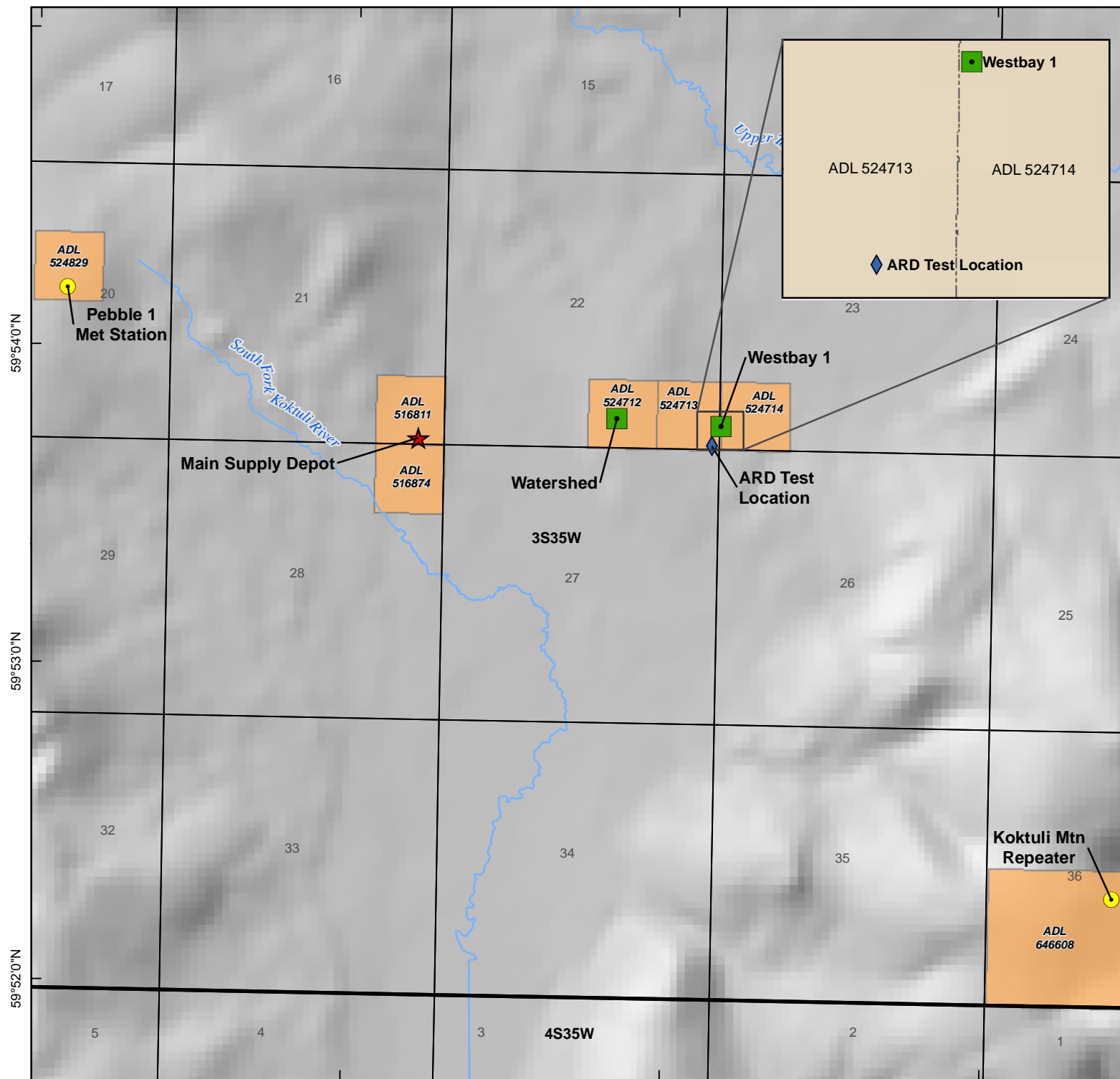
Project: 2016 Annual Reclamation Report

Date: 12/20/2016

Author: TH/PLP










155°20'0"W 155°18'0"W 155°16'0"W 155°14'0"W

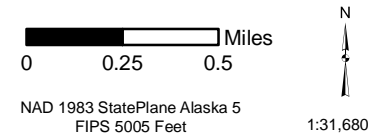


59°54'0"N
59°53'0"N
59°52'0"N

155°18'0"W 155°16'0"W 155°14'0"W



-  Claims with Surface Facilities
-  Main Supply Depot
-  Met/Communications
-  Secondary Storage
-  ARD Test Location
-  Township
-  Section



Source(s):
ADNR, Alaska Mining Claims,
9/2016

Figure
3

Field Installations: Deposit Area




Project: 2016 Annual Reclamation Report

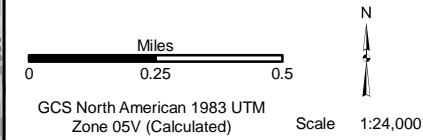
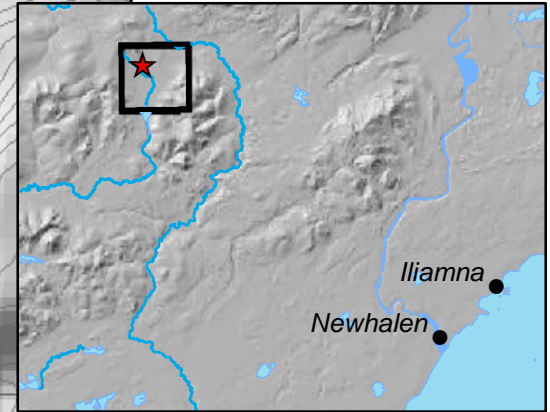
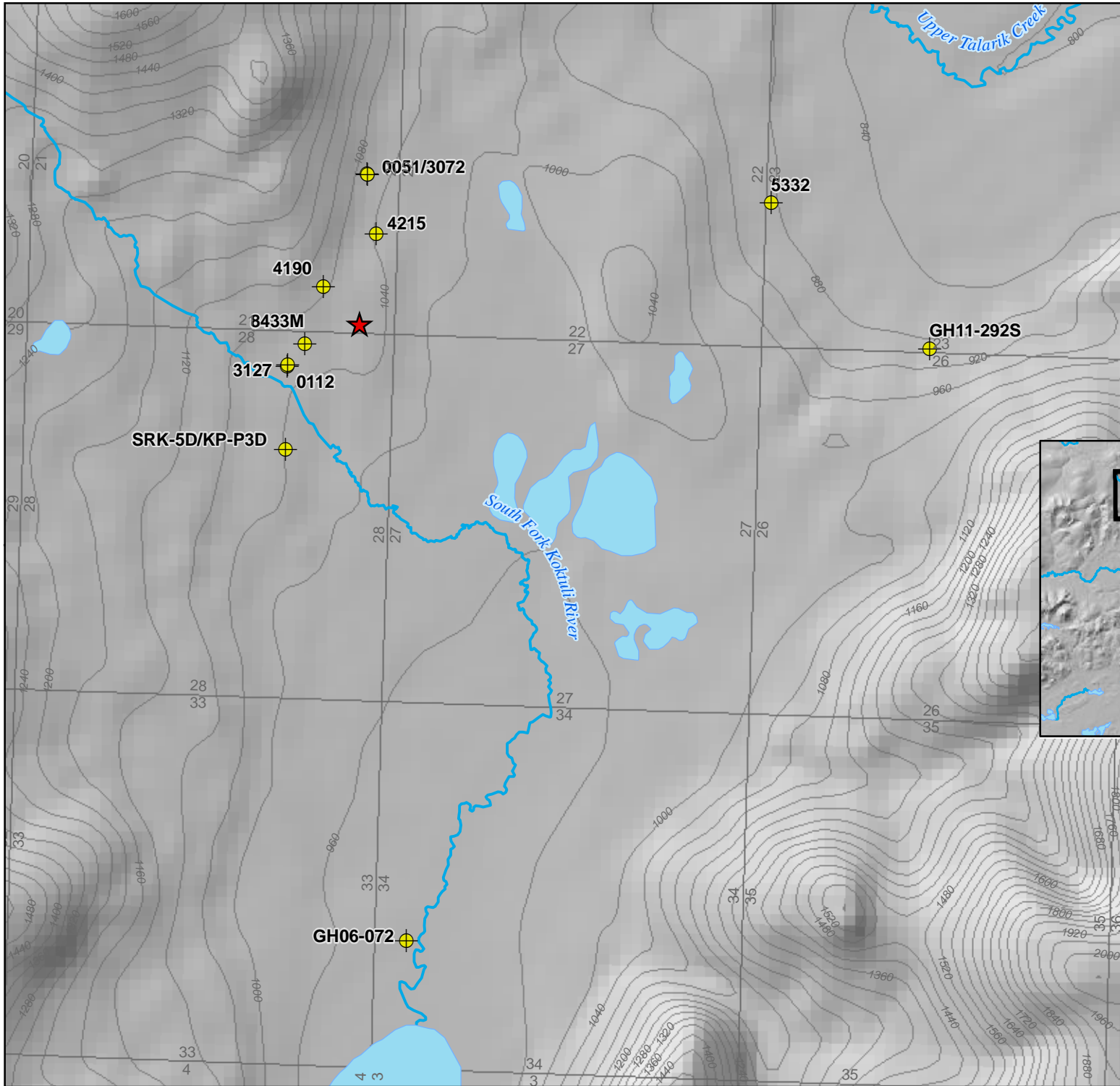
Date: 12/20/2016

Author: TH/PLP

Document Path: G:\GIS\ArcGIS\MXDs\ENVR\RO\2016\Reclamation_2016\3_PLP_Recl2016_Field.mxd



-  Maintenance Sites
-  Main Supply Depot
-  Section Boundary



Source(s):
PLP Borehole Database 2016

Figure
4

2016 Maintenance Sites

File: 4 PLP_Rec2016_Maintenance

Date: 12/30/2016

Author: TH/PLP

APPENDIX A

Representative Maintenance
Photographs

Appendix A—Maintenance and Inspection Photos

1. MSD

6/13/2016

*Main photo: vandalism damage to main supply tent.
Inset: repairs with high-strength adhesive patches.*



2. ARD Barrels

8/15/2016

Close-up of new covers. Most are 3/8-inch aluminum; others are 1/4-inch. New tarps installed prior to fixing covers.



Appendix A—Maintenance and Inspection Photos

3. 0051/3072
6/13/2016

*Aerial photo after new
topsoil and re-seeding.*



4. 0051/3072
7/26/2016

*New growth visible five
weeks after re-seeding.*

DNR Photo



Appendix A—Maintenance and Inspection Photos

5. 0112
6/14/2016

*Area after new topsoil
and re-seeding. Marker
intentionally left on
ground.*



6. 3127
6/14/2016

*Area after new topsoil
and re-seeding. Marker
intentionally left on
ground. Removed
Margo plug visible on
ground at left.*



Appendix A—Maintenance and Inspection Photos

7. 4190
6/14/2016

*Aerial photo after new
topsoil and re-seeding.
Marker intentionally
left on ground.*



8. 4215
6/14/2016

*Area after new topsoil
and re-seeding. Marker
intentionally left on
ground.*



Appendix A—Maintenance and Inspection Photos

9. 5332

7/26/2016

Area approximately five weeks after borehole filled with bentonite pellets. Water flow appears diminished.

DNR Photo (printed date is incorrect)



10. 8433M

6/14/2016

Borehole after being filled with bentonite pellets. Photo shows technician siphoning remaining surface water to verify seal.



Appendix A—Maintenance and Inspection Photos

11. 8433M

7/25/2016

Area approximately five weeks after borehole filled with bentonite pellets. Water flow from borehole has re-established at same rate prior to repair.

DNR Photo



12. GH06-072

8/15/2016

Photo shows well after new plug installed. Note that obstruction in casing prevented complete insertion, but seals could still be tightened to stop all water flow.



Appendix A—Maintenance and Inspection Photos

13. GH11-292S
6/14/2016

Monitoring well with steel plate removed. Although not immediately obvious, photo shows site submerged in clear water. Note location of piezometer cables under gasket.



14. GH11-292S
7/25/2016

Monitoring well with steel plate bolted in place. Piezometer cables removed. New threaded plug visible on top.



Appendix A—Maintenance and Inspection Photos

15. SRK-5D
6/14/2016

*Technicians installing
new Margo plug.*



16. SRK-5D
7/26/2016

*Monitoring well with
new Margo plug
installed.*

DNR Photo (printed
date is incorrect)



Appendix A—Maintenance and Inspection Photos

17. 3132

7/26/2016

Wood post marks location for boreholes 3131 (repaired in 2015) and 3132, which are roughly three inches apart. Wet area to lower right is three feet from marker.



18. 4279

6/14/2016

Borehole area during relatively dry period. Note absence of surface water. Darker areas are mosses/lichens that generally represent extent of flood during rain events.



Appendix A—Maintenance and Inspection Photos

19. 4279

9/16/2016

Borehole area after late summer rains. Note extent of surface water ponding.



20. Borehole 7386

8/15/2016

Close-up of upwelling (hexagonal area near center). Water flows clear at consistent rate of less than 1 gpm.



Appendix A—Maintenance and Inspection Photos

21. **Borehole 7386**
8/15/2016

*View of outflow channel
towards water source.*



22. **Borehole 11538**
8/16/2016

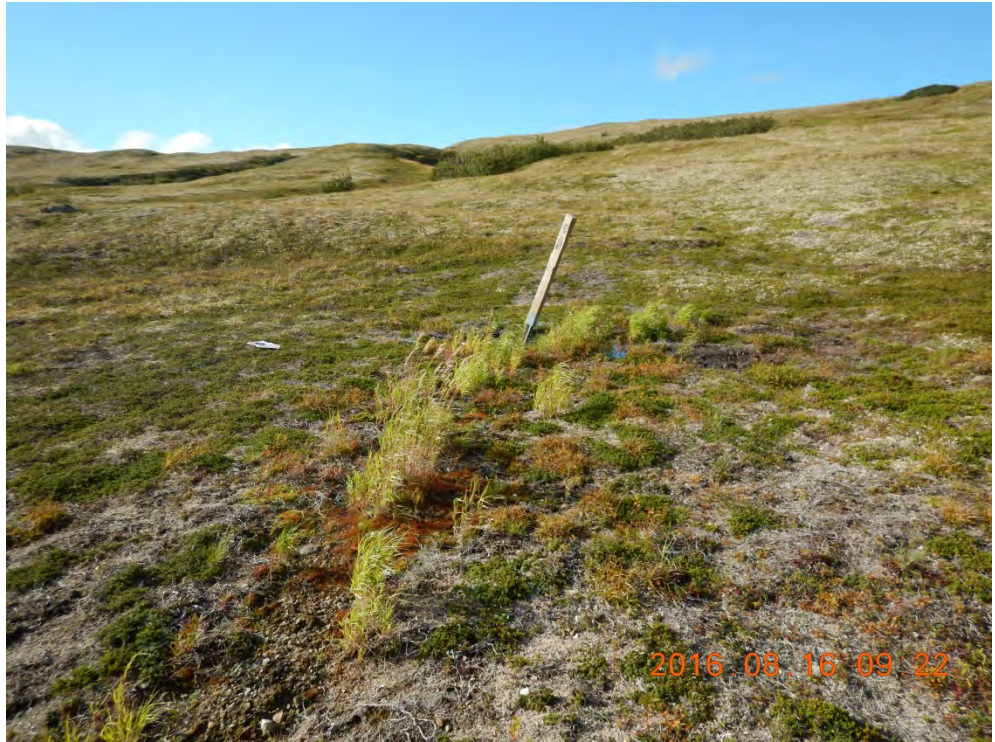
*Close-up of upwelling.
Water flows clear at
rate of less than 1 gpm.*



Appendix A—Maintenance and Inspection Photos

23. Borehole 11538
8/16/2016

View upslope towards borehole. Water volume does not create distinct channel, but vegetation growth indicates general flow pattern.



24. Borehole 12550
8/16/2016

Ponded water around borehole location. No upwelling or outflow observed. Discrete borehole could not be identified.



APPENDIX B

Inspection Categories

Table B-1. Borehole Status Codes

Code	Category	Description
1	Active	Primary designation for active monitoring wells (groundwater quality, geotechnical, etc.). Also used for some former exploration boreholes that are maintained as possible water sources. Active sites do not have material plugs (grout, cement, bentonite) but may be fitted with mechanical plugs or caps.
2	Inactive	Site is not currently used as monitoring/study location, but is preserved for potential future use (e.g., additional drilling, water source). Inactive sites maintain aboveground structures (casing, valves, caps).
3	Closed	Site is fully decommissioned. Borehole has been plugged as appropriate. All surface structures removed, with possible exception of wood post indicating location and borehole ID.

Table B-2. Reclamation/Maintenance Condition Codes

Code	Category	Description
A	Major Repairs	Site condition presents an identified environmental compliance or health & safety concern, or is at risk of progressing if not addressed as soon as possible. Significant repairs necessary, typically requiring advanced planning, technical staff and additional equipment. Coordination and approval from DNR or other agency may be required. <i>Examples: upwelling of discolored or voluminous water; discharge to surface water.</i>
B	Minor repairs	Site condition requires repairs or rehabilitation, but is stable and not at risk of deteriorating further. Work does not require technical staff but generally cannot be completed during routine maintenance trips or by one person. Advance approval from DNR or other agency is usually not required unless circumstances dictate. All repair activities summarized in annual report. <i>Examples: Margo plug replacement/installation; large area rehabilitation or revegetation efforts; grout injection.</i>
C	Routine Maintenance or Additional Investigation	Maintenance requirements are small or insignificant and generally the result of normal operation or exposure to elements. Repairs can be completed by staff during routine inspections and do not require specialized equipment or advance planning. Also used to identify sites where condition cannot be confirmed, thus requiring additional inspection or involvement of higher level staff. <i>Examples: application of sealant around cap; water valve replacement; ponded surface water with unconfirmed source.</i>
D	Stable/ Monitored	Site condition is stable and has been fully reclaimed, but with past maintenance issues or known to have higher maintenance needs. All structural equipment, if any, is in good condition. Routine monitoring is generally more frequent than Category E sites. <i>Examples: artesian sites; sites with recent, major repairs.</i>
E	Stable/ No Action	Site condition is stable and has been fully reclaimed. All structural equipment, if any, is in good condition. No known issues. No history of upwellings, leaks, or staining. Located in an area unlikely to cause concern (e.g., wetlands, artesian zone). Inspection frequency is lower than Category D sites.

APPENDIX C
Borehole Status
(electronic file)

APPENDIX D

2016 Reclamation Statement 2017 Letter of Intent to do Reclamation

2016 ANNUAL RECLAMATION STATEMENT

(32)

- Placer Mining
- Suction Dredging
- Hardrock Exploration

APMA #: A146118

Complete and return this statement by December 31, 2016. If you did not operate, fill in name, check bottom box, sign and return form.

In accordance with AS 27.19 (Reclamation Act):

I, Tim Havey hereby file an annual reclamation statement for the 2016 mining operation described in subject Application for Permits to Mine in Alaska. (Submission of this statement does not constitute reclamation approval.)

Volume of material disturbed in 2016: 0 cubic yards (includes strippings and processed material).

Sluice days last season: NA Cubic yards of material processed daily: NA Annually: NA

Total acreage disturbed in 2016: 0 acres. (Includes stripped areas, mining cuts, overburden and tailing stockpiles and disposal areas, temporary stream diversions, stream bypasses, and settling ponds). Federal operators should include area of camp and access roads.

Length _____ feet and Width _____ feet of stream diversion.

Stream diversion: Temporary Permanent (check one).

Total area reclaimed in 2016: 0 acres.

Total un-reclaimed acres: 0 (This should match "total acreage currently disturbed" on the 2017 reclamation/signature page)

For the areas reclaimed, the following reclamation measures were used (check only measures that were used). You must include photographs or videotapes of the completed reclamation work:

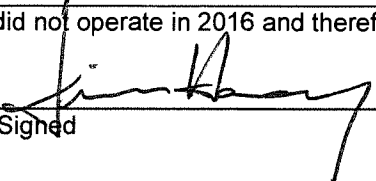
- Spread and contoured tailings
- Spread topsoil, vegetation, overburden muck or fines on the surface of contoured tailings
- Reestablished flood plain with stream channel in stable position
- Ponds are reclaimed
- Backfilled and reclaimed temporary stream diversions
- Camp removed, cleaned up and left free of debris
- Hardrock Exploration : Complete and submit an electronic Annual Reclamation Report

Other reclamation measures taken:

No ground-disturbing activities occurred in 2016.

I did not operate in 2016 and therefore did not conduct reclamation.

Relationship to Claim(s)
 Owner Lessee Operator
 Agent For: _____



 Signed

10/12/2016
Date

RECLAMATION PLAN

(33)

RECLAMATION PLAN

(Disturbed Area 5 Acres Or Greater or BLM Notices)

LETTER OF INTENT TO DO RECLAMATION

(Disturbed Area Less Than 5 Acres)

In accordance with Alaska Statute 27.19, reclamation is required of all mining operation. Reclamation bonding is required of operations with disturbance of 5 acres or greater. Completion of this application will meet the requirements for a "Reclamation Plan" for operations 5 acres and larger in size and "Letter of Intent To Do Reclamation" for operations under 5 acres. If you do not intend to use the reclamation methods presented below, please provide additional information concerning your plans for reclamation under separate attachments.

BLM requires that the reclamation plan be consistent with §43 CFR 3809.420, Performance Standards for the Surface Management regulations. Refer to **43 CFR 3809** or the BLM minerals website available at <http://www.blm.gov/ak/st/en/prog/minerals.html> for more information on what is needed for a reclamation plan.

Total acreage currently disturbed: 0 acres. This should match: "Total Unreclaimed Acres" on your 2016 Annual Reclamation Statement for Small Mines, or line #7 on your 2017 Bond Pool Renewal Form. Disturbed ground includes all unreclaimed mining and exploration activity (excluding camps and roads) since October 1991. Federal operators must include areas of camps and roads.

New acres to be disturbed in 2017 0 acres. Total acreage (currently disturbed plus new acres): 0 acres.

Acreage disturbed by land status: 0 State (general) NA State (Mental Health) NA Private NA Federal

Total acreage to be reclaimed in 2017: 0 acres; and:

Reclamation conducted concurrently with the exploration. Reclamation will be conducted at the end of the exploration season

Total volume of material to be disturbed in 2017: 0 cubic yard. (Including strippings and overburden to be removed. (1 acre of disturbance is equal to 4,840 square yards).

The following reclamation measures shall be used. (These measures are required by law. Those that do not apply may be crossed out; but, an explanation must be given as to why these measures are not necessary at your site.)

- Topsoil, vegetation, and overburden muck, not promptly redistributed to an area being reclaimed, will be individually separated and stockpiled for future use. This material will be protected from erosion and from contamination by acidic or toxic materials and will not be buried by tailings.
- The area reclaimed will be reshaped to blend with the surrounding area using tailings, strippings, and overburden and be stabilized.
- Stockpiled topsoil, overburden muck, will be spread over the contoured exploration sites to promote natural plant growth such that the area can reasonably be expected to revegetate within five years. Stockpiled vegetation will be spread over topsoils.
- Exploration trenches will be backfilled. Brush piles, stumps, topsoil, and other organics will be spread on the backfilled surface to inhibit erosion and promote natural revegetation. Exploration trenches shall be flagged and signs posted to notify the public of the existence of the open trenches. All exploration trenches shall be reclaimed by the end of the exploration season in which they are constructed, unless specifically approved by the DMLW.
- Shallow auger holes (limited to depth of overburden) shall be backfilled with drill cuttings or other locally available material in such a manner that closes the hole to minimize the risk to humans, livestock and wildlife.
- All drill hole casings shall be removed or cut off at, or below, ground level. All drill holes shall be plugged by the end of the exploration season with bentonite holeplug or equivalent slurry, for a minimum of 10 feet within the top 20 feet of the drill hole. The remainder of the hole will be backfilled to the surface with drill cuttings. If water is encountered in any drill hole, a minimum of 7 feet of bentonite holeplug or equivalent slurry shall be placed immediately above the static water level in the drill hole. Complete filling of the drill holes, from bottom to top, with bentonite holeplug or equivalent slurry is also permitted and is considered to be the preferred method of hole closure during which they are drilled, unless otherwise specifically approved by the DMLW.
- If artesian conditions are encountered, the operator shall contact the DMLW (Kindra Geis (907) 451-2790) or the DEC (Tim Pilon at 907 451-2136) for hole plugging requirements.
- All buildings and structures constructed, used or improved, on State land, will be removed, dismantled, or otherwise properly disposed of at the completion of exploration. The campsite will be cleaned up and left free of debris. In consideration of potentially significant historic properties/cultural resources, please do not remove or disturb any buildings, structures, objects, or artifacts that were located on the site prior to the current operation without preauthorization from SHPO (Contact Mckenzie Johnson of SHPO at (907) 269-8726 or mckenzie.johnson@alaska.gov).

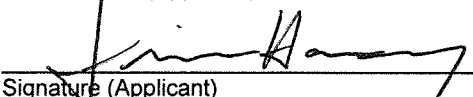
IMPORTANT: 1. Alternative reclamation measures may be approved if the reclamation measures presented above are not applicable to your site. Please explain in separate correspondence. Submit a sketch and describe additional reclamation measures you propose to conduct at your operation. Reclamation measures must comply with AS 27.19.

2. Federal land managers may require reclamation measures different to those identified above.

BONDING: In accordance with AS 27.19, bonding is required for all operations having a mined area of ≥five acres on State Land. This area must be bonded for \$750.00 per acre, unless the miner can demonstrate that a third party contractor can do the needed reclamation for less than that amount. A Statewide bonding pool has been established and may be joined by completing the bond pool application form. No reclamation plan approval goes into effect until the bonding pool deposit and annual nonrefundable fee are paid. Federal land managers may have additional bonding requirements. Use bond form to calculate area of disturbance for bonding.

Tim Havey _____

Printed name (Applicant)


Signature (Applicant)

Relationship to Claim(s)

- Owner Lessee Operator
 Agent For: _____

Date: 10/12/2016

APMA #: A146118