



united
TRIBES OF BRISTOL BAY



BRISTOL BAY NATIVE ASSOCIATION

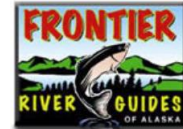
Stuyahok Limited

Ekwok Natives Limited

Koliganek Natives Limited



**COMMERCIAL FISHERMEN
FOR BRISTOL BAY**



November 3, 2015

Via email and hand delivery to:

Commissioner Mark Myers

mark.myers@alaska.gov

Alaska Department of Natural Resources

550 W. 7th. Avenue, Ste 1400, Anchorage, AK 99501

Re: Petition to the State of Alaska for a Detailed Inspection and Reporting of Impacts Associated with the Pebble Limited Partnership's Multi-Year Hardrock Exploration and Reclamation at the Pebble Deposit (Permit No. 6118)

Dear Commissioner Myers:

The Pebble mineral deposit underlies land owned by the State of Alaska at the headwaters of one of the most abundant and sustainable wild salmon fisheries in the world. The wild salmon of Bristol Bay support the cultural, spiritual, and subsistence way of life of the residents of Bristol Bay. Alaska Native households in Bristol Bay are highly reliant on subsistence resources as sources of food.¹ In addition, subsistence resources and activities related to harvesting these resources play a major role in defining Alaska Native families and communities.² The fishery is also the foundation for the region's economy. The direct annual monetary value of the commercial fishery alone is \$1.5 billion and it supports 14,000 jobs.³ Bristol Bay is also one of the world's preeminent sportfishing destinations, attracting anglers from around the globe who seek the region's beauty, remoteness, and phenomenal fishing, and provide jobs and annual

¹ Callaway, Don, *A Statistical Description of the Affected Environment as it Pertains to the Possible Development of the Pebble Mine—17 Communities in Bristol Bay* (2012) at 2, 17.

² See *id.* at 17.

³ Institute of Social and Economic Research at the University of Alaska, *The Economic Importance of the Bristol Bay Salmon Industry* (May 13, 2013) available at http://www.iser.uaa.alaska.edu/Publications/2013_04-TheEconomicImportanceOfTheBristolBaySalmonIndustry.pdf

revenues in excess of \$100 million. Subsistence commercial and sportfishing are all wholly dependent on Bristol Bay's renewable fishery resource and the region's pristine habitat and waters.

While no longer actively engaged in mineral exploration in the region, over the last three decades the Pebble Limited Partnership ("PLP") and its subsidiaries and predecessors have drilled 1,355 holes totaling 1,042,218 feet (over 190 miles) of core holes in the Pebble deposit area.⁴ This exploratory drilling, with some drillholes more than one mile deep, and associated staging activities have the potential to harm the abundant, pristine and critically important surface water and groundwater in the areas in which PLP's exploration activity has occurred.⁵ As the Alaska Supreme Court noted this year: "the hundreds of sumps [associated with PLP's exploration activities] containing toxic waste and chemically reactive material represent a continuing potential source of environmental harm"⁶

To ensure the protection of Bristol Bay's waters and wild salmon fishery, the undersigned groups and individuals ("Petitioners") hereby petition the State of Alaska, Department of Natural Resources ("DNR") to direct PLP to undertake an investigation.⁷ As detailed below, it appears from past and recent field reports and investigations that many of PLP's wells may not have been properly plugged, reclamation and re-vegetation efforts have been unsuccessful in many locations, and potentially toxic drilling waters and muds from PLP's drilling activities may have been mishandled and thus may pose a serious yet unquantified threat to surface water and groundwater in the region. The people of Bristol Bay are entitled to know the extent of the problems and thus a thorough investigation of the exploration activities and risks is warranted. The State should also be concerned about the extent of potential problems at the Pebble exploration site because if PLP's financial situation requires them to abandon the Pebble project the expense of conducting the statutorily required reclamation will fall onto the State. As it

⁴ Northern Dynasty Minerals Ltd., 2014 Technical Report on the Pebble Project, Southwest Alaska, USA (effective date Dec. 31, 2014), p.67 *available at* <http://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=00003151> (date of filing Feb. 6, 2015) (also available on SEC website at : <https://www.sec.gov/Archives/edgar/data/1164771/000106299315000646/exhibit99-1.htm>) [hereinafter "NDM 2014 Technical Report"] (attached hereto as Exhibit A). Regardless of who actually did the work on the claims now held by PLP, the company, being the sole permittee, is responsible for reclamation of any activity undertaken on those claims.

⁵ See Exhibit B for a map showing selected PLP boreholes with a depth greater than 5,000 feet. Some of these boreholes DNR has identified as problematic over the years, such as 8432, 8405, and 8420. Moreover, some of these drillholes are located less than 100 feet from water bodies.

⁶ *Nunamta Aulukestai, et al. v. State of Alaska, Dep't of Natural Res.*, No. S-14560/14579, at 47 (Alaska 2015); see also *id.* at 46 ("there is the potential for environmental damage primarily through pollution of groundwater by the toxic waste that has been disposed of on the land and by acid rock drainage").

⁷ DNR already appears to be starting an investigation into the status of PLP's reclamation. DNR took a good first step by requesting PLP provide a "[c]omplete catalog of drill holes and current site conditions for scheduling planned maintenance" in its most recent Field Monitoring Report. DNR, Field Monitoring Report—APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), *available at* <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>. From the language of the action item, however, it is unclear precisely what DNR is asking of PLP and in what timeframe, and as detailed below, in any event it is a subset of what petitioners seek here. Regardless, petitioners ask that whatever information DNR obtains from PLP through its action item be made publicly available.

stands now, PLP is exempt from preparing a reclamation plan and providing a security bond,⁸ and absent State action consistent with this petition, there is currently no mechanism in place to protect the State if PLP abandons the site.

As described in this petition, Petitioners request that: (1) DNR require PLP to undertake studies of the reclamation status and potential threats posed by its exploration activities; (2) DNR require PLP to provide a detailed accounting of the present reclamation status and surface and ground water quality for all sites associated with PLP's exploration activities between 1987 and today; and (3) DNR require PLP to present a plan, including cost estimates and work deadlines, for eliminating the threat posed by its exploration activities to water and wild salmon.

Three factors add urgency to this request. First, as PLP, DNR, and others acknowledge, PLP's exploration activities have exposed to air and water ore that has the potential to generate acid, which can have significant impacts on land and water quality and the life it sustains. As explained below, the time frame in which such acid can be generated is such that it may already be occurring from some of PLP's earlier exploration activities. Even where acid generation is not yet occurring, the potential for it to occur as a result of PLP's exploration activities is high and it is therefore critical that a timely effort be made to prevent such pollution in order to avoid the much more difficult challenge of redressing it after the fact. Second, PLP and its parent company, Northern Dynasty Minerals, are not currently engaged in exploration operations in Alaska and based on public information may be facing unusual financial liquidity constraints. Third, the reclamation costs for the already-existing exploration disturbances are a large unknown. Consequently, to avoid the risk that the State may have to cover the costs associated with assessing and reclaiming PLP's exploration activities if the company is financially unable to do so, it is important that DNR obtain the information and commitments sought by this petition in a timely manner.

I. Petitioners

Petitioners consist of groups and individuals who live, work, and recreate in the Bristol Bay region and have been concerned about PLP's exploration efforts for more than ten years.

United Tribes of Bristol Bay ("UTBB") is a tribally-chartered consortium in the Bristol Bay region of Southwest Alaska. UTBB acts as political subdivision of its member tribal governments who have been leading environmental justice work in Bristol Bay for decades. UTBB was founded in 2013 by six Bristol Bay tribes and has grown to represent fourteen tribal governments. UTBB's mission is to protect the lands and waters supporting the subsistence way of life by advocating against unsustainable large-scale hard rock mines like the Pebble Project. UTBB is guided by the results in the Bristol Bay Regional Visioning Project, a comprehensive project outlining a sustainable future that honors our traditional values and way of life. UTBB's fourteen member Tribal governments include: Togiak Traditional Council, Twin Hills Village

⁸ AS 27.19.050(c) ("A miner exempt under (a) of this section shall file an annual reclamation statement with the commissioner disclosing . . . the specific reclamation measures used to comply with AS 27.19.020,"); *see also*, Alaska DNR, Multi-Year 2014-2016 Miscellaneous Land Use Permit for Hardrock Exploration & Reclamation, Permit #6118 to Pebble Limited Partnership [hereinafter "PLP 2014-2016 MLUP"] ("[y]ou . . . are exempt from reclamation bonding").

Council, Manakotak Village Council, Curyung Tribal Council, Ekuk Village Council, Clark's Point Village Council, Aleknagik Traditional Council, Portage Creek Village Council, New Stuyahok Traditional Council, New Koliganek Village Council, Levelock Village Council, Nondalton Village Council, Pilot Point Tribal Council, and Chignik Lake Tribal Council.

Stuyahok Limited is a Native Corporation located in New Stuyahok, a village located on the Nushagak River. Ekwok Natives Limited is a Native Corporation with offices in Dillingham and Ekwok, a village located on the Nushagak River. Koliganek Natives Limited is a Native Corporation with offices in Koliganek, a village located on the Nushagak River.

Nunamta Aulukestai ("Nunamta"), which means Caretakers of our Land, is a 501(c)(3) non-profit that includes ten tribal corporations and ten tribal governments. The organization was incorporated as a non-profit in 2007.⁹ Nunamta's headquarters is in Dillingham, Alaska. Nunamta's mission is to protect the land, water, and air that will sustain their way of life for all generations. Since 2007, Nunamta has focused its organizational efforts on educating the local people and the general public about the Pebble Project and the harmful effects it would have on the subsistence, commercial, and sport fishing economies in Bristol Bay. In doing so, Nunamta advocates on behalf of more than 6,000 tribal and village corporation members in the Bristol Bay region. Nunamta has aesthetic, cultural, and subsistence interests in the public lands, waters and resources at the Pebble Project site. Members of Nunamta use the Pebble project area for hunting, fishing, other subsistence activities, and recreation. The members of Nunamta have lived off the land for thousands of years. For the members of Nunamta, subsistence has been and continues to be the means of survival in the region. Nunamta's members' subsistence depends on access to both (1) the Pebble project area and (2) wildlife resources that utilize that habitat in the project area.

Bristol Bay Native Association, Inc. ("BBNA") is an Alaska Native regional non-profit corporation and a tribal consortium of 31 federally recognized tribes of the Bristol Bay region. BBNA works collectively with tribes and partnering organizations to protect the lands and natural ecosystem of Bristol Bay as well as support subsistence opportunities for the people of the region. The Mission of BBNA is to maintain and promote a strong regional organization supported by the Tribes of Bristol Bay to serve as a unified voice to provide social, economic, cultural, educational opportunities and initiatives to benefit the Tribes and the Native people of Bristol Bay.

Bristol Bay Native Corporation ("BBNC") is a for-profit ANCSA regional corporation with more than 9,600 shareholders. BBNC was created by Congress in 1971 pursuant to ANCSA to represent the economic, social, and cultural interests of Alaska Native people from the Bristol Bay region. Since its inception, BBNC has taken seriously its responsibility to protect the assets entrusted to its care as well as the interests of its shareholders. BBNC remains actively engaged in a variety of efforts to preserve Bristol Bay's salmon fisheries, which serve as the basis for the

⁹ In April 2013, Nunamta filed an administrative appeal of PLP's 2013 MLUP (Permit No. A136118) that expressed concern with PLP's inadequate reclamation for certain boreholes, among other things. Because the 2013 permit has expired, Nunamta has agreed to withdraw its administrative appeal. However, Nunamta still has concerns about the particular boreholes addressed in the administrative appeal, but this Petition addresses those specific concerns along with Nunamta's overall concerns about reclamation at the Pebble site.

region's social, cultural, and economic well-being. In order to fulfill these duties and carry out the will of its Alaska Native shareholders, BBNC has a strong interest in protection of the water and salmon resources of Bristol Bay, as well as the associated subsistence, commercial and sport fishing, and cultural values of its shareholders.

Bristol Bay Economic Development Corporation ("BBEDC") is a regional, community-based corporation charged with developing and enhancing the economic opportunities in the 17 communities BBEDC represents and for the greater Bristol Bay watershed.

Commercial Fishermen for Bristol Bay ("CFBB") is a group of commercial fishermen and fishing organizations from around the country working together to protect the commercial fishing industry and commercial fishing jobs in Bristol Bay.

Alaska Sportsman's Bear Trail Lodge, Blue Mountain Lodge, Enchanted Lake Lodge, Alaska's Fishing Unlimited, Frontier River Guides, and No See Um Lodge are all sport fishing and guiding businesses that depend on Bristol Bay headwaters for the successful operation of their businesses.

II. PLP's Exploration Permit, Remediation, and Monitoring Requirements

PLP's current and past exploration activities were authorized by DNR under Miscellaneous Land Use Permits ("MLUP").¹⁰ An MLUP is issued under AS 38.05.850, which provides:

The director . . . may issue permits, rights-of-way, or easements on state land for roads, trails, ditches, field gathering lines or transmission and distribution lines, log storage, oil well drilling sites and production facilities for the purposes of recovering minerals from adjacent land under valid lease, and other similar uses or improvements, or revocable nonexclusive permits for the personal or commercial use or removal of resources that the director has determined to be of limited value.¹¹

Under this authority, the director and commissioner must make all decisions to grant, suspend, or revoke a MLUP by giving "preference to that use of the land that will be of greatest economic benefit to the State and the development of its resources."¹² The purpose of the permitting is to manage uses on State land "in order to minimize adverse effects on the land and its resources."¹³ DNR has the discretion to subject each permit to "any provisions the department determines necessary" to assure compliance with the MLUP regulations, and "to minimize conflicts with other uses, to minimize environmental impacts, or otherwise to be in the interests of the state."¹⁴

¹⁰ PLP's current MLUP will expire on December 31, 2016.

¹¹ AS 38.05.850. MLUPs are discretionary for many general land uses; however, DNR must issue MLUPs for "more intrusive" land uses, such as the activities involving the use of hydraulic prospecting or mining equipment or exploratory drilling to a depth in excess of 300 feet. 11 AAC 96.010(a)(1)(A) and (D). *See also Nunamta v. State*, No. S-14560/14579, at 29 (Alaska 2015).

¹² AS 38.05.850.

¹³ 11 AAC 96.005.

¹⁴ 11 AAC 96.040(b).

DNR issues MLUPs for mineral exploration operations with reclamation stipulations as required by Alaska Statute 27.19 (Reclamation).¹⁵ The standard for reclamation requires that mining operations “be conducted in a manner that prevents unnecessary and undue degradation of land and water resources, and... [is] reclaimed as contemporaneously as practicable with the mining operation to leave the site in a *stable condition*.”¹⁶ Leaving the site in a stable condition requires the permittee to “reclaim a mined area that has potential to generate acid rock drainage (acid mine drainage) in a manner that prevents the generation of acid rock drainage or prevents the offsite discharge of acid rock drainage.”¹⁷ This reclamation standard applies even if the miner is exempt from the reclamation plan and bonding requirements.¹⁸ If an exempt miner “fails to reclaim a mining operation to the standards of AS 27.19.020,” that miner is then required to prepare a reclamation plan and provide a bond.¹⁹ The bonding requirements under AS 27.19.040 are intended to protect the State should a miner leave a mining site without completing the necessary reclamation.

In addition to the general reclamation standard, PLP’s current MLUP contains the following specific reclamation stipulations:

- (a.) Topsoil and overburden muck, not promptly redistributed to an area being reclaimed, shall be separated and stockpiled for future use. This material shall be protected from erosion and contamination by acidic or toxic materials and should not be buried by broken rock.
- (b.) The area reclaimed shall be reshaped to blend with surrounding physiography using strippings and overburden, then be stabilized to a condition that shall retain sufficient moisture to allow for natural revegetation.
- (c.) Stockpiled topsoil, overburden muck, and organic material shall be spread over the contoured exploration to promote natural plant growth.
- (d.) Exploration trenches shall be backfilled and the surface stabilized to prevent erosion.... All exploration trenches shall be reclaimed by the end of the exploration season in which they are constructed, unless specifically approved by the Division of Mining, Land & Water.
- (e.) 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.
- (f.) All drill hole casings shall be removed or cut off at, or below, ground level.

¹⁵ See PLP 2014-2016 MLUP (issued by DNR “in accordance with and subject to the requirements and general stipulations of Alaska Statute 27.19 (Reclamation)...”); see also AS 27.19.100 (the definition of “mining operation” includes “each function, work, facility, and activity *in connection with* the development, extraction, and processing of a locatable or leasable mineral deposit... and each use reasonably incident to the development, extraction, and processing...” (emphasis added)).

¹⁶ AS 27.19.020 (emphasis added); see also PLP 2014-2016 MLUP Terms of Permit (issued by DNR “in accordance with and subject to the requirements and general stipulations of Alaska Statute 27.19 (Reclamation)...”).

¹⁷ 11 AAC 97.240.

¹⁸ AS 27.19.050(c) (“A miner exempt under (a) of this section shall file an annual reclamation statement with the commissioner disclosing . . . the specific reclamation measures used to comply with AS 27.19.020,”); see also AS 27.19.070(a) (“A miner exempted under AS 27.19.050(a) is subject to civil action for the full amount of reclamation and administrative costs incurred by the state related to the action if the commissioner determines that reclamation was not conducted under AS 27.19.020.”).

¹⁹ AS 27.19.050(d).

- (g.) All drill holes shall be plugged by the end of the exploration season during which they are drilled, unless otherwise specifically approved by the Division of Mining, Land & Water.
- (h.) All drill holes shall be plugged with bentonite holeplug, a benseal mud, or equivalent slurry, for a minimum of 10 feet within the top 20 feet of the drill hole in competent material. 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, a benseal mud, 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 a bentonite holeplug, benseal mud, or equivalent slurry is also permitted and is considered to be the preferred method of hole closure.
- (i.) If artesian conditions are encountered, the operator shall contact [DEC] for hole plugging requirements.
- (j.) Upon completion of drilling activity, drill pads shall be reclaimed as necessary, including reseeding, to encourage natural revegetation of the sites and protect them from erosion.²⁰

PLP's current MLUP requires that the company file an Annual Reclamation Statement by December 31st each year the permit is in effect, including photographs of the completed reclamation work. Failure of PLP to submit an Annual Reclamation Statement and photos may result in loss of PLP's exemption from reclamation bonding.²¹

PLP's current MLUP does not permit the company to allow surface structures to remain on the property beyond the expiration of the permit and, if surface structures remain, "they must be immediately authorized through another operations approval and land use permit or other written authorization, even if no mining is occurring, otherwise the surface structures will be deemed to be in trespass."²² If PLP fails to remove surface structures, DNR has the right to do so at PLP expense.²³

Under the terms of PLP's current MLUP, DNR may enter onto and inspect the Pebble deposit area and PLP's facilities at all reasonable times and without notice to PLP.²⁴ PLP's MLUP is revocable upon violation of any of the permit's terms, conditions, stipulations, or upon failure to comply with any other applicable laws, statutes, and regulations (both federal and state).²⁵ Moreover, DNR has the authority to require PLP, "at its expense" to clean an area "to the reasonable satisfaction of the State of Alaska" where "any unlawful discharge, leakage, spillage,

²⁰ PLP 2014-2016 MLUP Terms of Permit, Sec 1.

²¹ AS 27.19.050(c). *See also*, PLP 2014-2016 MLUP (DNR exempting PLP from reclamation bonding because the company submitted a Letter of Intent to do Reclamation).

²² PLP 2014-2016 MLUP Terms of Permit, Sec 5.

²³ 11 AAC 96.040(f) ("If the permittee fails to remove the improvements in compliance with this requirement, the department may sell, destroy, or remove the improvements, whichever is most convenient for the department, at the permittee's expense, including the department's costs associated with restoration and expenses incurred in the performance of these duties.").

²⁴ PLP 2014-2016 MLUP Terms of Permit, Sec 9.

²⁵ PLP 2014-2016 MLUP Terms of Permit, Sec 10. *See also id* at Sec. 3 (requiring that PLP's operations under the permit be conducted "in conformance with applicable Federal, State, and local laws and regulations now, or hereafter, in effect during the life of the permit.").

emission, or pollution of any type occur[s] due to permittee's or its employees', agents', contractors', subcontractors', licensees', or invitees' act or omission...."²⁶ In short, DNR has broad authority to investigate and enforce PLP's compliance with its permit.²⁷

As detailed below, evidence indicates that PLP may not be in compliance with the State reclamation standard and the reclamation stipulations contained in its permit. If this evidence proves true and PLP has un-remedied violations, DNR can condition a new permit on remedying the violations, requiring a reclamation plan, and securing financial assurance or a bond.²⁸ DNR has a duty to the people of Bristol Bay and all Alaskans to investigate this situation and to ensure that the risk posed by PLP's explorations efforts to area water quality and fishery resources is eliminated.²⁹

III. Evidence indicates that PLP's exploration efforts may pose significant risk to area water quality and fishery resources.

There is evidence that PLP is not complying with the reclamation standard and the conditions of its MLUP. As described below and further detailed in the attached Exhibits, Petitioners have categorized their concerns into five types of long- and short-term harm associated with PLP's exploration activities: (1) acid-generating pollution impacts from PLP's efforts to drill 1,355 holes and apparent failures to plug or properly plug abandoned drill holes; (2) impacts from unlined sumps to surface and ground water quality and re-vegetation and remediation efforts; (3) failure of remediation and re-vegetation efforts due to discharge of drilling waters and muds onto tundra and in natural water bodies and topographic depressions; (4) oil and fluid spills associated with exploration activities; and (5) storage of heavy equipment, materials, fluids, and debris on tundra, as well as abandoned facilities, buildings, and equipment.

DNR's recent visit to a limited portion of PLP's exploration drilling and activity sites furthers Petitioners' concerns with current and potential long-term contamination from PLP's exploration activities and reveals that PLP may be in on-going violation of its MLUP and the relevant statutes and regulations governing mineral exploration and reclamation. Furthermore, in clear violation of AS 27.19 and the terms of its MLUP, PLP has failed to file its most recent Annual Reclamation Statement for any land reclamation and activities conducted by the company during 2014.³⁰

²⁶ PLP 2014-2016 MLUP Terms of Permit, Sec 10.

²⁷ See, e.g., *id.* at Sec. 3. In addition, if PLP fails to comply with the terms and stipulations of its MLUP, or the provisions of the Miscellaneous Land Use Regulations and Reclamation Act, and "after receiving written notice, fails to remedy such default within the time specified in the notice, the Director may cancel this permit." *Id.* at Sec 16.

²⁸ 11 AAC 96.145(b); AS 27.19.050(d).

²⁹ 11 AAC 96.040(a); PLP 2014-2016 MLUP Terms of Permit, Sec 10.

³⁰ See <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/index.cfm>. (last accessed Nov. 1, 2015).

A. Acid-generating pollution impacts from efforts to drill 1,355 Drill Holes and failures to plug abandoned drill holes

Evidence indicates that PLP may have failed to plug or adequately plug many abandoned drill holes. For example, DNR's field monitoring report from this year concludes that, out of a sampling of 24 drill holes checked during the site visit (~2% of PLP's entire drilling effort), eight drill holes require action to eliminate surface water seepage and to repair equipment, caps, or plugs.³¹ Thus, 33% of the holes checked by DNR have problems, and if this ratio holds true for the entirety of PLP's holes, there could be well over 400 holes that require remedial action. This demonstrates why a full accounting is needed.

Many of PLP's drilling activities targeted and bore through potentially acid-generating (PAG) ore. As PLP acknowledges, the pre-Tertiary rock it pierced through and pulled from the ground "was found to be dominantly PAG due to elevated acid potential (AP) values resulting from increased sulphur concentrations and limited neutralization potential (NP) resulting from lack of carbonate minerals."³² PAG ore causes acid drainage with high levels of dissolved metals (such as ammonia, barium, and other contaminants) and high sulfate levels, and may have long-lasting impacts to surface water and ground water.³³ Importantly, the higher occurrence of Pebble PAG ore exists in the headwaters of river systems that provide habitat and nutrients to aquatic life that are sensitive to chemical fluctuations and are easily disrupted by discharge of acid drainage over time.³⁴

Furthermore, PAG ore can lead to the generation of acid in as little as ten years, and can persist for thousands of years. PLP further describes that "[i]n the pre-Tertiary samples, acidic conditions occur quickly in core with low NP [and] field data suggest that the onset to acidic conditions is about 20 years, while laboratory kinetic tests show that the delay to the onset of acidic conditions is expected to be between a decade and several decades."³⁵ Acid generation may persist in surface and ground water for hundreds to thousands of years.³⁶

To provide one example of the lasting impacts from PAG rock, in 2013 DNR reported that an abandoned PLP well hole drilled in 2011 was discharging iron-colored water, staining the surface and impacting vegetation.³⁷ Such discoloration is a sign that PAG ore may be generating

³¹ DNR, Field Monitoring Report—APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

³² NDM 2014 Technical Report at 146.

³³ Kendra Zamzow, PhD, *Potential Impacts to Water during Exploration at the Pebble Prospect, Alaska* (Aug. 2010) at 54, available at <http://www.csp2.org/files/reports/Potential%20Exploration%20WQ%20Impacts%20-%20Zamzow%20Aug10.pdf>.

³⁴ Zamzow at 54.

³⁵ NDM 2014 Technical Report at 146.

³⁶ Zamzow at 4 ("Depending on the other material in the rock, such as carbonates, the development of acid may be delayed by several decades; however, once started, it may continue unabated for hundreds to thousands of years.").

³⁷ ADNR Pebble Field Monitoring Report, p. 1, 16 (July 23, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072313.pdf>. For another example of long-term impacts, see DNR, Field Monitoring Report—APMA A20146118 Pebble Limited Partnership, p. 9 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22> (where DNR noted that a well hole drilled in 1988 was still discharging iron-colored water to the surface in 2015).

actual acid.³⁸ For ease of reference, Petitioners have compiled from past DNR reports numerous examples of failure to plug drill holes and abandoned drill holes impacting the tundra years later.

B. Impacts from unlined sumps to surface and ground water quality and re-vegetation and remediation efforts

Evidence indicates that PLP has not re-vegetated and remediated all sumps and trenches used in exploration. The regulations require that the company “reclaim a mined area that has potential to generate acid rock drainage (acid mine drainage) in a manner that prevents the generation of acid rock drainage or prevents the offsite discharge of acid rock drainage.”³⁹ DNR should further investigate to determine the status of PLP’s efforts to re-vegetate and remediate the sumps and trenches used in exploration.

As the Alaska Supreme Court recently noted regarding the risk of sumps associated with PLP’s exploration, “the hundreds of sumps containing toxic waste and chemically reactive material represent a continuing potential source of environmental harm.”⁴⁰ Between one and three sump pits were dug for the settlement of the slurry of drilling mud and drilling waste that was discharged from a single bore hole.⁴¹ The smaller sump pits are approximately eight feet long, four feet wide and six feet deep, while the larger sump pits are about 15 to 20 feet long, five feet wide and six feet deep.⁴² The risk of harm from sumps containing drill cuttings increases with time, as the onset to acidic conditions from PAG rock materials contained in the drill cuttings is about 10 years.⁴³

One third-party report of water quality sampled at a sump located at an active PLP exploration rig in October 2011 found that water sampled from the sump exceeded water quality standards for aluminum, cadmium, copper, iron, lead, manganese, silver, zinc, diesel range organics, and residual range organics.⁴⁴ The study found that these contaminants documented in the sump were “likely attributable to mineralized drill cuttings and rock ‘flour’ [as well as] from fuels and/or muds used in drilling.”⁴⁵ Moreover, studies of the Pebble deposit area show porous surface materials, highly interconnected ground and surface waters, and a subsurface perforated

³⁸ Zamzow at 54 (“Acid rock reactions occur as oxygenated groundwater moves through sulfidic rock; the onset of the reactions may be delayed by several years, but once started they are likely to continue for decades. This may be directly observable as red or orange water. . .”).

³⁹ 11 AAC 97.240.

⁴⁰ *Nunamta v. State*, No. S-14560/14579, at 47 (Alaska 2015).

⁴¹ *Nunamta v. State*, No. S-14560/14579, at 4 (Alaska 2015).

⁴² *Nunamta v. State*, Case No. 3AN-09-9173 CI (Superior Court’s Findings of Fact and Conclusions of Law) at 25-26 (citing Taylor at Tr. 817 and Wober at Tr. 264-65).

⁴³ NDM 2014 Technical Report at 146. *See also*, Zamzow at 1 (“Sulfide rock is particularly problematic in that it becomes sulfuric acid upon contact with water and oxygen; this process may occur quite quickly or may take several decades depending on the other material in and around the rock.”).

⁴⁴ Woody, Zamzow, Welker, and O’Neal, Water Quality at Pebble Prospect Drill Rig #6, South Fork Koktuli River, Bristol Bay, Alaska, 22-23 Oct. 2011 (Final Report July 9, 2012), *available at* http://www.pebblescience.org/pdfs/2013-July/SUMP_Final_9_July_2012compressed.pdf (Table 2 from report attached hereto as Exhibit C).

⁴⁵ Woody, et al., at 1.

so extensively by PLP's drilling operations that anything spilled to the surface waters or tundra may easily spread to the groundwater as well.⁴⁶

C. Failure of remediation and re-vegetation efforts due to discharge of drilling waters and muds onto tundra and in natural water bodies and topographic depressions

In addition, PLP's discharge of drilling waters and muds into water bodies and directly onto tundra may have occurred in the past without a permit from the State.⁴⁷ These discharges have led to failed re-vegetation efforts and lasting impacts on the tundra. If verified, this failure would also violate the regulatory requirement that PLP "reclaim a mined area that has potential to generate acid rock drainage (acid mine drainage) in a manner that prevents the generation of acid rock drainage or prevents the offsite discharge of acid rock drainage."⁴⁸

Use of the sumps as described above "describes best practices." However, there is evidence that at times PLP and its predecessors simply allowed the discharged material to flow onto the tundra or into tundra ponds.⁴⁹ Indeed, numerous DNR field reports describe discharge of drilling water and muds directly onto tundra and into natural water bodies (such as kettle ponds) and topographic depressions.⁵⁰ For ease of reference, in Exhibit D Petitioners have compiled from past DNR reports numerous examples of unsuccessful site re-vegetation and PLP's disposal of drill materials and water directly onto tundra.

D. Oil and fluid spills associated with exploration activities

Evidence indicates that there were numerous oil spills over time by PLP in its exploration efforts. Petitioners are concerned that the harms from these spills may still be present and the site may not be in a stable condition.⁵¹ DNR should investigate further to determine the status of any spills at the Pebble exploration site.

Petitioners have compiled a list of 27 oil, fuel, or fluid spills by PLP totaling 467 gallons.⁵² Some of these spills occurred during drilling operations and present challenges for keeping fluids

⁴⁶ Zamzow at 54.

⁴⁷ It is unclear to petitioners when the use of sumps became a part of PLP's Plan of Operations and when PLP completely discontinued discharging drilling waters and muds directly onto tundra and into natural water bodies. Petitioners have evidence that suggests PLP was discharging directly into water bodies and tundra pursuant to an expired Plan of Operations when they should have been using sumps as required in their current Plan of Operations. Such information gaps about potentially harmful and unlawful activities is precisely why DNR should be collecting more complete information from PLP.

⁴⁸ 11 AAC 97.240.

⁴⁹ *Nunamta v. State*, No. S-14560/14579, at 4, fn 2 (Alaska 2015). DNR field reports identified discharge directly onto tundra and surface waters as a problem in late 2008 and somewhere around 2009-2010 PLP's practices changed to greater use of sumps. See, e.g., ADNR Field Monitoring Report, p. 2 (Oct. 28, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102808.pdf> ("State regulatory agencies and the PLP should further discuss the relative merits of handling drill fluids by discharge onto the ground, discharge into dry depressions, or recirculation.")

⁵⁰ See Exhibit D—Selected Examples of Pebble Exploration Drill Holes with Known Past Recorded Problems.

⁵¹ AS 27.19.020.

⁵² See Exhibit E—ADEC Record of Reported Spills from Pebble Exploration Activities.

out of ground and surface water.⁵³ The porous surface materials at the Pebble deposit, combined with the subsurface perforated so extensively by PLP's drilling operations, means that anything spilled to the surface waters or tundra may easily spread to the groundwater as well.⁵⁴

For example, at one spill location, DNR made note that the smell and sheen from the spill remained in the soil months later; however, it is not clear that DNR ever was able to revisit the site to see if the issue was resolved.⁵⁵ And in another instance, observation of a drill site nearly two years after a hydraulic fluid spill showed reclamation issues with little vegetation regrowth and tundra replacement that did not survive.⁵⁶ And in a third instance, a spill of 40 gallons of hydraulic fluid was injected down the drill hole, so the leak was not noticed until circulation brought it back to the surface.⁵⁷ A DNR visit to the site a year later, once the drilling rig had been removed and drilling had ceased, showed that the tundra was regenerating slowly and an iron bacteria sheen was noted in water surface at the site.⁵⁸ These three examples are a small subset of the at least 27 spills caused by PLP during its exploration efforts. Review of DNR's field reports suggests that many of the more significant spill sites were never revisited by DNR.⁵⁹ These spill sites could be exhibiting similar reclamation issues.

E. Storage of heavy equipment, materials, fluids, and debris on tundra; abandoned facilities, buildings, and equipment

Finally, PLP has paused exploration activities and has performed no actual labor or improvements to its claims since September 19, 2013.⁶⁰ Despite PLP's failure to work on its claims for the past two seasons, the company has failed to remove much of its equipment, facilities, debris, and buildings. Petitioners have compiled a list of the known equipment and facilities located on PLP's claims in Exhibit F. Types of equipment left behind include: abandoned camp sites and buildings;⁶¹ mounted backhoes for digging sumps;⁶² likely hundreds

⁵³ Zamzow at 9-11.

⁵⁴ Zamzow at 54.

⁵⁵ ADNR Pebble Field Inspection, Part III at p. 2 (July 26, 2007),

<http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072607.pdf>

⁵⁶ ADNR Field Monitoring Report, p. 15 (Oct. 28, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102808.pdf> and ADNR Field Monitoring Report, p. 12 (Aug. 3, 2010),

<http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080310.pdf>.

⁵⁷ ADNR Pebble Field Monitoring Report, p. 3 (July 12, 2011),

<http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble071211.pdf>

⁵⁸ ADNR Pebble Field Monitoring Report, p. 11 (June 19, 2012),

<http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061912.pdf>

⁵⁹ See Exhibit D (oil and hydraulic fuel spills occurring at drill sites such as 10488, 10512, 11529, 11540, and 1549 were never mentioned in subsequent DNR field reports after an initial site visit).

⁶⁰ Pebble Limited Partnership, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2015, Recording Dist. 320 Iliamna, 2015-000160-0 9 (showing no labor from September 1, 2014 to September 1, 2015); and Pebble Limited Partnership, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2014, Recording Dist. 320 Iliamna, 2014-000302-0 (showing September 19, 2013 as the last day of actual work performed on claims).

⁶¹ ADNR Pebble Project Inspection (June 14, 2006), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble06142006.pdf> (describing 2004 camp site left behind

⁶² ADNR Pebble Field Inspection 9 (July 26, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072607.pdf> (describing site preparation for drilling operations). See also id at 10 (photo of backhoe used for drilling sumps)

of tundra mats (large wooden pallets, constructed with 2x6 boards with 4x4 cross members for support, sometimes placed on steel supports);⁶³ weather stations;⁶⁴ and drill rig facilities (e.g., a storage structure, fuel storage, numerous drill rods and casing).⁶⁵

Section 5 of PLP's MLUP requires that all surface structures be removed from State land upon expiration or termination of the MLUP.⁶⁶ As described below, Petitioners are concerned that PLP will abandon its exploration efforts and run out of the financial resources to comply with this permit condition, and will instead leave behind its equipment, facilities, and debris for the State to remove at substantial expense. In order to lessen the potential for this outcome, Petitioners request that DNR require an accounting from the company of everything that it will be required to remove from State land at the end of its permit term. In addition, given PLP's financial state, it may be prudent for DNR to obtain financial security from PLP to ensure that there are available funds for the statutorily required remediation.

IV. PLP's mine development and financial status

As noted above, between 1987 and 2013 PLP and its subsidiaries and predecessors drilled thousands of wells in the headwaters of Bristol Bay, totaling nearly 200 miles of holes through the mineralized rock, overburden, surface water, and groundwater of the region.⁶⁷ Since then, PLP has undertaken no exploration or other significant activity on its claims, and it has not made public any specific plans to do so.⁶⁸

Over the last decade, PLP has made multiple statements about its near-readiness to file for mine development permit applications. However, PLP has never followed through with action after making those statements, and in its recent filings with the U.S. Securities and Exchange Commission it is unclear whether PLP has current or specific plans to file for such permits.⁶⁹

In urging PLP to proceed with permitting, U.S. Senator Lisa Murkowski detailed some of these promises in a 2013 letter to PLP and its parent companies, pointing out that PLP promised "imminent" action on the mine for "nearly a decade" but "after years of waiting, it is anxiety, frustration, and confusion that have become the norm" in many Alaska communities in the

⁶³ *Id* at 9. Photos of PLP's Main Camp site from DNR's July 22, 2015 inspection show at least 10 piles of tundra pads stacked 10 high.

⁶⁴ *Id* at 4 (photo of weather station)

⁶⁵ *Id* at 12-13 (see also photos at 14-22).

⁶⁶ PLP 2014-2016 MLUP Terms of Permit, Sec 5.

⁶⁷ NDM 2014 Technical Report at 67-73. *See also*, Pebble Limited Partnership, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2014, Recording Dist. 320 Iliamna, 2014-000302-0 *and* Pebble Limited Partnership, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2015, Recording Dist. 320 Iliamna, 2015-000160-0 9 (showing no labor from September 1, 2014 to September 1, 2015) (showing that PLP's last field work on its claims occurred on September 19, 2013).

⁶⁸ *See* NDM 2014 Technical Report at 14. *See also, supra* at fn. 60 (labor affidavits showing no labor conducted on the claims from since September 13, 2013). *See also*, NDM 2014 Technical Report at 30 ("There are no activities proposed that require additional permits.").

⁶⁹ The report "is unable to offer any assessment of the likelihood of permitting a future mine at Pebble as it is beyond the scope of this report;" however, the report also states that "There are no activities proposed that require additional permits." NDM 2014 Technical Report at 30.

region of the Pebble deposit.⁷⁰ Statements from PLP and its parent companies claiming permitting is imminent include:

- November 3, 2004: a press release asserting “completion in 2005 of . . . permit applications.”⁷¹
- August 12, 2005: a press release asserting “a full permitting process for a port, access road and open pit mine all slated to begin in 2006.”⁷²
- October 27, 2008: a press release asserting the company was “on schedule to finalize a proposed development plan in 2009 and, following input from project stakeholders, apply for permits in early 2010.”⁷³
- March 18, 2009: a press release asserting the company was in “preparation to initiate state and federal permitting under the National Environmental Policy Act (NEPA) in 2010.”⁷⁴
- February 1, 2010: a press release asserting the company was “preparing to initiate project permitting under the National Environmental Policy Act (NEPA) in 2011.”⁷⁵
- May 2, 2011: a press release announcing that the company intended “to enter the permitting phase towards the end of 2012.”⁷⁶
- October 18, 2011: a media statement from a PLP representative that “We have never even said that we’re going to [seek a] permit. We may not.”⁷⁷
- June 13, 2013: a media statement from a PLP representative that the company “hope[s] to have a project to take into permitting this year.”⁷⁸

Today, PLP’s website claims that they are “working toward the goal of submitting our initial project description for permitting” and “we’re only just now preparing to apply for permits.”⁷⁹ However, according to PLP’s most recent SEC filings, additional work on its claims and prerequisite prefeasibility studies will be undertaken at a later, unknown, date “*as funds become available*.”⁸⁰

Further, public records reveal that PLP and its parent company NDM are facing potential cash flow constraints. According to the company’s most recent quarterly financial disclosures, it is spending roughly \$25 million per year.⁸¹ To meet these expenses, three times in the last year NDM has raised working capital by issuing special warrants that can be converted into NDM

⁷⁰ Letter from Senator Lisa Murkowski to John Shively, PLP CEP, Mark Cutafini, Anglo American CEO, and Ron Thiessen, NDM CEO (July 1, 2013), *available at*

http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=3b2efb37-cdd2-4203-8568-72c405e2a4e4.

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ <http://www.pebblepartnership.com/plan.html> (last accessed Nov. 1, 2015).

⁸⁰ NDM 2014 Technical Report at 14 (emphasis added).

⁸¹ Northern Dynasty Minerals Ltd., Management’s Discussion and Analysis (ended June 30, 2015), *available at* <http://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=00003151> (date of filing Aug. 14, 2015) (also available on SEC website at : <https://www.sec.gov/Archives/edgar/data/1164771/000106299315004694/exhibit99-2.htm>)

stock shares.⁸² In other words, Northern Dynasty has been diluting its value in order to generate its operating capital. Significant to this petition, the money NDM has been raising is not being spent on advancing its claims or dealing with environmental concerns outlined above. Between 2010 and 2014 PLP spent in excess of \$23 million on its drilling and exploration efforts,⁸³ but during the 2014-2015 season, it does not appear as if the company has spent any money on either due diligence on its claims or reclamation efforts.⁸⁴

Equally telling, all of PLP's major mining partners (Mitsubishi, Anglo American, and Rio Tinto) have departed the project.⁸⁵ This suggests that some of the world's most sophisticated and experienced mining companies see mining the Pebble deposit as a major risk that is not worth the investment.

Petitioners are concerned that, given PLP's financial status and its decade of unreliable and misleading statements regarding its federal permit application timeline, the company cannot be trusted to keep its promises to the State of Alaska and the people of Bristol Bay that it will fully document, reclaim, and remediate all of the harms associated with its mineral exploration operations.

V. Request to DNR for a Complete Reclamation Status and Formal Exploration Reclamation Plan from PLP

In order to ensure that PLP is in compliance with state law and the terms of its permit, and to ensure that PLP fully reclaims its exploration operations, Petitioners hereby request that DNR require PLP: (1) to undertake studies of the reclamation status and potential threats posed by its exploration activities; (2) to provide a detailed accounting of the present reclamation status and surface and ground water quality for all sites associated with PLP's exploration activities

⁸² See, e.g. NDM, News Releases, *Northern Dynasty to Raise Up to \$20 Million in Financing Transactions* (Aug. 10, 2015) (Northern Dynasty Minerals planning to raise about US\$20 million dollars by offering Special Warrants (to be converted to NDM shares) and by acquiring Cannon Point Resources, a small mineral exploration company. The acquisition of Cannon Point Resources was contingent on selling US\$10 million Special Warrants).

⁸³ PLP, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2011, Recording Dist. 320 Iliamna, 2011-000252-0 (spending in excess of \$3,806,240); PLP, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2012, Recording Dist. 320 Iliamna, 2012-000366-0 (spending in excess of \$13,552,783); PLP, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2013, Recording Dist. 320 Iliamna, 2013-000302-0 (spending in excess of \$4,322,289); and PLP, Affidavit of Annual Labor for State Mining Claims for the Year Ending September 01, 2014, Recording Dist. 320 Iliamna, 2014-000302-0 (spending in excess of \$2,130,230).

⁸⁴ See *supra* at fn. 60 (labor affidavits showing no labor conducted on the claims from since September 13, 2013). See also, <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/index.cfm>. (last accessed Nov. 1, 2015) (showing PLP failed to file an Annual Reclamation Report for 2014).

⁸⁵ See, InvestorPoint, *All Insiders Activity for Northern Dynasty Minerals Ltd. – Mitsubishi Corporation*, <http://www.investorpoint.com/stock/nak-Northern%20Dynasty%20Minerals%20Ltd./insider/Mitsubishi%20Corporation/All%20Types/> (showing Mitsubishi sale of 10.1 million Northern Dynasty shares and divestment from the company on Feb. 25, 2011); and NDM News Releases, *Anglo American Withdraws from Pebble Project* (Sept. 16, 2013), available at: <http://www.northerndynastyminerals.com/ndm/NewsReleases.asp?ReportID=605024>; and Rio Tinto News Releases, *Rio Tinto gifts stake in Northern Dynasty Minerals to Alaskan charities* (April 7, 2014), http://www.riotinto.com/media/media-releases-237_10183.aspx.

between 1987 and today; and (3) to present a plan, including cost estimates and work deadlines, for eliminating the threat posed by its exploration activities to water and wild salmon.

A reclamation plan and reclamation bonding protects the State from bearing the financial burden of statutorily required reclamation when a mining operation fails to do so.⁸⁶ However, PLP is exempt from the reclamation plan and bonding requirements.⁸⁷ In the normal circumstance, a mining operation would proceed from exploration to production, which would trigger the requirements for a reclamation plan and bonding. Thus, the State is typically able to protect itself at that stage. Indeed, the development of many mines in Alaska proceed directly from exploration to permitting and development in very short order, sometimes within one year.⁸⁸ However, as demonstrated above, there is no certainty that PLP will ever progress to that stage.⁸⁹ In addition, there are legitimate questions about PLP's financial ability to ever do so.⁹⁰ Indeed, there are numerous examples of when a state and/or federal government have become financially responsible for significant reclamation costs after a mining company abandons a project or declares bankruptcy.⁹¹ As a result, the State has a financial interest right now in investigating the status of PLP's reclamation. If there are any questions about whether PLP has met the reclamation requirements under the statute or the conditions in their permit, the State should make the necessary determinations and require a reclamation plan and bonding.⁹²

Petitioners request that any reclamation plan should include all of the following elements to address the suspected reclamation violations described above:

A. 1,355 Drill Holes

Petitioners request that DNR require PLP to provide a full listing of all 1,355 drill holes and should include at least the following information:

- Type of drill hole
- Location of drill hole
- Date drilled and date plugged

⁸⁶ AS 27.19.030-.040; 11 AAC 97.310; 11 AAC 97.400-.450.

⁸⁷ AS 27.19.050(a); PLP 2014-2016 MLUP.

⁸⁸ See U.S. Dept. of Interior, Bureau of Mines, *Regulator Processes Associated with Metal-Mine Development in Alaska—A Case Study of the Red Dog Mine*, at pp. 9-11, available at http://www.blm.gov/style/medialib/blm/ak/jrmic/usbm_rpts.Par.22991.File.tmp/OFR_93-92.pdf (explaining that exploration activities of the Red Dog deposit were conducted from 1980-81, while at the same time the EIS process under NEPA began in 1981 and was completed in 1984 with full permitting completed in 1984 and construction on the project and infrastructure beginning in 1986.).

⁸⁹ See *supra* at Sec. IV.

⁹⁰ *Id.*

⁹¹ See Jim Kuipers, *Putting a Price on Pollution, Financial Assurance for Mine Reclamation and Closure*, Center for Science in Public Participation, (March 2003), available at <https://www.earthworksaction.org/files/publications/PuttingAPriceOnPollution.pdf>; see also U.S. Gov't Accountability Office, GAO-05-377, *Hardrock Mining: BLM Needs to Better Manage Financial Assurances to Guarantee Coverage of Reclamations Costs* (2005), <http://www.gao.gov/assets/250/246828.pdf> (out of 48 hardrock operations on BLM land "that had ceased and not been reclaimed by operators," BLM only has \$69 million in financial assurances while the actual cost for reclamation was \$10.6 million, which left a \$56.4 million shortfall that the government had to cover).

⁹² AS 27.19.050(d); 11 AAC 97.610.

- Observed issues over the years
- Current status of drill hole
- Water quality samples from surface water and ground water near drill hole
- Estimated cost of plugging and further reclamation

B. Sumps associated with each drill hole

Petitioners request that DNR require PLP to provide a full listing of all sumps and trenches associated with each of the 1,355 drill holes and should include at least the following:

- Location of sump
- Associated drill hole
- Date of reclamation
- Observed issues over the years
- Current status of sump
- Water quality samples directly from the sump, remove overburden from reclaimed sump and sample the surface water beneath
- Estimated cost of further reclamation

C. Drilling water overflow areas, including trenches, kettle ponds, topographic depressions, and tundra uplands

Petitioners request that DNR require PLP to provide a full listing of all areas where water and drilling muds were allowed to overflow from sump and drill holes or where discharged into trenches, kettle ponds, topographic depressions, and tundra uplands and should include at least the following information:

- Location of overflow or discharge
- Associated drill hole number and location
- Date of reclamation
- Observed issues over the years
- Current status of overflow or discharge area, including status of re-vegetation
- Water quality and soil quality samples directly from kettle ponds and topographic depressions used as overflow areas
- Estimated cost of further reclamation

D. Oil and Fluid Spills

Petitioners request that DNR require PLP to provide a full listing of all oil and other liquid spills, including those that may not have been reported to the Department of Conservation, if any, and should include in this listing at least the following information:

- A description of the spill, including location, type of material, and volume
- How the spill was cleaned up at the time
- Subsequent efforts to clean up spill impacts
- Current status of reclamation and re-vegetation of the spill site
- Soil and/or water testing of the spill site
- Estimated cost of further cleanup

E. Storage of heavy equipment, materials, fluids, and debris on tundra; abandoned facilities, buildings, and equipment

Petitioners ask that DNR obtain from PLP a complete and more detailed accounting of the items that remain on the surface of the mining claims held by PLP and its affiliates in the Pebble deposit. This accounting will allow the State and public to assess the cost and the company's ability to remove such equipment and facilities. This accounting will also be beneficial to the State when PLP is required to remove such equipment at a future date, pursuant to its MLUP permit conditions. Petitioners ask that DNR require PLP to provide a list detailing all equipment, including but not limited to all materials, fluids, debris, facilities, and should include at least the following information:

- A description of each item,
- How long each item has been located in the Pebble deposit area
- Whether the company plans to use the item in the future
- The weight of the item and estimated cost of removal.

In addition, the reclamation plan should include any additional requirements that DNR deems necessary to meet the statutory requirements and the requirements of PLP's current MLUP. These statutory and permit requirements include: minimizing adverse effects on State land and resources;⁹³ reclaiming the exploration disturbances to leave the site in a stable condition, including the prevention of generation and/or discharge of acid rock drainage;⁹⁴ cleaning up any discharges, leakages, spills, or pollution;⁹⁵ and removal of all surface structures, facilities, and debris from the surface of the mining claims held by PLP and its affiliates.⁹⁶ Finally, pursuant to the terms and stipulations of its MLUP, DNR should require PLP to clean up any threats posed by its exploration activities to water and wild salmon "to the reasonable satisfaction of the State of Alaska."⁹⁷

VI. Conclusion

Evidence from public documents raises serious questions about the existing and potential impact stemming from Pebble Limited Partnership's exploration activities. Given the unique attributes of the proposed Pebble mine—its large size, potentially-acid-generating ore type, and sensitive location—it is important that the State of Alaska be especially vigilant in its oversight of PLP's exploration activities. PLP's ambiguous future—both in terms of its finances and permitting plans—add further weight and urgency to this petition. To ensure the protection of Bristol Bay's waters and wild salmon fishery and to protect itself from potential financial exposure, the State should timely act on this petition.

⁹³ 11 AAC 96.005.

⁹⁴ AS 27.19.020; 11 AAC 97.240.

⁹⁵ PLP 2014-2016 MLUP Terms of Permit, Sec 10.

⁹⁶ PLP 2014-2016 MLUP Terms of Permit, Sec 5.

⁹⁷ PLP 2014-2016 MLUP Terms of Permit, Sec 10.

Sincerely,



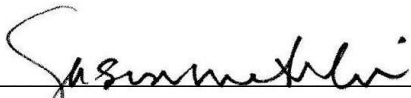
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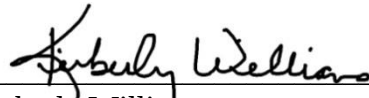
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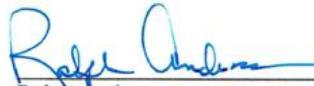
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Cc

Governor Bill Walker
Lieutenant Governor Byron Mallott
Representative Bryce Edgmon
Senator Lyman Hoffman
Tom Collier, CEO, Pebble Limited Partnership

LIST OF EXHIBITS

- A.** Northern Dynasty Minerals Ltd., 2014 Technical Report on the Pebble Project, Southwest Alaska, USA (effective date Dec. 31, 2014), Chapter 10, *available at* <http://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=00003151> (date of filing Feb. 6, 2015) (also available on SEC website at : <https://www.sec.gov/Archives/edgar/data/1164771/000106299315000646/exhibit99-1.htm>)
- B.** Map of Selected PLP Boreholes with Depth Greater than 5,000 Feet
- C.** Analyte Concentrations of Water Quality Parameters Measured at Pebble Drill Rig #6, South Fork Koktuli River, Nushagak River Drainage, Bristol Bay Alaska on October 22 and 23, 2011, from Woody, Zamzow, Welker, and O'Neal, *available at* http://www.pebblescience.org/pdfs/2013-July/SUMP_Final_9_July_2012compressed.pdf
- D.** Selected Examples of Pebble Exploration Drill Holes with Known Past Recorded Problems
- E.** ADEC Record of Reported Spills from Pebble Exploration Activities
- F.** Pebble Exploration Facilities and Equipment Left Behind

Exhibit A

**2014 TECHNICAL REPORT
ON THE
PEBBLE PROJECT, SOUTHWEST ALASKA, USA**

NORTHERN DYNASTY MINERALS LTD.

Effective Date – December 31, 2014

Qualified Persons

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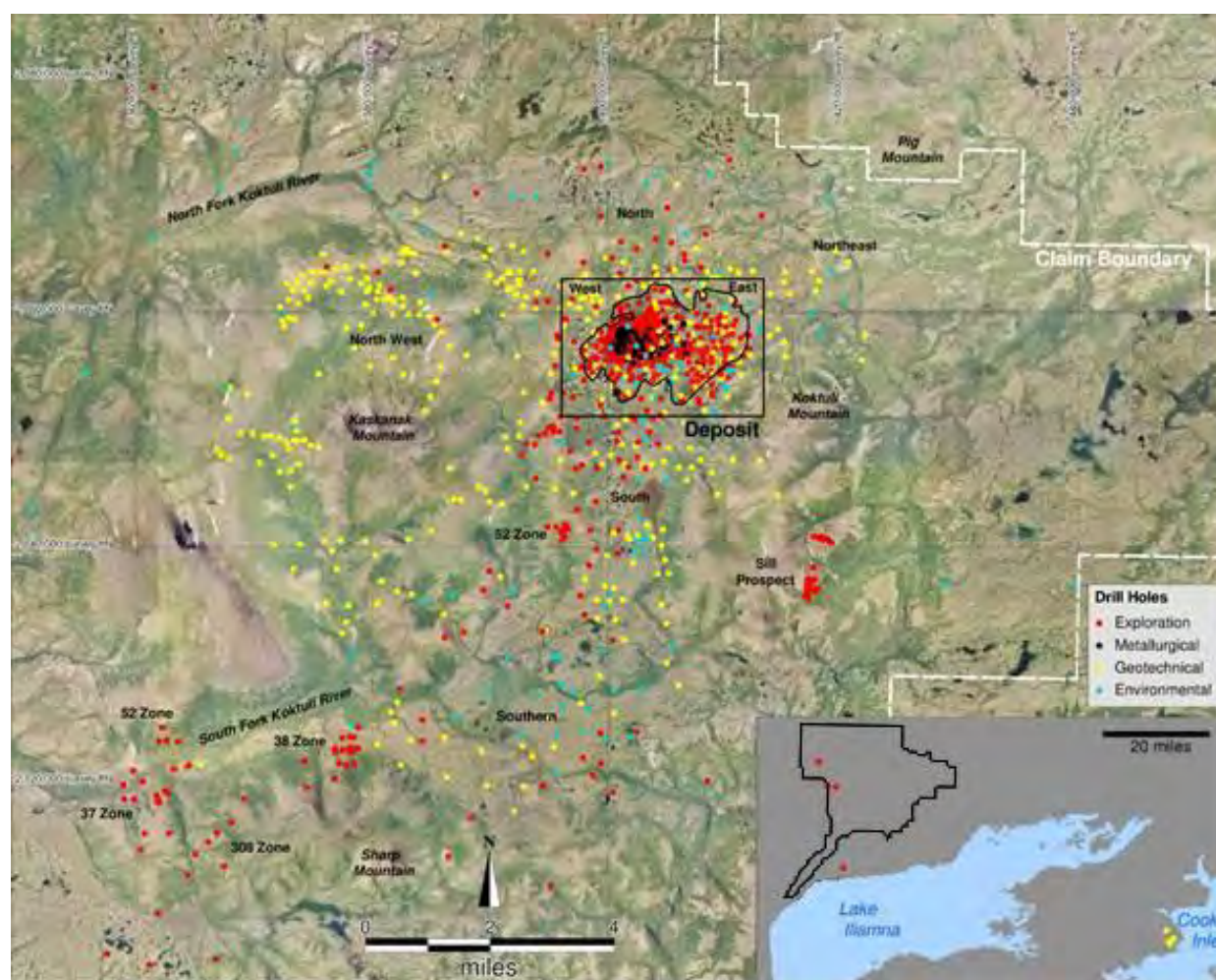
Ting Lu, PEng.

10.0 DRILLING

10.1 LOCATION OF ALL DRILL HOLES

Extensive drilling totaling 1,042,218 ft has been completed in 1,355 holes on the Pebble Project. These drill campaigns took place during 19 of the 26 years between 1988 and 2013. The spatial distribution and type of holes drilled is illustrated in Figure 10.1.1.

Figure 10.1.1 Location of all Drill Holes



Drilling completed by Cominco (Teck) (1988 to 1997) is described briefly in Section 6.0 and will not be discussed further here.

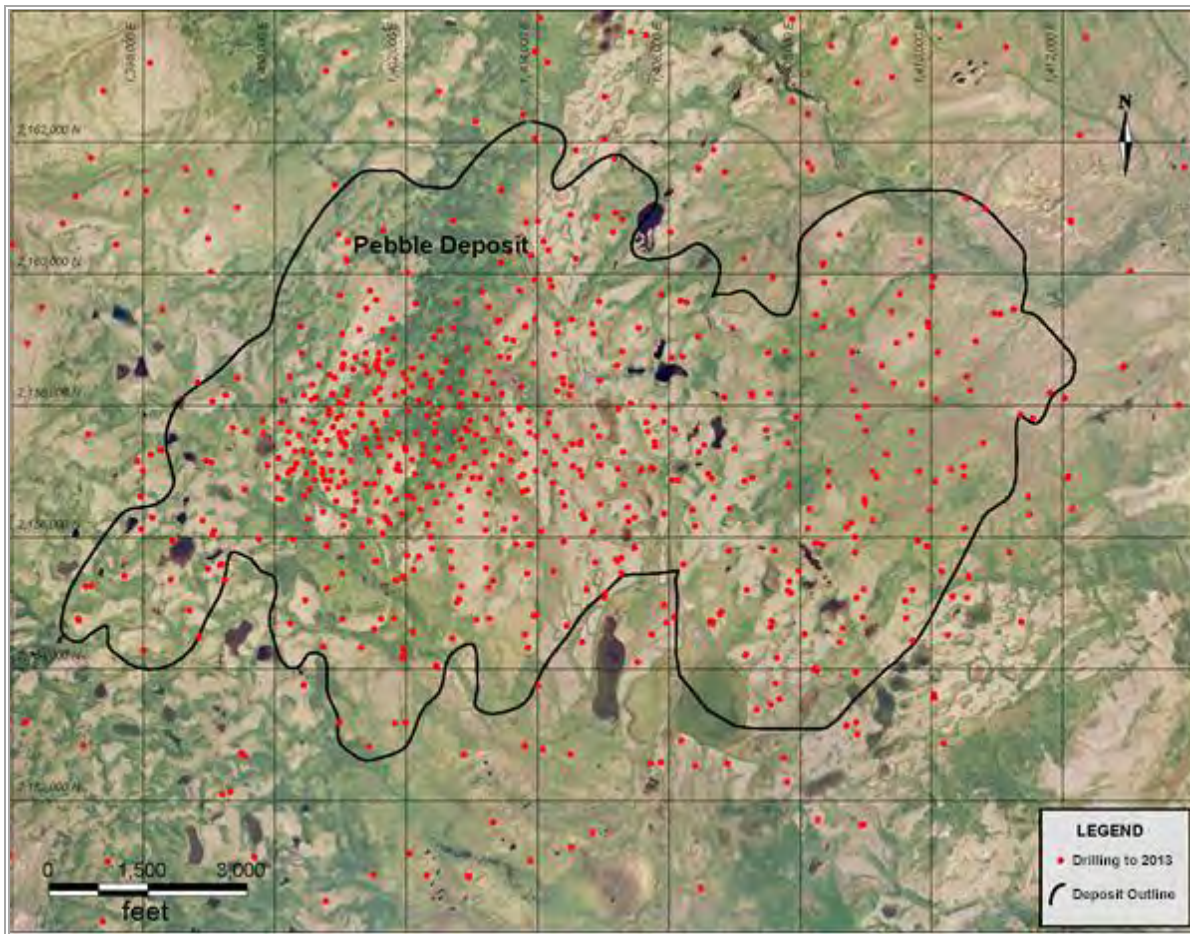
All drill hole collars have been surveyed using a differential global positioning system (GPS). A digital terrain model for the site was generated by photogrammetric methods in 2004. All post-Cominco (Teck) drill holes have been surveyed downhole, typically using a single shot magnetic gravimetric tool. A total of 989 holes were drilled vertically (-90°) and 192 were inclined from -42° to -85° at various azimuths.

10.2 SUMMARY OF DRILLING 2001 TO 2013

The Pebble deposit has been drilled extensively (Figure 10.2.1). Drilling statistics and a summary of drilling by various categories to the end of the 2013 exploration program are compiled in Figure 10.2.2. This includes seven drill holes completed by FMMUSA, drilled by Peak Exploration (USA) Corp. in the area in 2008; these holes were drilled on claims that are now part of the Pebble property and have been added to the Pebble dataset. Detailed descriptions of the programs and results for 2009 and preceding years may be found in technical reports by Rebagliati and Haslinger (2003 and 2004), Haslinger et al. (2004), Rebagliati and Payne (2005, 2006 and 2007), and Rebagliati et al. (2008, 2009 and 2010).

Most of the footage on the Pebble Project was drilled using diamond core drills. Only 18,716 ft was percussion-drilled from 222 rotary drill holes. Many of the cored holes were advanced through overburden, using a tricone bit with no core recovery. These overburden lengths are included in the core drilling total.

Since early 2004, all Pebble drill core has been geotechnically logged on a drill run basis. Over 69,000 measurements were made for a variety of geotechnical parameters on 735,000 ft of core drilling. Recovery is generally very good and averages 98.5% overall; two-thirds of all measured intervals have 100% core recovery. Additionally, all Pebble drill core from the 2001 through 2013 drill programs was photographed in a digital format.

Figure 10.2.1 Location of Drill holes – Pebble Deposit**Figure 10.2.2 Summary of Drilling to December 2013**

	No. of Holes	Feet	Metres
By Operator			
Cominco (Teck) ¹	164	75,741.0	23,086
Northern Dynasty	578	495,069.5	150,897
Pebble Partnership ²	606	465,957.7	142,024
FMMUSA	7	5,450.0	1,661
Total	1,355	1,042,218.2	317,668
By Type			
Core ^{1,5}	1,132	1,023,297.6	311,901
Percussion ⁶	223	18,920.6	5,767
Total	1,355	1,042,218.2	317,668
By Year			
1988 ¹	26	7,601.5	2,317

	No. of Holes	Feet	Metres
1989 ¹	27	7,422.0	2,262
1990	25	10,021.0	3,054
1991	48	28,129.0	8,574
1992	14	6,609.0	2,014
1993	4	1,263.0	385
1997	20	14,695.5	4,479
2002	68	37,236.8	11,350
2003	67	71,226.6	21,710
2004	267	165,567.7	50,465
2005	114	81,978.5	24,987
2006 ³	48	72,826.9	22,198
2007 ⁴	92	167,666.9	51,105
2008 ⁵	241	184,726.4	56,305
2009	33	34,947.5	10,652
2010	66	57,582.0	17,551
2011	85	50,767.7	15,474
2012	81	35,760.2	10,900
2013	29	6,190.0	1,887
Total	1,355	1,042,218.2	317,668
By Area			
East	141	446,379.3	136,056
West	443	351,986.7	107,286
Main ⁷	101	10,674.7	3,254
NW	203	45,948.4	14,005
North	46	25,695.9	7,832
NE	10	1,097.0	334
South	98	50,262.5	15,320
25 Zone	8	4,047.0	1,234
37 Zone	7	4,252.0	1,296
38 Zone	20	14,221.5	4,335
52 Zone	5	2,534.0	772
308 Zone	1	879.0	268
Eastern	21	3,105.0	946
Southern	153	60,442.4	18,423
SW	51	9,337.8	2,846
Sill	39	10,445.5	3,184
Cook Inlet	8	909.5	277
Total	1,355	1,042,218.2	317,668

Notes:

1. Includes holes drilled on the Sill prospect.
2. Holes started by Northern Dynasty and finished by the Pebble Partnership are included as the Pebble Partnership.
3. Drillholes counted in the year in which they were completed.

4. Wedged holes are counted as a single hole including full length of all wedges drilled.
 5. Includes FMMUSA drillholes; data acquired in 2010.
 6. Shallow (<15 ft) auger holes not included.
 7. Comprises holes drilled entirely in Tertiary cover rocks within the Pebble West and Pebble East areas.
- Some numbers may not sum exactly due to rounding.

The drill hole database includes drill holes completed up until 2013; the drilling completed in 2013 is outside the area of the resource estimate. Highlights of drilling completed by Northern Dynasty and the Pebble Partnership between 2001 and 2013 include:

- Northern Dynasty drilled 68 holes for a total of 37,237 ft during 2002. The objective of this work was to test the strongest IP chargeability and multi-element geochemical anomalies outside of the Pebble deposit, as known at that time, but within the larger and broader IP chargeability anomaly described above. This program discovered the 38 Zone porphyry copper-gold-molybdenum deposit, the 52 Zone porphyry copper occurrence, the 37 Zone gold-copper skarn deposit, the 25 Zone gold deposit, and several small occurrences in which gold values exceeded 3.0 g/t.
- In 2003, Northern Dynasty drilled 67 holes for a total of 71,227 ft, mainly within and adjacent to the Pebble West zone to determine continuity of mineralization and to identify and extend higher grade zones. Most holes were drilled to the zero meter elevation above mean sea level and were 900 to 1,200 ft in length. Eight holes for a total of 5,804 ft were drilled outside the Pebble deposit to test for extensions and new mineralization at four other zones on the property, including the 38 Zone porphyry copper-gold-molybdenum deposit and the 37 Zone gold-copper skarn deposit.
- Drilling by Northern Dynasty in 2004 totalled 165,481 ft in 266 holes. Of this total, 131,211 ft were drilled in 147 exploration holes in the Pebble deposit; one exploration hole 879 ft in length was completed in the southern part of the property that discovered the 308 Zone porphyry copper-gold-molybdenum deposit. Additional drilling included 21,335 ft in 26 metallurgical holes in Pebble West zone, 9,127 ft in 54 geotechnical holes and 3,334 ft in 39 water monitoring holes, of which 33 holes for a total of 2,638 ft were percussion holes. During the 2004 drilling program, Northern Dynasty identified a significant new porphyry centre on the eastern side of the Pebble deposit (the Pebble East zone) beneath the cover sequence (as described in Section 7).
- In 2005, Northern Dynasty drilled 81,979 ft in 114 holes. Of these drill holes, 13 for a total of 12,198 ft were drilled mainly for engineering and metallurgical purposes in the Pebble West zone. Seventeen drill holes for a total of 60,696 ft were drilled in the Pebble East zone. The results confirmed the presence of the Pebble East zone and further demonstrated that it was of large size and contained higher grades of copper, gold and molybdenum than the Pebble West zone. The Pebble East zone remained completely open at the end of 2005. A further 13 holes for a total of 2,986 ft were cored for engineering purposes outside the Pebble deposit area. An additional 6,099 ft of drilling was completed in 71 non-core water monitoring wells.
- Drilling during 2006 focused on further expansion of the Pebble East zone. Drilling comprised 72,827 ft in 48 holes. Twenty of these holes were drilled in the Pebble East zone, including 17 exploration holes and three engineering holes for a total of 68,504 ft. The Pebble East zone again remained fully open at the conclusion of the 2006 drilling program. In addition, 2,710 ft were drilled

in 14 engineering core holes and 1,612 ft were drilled in 14 monitoring well percussion holes elsewhere on the property.

- Drilling in 2007 continued to focus on the Pebble East zone. A total of 151,306 ft of delineation drilling in 34 holes extended Pebble East to the northeast, northwest, south and southeast; the zone nonetheless remained open in these directions, as well as to the east in the East Graben. Additional drilling included 10,167 ft in nine metallurgical holes in Pebble West, along with 4,367 ft in 26 engineering holes and 1,824 ft in 23 percussion holes for monitoring wells across the property.
- In 2008, 234 holes were drilled totalling 179,275 ft, the most extensive drilling on the project in any year to date. A total of 136,266 ft of delineation and infill drilling, including six oriented holes, was completed in 31 holes in Pebble East. This drilling further expanded the Pebble East zone. Fifteen metallurgical holes for a total of 14,511 ft were drilled in the Pebble West zone. One 2,949 ft infill/geotechnical hole was drilled in the Pebble West zone. Geotechnical drilling elsewhere on the property included 105 core holes for a total of 18,806 ft. Hydrogeology and geotechnical drilling outside of the Pebble deposit accounted for 82 percussion holes for a total of 6,745 ft. In 2010, the Pebble Partnership acquired the data for seven holes totalling 5,450 ft drilled by FMMUSA in 2008. These drill holes are located near the Property on land that is now controlled by the Pebble Partnership and provided information on the regional geology.
- The Pebble Partnership drilled 34,948 ft in 33 core drill holes in 2009. Five delineation holes were completed for 6,076 ft around the margins of Pebble West and 21 exploration holes for a total of 22,018 ft were drilled elsewhere on the property. In addition, seven geotechnical core holes were drilled for a total of 6,854 ft.
- In 2010, the Pebble Partnership drilled 57,582 ft in 66 core holes. Forty-eight exploration holes totalling 54,208 ft were drilled over a broad area of the property outside the Pebble deposit. An additional 3,374 ft were drilled in 18 geotechnical holes within the deposit area and to the west.
- In 2011, the Pebble Partnership drilled 50,768 ft in 85 core holes. Eleven holes were drilled in the deposit area totalling 33,978 ft. Of these, two holes were drilled in Pebble East for metallurgical and hydrogeological purposes. The other nine holes in the deposit area were drilled for further delineation of Pebble West and the area immediately to the south. These results indicated the potential for resource expansion to depth in the Pebble West zone. Six holes totalling 8,780 ft were also drilled outside the Pebble deposit area to the west and south. In addition, 8,010.2 ft was drilled in 68 geotechnical holes within and to the north, west and south of the deposit.
- The Pebble Partnership drilled 35,760 ft in 81 core holes in 2012. Eleven holes totalling 13,754 ft were drilled in the southern and western parts of the Pebble West zone. The results show potential for lateral resource expansion in this area and further delineation drilling is warranted. Six holes totalling 6,585 ft. were drilled to test exploration targets to the south on the Kaskanak claim block, to the northwest and south of Pebble, and on the KAS claim block further south. An additional 64 geotechnical and hydrogeological holes were drilled totalling 15,422 ft. Of this drilling, 41 holes were within the deposit area and 15 geotechnical holes were drilled at sites near the deposit, and eight geotechnical holes were completed near Cook Inlet.

- The Pebble Partnership drilled 6,190 ft in 29 core holes for geotechnical purposes in 2013 at sites west, south and southwest of the deposit area.
- No holes were drilled in 2014.

A re-survey program of holes drilled at Pebble from 1988 to 2009 was conducted during the 2008 and 2009 field seasons. For consistency throughout the project, the resurvey program referenced the control network established by R&M Consultants in the U.S. State Plane Coordinate System Alaska Zone 5 NAVD88 Geoid99. The resurvey information was applied to the drill collar coordinates in the database in late 2009.

In 2009 and 2013, the survey locations, hole lengths, naming conventions and numbering designations of the Pebble drill holes were reviewed. This exercise confirmed that several shallow, non-cored, overburden drill holes described in some engineering and environmental reports were essentially the near-surface pre-collars of existing bedrock diamond drill holes. As these pre-collar and bedrock holes have redundant traces, the geologic information was combined into a single trace in the same manner as the wedged holes. In addition, a number of very shallow (less than 15 ft), small diameter, water-monitoring auger holes were removed from the exploration drill hole database, as they did not provide any geological or geochemical information.

10.3 BULK DENSITY RESULTS

Bulk density measurements were collected from drill core samples, as described in Section 11.4. A summary of all bulk density results is provided in

Figure 10.3.1.

Figure 10.3.2 shows a summary of bulk density drill holes used in the current mineral resource estimate.

Figure 10.3.1 Summary of All Bulk Density Results

Age	No. of Measurements	Density Mean	Density Median
Quaternary	34	2.60	2.61
Tertiary	2,703	2.57	2.57
Cretaceous	8,671	2.66	2.64
All	11,775	2.63	2.62

Figure 10.3.2 Summary of Bulk Density Results Used for Resource Estimation

Age	No. of Measurements	Density Mean	Density Median
Tertiary	3,026	2.56	2.57
Cretaceous	8,130	2.64	2.62
All	11,185	2.62	2.61

Exhibit B

Exhibit B

ID: 8416
Depth: 5007
Distance: 261

ID: 7361
Depth: 5288
Distance: 656

ID: 8402
Depth: 5111
Distance: 319

ID: 8406
Depth: 5148
Distance: 321

ID: 7358
Depth: 5998
Distance: 214

ID: 6354
Depth: 5150
Distance: 411

ID: 8405
Depth: 5091
Distance: 515

ID: 8421
Depth: 5078
Distance: 434

ID: 6344
Depth: 5700
Distance: 551

ID: 6343
Depth: 5002
Distance: 305

ID: 8423
Depth: 5636
Distance: 289

ID: 6339
Depth: 5085
Distance: 162

ID: 8420
Depth: 5030
Distance: 316

ID: 6347
Depth: 5395
Distance: 112

ID: 6348
Depth: 5663
Distance: 207

ID: 7386
Depth: 5901
Distance: 64

ID: 6356
Depth: 6425
Distance: 109

Lincoln Lakes

Upper Talarik Creek

Frying
Pan
Lake

Pebble Boreholes with Depth Greater than 5,000 Feet

Labeled with Distance to Nearest Stream or Lake
Superimposed with State Mining Claim Boundaries

All units in feet

0 0.5 1 mi

Exhibit C

Exhibit C

Analyte Concentrations of Water Quality Parameters Measured at Pebble Drill Rig #6, South Fork Koktuli River, Nushagak River Drainage, Bristol Bay Alaska on October 22 and 23, 2011

Table 2. Metal, DRO, and RRO concentrations at Pebble Drill Rig 6 sample sites (SUMP, POOL, SPRING) and Pebble Limited Partnership (PLP) sample site SK133A relative to Water Quality Criteria (WQC). All parameters in µg/L unless otherwise noted. Exceeded WQC are bold. Where replicates were collected (all data from 10/23), means of replicates are listed. Where an analyte was undetected, symbol < is noted with method detection limit. PLP water quality analyte medians for site SK133A included for comparison.²⁰ Data unavailable for diesel range organics and residual range organics for SK133A. Note: exploration activities are not required to meet WQC. Data for metals not listed here (nickel, mercury, antimony, molybdenum, selenium) are available in Appendix III.

Parameter	SUMP	POOL		SPRING		PLP SK133A	Water Quality Standard*
	10/23	10/22	10/23	10/22	10/23	2004-2008	
Aluminum (Total)	55,750	27,600	16,300	23	35	39	87
Aluminum (Dissolved)	911	59	946	14	20	13	87
Arsenic (Total)	14.7	8.29	4.47	<0.15	<0.15	0.155	10
Arsenic (Dissolved)	1.90	1.31	1.14	<0.15	<0.15	0.155	10
Barium (Total)	368	505	280	5.7	5.4	6.2	2,000
Barium (Dissolved)	11.5	27.6	38	5.0	4.2	6.0	2,000
Cadmium (Total)	0.164	0.177	0.146	<0.015	<0.015	0.0167	0.10
Cadmium (Dissolved)	0.0673	0.0528	0.0470	<0.015	<0.015	0.0125	0.09
Chromium (Total)	45.2	16.4	7.54	0.124	0.132	0.259	100
Chromium (Dissolved)	0.635	0.364	0.720	0.143	0.191	0.243	100
Copper (Total)	435	137	70.8	0.2	0.3	0.8	2.85
Copper (Dissolved)	2.7	3.95	5.8	0.8	0.7	0.7	2.74
Iron (Total)	60,950	20,600	12,700	99	87	223	1000
Iron (Dissolved)	595	594	945	26	36	107	1000
Lead (Total)	13.0	10.7	5.01	<0.03	<0.03	0.05	0.54
Lead (Dissolved)	0.17	0.478	0.483	0.04	0.04	0.05	0.54
Manganese (Total)	865	490	383	6.1	6.4	18	50
Manganese (Dissolved)	15.9	153	182	2	1.6	14	50
Silver (Total)	9.35	2.01	1.65	<0.006	0.007	0.003	0.37
Zinc (Total)	116	85.3	71.8	2.8	1.8	3.3	37.02
Zinc (Dissolved)	3.71	6.48	9.11	23.2	4.6	2.8	36.20
Diesel Range Organics (mg/L)	2.95	0.94	0.335	<0.18	<0.18	--	1.5
Residual Range Organics (mg/L)	2.68	1.32	0.515	0.421	0.201	--	1.1

* The most stringent standard for all uses is listed (ADEC 2008 <http://dec.alaska.gov/water/wqsar/wqs/index.htm>). For hardness-dependent metals, a hardness of 25 mg/L is used for calculations.

²⁰ Pebble Limited Partnership Environmental Baseline Document, Chapter 9, Water quality, Appendix 9.1B available at: <http://www.pebbleresearch.com/ebd/bristol-bay-phys-chem-env/chapter-9/>

Exhibit D

Obs. Date	Drill Hole Site No.	Type of Problem	Details
6/14/2006	DH 6339	Drill fluids overflow onto tundra	PLP encountered water at 1200' depth, discharged 2-30 gallons per minute of water over a rocky area on a hill. ¹ The "water" discharged onto the tundra at this drill rig – as well as with all others in this Exhibit – was a mixture of water, drilling muds (such as EZ-mud) and cuttings from bore holes.
6/14/2006	DH 6340	Drill fluids overflow onto tundra	PLP encountered water at 150' to 275' depth, produced 80-130 gallons per minute. ² Water flowed from the drill hole through a hose to a ditch flowing into a sump and the sump was overflowing onto the tundra and a large pump moved water from the sump to an upland pond. ³
5/9/2007	DDH 7366	Fuel spill; unknown if drill hole was cemented when abandoned.	PLP spilled 2-5 gallons of diesel fuel while slinging a fuel tank away from DDH 7366. The diesel spilled onto the tundra approximately 200 yards east-southeast of the hole. A light backhoe was used to scoop up the contaminated soil. Inspection of the site by DNR nearly 2 months later indicated a faint smell of diesel from the soil. ⁴ Also unknown if the drill hole was cemented when abandoned. ⁵
9/6/2007	DDH 7374	Drill fluids overflow onto tundra	Overflow water from the sump was discharged directly to tundra and DNR observed evidence that the settling sump pit had overflowed. ⁶
9/6/2007	DDH 7368	Drill fluids overflow onto tundra; footprint visible after reclamation	Sump pits were not used during drilling, drilling water was discharged directly onto the tundra, post-reclamation the site was not re-vegetated and bare soil was observed. ⁷
9/6/2007	DDH 6355	Drill fluids overflow onto tundra; footprint visible after reclamation	Sump pits were not used during drilling, drilling water was discharged directly onto the tundra, post-reclamation the site footprint was slightly visible. ⁸

¹ ADNR Pebble Project Inspection, pp. 2-3 (June 14, 2006), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble06142006.pdf>.

² ADNR Pebble Project Inspection pp. 3-4 (June 14, 2006), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble06142006.pdf>.

³ ADEC Pebble Project Inspection pp. 3-4 (June 14, 2006), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebbledec06142006.pdf>.

⁴ ADNR Pebble Field Inspection, Part III at p. 2 (July 26, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072607.pdf>.

⁵ ADNR Pebble Field Report, p. 4 (Sept. 13, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble091307.pdf>.

⁶ ADNR, Pebble Field Report, p. 3 (Sept. 6, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble090607.pdf>.

⁷ ADNR, Pebble Field Report, p. 5 (Sept. 6, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble090607.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
9/13/2007	Drill Site/Well No. 6347	Not plugged or reclaimed, potential groundwater contamination site	“One hole was located that was drilled in 2006 and not plugged or reclaimed (drill hole 6347).” ⁹ “Wells used as water sources need to be capped when not in use to prevent contamination of groundwater, e.g., Well No. 6347.” ¹⁰
10/4/2007	DDH 7385	Drill fluids overflow onto tundra	Sump pit and trench flooded, water and material discharged directly onto the tundra north of the rig, trench and sump pit system inadequate due to marshy conditions. ¹¹
10/4/2007	Drill Site No. 7369	Natural hallow used a sump	A large natural hallow is used as a secondary sump, DNR pictures show a large pond completely filled with drilling mud-laden water. ¹²
10/17/2007	DDH 7388	Drill fluids overflow onto tundra	Artesian flow of 4 gallons/minute, drill water discharge was flowing along a trench into a sump which was overflowing into a small depression nearby and spilling onto the surrounding tundra. ¹³
6/18/2008	DDH 7362	Not plugged; water discharging from hole	Abandoned drill site, not plugged, unknown if cemented, site not re-vegetated, reclamation on-going, water discharging from the hole. ¹⁴
6/18/2008	DDH 5331	Drill fluids overflow onto tundra; footprint visible after reclamation	Abandoned drill site, site plugged and reclamation on-going, footprint still visible with bare patches present ¹⁵
6/18/2008	DDH 7389	Not plugged, water discharging from hole	Abandoned drill site, not plugged, water discharging from the hole, hole not cemented, reclamation work had been done. ¹⁶
8/27/2008	Drill Hole/Site no. 8423	Drill fluids overflow onto tundra; smell of fuel	Drill water overflow discharged to upland tundra from sumps, slight fuel odor near the fuel tanks and staining on the ground near the odor. ¹⁷

⁸ ADNR, Pebble Field Report, p. 6 (Sept. 6, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble090607.pdf>.

⁹ ADNR Pebble Field Inspection Report, p. 1 (Sept. 13, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble091307.pdf>.

¹⁰ ADNR Pebble Field Inspection Report p. 1 (Oct. 4, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble100407.pdf>.

¹¹ ADNR Pebble Field Inspection Report p. 3 and 10 (Oct. 4, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble100407.pdf>.

¹² ADNR Pebble Field Inspection Report p. 8 (Oct. 4, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble100407.pdf>.

¹³ ADNR Pebble Field Inspection Report p. 3 (Oct. 17, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101707.pdf>.

¹⁴ ADNR Pebble Field Monitoring Report p. 8 (June 18, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061708.pdf>.

¹⁵ ADNR Pebble Field Monitoring Report p. 8 (June 18, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061708.pdf>.

¹⁶ ADNR Pebble Field Monitoring Report p. 9 (June 18, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061708.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
8/27/2008	Drill Hole/Site No. 8420	Drill fluids discharged onto tundra	Drill water overflow discharged to upland tundra from sumps. ¹⁸
8/27/2008	Drill Hole/Site No. 8418	Drill fluids discharged onto tundra	Drill water overflow discharged to upland tundra from sumps. ¹⁹
8/27/2008	DDH 8405	Footprint visible after reclamation, unable to tell if plugged	Abandoned well hole, unable to tell if drill hole had been plugged or not, no re-vegetation, footprint visible. ²⁰
8/27/2008	DDH 8415	Footprint visible after reclamation, unable to tell if plugged	Abandoned well hole, unable to tell if drill hole had been plugged or not, no re-vegetation, footprint visible. ²¹
10/28/2008	Drill Hole/Site No. 8440	Drill fluids discharged onto tundra	Mud was flowing out of the recirculation tank, onto the ground next to the drill, mud flowed downhill towards a kettle pond. ²²
10/28/2008	Drill Hole/Site No. 8441	Fuel spill	Approximately one gallon of hydraulic fluid was spilled; some got into the sump and surrounding area; discharge of drill water and mud into topographic depression. ²³ Observation of this site 2 years later showed reclamation issues with little soil or vegetation and tundra replacement that did not survive. ²⁴
10/28/2008	Drill Hole/Site No. 8420	Drill fluids discharged onto tundra	No water recirculation, drilling water and mud discharged onto snow/tundra. ²⁵
10/15/2009	Drill Hole/Site No. 9473	Drill water discharged onto tundra	Drill water and mud from sump pits discharged uphill onto tundra. ²⁶ Returning to this site one year later to observe reclamation, the drill hole was not plugged and reclamation was not finished. ²⁷

¹⁷ ADNR Pebble Field Monitoring Report, pp. 8-10 (Aug. 27, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082708.pdf>.

¹⁸ ADNR Pebble Field Monitoring Report, pp. 12-14 (Aug. 27, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082708.pdf>.

¹⁹ ADNR Pebble Field Monitoring Report, pp. 15-16 (Aug. 27, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082708.pdf>.

²⁰ ADNR Pebble Field Monitoring Report, pp. 1, 23-24 (Aug. 27, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082708.pdf>.

²¹ ADNR Pebble Field Monitoring Report, pp. 1, 25-26 (Aug. 27, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082708.pdf>.

²² ADNR Pebble Field Monitoring Report, p. 8 (Oct. 28, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102808.pdf>.

²³ ADNR Pebble Field Monitoring Report, p. 15 (Oct. 28, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102808.pdf>.

²⁴ ADNR Pebble Field Monitoring Report, p. 12 (Aug. 3, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080310.pdf>.

²⁵ ADNR Pebble Field Monitoring Report, p. 18 (Oct. 28, 2008), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102808.pdf>.

²⁶ ADNR Pebble Field Monitoring Report, p. 3 (October 15, 2009), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101509.pdf>.

²⁷ ADNR Pebble Field Monitoring Report, p. 15 (May 24, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble052411.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
10/15/2009	Drill Hole/Site No. 9471	Drill fluids discharged onto tundra	Drill water and mud from sump pits discharged uphill onto tundra ²⁸
10/15/2009	Drill Hole/Site No. 9462	Sump pit not reclaimed	Abandoned drill hole, plugged, but sump pit not reclaimed and water discharge trench only partially filled in.
6/8/2010	DDH 10488	Fuel spill	Spill of 15.0 gallons of hydraulic oil ²⁹
6/15/2010	Drill Hole/Site No. 8429	Footprint visible after reclamation	“Site was reclaimed but vegetation is not growing well”; dead vegetation at the site. ³⁰
6/15/2010	Drill Hole/Site No. 8432	Footprint visible after reclamation	“site reclaimed but vegetation growth is limited and bare soil present.” ³¹
6/15/2010	Drill Hole/Site No. 9466	Footprint visible after reclamation	“Vegetation growth appears slower here than other sites.” ³²
6/15/2010	Drill Hole/Site No. 9470 and 9471	Footprint visible after reclamation	“Site reclaimed, but areas of exposed soil were observed where vegetation did not take.” ³³
6/16/2010	Drill Hole/Site No. 8412	Incomplete or unsuccessful remediation	Unknown if drill hole was plugged or cemented, vegetation is not regrowing at the site, “Site was messy and in poor condition. What appeared to be bentonite was present in clumps on the ground. Standing water around drill hole.” ³⁴
6/16/2010	Drill Hole/Site No. 8440	Footprint visible after reclamation	“Most of the vegetation is dead and not growing back.” ³⁵
7/8/2010	DDH 10488	Fuel Spill	Spill of 15.0 gallons of hydraulic oil. ³⁶
8/3/2010	DDH 10498	Drill fluids discharged onto tundra	Drill water and mud from sump pits discharged uphill onto tundra ³⁷

²⁸ ADNR Pebble Field Monitoring Report, p. 7 (October 15, 2009), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101509.pdf>.

²⁹ ADEC Spill Report (June 8, 2010), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=35905>.

³⁰ ADNR Pebble Field Monitoring Report, p. 8 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³¹ ADNR Pebble Field Monitoring Report, p. 9 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³² ADNR Pebble Field Monitoring Report, p. 11 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³³ ADNR Pebble Field Monitoring Report, p. 12 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³⁴ ADNR Pebble Field Monitoring Report, p. 14 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³⁵ ADNR Pebble Field Monitoring Report, p. 16 (June 15-16, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061510.pdf>.

³⁶ ADEC Spill Report (July 8, 2010), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=35905>.

³⁷ ADNR Pebble Field Monitoring Report, p. 7 (Aug. 3, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080310.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
8/3/2010	DDH 9464	Footprint visible after reclamation	“much of the site has not revegetated.” ³⁸
8/3/2010	DDH 7378	Footprint visible after reclamation	“Tundra has been replaced, but growth of the vegetation is quite limited.” ³⁹
9/10/2010	DDH 10512	Fuel spill	Spill of 25.0 gallons of hydraulic oil ⁴⁰
10/13/2010	Drill Hole/Site No. 10523	Drill fluids discharged onto tundra	Drill water and mud from sump pits discharged downslope from pits onto tundra ⁴¹
5/24/2011	DDH 11528	Drill fluids discharged onto tundra	“DDH 11528 had areas on the tundra where drill water had overflowed trench.” ⁴²
6/22/2011	Drill Hole/ Site No. 10514	Staining and petroleum odor at reclamation site	Reclaimed in Fall 2010, “Slight petroleum odor on vegetation adjacent to drill hole. Approximately a 4-foot diameter area was stained at this site.” ⁴³ Spill remediated by next site visit but the vegetation around the drill site is sparse. ⁴⁴
6/26/2011	DDH 11529	Fuel spill	Spill of 3.0 gallons of hydraulic fluid ⁴⁵
6/26/2011	Drill Hole/Site No. 11533	Fuel Spill; Incomplete or unsuccessful remediation	Spill of 40.0 gallons of hydraulic fluid. Hydraulic fluid was injected down the drill hole, so the leak was not noticed until circulation brought it back to the surface. ⁴⁶ A year later, after abandoned, tundra is regenerating slowly and iron bacteria sheen noted on water surface at reclamation site. ⁴⁷
7/12/2011	DDH 10523	Filled sump collapsed	“A filled sump at DDH 10523 has collapsed, and needs more fill.” ⁴⁸

³⁸ ADNR Pebble Field Monitoring Report, p. 11 (Aug. 3, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080310.pdf>.

³⁹ ADNR Pebble Field Monitoring Report, p. 13 (Aug. 3, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080310.pdf>.

⁴⁰ ADEC Spill Report (Sept. 10, 2010), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=36292>.

⁴¹ ADNR Pebble Field Monitoring Report, p. 2 (Oct. 13, 2010), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101310.pdf>.

⁴² ADNR Pebble Field Monitoring Report, p. 1 (May 24, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble052411.pdf>.

⁴³ ADNR Pebble Field Monitoring Report, p. 14 (June 22, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble062211.pdf>.

⁴⁴ ADNR Pebble Field Monitoring Report, p. 1 (July 12, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble071211.pdf>.

⁴⁵ ADEC Spill Report (June 26, 2011), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=38026>.

⁴⁶ ADNR Pebble Field Monitoring Report, p. 3 (July 12, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble071211.pdf>.

⁴⁷ ADNR Pebble Field Monitoring Report, p. 11 (June 19, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061912.pdf>.

⁴⁸ ADNR Pebble Field Monitoring Report, p. 1 (July 12, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble071211.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
8/25/2011	Drill Hole/Site No. 11531	Impacts to vegetation	“Evidence of significant impacts to riparian vegetation or stream banks.” ⁴⁹
8/25/2011	Drill Hole/Site No. 11-533	Impacts to vegetation	“Site 11-522 will require extra attention during reclamation as the site was occupied for a considerable period of time and some vegetation was trampled.” ⁵⁰
10/7/2011	GH11292S	Fuel spill	Spill of 13.0 gallons of diesel ⁵¹
10/20/2011	Drill Hole/Site No. 09462	Artesian flow impacting remediation efforts	Abandoned well, plugging in progress, “lots of water issued from the hole;” water upflowing through subsurface materials and discharging to the ground. “Overland flow as created discolored, possibly iron stained zones on the surface 10-15 feet wide.” ⁵² Eight months later, grouting stopped the artesian flow, but the drill hole was not yet reclaimed and iron staining and remnants of materials discharged from previous artesian upwelling were observed. ⁵³ And in summer 2013 there was still some iron staining on the tundra adjacent to the revegetated sump pits and most of the vegetation was not doing well. ⁵⁴
6/8/2012	DDH 11540	Fuel spill	Spill of 10.0 gallons of hydraulic fluid ⁵⁵
6/19/2012	DDH 11534	Incomplete or unsuccessful remediation	Abandoned drill hole site from previous year, replaced tundra not doing very well. ⁵⁶
8/7/2012	DDH 1549	Fuel spill	Spill of 13.0 gallons of hydraulic fluid ⁵⁷
8/21/2012	GH 12-333	Drill fluids discharged onto tundra	“Water from sump pit pumped up slope and away from any surface water and discharged on tundra.” ⁵⁸

⁴⁹ ADNR Pebble Field Monitoring Report, p. 2 (Aug. 25, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082511.pdf>.

⁵⁰ ADNR Pebble Field Monitoring Report, p. 1 (Aug. 25, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082511.pdf>.

⁵¹ ADEC Spill Report (Oct. 7, 2011), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=38469>.

⁵² ADNR Pebble Field Monitoring Report, p. 10 (Oct. 20, 2011), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble102011.pdf>.

⁵³ ADNR Pebble Field Monitoring Report, p. 1, 6 (June 19, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061912.pdf>.

⁵⁴ ADNR Pebble Field Monitoring Report, p. 1, 16 (July 23, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072313.pdf>.

⁵⁵ ADEC Spill Report (June 8, 2012), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=39865>.

⁵⁶ ADNR Pebble Field Monitoring Report, p. 9 (June 19, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble061912.pdf>.

⁵⁷ ADEC Spill Report (Aug. 7, 2012), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=40301>.

⁵⁸ ADNR Pebble Field Monitoring Report, p. 2 (Aug. 21, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble082112.pdf>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
10/17/2012	DDH 12561	Drill fluids discharged onto tundra	Water from sump pit discharged on tundra approximately 200ft south of the rig. ⁵⁹
10/17/2012	DDH 12560	Drill fluids discharged onto tundra	Water from sump pit discharged on tundra approximately 200ft south of the rig. ⁶⁰
6/28/2013	DDH 12562	Fuel spill	Spill of 2.0 gallons of hydraulic fluid ⁶¹
7/23/2013	GH 13-371	Drill fluids discharged onto tundra	Water from sump pit discharged on tundra about 200ft northwest of the rig, some murky water pooled at discharge site. ⁶²
7/23/2013	GH 12-322S	Footprint visible after reclamation, drill hole not plugged	Drill hole not plugged and the trench and sump pit locations were visible due to brown color of tundra. ⁶³
8/6/2013	DDH12555	Footprint visible after reclamation	Abandoned drill site, vegetation sparse. ⁶⁴
9/9/2013	GH 13-383	Drill fluids discharged onto tundra	Water from sump pit discharged on tundra about 200ft northeast of the rig. ⁶⁵
7/22/2015	DH 4223	Water upwhelling near abandoned drill hole	"The area around the drill hole location is extremely wet and spongy. Lab tests conducted by PLP indicate that the chemical composition is similar to other nearby seeps in the surrounding area." ⁶⁶
7/22/2015	DDH 40	Water from well created surface staining	"Water from DDH 40 created the surface staining with iron algae in a channel approximately 120 feet long." ⁶⁷
7/22/2015	DH 9	Surface staining; impacts to vegetation	Abandoned well hole from 1988, "Surface staining and impact on vegetation are evident from aerial view." ⁶⁸

⁵⁹ ADNR Pebble Field Monitoring Report, p. 8 (Oct. 17, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101712.pdf>.

⁶⁰ ADNR Pebble Field Monitoring Report, p. 14 (Oct. 17, 2012), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble101712.pdf>.

⁶¹ ADEC Spill Report (June 28, 2013), <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=42036>.

⁶² ADNR Pebble Field Monitoring Report, p. 2 (July 23, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072313.pdf>.

⁶³ ADNR Pebble Field Monitoring Report, p. 13 (July 23, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072313.pdf>.

⁶⁴ ADNR Pebble Field Monitoring Report, pp. 5-6 (Aug. 6, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble080613.pdf>.

⁶⁵ ADNR Pebble Field Monitoring Report, pp. 2-4 (Sept. 9, 2013), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble090913.pdf>.

⁶⁶ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 7 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁶⁷ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 9 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

Obs. Date	Drill Hole Site No.	Type of Problem	Details
7/22/2015	DH 1240	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁶⁹
7/22/2015	DH 4224	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷⁰
7/22/2015	DH 5330	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷¹
7/22/2015	DH 7382	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷²
7/22/2015	DH 8413	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷³
7/22/2015	DH 8423	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷⁴
7/22/2015	DH 9475	Field maintenance needed	“Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps, or plugs.” ⁷⁵

⁶⁸ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 9 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁶⁹ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷⁰ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷¹ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷² ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷³ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷⁴ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁷⁵ ADNR, Pebble Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, p. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

Exhibit E

Date	Spill Number	Spill Name	Gallons Spilled	Material Spilled	Responsible Party
3/12/2006	06269907101 ¹	Northern Dynasty Mine/ Pollux Aviatin	35.0	Aviation Fuel	Northern Dynasty Mine
5/28/2006	06269914801 ²	Northern Dynasty Mines, Iliamna Runway Spill	90.0	Diesel	-----
6/23/2006	06269917402 ³	Northern Dynasty Mine Connector	20.0	Diesel	Northern Dynasty Mine
5/9/2007	07269912901 ⁴	Northern Dynast Mine AK Plane zone 5	80.0	Diesel	Northern Dynasty Mine
9/12/2007	07269925501 ⁵	Northern Dynasty Mines Diesel	12.0	Diesel	Northern Dynasty Mine
2/15/2008	08269904601 ⁶	Pebble Mine Hydraulic Oil 2/15/08	30.0	Hydraulic Oil	Northern Dynasty Mine
5/16/2008	08269913701 ⁷	-----	5.0	Hydraulic Oil	Pebble Mine
5/17/2008	08269913801 ⁸	-----	3.0	Engine Lube Oil	Pebble Mine
5/22/2008	08269914301 ⁹	-----	4.0	Hydraulic Oil	Pebble Mine
6/13/2008	08269916501 ¹⁰	-----	8.0	Hydraulic Oil	Pebble Mine
7/15/2008	08269919701 ¹¹	-----	18.0	Aviation Fuel	Pebble Mine
7/28/2008	08269921001 ¹²	-----	2.0	Ethylene Glycol	Pebble Mine
9/2/2008	08269924601 ¹³	Pebble 5 gal hydraulic spill	5.0	Hydraulic Oil	Pebble Limited Partnership
9/2/2008	08269924602 ¹⁴	Pebble Project 5 gal Hydraulic Spill	5.0	Hydraulic Oil	Pebble Limited Partnership
9/25/2008	08269926901 ¹⁵	Pebble Exploration AvGas Spill 40 Gallons	40.0	Aviation Fuel	Pebble Exploration
11/17/2008	08269932201 ¹⁶	-----	9.0	Hydraulic Oil	Pebble Mine

¹ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=26070>

² <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=26636>

³ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=26839>

⁴ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=28682>

⁵ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=29926>

⁶ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=30799>

⁷ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31549>

⁸ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31551>

⁹ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31552>

¹⁰ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31702>

¹¹ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31800>

¹² <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=31889>

¹³ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=36122>

¹⁴ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=36124>

¹⁵ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=32204>

Date	Spill Number	Spill Name	Gallons Spilled	Material Spilled	Responsible Party
8/3/2009	09269921501 ¹⁷	South Hanger, Iliamna Airport	10.0	Diesel	Pebble Exploration
8/15/2009	09269922701 ¹⁸	Hydraulic line ruptured	1.5	Hydraulic Oil	Pebble Exploration
10/15/2009	09269928801 ¹⁹	Pebble Exploration 7 Gal Hydraulic Spill	7.0	Hydraulic Oil	Pebble Project
6/1/2010	10269915201 ²⁰	Pebble Project Diesel	1.5	Hydraulic Oil	Pebble Limited Partnership
7/8/2010	10269918901 ²¹	Pebble Project Bore Hole DDH 10488	15.0	Hydraulic Oil	Pebble Limited Partnership
9/10/2010	10269925301 ²²	Pebble Bore Hole DDH 10512	25.0	Hydraulic Oil	Pebble Limited Partnership
6/26/2011	11269917702 ²³	Pebble Exploration Boring DDH 11529	3.0	Hydraulic Oil	Pebble Limited Partnership
10/7/2011	11269928001 ²⁴	Pebble Project Drill Site GH11292S	13.0	Diesel	Pebble Limited Partnership
6/8/2012	12269916001 ²⁵	Pebble Limited Partnership, DDH 11540, 10 Gal Hydr	10.0	Hydraulic Oil	Pebble Limited Partnership
8/7/2012	12269922001 ²⁶	Pebble DDH1549 Hydraulic	13.0	Hydraulic Oil	Pebble Limited Partnership
6/28/2013	13269917901 ²⁷	Pebble BH DDH 12562 Hydraulic	2.0	Hydraulic Oil	Pebble Limited Partnership
Total Spills = 27			Total Gallons Reported Spilled = 467		

¹⁶ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=32592>

¹⁷ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=34277>

¹⁸ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=34507>

¹⁹ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=34651>

²⁰ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=35949>

²¹ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=35905>

²² <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=36292>

²³ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=38026>

²⁴ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=38469>

²⁵ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=39865>

²⁶ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=40301>

²⁷ <http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillDetails?SpillID=42036>

Exhibit F

Facility or Equipment	Location	Description
2004 Camp Site with 8-10 buildings	SE1/4 SE1/4 Sec 21 T3S R35W	“Northern Dynasty built a camp with 8-10 small buildings for use in 2004. The facility is no longer used as a camp, but Northern Dynasty has left the structures in place for storage and a possible shelter in bad weather.” ¹ As of 2013, it is “used for storage of drill parts, water line, reclamation supplies, etc. in temporary structures. When not in use at the drill rigs, all other temporary structures used as emergency shelters, water heater housing, empty garbage totes, outhouses, etc., are also stored at the Supply Depot. One 10ft x 20ft wooden structure is used to store drill supplies that require protection from the elements. A WeatherPort type tent (approximately 24ft x 60ft) is used to temporarily store mechanical equipment. Both temporary structures are heated.” ²
Discovery Outcrop Old Exploration Camp	West Orebody, discovery outcrop	The old exploration camp is located about 200 yards south of discovery outcrop and was being used for storage during many years of PLP’s exploration efforts. According to DNR in 2007, PLP “has a lot of materials stored in the old camp, particularly drill steel.” ³
Main Supply Depot	Near drill hole GH12-320S	As of July 2015, the following items remained at the depot: (1) at least 19 boxes for line heaters; (2) spill response kits; (3) at least 3 wooden fly boxes; (4) at least 10 piles of tundra pads stacked 10 high; (5) multiple drill platforms not being used; (6) numerous drill rods and casing; (7) dunnage material for cribbing; (8) multiple aluminum water boxes and fly boxes stored for future use; (9) two med ports; (10) numerous empty fuel tanks; (11) sheds; (12) supply storage tents; and (13) the main supply storage building. ⁴
Watershed Supply Area	Near DH 5326	As of July 2015, this closed site contained a few buildings, a Quonset hut, support structures out in the field, and many scattered barrels. ⁵ Contains two temporary structures erected to protect water hose and keep it from freezing. One is metal clad (approximately 10ft x 20ft) and the other is a wooden structure (approximately 20ft x 40ft). ⁶

¹ ADNR Pebble Project Inspection (June 14, 2006), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble06142006.pdf>.

² PLP, 2013 Annual Reclamation Report, The Pebble Project, p 3 (April 4, 2014), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2013.pdf>.

³ ADNR Pebble Field Inspection, Part III at 6 and 9 (July 26, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble072607.pdf>.

⁴ ADNR, Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, pp. 2-5 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁵ ADNR, Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, pp. 11-12 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

⁶ PLP, 2013 Annual Reclamation Report, The Pebble Project, p 3 (April 4, 2014), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2013.pdf>.

Facility or Equipment	Location	Description
Weather Monitoring Facilities	Various	Pebble 1, aka North Weather Station, is situated at 59d 54.183 N, 155d 19.800 W. Pebble 8, aka Northwest Weather Station, is situated at 59d 54.536 N, 155d 18.742 W. “During 2013, two 60 meter towers were installed at two distinct locations. The purpose of these stations is to collect wind data for 18 to 24 months, after which the towers and stations will be removed and site reclaimed. Meteorological Tower 1 is located on State of Alaska land, PLP mining claim, on Kaskanak Mountain approximately 18 miles from the Iliamna Airport at 59d 49 40.08 N, 155d 28 33.67 W. Meteorological Tower 2 is located on State of Alaska land, PLP mining claim, on Sharp Mountain approximately 17 miles from the Iliamna Airport at 59d 46 55.70 N, 155d 26 01.72 W.” ⁷
West Bay (3)	Western extent of PLP operations, former drill sites DDH-6349, GH10-220, and DDH 11531 ⁸	Three small facilities for storage and to provide shelter for crews during data collection. ⁹
Wiggly Lake Airport and fuel storage	Wiggly Lake	In 2007, the site was used for on-site fuel storage – one depot held 3,000 gallons and was 200 feet from the lake, the other depot held 2,000 gallons and was 100 feet from the lake and fuel was parsed out to the various drill sites as needed. ¹⁰ However, as of summer 2015, the structures and infrastructure for the heliport site and fuel supply depot at Wiggle Lake had been removed. ¹¹

⁷ PLP, 2013 Annual Reclamation Report, The Pebble Project, p 3 (April 4, 2014), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2013.pdf>.

⁸ PLP, 2013 Annual Reclamation Report, The Pebble Project, p 3 (April 4, 2014), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2013.pdf>.

⁹ ADNR, Field Monitoring Report, APMA A20146118 Pebble Limited Partnership, pp. 15 (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.

¹⁰ ADNR, Field Report Pebble Copper/Gold Project (April 5, 2007), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble040507.pdf>.

¹¹ ADNR, Pebble Project Field Monitoring Report (July 22, 2015), <http://dnr.alaska.gov/mlw/mining/largemine/pebble/field-reports/pebble10122015.pdf?pdf=pebble-july22>.