# The Pebble Final EIS understates impacts and risks to salmon and the people of Bristol Bay and is not adequate to support issuance of a Clean Water Act permit

A preliminary review of the Pebble Final EIS reveals that the document does not and cannot support the conclusion that the proposed Pebble mine and Bristol Bay salmon can co-exist. This conclusion is supported by both direct contradictions in the Final EIS and larger record, as well as through the Corps' deferral of critical and major details and analyses to later permitting processes. Examples of these problems are detailed below, with references to the Final EIS and other documents that are in the public record of the Pebble EIS process.[1]

## I. The Corps admits that Pebble's concept-only approach to managing tailings has "implications for [dam] stability."

Tailings are the waste rock left over after commercially-valuable minerals are removed from the mined ore. Tailings can include heavy metals and must be managed to prevent contamination of the surrounding environment. Pebble plans to store 1.140 billion tons of bulk tailings in a Bulk Tailings Storage Facility (TSF) and 155 million tons of pyritic tailings in a Pyritic TSF. Final EIS Chapter 2, at page 2-15.

In 2015, a tailings dam failed at the Mt. Polley mine in British Columbia, polluting downstream waters and killing fish in the Fraser River drainage.

According to Pebble Limited Partnership's (PLP) EIS contractor AECOM, PLP's concept for its bulk tailings dam is "very similar" to that used at Mt. Polley, relying on tailings management and flow-through dam design to drain water away from the face of the dam. AECOM memo (Dec. 13, 2019), at page 7. This concept for Pebble was prepared by some of the same engineers – BGC Engineering and Knight Piesold – that worked on the Mt. Polley dam. In an apparent effort to quell concerns about how it would handle Pebble tailings, PLP stated the following shortly after the Mt. Polley disaster:

> To ensure that Pebble meets the standards and expectations of Alaskans, PLP CEO Tom Collier has committed to submit the engineering design for the project's tailings storage facility to an independent review prior to initiating permitting.

PLP has not followed through on this commitment.

In their review of the Draft EIS, agency experts critiqued PLP's conceptual approach to managing tailings, emphasizing that it is not clear whether the tailings would allow water to drain from behind the dam, which is critical to ensuring the stability of the dam. Thereafter, PLP's own contractor, AECOM characterized PLP's description of how tailings will segregate to allow safe operations as "incomplete and misleading." AECOM memo, (Dec. 13, 2019).

The Final EIS acknowledges this huge uncertainty:

> There remains some uncertainty regarding the ability of bulk tailings to drain sufficiently at the current conceptual level of design. It is uncertain whether the thickened tailings at 55 percent solids would segregate enough, with coarse tailings forming the tailings beach near the spigots and finer tailings in the middle of the TSF, to promote reduction of the phreatic surface near the bulk TSF main embankment (AECOM 2019n). **Although**

[1] Other issues which should preclude issuance of a permit for the proposed Pebble mine, such as landowner objections to the use of their property for Pebble-related infrastructure, are not addressed in this document.

> **the design is intended to promote unsaturated conditions, the majority of tailings may remain saturated throughout operations, and potentially into post-closure**.

Final EIS at page 4.27-92 (emphasis added).

This is no small matter because, if the design does not work, the Final EIS acknowledges that the dam could be unstable:

> [i]t is uncertain whether the thickened tailings at 55 percent solids would segregate enough, with coarse tailings forming the tailings beach near the spigots and finer tailings in the middle of the impoundment, to promote reduction of the phreatic surface near the bulk TSF main embankment, which has **implications for embankment stability**.

Final EIS, Appendix K (emphasis added).

To make matters worse, the Corps "deemed inappropriate" the modeling of a full tailings dam failure "based on [PLP's] permeable, flow-through design" for the tailings dam. Final EIS Executive Summary, at page 2. As the Final EIS acknowledges, even a minor failure at the bulk TSF or pyritic TSF would result in heavy metal pollution reaching hundreds of miles to Bristol Bay's marine waters:

> Small amounts of tailings that may remain on land or in waterways [and] would likely be naturally flushed downstream by precipitation, overland flow, and stream water over months to years. […] Small amounts of tailings that are not recovered could leach metals or generate acid very slowly over years to decades […] Most of the fine tailings particles would be transported downstream, causing elevated TSS [total suspended solids] in exceedance of WQC [water quality criteria] for approximately 230 miles downstream as far as the Nushagak River Estuary, where the river feeds into Nushagak Bay, part of greater Bristol Bay. […] Tailings fluids from both [bulk and pyritic TSF] releases would have elevated concentrations of the following metals relative to the applicable WQCs: antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, selenium, silver, and zinc, with the addition of cobalt for the pyritic tailings release.

Final EIS, Executive Summary, at page 104.

The Corps' refusal to model a full tailings dam failure therefore enabled it to avoid characterizing the full consequences of a tailings dam failure that the Final EIS itself recognizes may happen, which presumably would also reach hundreds of miles to marine waters.

The uncertainties related to how the tailings approach actually would work, and the consequences of dam failure, severely undercut the statement in the Final EIS that "[u]nder normal operations" Pebble would not impact Bristol Bay salmon. Final EIS Executive Summary, at page 87.

## II. Pebble requires unprecedented water management and treatment, and yet it has no real plan

Bristol Bay is an extremely wet environment. The Pebble ore deposit exists in a "transitional climatic zone with a strong maritime influence," Final EIS, Chapter 3.20 at page 9, and receives an average of 40-50 inches of precipitation annually. Final EIS, Chapter 3.20 at page 10.

A compounding problem arises from the nature of open-pit mining itself, "the nature of open-pit mining would lead to a complex interaction between groundwater, surface water, and a number of water-related resources." Final EIS, Executive Summary at page 56. This means that PLP must have a plan to treat vastly more water than other hard rock mines. Under PLP's 20-year mine plan, which targets less than 13% of the Pebble ore deposit, the Final EIS states that PLP must treat nearly 39 million gallons of water per day for the 78 year plan, which targets 55% of the ore deposit, this number jumps to nearly 54 million gallons per day. Because of the composition of the tainted water at Pebble, this water treatment involves multiple complex processes and equipment, including chemical precipitation, filtration, high-pressure membrane filtration, and reverse osmosis. These facts are documented in the chart below.

By way of a size comparison, Anchorage's wastewater treatment plant handles 58 million gallons per day while serving a city of nearly 300,000 people. In contrast to the complex treatment required for Pebble, Anchorage's treatment plant provides only primary treatment of its water.

As shown in the following chart, other hard rock mines in Alaska do not come near the same level of necessary water treatment as Pebble. Further, these hardrock mines do not require the complex treatment processes or equipment that Pebble would require.

**Water Treatment Capacities at Alaska Hardrock Mines**

| Mine | Gallons per Day | Process/Equipment | Pebble vs others |
|---|---|---|---|
| Pebble Mine Water Treatment Plants (WTPs) (proposed), 20 year mine | 38,779,012 (combined based on two proposed WTPs)[1] | chemical precipitation, filtration, high-pressure membranes filtration, and reverse osmosis | -- |
| Pebble Mine WTPs (proposed), 78 year mine | 53,902,829 (approximate)[2] | unknown | -- |
| Kensington Mine WTP | 2,160,000[3] | Co-precipitation | Pebble 20 year mine requires water treatment **18 times** that of Kensington; 78 year plan is **25 times** |
| Greens Creek Mine WTP | 3,600,000[4] | Co-precipitation | Pebble 20 year mine requires water treatment **10.8 times** that of Greens Creek; 78 year plan is **15 times** |
| Red Dog Mine WTP | 6,624,000[5] | Chemical precipitation | Pebble 20 year mine requires water treatment **5.9 times** that of Red Dog; 78 year plan is **over 8 times** |
| Donlin WTP (proposed) | 6,840,000 (max. capacity)[6] | Oxidation, clarification, and filtration | Pebble 20 year mine requires water treatment **5.7 times** that proposed for Donlin; 78 year plan is **nearly 8 times** |

Should PLP's water treatment approach fail, the resulting pollution would flow directly into Bristol Bay's salmon-rich waters. Pebble's uniquely sensitive location requires the highest level of precaution in mine design, especially including water treatment of these magnitudes.

Yet, in a continuing theme, PLP only presented the Corps with concept-level technology to treat massive amounts of water. As stated in the Final EIS:

- "The water treatment process design will continue as the project advances, and would be required to comply with applicable regulatory requirements of the State of Alaska." Final EIS, Appendix D, page D-273.
- "Additional detail would be developed and included in updates to these plans as the project proceeds through the state permitting process." Final EIS at page 2-33.
- "Specific details on [closure water treatment] compliance monitoring and a detailed monitoring plan would be developed during the state permitting process." Final EIS at page 2-38.

In short, the Corps' refusal to require actual details on PLP's water management and treatment plans further undercut its statement that Pebble would not impact Bristol Bay or its salmon resources.

## III. Multiple elements of the permit process are inadequate or incomplete and undercut both the integrity of the permitting process

PLP has submitted major project changes since July 2019, when the comment periods closed on the Draft EIS and PLP's Clean Water Act permit application. Among other examples, PLP's concept for water treatment changed considerably, resulting in a 40% increase in the estimate of water it must manage and treat. Other PLP project changes resulted in a 30% increase in stream miles destroyed since the last opportunity for public input.

| Chronology of Pebble Project Changes | |
|---|---|
| December 2017 | PLP submits its first Project Description and first 404 Permit Application |
| **April 1, 2018** | **NEPA scoping begins** |
| May 2018 | Mid-scoping, PLP amends its project plans with 5 significant changes, **increasing the amount of ore it plans to mine by 25%** and significantly changing its tailings facility design |
| June 29, 2018 | NEPA scoping ends |
| October 2018 | PLP submits its second Project Description to the Army Corps |
| December 2018 | PLP submits its third Project Description to the Army Corps |
| January 2019 | PLP submits its first revised 404 permit application to the Army Corps |
| **February 20, 2019** | **Draft EIS is released** |
| July 1, 2019 | Comment period on Draft EIS closes |
| August 2019 | Post-Draft EIS, PLP amends its project plans with 13 significant changes, including changes to the marine pipeline, port site, and mine site facility locations. |
| July 2019-Jan. 2020 | PLP supplements its proposal with new data, analysis, and plans in more than 100 new Requests for Information |
| October 2019 | PLP submits its permit application to BSEE for its 104-mile subsea pipeline |
| December 2019 | PLP submits its fourth Project Description to the Army Corps, including significantly changing its water treatment plans and **increasing the quantity of water to be treated and managed by 40%** |
| December 2019 | PLP submits its second revised 404 Permit Application to the Army Corps, significantly altering its projected wetlands impacts and **increasing its projected stream miles destroyed by 30%** |
| December 2019 | PLP submits its bridge permit applications to the US Coast Guard |
| February 2020 | The Corps releases the **Preliminary Final EIS** to cooperating agencies for comment |
| March 30, 2020 | Cooperating agencies submit comments on the Preliminary Final EIS |
| April 14, 2020 | PLP submits its fifth Project Description to the Army Corps, redefining the proposed project transportation corridor to use the northern route and port at Diamond Point. |
| May 8, 2020 | PLP submits its sixth Project Description to the Army Corps, changing the Diamond Point port location and configuration |
| June 8, 2020 | PLP submit its third revised 404 Permit Application to the Army Corps, amending its proposed project to the northern transportation corridor. |
| **July 24, 2020** | **Final EIS is released** |
| August 5, 2020 | Comment period ends on Coast Guard bridge permit applications |
| August 24, 2020 | Comment period ends on Clean Water Act 401 Certification and National Historic Preservation Act Programmatic Agreement |
| **Fall 2020** | The Corps estimates Fall 2020 for its **Record of Decision.** |

PLP's transportation and utility corridor includes, among other changes, a complete relocation and redesign of the port, which also has not been subject to public review or opportunity for input.

Public review and input of the Pebble mine proposal and its potential impacts are key aims of both the National Environmental Policy Act (NEPA) and the Clean Water Act. The Corps cannot claim that the Final EIS is robust treatment of Pebble and its potential impacts without complying with the public review and input requirements of these laws.

Furthermore, the following elements of the permitting process were incomplete as of the publication of the Final EIS, further undercutting any claim that the Final EIS is a comprehensive treatment of Pebble and its potential impacts:

> **Incomplete National Historic Preservation Act Consultation Process**: "Section 106 of the National Historic Preservation Act (NHPA) is relevant to identifying cultural resources and evaluating project impacts on cultural resources that are eligible for or listed in the National Register. [... ]The USACE is using a phased identification and evaluation of historic properties [...] through the execution of a Programmatic Agreement (PA). [...] The USACE intends to complete the PA prior to the Record of Decision for review of the permit application. Final EIS, Chapter 3.7 at pages 5-6, 11-12.
>
> **Incomplete Clean Water Act Compliance Requirements – Compensatory Mitigation Plan**: "As part of the permit decision, USACE will decide if mitigation for aquatic resource losses, would be required, and, if required, whether the applicant's proposed compensatory mitigation plan would appropriately offset losses to aquatic resources. … The need for compensatory mitigation and the determination if the applicant's proposal adequately offsets aquatic resource losses would be determined as part of the Joint Record of Decision." Final EIS, Chapter 4.22 at page 8.
>
> **Incomplete Endangered Species Act Formal Consultation Process**: "USACE has determined that the project may have potential to impact threatened or endangered species protected under the ESA; therefore, USACE has engaged the Services in dialogue prior to initiating formal consultation, which will occur at a later date." Final EIS, Chapter 6 at page 1.
>
> **Incomplete Essential Fish Habitat (EFH) Consultation Process**: "The Pebble Project has potential to affect EFH for five species of Pacific salmon's habitat that could occur in the project area, including: Chinook, sockeye, coho, chum, and pink salmon. [...] Federal agencies must consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH." Final EIS, Chapter 6 at pages 1-2.
>
> **Incomplete Coast Guard Bridge Permitting Process**: According to the Final EIS, Coast Guard "authorization is required for proposed bridges over the Newhalen River and the Iliamna River." Final EIS, Chapter 1 at page 2. Currently, Coast Guard is holding a public comment period on the Newhalen River bridge permit application, with comments due August 5, 2020. The Coast Guard has not issued a public notice for comments on a proposed Iliamna River bridge and has verbally informed interested parties that the agency was not expecting that PLP needed an Iliamna River bridge permit.
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> **Incomplete Clean Water Act Compliance Requirements – Public Interest Review and 404(b)(1) Evaluation**: "USACE's 404(b)(1) evaluation and Public Interest Review will be completed after the FEIS." Final EIS, Chapter 2 at page 11.

## IV. Pebble's impacts to salmon habitat are huge, and unprecedented in the U.S., including Alaska

As detailed in this chart, Pebble's impact on Bristol Bay wetlands and waters is huge under any scenario reviewed in the Final EIS:

| Pebble Mine Final EIS – Quantified Impacts to Waters and Fish Habitat | | |
|---|---|---|
| **Impact** | **20-year mine (Alt. #3; 12.7% of deposit)** | **78-year mine (~55% of deposit[2])** |
| **Wetlands and Other Waters** | | |
| **Direct & permanent impacts – loss of wetlands** | 2,232 acres of wetlands and other waters | 10,987 acres of wetlands and other waters |
| **Direct & permanent impacts – loss of streams** | 105.4 miles of streams | 435.9 miles of streams |
| **Direct & temporary impacts (construction access) – wetlands and other waters** | 773 acres of wetlands and other waters | 773 acres of wetlands and other waters |
| **Direct & temporary impacts (construction access) – streams** | 6.2 miles of streams | 6.2 miles of streams |
| **Indirect impacts – fugitive dust, dewatering, and fragmentation** | 1,609 acres of wetlands and other waters<br><br>79.5 miles of streams | 3,438 acres of wetlands and other waters<br><br>96.5 miles of streams |
| **Total Impacts** | **4,614 acres of wetlands impacted**<br><br>**191.1 miles of streams impacted** | **15,198 acres of wetlands impacted**<br><br>**538.6 miles of streams impacted** |
| **Fish Habitat** | | |
| **Direct & permanent impacts – mine site – fish habitat loss** | 8.5 miles of anadromous fish habitat permanently lost<br><br>12.7 additional miles of resident fish stream habitat permanently lost<br><br>Total 21.2 miles of fish-bearing streams permanently lost (blocked or filled by mine components) | 43.5 miles of anadromous fish habitat permanently lost (blocked or filled by mine components) |
| **Direct & permanent impacts – transportation corridor – total stream crossings** | 205 stream crossings, including 17 bridges | 205 stream crossings, including 17 bridges |
| **Direct & permanent impacts – transportation corridor – fish passage stream crossings** | 54 fish stream crossings | 54 fish stream crossings |

[2] See, Final EIS Chapter 4, Table 4.1-1 ("Pebble Project expansion—develop 55% of delineated resources").

Furthermore, as shown in this chart, no mine or development project in Alaska comes close to directly destroying the amount of wetlands, waters and salmon streams as PLP proposes to do here:

| **Section 404 Permit Alaska Project Comparison Chart** | | | |
|---|---|---|---|
| | Salmon & Fish Streams | All Streams | Wetlands, Lakes, Ponds, & Marine Waters |
| **Pebble Mine** (**Alt #3**) 20-Year Proposal **(**targeting 12.7% of resource) | – More than 8 miles anadromous-cataloged streams destroyed[7]<br>– More than 20 miles of fish-bearing streams destroyed.[8] | – At least 105.4 miles destroyed.[9]<br>– Water flow and water quality impacts could affect 79.5 more miles.[10] | – At least 2,232 acres direct and permanent loss (plus 773 acres temporary impact and 1,609 acres indirect impacts from dust, dewatering, and fragmentation)[11] |
| **Pebble Mine** 78-Year Expanded Development Scenario (targeting 55% of resource) | Over 43 miles anadromous-cataloged streams destroyed at the mine site[12] | 435.9 miles permanently destroyed[13] | 10,987 acres permanently destroyed[14] |
| **Greens Creek Mine** | 0 linear miles[15] | Not quantified. | – Impacts through 2003 not quantified.[16]<br>– 10.2 additional acres (2003 tailings)[17]<br>– 14.5 additional acres (2013 expansion)[18] |
| **Fort Knox Mine** | 0 linear miles. Burbot and grayling habitat only.[19] No ADF&G anadromous waters catalog designations in or around mine site area.[20] | Not quantified. | – 480 acres (1995 tailings construction)[21]<br>– 57.6 additional acres (2007 heap leach facility)[22]<br>– 15.64 additional acres (2011 TSF dam raise);[23] 2 additional acres (2015 waste rock dump expansion);[24] 0.97 additional acres (2018 phase 10 pit expansion)[25] |
| **Kensington Mine** | No permanent loss and Slate Creek dam not located in designated anadromous waters.[26] | Not quantified. | – 83.4 acres permitted[27] |
| **Pogo Mine** | 0 linear miles | Not quantified. | 306 acres[28] |
| **Red Dog Mine** | Not quantified. | Not quantified. | – 1,402.6 acres (observed 1984-2009)[29]<br>– 119 additional acres (2009 Aqqaluk expansion)[30] |
| Oil & Gas Projects in Alaska | | | |
| **Nanushuk** | 0 linear miles | 0 linear miles | 288 acres[31] |
| **Point Thompson Development Project** | 0 linear miles salmon streams.[32] Not quantified, but ROD discusses avoidance of work in anadromous fish habitat[33] | Not quantified in ROD, impacts not clear | 267.1 acres[34] |
| **Northstar Project** | 0 linear miles | 0 linear miles | 23.3 acres for Seal Island construction[35] |
| **Liberty (Hilcorp)** | 0 linear miles | 0 linear miles | 88.1 acres[36] |
| **ASRC Colville River Consolidated Gravel Material Site 1998-2018+** | 0 linear miles | 0 linear miles | 580 acres (cumulative, phases 1 through 3 from 1998-present and beyond)[37] |

**THE BOTTOM LINE: FEDERAL GOVERNMENT SHOULD NOT ISSUE PEBBLE A CLEAN WATER ACT PERMIT**

Year after year, commercial fishermen harvest nearly 50% of the world's supply of wild sockeye salmon from Bristol Bay waters. This activity supports 14,000 commercial fishing-related jobs in an industry that generates over $1.5 billion in annual economic activity. No other place in the world has been as reliable a producer of huge numbers of wild sockeye salmon, year after year, as Bristol Bay. In fact, communities in watersheds where salmon were once plentiful are annually spending billions of dollars in an effort to recover a semblance of the salmon runs that used to occur in those watersheds, and face restrictions on their activities and economies in the process.

Bristol Bay salmon also support the culture and subsistence activities of the region's indigenous residents, now as they have for millenia. And they support a robust sportfishing and eco-tourism industry through lodges and other businesses that provide clientele with bucket-list experiences that are remembered for a lifetime.

Pebble Limited Partnership has had ample opportunity to prove that mining of the Pebble ore deposit can occur without harming Bristol Bay salmon. It has failed to do so. It is time to let the people of Bristol Bay proceed with their Fish First vision, and reject Pebble.

- **The Corps should deny a Clean Water Act Section 404 permit for the proposed Pebble mine.**

- **EPA should use its Clean Water Act section 404(c) authority to prohibit the issuance of a Clean Water Act Section 404 permit for the proposed Pebble mine.**

[1] Final EIS, Executive Summary, at page 13 (two water treatment plans proposed to treat influent of 14 cfs and 46 cfs (60 cfs total) converts to 26,929.87 gallons per minute).
[2] Final EIS, Chapter 4.1, Table 4.1-2: Assumptions for Pebble Project Expansion ("For the purpose of this analysis, the increase in water required for production and treatment would increase by 39%, commensurate with the increase in production.") (60 cfs increased by 39% results in 83.4 cfs, which converts to 37,432.52 gallons per minute).
[3] Water Engineering Technologies, Inc., White Paper on Water Treatment Process, prepared for Pebble Limited Partnership (July 24, 2012), p. 5, available at https://pebbleprojecteis.com/files/25246462-5d2d-47a2-8bfb-c8370b4a5481 (Kensington Mine process rate of 1,500 gallons per minute)
[4] Id at p. 5 (Greens Creek Mine process rate of 2,500 gallons per minute)
[5] Id (Red Dog Mine process rate of 4,600 gallons per minute).
[6] Donlin APDES permit, available at http://dec.alaska.gov/Water/WPSdocs/AK0055867_docs.pdf (based on 4,750 gallons per minute permitted capacity).
[7] Final EIS, page 4.24-3, Table 4.24-1.
[8] Final EIS, page 4.24-3, Table 4.24-1.
[9] Final EIS, Executive Summary, p.93, Table ES-1.
[10] Final EIS, Executive Summary, p.93, Table ES-1.
[11] Final EIS, page 4.22-111, Table 4.22-40.
[12] Final EIS, Chapter 4.24, Table 4.24-4: Summary of Cumulative Effects for Fish Values ("At the mine site, an additional 35 miles of anadromous stream habitat would be lost in the SFK and UTC watersheds.").
[13] Final EIS, page 4.22-111, Table 4.22-40.
[14] Final EIS, page 4.22-111, Table 4.22-40.
[15] USDA Forest Service, Record of Decision Greens Creek Mine Tailings Disposal Facility Expansion (Sept. 5, 2013), p. 34, *available at* http://dnr.alaska.gov/mlw/mining/largemine/greenscreek/pdf/FEIS_ROD.pdf.
[16] *Id* at p. 3-114.
[17] USDA Forest Service, Record of Decision and Final EIS, Greens Creek Tailings Disposal (Nov. 2003), p. 4-37, *available at* http://dnr.alaska.gov/mlw/mining/largemine/greenscreek/pdf/feis1.pdf.
[18] Army Corps of Engineers, signed authorization of work, Greens Creek Tailings Disposal (Feb. 11, 2015), *available at* http://dnr.alaska.gov/mlw/mining/largemine/greenscreek/pdf/poa1988-269m6.pdf
[19] ADF&G Technical Report No. 14-08, Arctic Grayling and Burbot Studies at the Fort Knox Mine (Oct. 2014), *available at* https://www.adfg.alaska.gov/static/home/library/pdfs/habitat/14_08.pdf
[20] https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=main.interactive
[21] SRK Consulting, Fort Knox and True North Mines Environmental Audits, submitted to Alaska DNR, DEC, DF&G (May 2012), p. 53-54, *available at* http://dnr.alaska.gov/mlw/mining/largemine/fortknox/pdf/fgmiaudit2012.pdf.
[22] State of Alaska, DEC, Fish Creek FGMI Mining POA-1992-574-S, Section 401 Certificate of Reasonable Assurance (July 12, 2007), *available at* http://dnr.alaska.gov/mlw/mining/largemine/fortknox/pdf2/401scert.pdf.
[23] Army Corps of Engineers, Public Notice of Application for Permit, Fish Creek POA-1992-574-M19 (Sept. 29, 2010), *available at* http://dec.alaska.gov/Water/WPSdocs/POA-1992-574-M19_CERT.PDF
[24] Army Corps of Engineers, POA-1992-574-M24 (issued May 2, 2014).
[25] Fort Knox Mine Plan of Operations Amendment Request (Dec. 12, 2018), *available at* http://204.89.222.126/mlw/mining/largemine/fortknox/pdf2018/f20149852poo-mod-request-15.pdf
[26] Alaska Dept. of Fish and Game Fish Habitat Permit FH05-I-0050 (Aug. 28, 2009), p. 2, *available at* https://www.adfg.alaska.gov/static/home/library/pdfs/habitat/11_08b.pdf
[27] Army Corps of Engineers, Public Notice of Application for Permit, Lynn Canal POA-1990-592-M6 (July 17, 2009), *available at* http://dnr.alaska.gov/mlw/mining/largemine/kensington/pdf/kensusacepnjul09.pdf
[28] Army Corps of Engineers, Public Notice of Application for Permit, Goodpaster River 1 (Sept. 19, 2003), p. 2, *available at* http://dnr.alaska.gov/mlw/mining/largemine/pogo/pogo9-18/pogo_feis_vol_II.pdf (appendix B).
[29] Red Dog Mine Extension – Aqqaluk Project Final SEIS, p. 3-100, *available at* http://dnr.alaska.gov/mlw/mining/largemine/reddog/pdf/rdseis2009vol1.pdf.
[30] Army Corps of Engineers, Public Notice of Application for Permit, Chukchi Sea POA-1984-12-M45 (Oct. 9, 2009), *available at* http://dnr.alaska.gov/mlw/mining/largemine/reddog/pdf/rdseis2009vol2a.pdf
[31] http://www.nanushukeis.com/projectdescription.html
[32] Army Corps of Engineers, Record of Decision, Point Thompson Development Project (Oct. 19, 2012), *available at* https://www.poa.usace.army.mil/Portals/34/docs/regulatory/PtThomsonRODOct2012.pdf
[33] *Id* at p. 58.
[34] *Id* at p. 2.
[35] Army Corps of Engineers, Record of Decision, Northstar (May 3, 1999), p. 22, *available at* https://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Plans/1999-5-3_US_Corp_of_Engineers_Alaska_Distric_Record_of_Decision.pdf
[36] Army Corps of Engineers, Public Notice of Application for Permit, Beaufort Sea POA-2015-16 (Aug. 21, 2017), *available at* https://www.poa.usace.army.mil/LinkClick.aspx?fileticket=wDoo3enUTMk%3D&portalid=34
[37] Army Corps of Engineers, Public Notice of Application for Permit, Colville River POA-1996-869-M11 (May 3, 2017), *available at* https://www.poa.usace.army.mil/Portals/34/docs/regulatory/publicnotices/POA-1996-869-M11,%20Colville%20River_PN.pdf?ver=2017-05-03-141233-113