Barbara Schuhmann

Please see my comments in this letter 2. EIS.docx, with attachments.

February 14, 2023

Manh Choh Project

Major Environmental Issues of Concern

In my opinion, the biggest environmental issues with hardrock mines are the long-term acid producing and metal leaching properties of the waste products, which are major problems with most hardrock mining ventures in Alaska including Red Dog, Donlin, the Pebble prospect, Pogo, Greens Creek, and now Manh Choh. A notable exception is the Fort Knox mine near Fairbanks. Most solutions to the problem after a mine has exhausted the mineral deposit has been to minimize oxygen exposure for reactive material and capture resulting mine effluent and provide some sort of treatment that will neutralize the acidity and precipitate the leached metals before releasing the water to the environment downstream. A long-term monitoring program is generally required to confirm that the mitigation efforts are effective. However, the toxic effluent can persist for hundreds or thousands of years following the closure of an acid producing mine. It used to be that mining ventures would simply abandon the mines when the ore was depleted and leave the mitigation to the State of Federal Government to deal with. Many of those abandoned mines in the lower 48 states are now superfund sites that will continue to be mitigated long into the future. The Alaska mining laws require that acid producing mines establish an assurance bond prior to the start of mining to cover the cost of eventual reclamation and closure of a mine, as well as perpetual mitigation of toxic effluent. The following section highlights some critical issues related to the handling, transportation, processing, and eventual disposal of these toxic waste products.

1) According to the geochemical characterization report (SRK 2022), the ore and much of the waste rock is acid producing and metal leaching, which means it must be handled carefully at every step of the process and contained after the gold is removed or organized in such a way that the contaminated effluent can be captured and mitigated before it causes harm in downstream aquatic habitats.
2) There are five primary regions in which the material must be contained: A) the mine site where waste rock and pit walls will remain; B) the road from the mine to the Alaska Highway staging area where the ore will be transported with large dump trucks that are not suitable for highway transportation; C) the ore will then be dumped at the staging area and reloaded on large double trailer haul trucks; D) the 250 mile route along a series of public highways and roads where the ore will be hauled, ultimately to the processing facility at Fort Knox; and E) the ore will be processed at the Fort Knox milling facility to extract the gold, leaving all of the acid producing and metal leaching tailings at the Fort Knox mine, which does not produce acid or large quantities of dissolved metals.

A) The reclamation and closure plan for the mine site, once the ore has been removed, is to move the waste rock back into the two pits, the primarily metal leaching rock in the north pit and the primarily acid producing rock in the south pit. The north pit will then be filled with non-reactive waste rock until it is slightly domed over the pit. An impermeable cap layer will be just below the top layer where plants will be sown. As such, snow and rain

are expected to mostly run off and not fill the north pit, which will have groundwater saturating the lower reaches of the pit. Minimizing the rain and snowmelt is expected to reduce the metal leaching of the buried rock. The most reactive acid producing waste rock in the south pit will be below the level where the top of the groundwater is expected to reach. Submerging the reactive rock in water will minimize oxygen exposure and subsequent sulfuric acid production. A thick layer of nonreactive waste rock will cap the reactive material and elevate the surface above the expected water level but not as high as the rim of the pit. There will then be a depression in the south pit, rather than a dome, but the proponents are not expecting a lake to form. Based on the groundwater flow experiments that were conducted, they believe there will be a slow exchange of water from the pit to the larger groundwater reservoir and then into perennial streams that flow to the Tetlin Lake and Tetlin River on the south and east side of the Tetlin Hills, and the Tok River on the north and west side of the Tetlin Hills. They believe the acid and dissolved metals will be sufficiently diluted once they reach surface waters that they will achieve State of Alaska water quality standards. They intend to monitor water quality for at least 10 years following mining, and 7 years following closure from a series of groundwater and surface water test points on both sides of the Tetlin Hills. The implication being that if water quality did not achieve their expectations, they would be required to create a more robust mitigation plan.

B) Transporting the ore from the mine site to the transfer station is poorly described in the mine plan. It's not clear if the large dump trucks used for this segment of the ore transportation operation will be covered or not. If there are no covers on the large dump trucks, high metal content fugitive dust will contaminate the landscape and associated wetlands as it has done along the Red Dog haul road in NW Alaska.

C) It isn't clear whether there will be any indoor facility or other type of wind shelter at the transfer site where ore can be dumped from the mine trucks and then reloaded onto the highway haul trucks without having fine material blow away across the landscape and wetland habitats that prevail in that area.

D) The highway haul trucks are designed to have covers over their load beds to minimize fugitive dust. However, as demonstrated along the Red Dog haul road, despite covers, fugitive dust is still dispersed in smaller measure from the truck beds and from wheel wells, tires, underbeds, and other external features of the trucks. While the Red Dog haul road runs through a remote region of the State with no other traffic or communities, the route between the Tetlin transfer area and Fort Knox will be on public roads winding through several rural communities, agricultural areas, and urban cities on its way to and from the Fort Knox mine. The contamination risk from fugitive dust to people living beside this haul route could be substantial during the several year life of the Manh Choh mine.

E) Ore from the Fort Knox mine does not generate acid mine drainage or substantial amounts of metal leaching. As a result, the reclamation and closure plan suggests that when they exhaust the local mineral deposits they will be able to attain complete closure and stabilization of the mine site and associated effluent within 100 years and then walk away without consigning many generations of people to perpetually mitigate toxic

effluent. Many mines, such as Red Dog and Donlin, will require generations of people far into the future to be mitigating the toxic effluents produced by those mines. But what happens to the Fort Knox reclamation and closure plans after four to five years of continuous deliveries of acid producing and metal leaching ore from the Manh Choh mine? In the Manh Choh geochemical characterization report, the proponents described blending Manh Choh ore with Fort Knox ore at 20:80 and 30:70, Manh Choh:Fort Knox, presumably to see whether tailings with a mix of ore types would neutralize acid production and metal leaching. They conclude that all ore samples produce acid and elevated levels of dissolved metals. Given these results, will Fort Knox then require perpetual mitigation of effluent? The Manh Choh documents suggest that Fort Knox will not require any additional permits or oversight to accept these very different type of ore deliveries. The Army Corps of Engineers wetland permit for the Manh Choh mine declined to consider wetland impacts beyond the actual mine site and associated road to the Alaska Highway transfer site.

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Vol 2: https://dnr.alaska.gov/mlw/mining/large-mines/pogo/pdf/pogo_feis_vol_II.pdf

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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WATER
DIVISION

August 19, 2022

Mr. Gregory Mazer
Project Manager
U.S. Army Corps of Engineers, Alaska District
Fairbanks Field Office
Regulatory Division (1145)
CEPOA-RD
PO Box 35066
Fort Wainwright, Alaska 99703

Dear Mr. Mazer:

As I am sure you are aware, the U.S. Environmental Protection Agency has been reviewing Peak Gold LLC's proposal to develop the Manh Choh Mine to "produce gold from land owned by the Native Village of Tetlin utilizing open-pit mining methods and existing proven recovery processes."[1] The proposed work would impact 5.2 acres of waters of the United States to extract gold-laden ore, deposit waste rock, and develop the infrastructure necessary to operate the mine and haul the ore to Fort Knox.

On February 11, 2022, EPA provided comments pertaining to potential environmental impacts of the project in response to the U.S. Army Corps of Engineers (Corps) Public Notice (PN) POA-2013-00286 dated January 13, 2022.[2] This letter expressed concerns with impacts associated with development of the Manh Choh Mine, including compliance with the restrictions on discharge contained in the Clean Water Act Section 404(b)(1) Guidelines and provided related recommendations for the Corps' permitting process and forthcoming supporting NEPA analysis.

Since February, the Corps and the applicant have provided some additional information to EPA in response to our initial comment letter. On May 11, 2022, EPA received initial responses to our comments from the applicant, which included responses to concerns expressed by the U.S. Fish and Wildlife Service. EPA also received additional responses to our February comment letter from the applicant on June 30, 2022.[3] In July, EPA requested additional information referenced in the June 30th responses and received the majority of these reports on August 4, 2022. In total, EPA has received 19 new technical reports and documents from the applicant since the closure of the PN comment period on February 11, 2022.

EPA is providing supplemental responses based on our review of the additional information provided. Specifically:

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[1] U.S. Army Corps of Engineers, Alaska District. (2022, January 13). Public Notice POA-2013-00286. p.2.
[2] EPA letter to USACE regarding POA-2013-00286, February 11, 2022.
[3] Kinross. June 30, 2022. Peak Gold, LLC Responses to US EPA Region 10 February 11, 2022, Comment Letter to USACE Public Notice POA-2013-00286. 74 pp.

- Additional measures should be applied to minimize impacts to the aquatic ecosystem and downgradient waters of the United States. Adaptive management should be required if contamination is observed in downgradient waters.
- The proposal to haul ore over 250 miles to facilities in Fort Knox, AK has the potential to contribute additional air quality concerns in the Fairbanks $PM_{2.5}$ Nonattainment Area;

Please see the attached information, which includes recommendations for how to offset these impacts. This information may be relevant in development of your NEPA documents and permitting decision process.

Thank you for considering our recommendations in support of the Corps permit decision. If you have questions about our review, please contact me at jensen.amy@epa.gov or have your staff contact Kelly McDonald at 907-271-1208 or by email at mcdonald.kelly@epa.gov.

Sincerely,

AMY JENSEN

Digitally signed by AMY JENSEN
Date: 2022.08.19 15:24:58 -07'00'

Amy Jensen
Regional Wetland Coordinator

Enclosure

cc: Mr. Robert Henszey, US Fish and Wildlife Service,
Ms. Louise Smith, US Fish and Wildlife Service,

Enclosure

Synthesis of Key Findings from Review of Additional Documents Regarding the Proposed Man Choh Mine

The following summarizes the key findings of the U.S. Environmental Protection Agency following review of documents provided by Kinross regarding Peak Gold LLC's proposal to produce gold from land owned by the Native Village of Tetlin in Alaska utilizing open-pit mining methods and existing proven recovery processes.

I. Key Findings from EPA's Review of Additional Information

A. Water Resource Impacts

The Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material are the substantive environmental criteria used to evaluate proposed discharges of dredged or fill material.[4] The Guidelines require the Corps to make written factual determinations of the potential short-term or long-term effects of a proposed discharge on the physical, chemical, and biological components of the aquatic environment and "[s]uch factual determinations shall be used in § 230.12 in making findings of compliance or non-compliance with the restrictions in § 230.10."[5]

Based on EPA's review of several materials received from the applicant, specifically the Peak Gold Response,[6] Hydrogeological Report,[7] Water Management Plan,[8] Waste Rock Management Plan,[9] and the Reclamation and Closure Report,[10] we remain concerned that Manh Choh Mine Project as proposed has the potential to adversely impact additional waters of the United States (WOTUS) downgradient of the mine site over time. More specifically, EPA is concerned that perennial streams in the project vicinity would be subject to increased transport of dissolved arsenic during and after mining activities due to the proposed plans for water and waste rock management. Allowing for the discharge of polluted, contact water to groundwater has the potential to cause or contribute to water quality exceedances in downgradient WOTUS that already have recorded water quality exceedances on multiple occasions.

According to the Hydrogeological Report, several creeks located downgradient from the mining activities are supported by groundwater flow discharging from the bedrock water table, such as Hillside Creek and Tors Creek.[11] The baseline monitoring in these streams indicates that several water quality parameters exceed the state water quality standards on occasion. For example, Tors Creek, which drains east to Tetlin Lake, and Hillside Creek, which drains west to Tok River, have recorded levels of pH, alkalinity, arsenic, aluminum, lead, and manganese in exceedance of ADEC water quality standards due

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[4] 40 CFR § 230.10; 40 CFR § 230.12.
[5] 40 CFR § 230.11.
[6] Kinross. June 30, 2022. Peak Gold, LLC Responses to US EPA Region 10 February 11, 2022, Comment Letter to USACE Public Notice POA-2013-00286. 74 pp.
[7] Piteau Associates. 2021. Manh Choh Project Hydrogeological Characterization and Groundwater Modeling Summary Report, Prepared for Peak Gold, LLC.
[8] Piteau Associates. 2021. Manh Choh Project Water Management Plan. Prepared for Peak Gold, LLC.
[9] SRK Consulting. 2021. Manh Choh Project. Waste Rock Management Plan. Prepared for Peak Gold, LLC.
[10] SRK Consulting. 2021. Manh Choh Project Reclamation and Closure Plan. Prepared for Peak Gold, LLC.
[11] "The near-surface groundwater elevation limits recharge and thus most groundwater and precipitation that does not evaporate will discharge as surface water flow." Source: Hydrogeological Report. p.17.

to existing interactions between groundwater, the ore body, and the discharge of that groundwater into these streams.[12] The Guidelines at 230.10(b)(2) specify that no discharge of dredged or fill material shall be permitted if it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable water quality standard, thus the proximity of these downgradient waters to the proposed mining infrastructure prompt the need for accurate baseline water quality characterization and monitoring over time.

Accurate baseline information is critical to understand how the project is impacting water quality over the long term. In our review of the available baseline information, we have identified some inconsistencies in the water sampling data from Tors Creek and Hillside Creek that was used in project planning phases.[13] The supplied baseline surface water quality data includes data that is indicated by a table note to be erroneous due to instrument malfunction.[14] Furthermore, at Hillside Creek on July 28, 2021 (i.e., which is not a date indicated in footnotes that contains erroneous results), a surface water sample was collected that resulted in a 11.9 mg/L dissolved iron content with a pH of 7.68.[15] Given the fact that iron solubility in natural water is determined heavily by pH and that iron begins to precipitate out of solution around neutral pH,[16] this reading also appears to be erroneous and not an accurate reading of the baseline parameters. This reading and others call into question the quality assurance and quality control (QAQC) used in the existing water quality monitoring data. EPA encourages the continuation of water quality monitoring in Tors and Hillside Creeks prior to beginning mining activities with sufficient QAQC in an effort to accurately characterize baseline water quality conditions. EPA supports the monitoring proposed by the applicant and recommends that this water quality monitoring should continue during operations and after mining has ended.

EPA has concerns about the level of uncertainty associated with the hydrologic modelling provided by the applicant and the disclosed potential for metal and arsenic pollution from the project. Specifically, EPA is concerned assumptions used in the modeling may have led to modeling results that underestimate the potential for groundwater contamination. For example, the assumption that all precipitation would runoff surficially and not infiltrate the waste rock piles during operations appears unfounded given the annual precipitations rates and patterns, that waste rock areas will not be covered, and that broken waste rock is highly permeable, even if the crystalline rocks themselves are not. Even if precipitation infiltration of the proposed waste rock piles is minimal during operations, portions of the waste rock backfilled into the pits will be in contact with groundwater.

Additionally, the arsenic adsorption model prepared for this project may not accurately represent the geologic setting of the mine site. The arsenic adsorption model described in the Hydrogeological Report uses a sorption coefficient for a soil/water partition and is not applicable to groundwater movement through bedrock.[17,18] While we acknowledge that the modelers attempted to account for this point by scaling for surface area in fractured limestone, this model is objectionable for evaluating the attenuation of arsenic in bedrock that is primarily quartz muscovite schist. As such, EPA does not have confidence that the provided arsenic transport model results accurately represent the likelihood for groundwater contamination by arsenic from waste rock from the proposed mining activities.

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[12] Hydrogeological Report. Table B-2, p.108, Table B-11b, p. 120.
[13] Hydrogeological Report. Appendix B, Table B-2, p.108, Table B-11b, p. 120.
[14] Hydrogeological Report. Appendix B, Table B-3, p. 109.
[15] Hydrogeological Report. Appendix B, Table B-11b, p. 120.
[16] USGS. Chemistry of Iron in Natural Water, Geological Survey Water-Supply paper 1459. 1962. 268 pp.
[17] Allison, J. D., & Allison, T. L. 2005. Partition coefficients for metals in surface water, soil, and waste. Rep. EPA/600/R-05, 74.
[18] Hydrogeological Report. p. 33.

Compliance with the Guidelines at 230.10(d) requires projects to incorporate appropriate and practicable steps to minimize impacts to the aquatic ecosystem. In accordance with 230.10(d), EPA believes additional practicable mitigation measures should be applied to the project to minimize the potential degradation of water quality from secondary impacts of the project. Specifically, we are providing recommendations on measures for site preparation and reclamation work to ensure secondary impacts are minimized to downgradient WOTUS.

The project includes subaqueous disposal of PAG waste rock within the South Pit. According to the Reclamation and Closure Report,[19] after reclamation, the South Pit is proposed to be left as a depression that can collect more water than under current, natural conditions. EPA recommends the South Pit be fully backfilled, mounded and capped as proposed for the North Pit. Fully backfilling the South Pit will restore the original site contours to the maximum extent practicable and will minimize the size and footprint of the post-closure Main Waste Rock Dump. It will also more fully encapsulate the PAG waste rock and provide greater protection from environmental weathering. Reducing the infiltration of water into the pit will also minimize the potential for the project to increase the seasonal groundwater fluctuations beyond the natural conditions.

EPA is concerned about infiltration through waste rock in the waste rock dumps both during and after mine closure. EPA believes it is practicable to reduce the potential for water to infiltrate beneath the proposed waste rock dumps by establishing low-permeability foundations of compacted fine-grained materials during site preparation. The foundations should be established after clearing, removing overburden/organics, and leveling the waste rock dump sites. The foundations should be graded or crowned to direct site precipitation laterally to the perimeter ditches. The post-closure Main Waste Rock Dump should also be contoured and capped to promote runoff and minimize infiltration into the waste rock as proposed for the North Pit.

The proposed management of contact water also presents opportunities for infiltration or the spread of contaminants. EPA recommends that opportunities for contact water in the perimeter ditches to pond and infiltrate should be minimized by maintaining consistent flow lines and gradient within the ditches. The applicant should avoid excavating or establishing the proposed holding ponds within jurisdictional waters, including wetlands. Contact water and treated effluent should not be used for dust control unless sampling indicates it would not alter the chemistry of potential receiving waters (e.g., wetlands adjacent to mine facilities or the road that could receive runoff or fugitive dust). Brine from the water treatment plant and filter wash water should generally not be used for dust suppression, as it can elevate the concentration of metal salts in adjacent surface waters. Brine from the water treatment plant and filter wash water could potentially be used for dust suppression or material compaction at the waste rock dumps. Obviously, point source discharges into jurisdictional waters would require APDES authorization pursuant to CWA Section 402.

Even with these additional minimization measures, there is still some potential for adverse impacts to downgradient WOTUS from pit seepage and groundwater altered by contact with PAG waste rock. EPA recommends that the Corps require as a condition of the permit that the applicant develop an adaptive management plan that identifies how seepage from the pits will be collected for treatment if the groundwater or surface water monitoring indicates that groundwater chemistry has been altered by the contact water. A specific concern is that contact water from the South Pit will move downgradient and emerge in the drainages flowing to Hillside Creek. There appears to be less risk that the chemistry of

[19] Reclamation and Closure Report. Figure 10.

groundwater within the North Pit will be altered by contact water and that seepage will impact Tors Creek; however, the adaptive management plan should address the potential need to capture seepage from both pits.

B. Air Quality Impacts

In an effort to use existing ore processing infrastructure, the applicant proposes to transport extracted materials from the Manh Choh mine to the Fort Knox ore processing center using the Alaska highway system and other public roads. As EPA indicated in our February 11, 2022 comment letter, the PN did not mention the planned haul route or provide details for the transportation of ore being hauled to Fort Knox for processing. According to subsequent information received from the applicant, the general route the extracted materials would take via truck would travel via constructed gravels roads to Tetlin Village Road, then on Alaska Highway 2 to Delta Junction, where the trucks would likely take Richardson Highway to Fairbanks, and pass through Fox, AK to the Fort Knox Facility on Steese Highway. The route is approximately 250 miles long each way, and the proposed route would experience an increase in the annual average daily traffic (AADT) of 192 vehicles along this route.[20]

Based on this new information, the proposed haul route would seemingly direct trucks through an airshed that has been formally designated by EPA as "Serious" Nonattainment for exceedances of the National Ambient Air Quality Standards (NAAQS).[21] A portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a Nonattainment Area for Particulate Matter ($PM_{2.5}$) in December 2009 because these areas exceed the health based 24-hour $PM_{2.5}$ NAAQS of 35 micrograms/cubic meter.[22] According to Alaska Department of Environmental Conservation (ADEC), particulate pollution in this area is the result of local emissions from emissions from wood stoves, burning distillate oil, and industrial sources, as well as motor vehicles and trucks. $PM_{2.5}$ is primarily a concern during the winter months (October through March) when extremely strong temperature inversions are frequent and human-caused air pollution impacts increase.

Emissions that originate from gasoline and diesel engines, primarily motor vehicles, contribute to these $PM_{2.5}$ concentrations. The drastic increase in AADT resulting from this project is likely to have an adverse effect on the air quality in the nonattainment area.

EPA recommends that the Corps consider and disclose the air quality impacts that would result from the proposed use of heavy duty vehicles in the Fairbanks $PM_{2.5}$ Nonattainment Area, particularly the effect on emission budgets for transportation planning and conformity purposes.

To help reduce the $PM_{2.5}$ emissions from the heavy-duty trucks carrying ore through Fairbanks from the Manh Choh Mine to the Fort Knox ore processing facility, EPA suggests the applicant consider and identify mitigation measures. Implementing measures that ensure efficient vehicle performance and best practices for heavy-duty hauling will minimize air quality impacts. Examples include:

1) Only use heavy duty trucks with Tier 3 engines, preferably 2010 or newer. In addition to the Tier 3 engines, we recommend that the project verify that the engines in these trucks have fully functional emission reduction systems.
2) Ensure all trucks have a tarp deployed over the bed to "cover the load" and minimize material from blowing out the back of the truck.

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[20] Peak Gold Response. p.29.
[21] 40 CFR § 81.302.
[22] See 86 FR 10511, 10511-12 (Feb. 22, 2021).

3) The project could supply the municipalities in the nonattainment area with a street sweeper capable of removing $PM_{2.5}$ and smaller, and the municipalities would then operate this sweeper on the truck route to remove road dust, which decreases particulates raised by these trucks.

Further, EPA understands the applicant has proposed to cover the beds of trucks that will be transporting ore via Alaska public highways,[23] and it is not clear whether all roads used to haul ore are considered Alaska public highways and would be subject to this measure. EPA recommends applying this mitigating measure to the entire haul route as feasible.

While covering the truck beds will help reduce the amount of particulate matter generated by this proposed activity, particulate matter is also generated from the emissions of the truck engines, wearing of tires and brake pads, and traffic congestion. Thus EPA expects particulate matter would still increase in the Fairbanks $PM_{2.5}$ nonattainment area as a result of the sheer volume of additional heavy duty trucks proposed to be operating to haul ore from the Manh Choh Mine to the ore processing facility in Fort Knox, as well as the potential for increased traffic congestion and subsequent vehicular emissions. Such impacts to air quality have the potential in the near term[24] to impact the Fairbanks North Star Borough's ability to build future transportation infrastructure projects if the area is not able to meet the State Implementation Plan developed by ADEC and approved by EPA. Over the long term, these truck emissions could impact the area's ability to meet the 24-hour $PM_{2.5}$ NAAQS of 35 micrograms/cubic meter in a timely manner. EPA recommends that at a minimum, the Corps evaluate and disclose the potential impacts to air quality in the NEPA analysis for this project.

[23] Peak Gold Response. p. 30.

[24] The current transportation conformity approval for the Fairbanks NorthStar Borough expires January 19, 2023. If the motor vehicle emissions budget (MVEB) cannot be met by FAST Planning in the transportation conformity analysis currently underway, then the area enters a 12-month grace period on January 20, 2023. If the conformity analysis cannot be approved within that 12-month grace period, a lapse goes into effect. Such a lapse could lead to the delay or diversion of federal transportation dollars as well is triggering transportation planning issues.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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WATER
DIVISION

February 11, 2022

Mr. Gregory Mazer
Project Manager
U.S. Army Corps of Engineers, Alaska District
Fairbanks Field Office
Regulatory Division (1145)
CEPOA-RD
PO Box 35066
Fort Wainwright, Alaska 99703

Dear Mr. Mazer:

The U.S. Environmental Protection Agency has reviewed the U.S. Army Corps of Engineers (Corps) Public Notice (PN) POA-2013-00286 dated January 13, 2022, for compliance with the restrictions on discharge contained in the Clean Water Act Section 404(b)(1) Guidelines (Guidelines). The PN describes a proposal by Peak Gold LLC to "produce gold from land owned by the Native Village of Tetlin utilizing open-pit mining methods and existing proven recovery processes."[1] The proposed work would impact 5.2 acres of waters of the United States to extract gold-laden ore, deposit waste rock, and develop the infrastructure necessary to operate the mine and haul the ore to Fort Knox.

The Guidelines are the substantive environmental criteria that must be met in order for the Corps of Engineers to issue a Section 404 permit for the activity. Based on EPA's review of the PN and the Permittee-Responsible Mitigation plan submitted, we recommend that the applicant provide additional information to demonstrate that the proposed project complies with the restrictions on discharge contained in the Guidelines. Specifically, EPA has identified issues associated with the potential impacts to aquatic resources due to road construction and increased road traffic, including the potential for secondary impacts to WOTUS from fugitive dust, and the cumulative impacts of the area's mining development over time. The enclosure provides our detailed comments and recommendations, as well as additional information that we have compiled.

EPA understands there is a high level of public interest in this project due to the plan to transport mined ore to a separate location for processing and expects that decision processes related to this proposal may be controversial and believes this project would greatly benefit from a more thorough review of the facility's Plan of Operations, including construction and operation, and an ore transportation plan. Such a review would allow for a more accurate characterization of the direct, secondary, and cumulative impacts occurring within and nearby the proposed project area.

[1] U.S. Army Corps of Engineers, Alaska District. (2022, January 13). Public Notice POA-2013-00286. p.2.

Thank you for the opportunity to review this project. We appreciate the coordination you and your staff have provided on this project and look forward to continued engagement. If you have questions about our review, please contact me at jensen.amy@epa.gov or have your staff contact Kelly McDonald at 907-271-1208 or by email at mcdonald.kelly@epa.gov.

Sincerely,

Amy Jensen
Regional Wetland Coordinator

Enclosure

cc: DEC-401Cert@alaska.gov

Enclosure to EPA's Comment Letter on Public Notice POA-2013-00286

The following are detailed comments submitted by the U.S. Environmental Protection Agency in response to the U.S. Army Corps of Engineers Public Notice (PN) POA-2013-00286, issued January 13,
2022, and applied for by Peak Gold, LLC. In addition to the PN, we have reviewed the applicant's Permittee Responsible Mitigation (PRM) Plan provided by the U.S. Army Corps of Engineers.[2]

I. Project Description

The PN indicates Peak Gold LLC has applied for a Department of Army permit under Clean Water Act (CWA) Section 404 "to profitably produce gold from land owned by the Native Village of Tetlin utilizing open-pit mining methods and existing proven recovery processes."[3] The stated project site is located near the Native Village of Tetlin, Alaska.

The proposed project would excavate and extract gold-laden ore and waste rock for approximately 4.5
years. All extracted ore would be hauled to Fort Knox Mine for processing, including milling and tailings disposal. Fort Knox mine is approximately 250 miles northwest of the proposed mine, and the ore would be transported on public highways and roads via trucks.

In this PN, the applicant is proposing to:

- Construct two new gravel mine access roads with culverts:
    - The Manh Choh Twin Road would be built parallel to the Tetlin Village Road from the Alaska Highway intersection to approximately 5 miles southward where it would meet the Manh Choh Site Road.
    - The Manh Choh Site Road would be built to two designated mine sites in the Tetlin Hills, approximately 12 miles west of the Native Village of Tetlin.
- Establish several material sites along the new gravel roads to extract sand and gravel to construct project roads and pads.
- Re-align a section of the Tetlin Village Road, which would not be used to service mine operations.
- Extract ore for 4.5 years and haul the ore to Fort Knox for processing; no milling or tailings disposal would occur at the project site.
- Commence reclamation immediately after mining is complete.[4]

The proposed project would result in the permanent loss of approximately 5.2 acres of waters of the United States (WOTUS), including predominantly wetlands, but also a small part of a pond and very small part of a non-fish bearing stream.

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[2] Stantec Consulting Services Inc., prepared for Kinross. (2021, December 30). Manh Choh Project Permittee Responsible Mitigation Plan. 14 pp.

[3] U.S. Army Corps of Engineers, Alaska District. (2022, January 13). Public Notice POA-2013-00286. p. 2.

[4] Id.

II. Comments Related to Clean Water Act Section 404(b)(1) Compliance

The Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material are the substantive environmental criteria used to evaluate proposed discharges of dredged or fill material.[5] The Guidelines require the Corps to make written factual determinations of the potential short-term or long-term effects of a proposed discharge on the physical, chemical, and biological

components of the aquatic environment and "[s]uch factual determinations shall be used in 40 CFR § 230.12 in making findings of compliance or non-compliance with the restrictions in 40 CFR § 230.10."[6]

The purpose of the Section 404(b)(1) Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States. These goals are achieved, in part, by prohibiting discharges of dredged or fill material that would result in avoidable or significant adverse impacts on the aquatic environment. The burden to demonstrate compliance with the Guidelines rests with the permit applicant. The Guidelines contain four main requirements each of which must be complied with to obtain a Section 404 permit.

1. Section 230.10(a) prohibits a discharge if there is a less environmentally damaging practicable alternative to the proposed project. These alternatives are presumed for non-water dependent activities in special aquatic sites.
2. Section 230.10(b) prohibits discharges that will result in a violation of the water quality standards or toxic effluent standards, jeopardize a threatened or endangered species, or violate requirements imposed to protect a marine sanctuary.
3. Section 230.10(c) prohibits discharges that will cause or contribute to significant degradation of the waters of the United States. Significant degradation may include individual or cumulative impacts to human health and welfare; fish and wildlife; ecosystem diversity, productivity and stability; and recreational, aesthetic or economic values.
4. Section 230.10(d) prohibits discharges unless all appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Furthermore, the Guidelines require the prediction of cumulative effects to the extent reasonable and practical.[7] These factual determinations include potential impacts on physical and chemical characteristics of the aquatic ecosystem such as substrate; suspended particulates/turbidity; current patterns and water circulation; normal water fluctuations; salinity gradients; potential impacts on biological characteristics of the aquatic ecosystem such as threatened and endangered species, fish, other aquatic organisms in the food web, and wildlife; potential impacts on Special

[5] 40 C.F.R. § 230.10; 40 C.F.R. § 230.12.
[6] 40 C.F.R. § 230.11.
[7] 40 C.F.R. § 230.11(g)(2).

Aquatic sites including sanctuaries and refuges, wetlands, mud flats, and vegetative shallows; and potential effects on human use characteristics such as recreation and commercial fisheries, water related recreation, aesthetics, wilderness areas, and research sites.[8]

The Guidelines recognize that the level of required analysis and documentation are scaled to reflect the significance and complexity of the proposed discharge activity.[9] EPA believes the proposed discharges and the associated on-going operations of this project have the potential for adverse direct, indirect, and cumulative impacts to WOTUS, including wetlands, and thus require more detailed information, evaluation, and documentation to demonstrate compliance with the Guidelines. Sections A-D provide our comments regarding information and evaluation relevant to each requirement and recommendations
regarding the areas where we believe the proposal has yet to demonstrate compliance with the Guidelines.[10]

A. Aquatic Resource Information

EPA has compiled some additional information regarding the area to better understand the potential effects of the proposed project, and we provide this information herein to support the Corps' analysis.

The Tanana and Tok Rivers have their headwaters in mountain streams in eastern Alaska near the
Yukon border. The Tanana River flows northwest to meet with the Delta River, a Wild and Scenic River, before joining the Yukon River across the state. The upper Tanana River is a critical reach of the river system, along with the confluence with Tok river, and Tetlin Lake as they serve important functions for wildlife, fisheries, subsistence, and recreation. This reach is where fish and wildlife migrate to reproduce seasonally. The areas of the Upper Tanana River Valley through the Tetlin National Wildlife Refuge (TNWR) are known for being a migratory corridor from numerous species of protected birds, including but not limited to the Bald Eagle, Golden Eagle, Hudsonian Godwit, Lesser Yellowlegs, and Olive-sided Flycatcher.

Alaska recognizes any fish-bearing waterbody as essential fish habitat regardless of species and life stage. National Marine Fisheries Service (NMFS) considers all freshwaters classified anadromous waters as essential fish habitat but defers to the Alaska Anadromous Waters Catalog (AWC) for classifications. According to the AWC, the Tanana River in the vicinity of Tok and Tetlin supports Coho salmon.[11] The Upper Tanana River has known populations and subsistence

[8] 40 C.F.R. § 230 (Subparts C-F).
[9] 40 C.F.R. § 230.6(b).
[10] 40 C.F.R. § 230.6(b); 40 C.F.R. § 230.11; and 40 C.F.R. § 230.12(b).
[11] ADF&G. (2008, December 12). Anadromous Waters Catalog: USGS Quad: Tanacross A5. Retrieved February 2022 from: https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=nomSearch.nomDetails&NomID=09-183

fishing of Arctic Grayling, Burbot, Lake Trout, Northern Pike, and Whitefish.[12] Furthermore, the TNWR is a highly used area for numerous protected species, some which are highly migratory. Humpback Whitefish have been observed moving between the TNWR and downstream areas of the Tanana River to spawn. While there are no significant salmon runs in the upper Tanana River drainage, the TNWR has recorded small runs of chum salmon and an occasional chinook and coho.[13] Based on the life histories of salmonid species, it is logical to presume these species use the downstream reaches of the Tanana River as well.

B. Alternatives Analysis– 40 CFR 230.10(a)

The Guidelines require that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge, that meets the project purpose, which has less adverse impacts on the aquatic ecosystem.[13] The Corps is therefore only able to issue a permit for the least environmentally damaging practicable alternative (LEDPA).[14] Identification of the LEDPA is achieved by performing an alternatives analysis that evaluates the direct, secondary/indirect, and cumulative impacts to jurisdictional waters resulting from each alternative considered. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences.

Based on the information provided in the PN and PRM, EPA believes other potentially practicable alternatives should also be evaluated to respond to the Guidelines requirements related to determining the LEDPA. The following comments highlight information relevant to the LEDPA analysis that the Corps should consider.

Based on our review of the PN, the proposed project may impact additional WOTUS along the haul route that have not been disclosed. The PN indicates the applicant plans to transport the excavated ore approximately 240 miles to an existing gold mill for processing at Fort Knox. EPA estimates the project would require the transport of more than 70,000 trucks per year (up to 8 trucks per hour- 4 loaded, 4 empty, every hour) and may even operate 24 hours a day.[15] The PN also indicates that the Manh Choh
Twin Road would be built parallel to the Tetlin Village Road for approximately 5 miles from the Alaska Highway intersection to where it would meet the Manh Choh Site Road. The need to construct an entirely new road parallel to the existing Tetlin Village Road has not been disclosed

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[12] Halpin, L. (1987). Living off the Land: Contemporary Subsistence in Tetlin, Alaska. Technical Paper No. 149. U.S. Fish and Wildlife Service. Anchorage, Alaska. 132 pp.

[13] USFWS. (2012). Fish. Tetlin National Wildlife Refuge Webpage. U.S. Fish and Wildlife Service. https://www.fws.gov/refuge/Tetlin/wildlife_and_habitat/fish.html [13] 40 C.F.R. § 230.10.

[14] Provided that it complies with the other portions of the Guidelines.

[15] Kinross. (2021, April 6). Introduction to the Kinross Manh Choh Project. https://deltajunction.us/wpcontent/uploads/20210406-Kinross-Manh-Choh-Project.pdf [16] 40 C.F.R. § 230.10(a)(3).

in the PN or as part of the project purpose, but EPA assumes this road is needed for safety given the heavy truck traffic expected.

The LEDPA should be determined based on an evaluation of the combination of alternative sites with a site design that provides the least impacts to WOTUS. The distance and route taken to the processing facility is a critical aspect in siting this project, and the project purpose does not appear to be waterdependent; therefore, alternative sites (i.e., processing at the extraction location) are presumed to be available, unless clearly demonstrated otherwise by the applicant.[16] If the applicant has already evaluated alternative sites that do not impact aquatic resources, such as alternative locations for the Manh Choh Twin Road, it would be beneficial to provide that analysis. Other alternatives to be considered in the alternatives analysis may include analyses of alternate haul routes, alternate ore processing locations, and building additional culverts into constructed gravel roads to allow for maintenance of wetland equilibrium and function adjacent to the road.

C. Compliance with other Environmental Standards – 40 CFR 230.10(b)

The Guidelines specify that no discharge of dredged or fill material shall be permitted if it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable water quality standard or violates any applicable toxic effluent standard or prohibition under section 307 of the CWA.[16] This project has the potential to result in indirect and cumulative impacts to water quality in the Tok and Tanana River watersheds from the additional haul traffic, potential accidents involving mine ore, and fugitive dust from trucks, etc, which may contribute to exceedances of water quality standards related to metals. EPA recommends the applicant evaluate the risk of potential spills from trucks to wetlands and other WOTUS along the entire transportation network. We believe a project of this scale should include a thorough emergency response plan, complete with training, preparedness, and complete cleanup capabilities.

EPA expects the NEPA document for the project will evaluate information on impacted waters in the planning area, the nature of the impacts, and specific pollutants likely to affect those waters; how the proposed project will coordinate with on-going protection efforts; any mitigation measures required to be implemented to avoid degradation of waters; and how the project will meet the antidegradation provisions of the CWA. The Guidelines also prohibit degrading water quality within water bodies that are currently meeting water quality standards. Harmful compounds like mercury, arsenic, and acid can be present in mined rock and present risks for human health and environmental degradation. Geochemical testing of ore and waste rock should be used to identify potentially harmful compounds, and if present, these compounds should be managed to reduce risk to human health and the environment. Similarly, acid-base accounting should be completed to evaluate the acid generating potential of waste rock. Proposed waste rock piling is

[16] 40 C.F.R. § 230.10(b)(2).

likely to result in weathering and leeching of harmful compounds into WOTUS. These toxic chemicals may pose a risk to human health by cumulatively biomagnifying throughout the food web and eventually affecting humans through consumption of subsistence foods. Ultimately, the project evaluation will need to clearly demonstrate that the project would not cause or contribute to further exceedances of water quality standards to comply with the Guidelines.

We note that the Corps has served as the lead federal agency for several proposed hard rock mine projects in Alaska. These projects include, but are not limited to, the following: Pebble Project, Donlin Gold Project, Greens Creek Mine, Red Dog Mine Extension – Aqqaluk Project, Pogo Gold Mine Project, and the Kensington Gold Project. The NEPA evaluations completed for these major federal actions established a precedent, which we recommend be considered in determining the appropriate level of NEPA review and documentation to evaluate the Clean Water Act Section 404 permit application for the proposed Manh Choh Mine.

D. Significant Degradation -- 40 CFR 230.10(c)

The Guidelines prohibit issuance of a CWA Section 404 permit if project activities will cause or contribute to significant degradation of the Nation's waters including degradation to: (1) human health and welfare; (2) aquatic life and other wildlife: (3) aquatic ecosystem diversity, productivity, and stability; and (4) recreation, aesthetic, and economic values. The Guidelines require the prediction of cumulative effects to the extent reasonable and practical.[17] The Guidelines also require that information about secondary effects on aquatic ecosystems be considered. Secondary effects are the effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials but do not result from actual placement of the materials.[19]

As mentioned previously, the PN does not disclose the impacts on WOTUS from the operation of the facility, notably the effects from the facility operating potentially 24 hours a day, with constant transport of ore via truck on gravel roads. EPA has concerns that the future and cumulative impacts of relying on public highway transit has not been evaluated for potential negative impacts. The PN does not mention the planned haul route or provide details for the transportation of ore being hauled to Fort Knox for processing. EPA recommends including details related to the current traffic load and predicted mine traffic on the public highways between the mine and processing sites for both the near-term construction and long-term operation and maintenance. Increased traffic with mine haul trucks would increase noise for residents and migratory birds, the potential for vehicle accidents, and impacts to WOTUS near the roads from fugitive dust. Additionally, the highway infrastructure would require maintenance and potentially upgrades during operation, which may increase in frequency and need due to the proposed hauling. The applicant's current proposal does not reflect these expected connected actions.

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[17] 40 C.F.R. § 230.11(g)(2). [19] 40 C.F.R. § 230.10(b)(2).

EPA recommends that additional analyses of these potential impacts be conducted to determine the significance of the direct and secondary impacts on the natural and human environment. At a minimum, an appropriate analysis of the cumulative effects of increased highway traffic and WOTUS near the haul route in the project area should be performed to assess the significance of their effects in this section of Tok and Tanana River watersheds. Given the potential for water quantity and quality impacts to occur to the nearby aquatic systems (e.g., effects on in-stream water quality parameters from fugitive dust such as turbidity, dissolved oxygen, removal of foraging habitat, etc.,), impacts to listed salmonids and other aquatic organisms that utilize the area should be evaluated and disclosed.

EPA also has concerns about the impacts related to the construction of the two new gravel roads to access the mine site. Based on our review of the PN, it is unclear if the applicant has identified or addressed potential impacts from periodic maintenance activities or how many culverts will require construction and maintenance to maintain hydrology of the area. The long-term analysis of such an action should include contingencies for any repair or emergency activities within regulated aquatic environments.

Executive Order 13990, Section 5. Accounting for the Benefits of Reducing Climate Pollution requires federal agency actions to evaluate the full cost of GHG emissions by accounting for global damages to facilitate sound decision-making, which directly relates to the NEPA compliance process. On February 26, 2021, the Interagency Working Group (IWG) on the SC-GHG published the *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide*, which identified the interim social cost of carbon to be $51.00. [18] This interim value should be used by agencies when monetizing the value of changes in GHG resulting from federal actions. EPA recommends that the Corps provide estimates of the monetized damages associated with incremental increases of GHG emissions to include the SCGHG consistent with this technical support document for this project in the NEPA analysis. We recommend discussing the effects that the project may have on its local environment regarding climate change, whether the project will exacerbate or protect local resources from the future effects of climate change. Predictions of GHG emissions during operations should include the entire transportation network, including, trains, trucks, etc. travelling to and delivering ore and fuel and other materials to and from the facility.[21]

EPA recommends that the NEPA document for this project include a discussion of effects that changes in the climate may have on the proposed project and the project area, including its long-term infrastructure. Such an analysis could help inform the development of measures to improve the resilience of the proposed project. If projected changes could notably exacerbate the environmental impacts of the project, EPA recommends these impacts also be considered as part of the NEPA analysis. Wetlands that rarely dry out are expected to shift to more frequent drying

[18] Accessible at https://www.whitehouse.gov/wpcontent/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf?source=email. [21] E. O. 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (2021, January 25); EO 14008. Tackling the Climate Crisis at Home and Abroad (2021, February 1).

in some areas, and wetlands that currently are frequently dry may be lost in some areas.[19] In other areas where precipitation is expected to increase or the timing is expected to change, wetlands that occasionally dry out may become wetter.[20] It is important to evaluate how the mitigation area and associated wetlands will be constructed with respect to localized climatic changes over time.

E. Mitigation Sequence -- 40 CFR 230.10(d)

The 1990 Memorandum of Agreement regarding Mitigation under CWA Section 404(b)(1) Guidelines between EPA and the Corps (1990 EPA/Corps MOA) established a three-part process, known as the mitigation sequence (avoid, minimize, and compensate), to help guide mitigation decisions and determine the type and level of mitigation required. This sequence is also embedded in the requirements of the 2008 Final Rule on Compensatory Mitigation[21] and should be followed in that order. All three

steps of the sequence are mandatory, and one step may not substitute for any other. The first step in the sequence requires impacts to the aquatic ecosystem be avoided whenever practicable. Compensatory mitigation is intended to offset unavoidable impacts that result after avoidance and minimization has been applied. Appropriate and practicable steps used to avoid, minimize, and compensate for any unavoidable impacts must be outlined prior to issuance of a permit, in accordance with both the Guidelines and the 1990 EPA/Corps MOA regarding mitigation.[22]

EPA appreciates that the applicant has proposed compensatory mitigation within the same watershed as the project impacts, the Upper Tanana River watershed. The applicant has submitted a PermitteeResponsible Mitigation (PRM) Plan, which states the long-term goal of the PRM Plan is "establish productive wildlife habitat upon completion of mining and reclamation at the mine site that aligns with the goals and land use objectives of the Native Village of Tetlin."[26] The Applicant plans to replace two culverts near the proposed mine site for the benefit of the Native Village of Tetlin. The PRM Plan states that the applicant would restore hydrology of degraded stream channels and enhance wetlands but does not quantify the functional lift of specific acreage or linear feet of stream that would be impacted by proposed actions.

There does not appear to be any accounting for the loss of wetland and stream function of the temporarily affected WOTUS, or the temporal lag associated with the enhanced wetlands. The Guidelines require that "the district engineer shall require, to the extent practicable, additional compensatory mitigation to offset temporal losses of aquatic functions that will result from the

[19] Halabisky, M. (2017). *Reconstructing the Past and Modeling the Future of Wetland Dynamics Under Climate Change* (Doctoral dissertation). University of Washington, Seattle, WA. p. 14. https://digital.lib.washington.edu/researchworks/bitstream/handle/1773/40585/Halabisky_washington_0250E_17613.pdf?isA llowed=y&sequence=1

[20] Id.

[21] 33 C.F.R. Parts 325 and 332 and 40 C.F.R. Part 230.

[22] 40 C.F.R. § 230.10(d). [26] PRM Plan. p. 2.

permitted activity."[23] Temporal loss is defined in the Guidelines as, "the time lag between the loss of aquatic resource functions caused by the permitted impacts and the replacement of aquatic resource functions at the compensatory mitigation site. Higher compensation ratios may be required to compensate for temporal loss."[24] Although the applicant intends to construct the wetland mitigation area concurrently, to account for the temporal lag of regrowth EPA recommends construction of the mitigation area in advance of the project area.[25]

The PN states that proposed mine activities are expected to last 4.5 years, and the PRM states the mitigation construction would occur concurrently. Full reestablishment of native vegetation is not expected for at least five years post project completion, as even rapid-growing subarctic perennials do not reach mature size until after year 3.[26] Section 2.10 of the PRM indicates seasonal monitoring will occur for two successive years to determine if changes are recommended.[27] Because projects involving channel construction are far more challenging to effectively implement, we recommend continued monitoring of performance standards for a minimum of seven years.

The Guidelines identify that "Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit."[28] They also identify that: "the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. If a functional or condition assessment or other suitable metric is not used, a

minimum one-to-one acreage or linear foot compensation ratio must be used."[29] The proposed mitigation does not appear to provide sufficient offset of the proposed impacts to WOTUS.

EPA recommends that the applicant complete functional wetland and stream assessments to determine the existing aquatic resource function and the potential for functional lift. EPA also recommends that the applicant further consider other permittee-responsible mitigation opportunities along the Tetlin to Fort Knox Corridor, as well as the possibility of restoration of previously mined streams and wetlands in the local Tetlin and Tok areas that could be rehabilitated. EPA believes compensation credits could potentially be generated by replacing stream and wetland crossings if the enhancement of aquatic resource function could be quantified, but such compensation can only be generated through actions that would otherwise be unaffected by the project.

[23] 40 C.F.R. § 230.93(m).
[24] 40 C.F.R. § 230.92 (Sub Part J Compensatory Mitigation for Losses of Aquatic Resources).
[25] 40 C.F.R. § 230.93(m).
[26] Densmore, R.V., M.E. Vander Meer, and N.G. Dunkle. 2000. Native plant revegetation manual for Denali National Park and Preserve. U.S. Geological Survey, Biological Resources Division, Information and Technology Report USGS/ BRD/ITR-2000-0006. 42 pp.
[27] PRM Plan. p. 12.
[28] 40 CFR § 230.93(a)(1).
[29] 40 CFR § 230.93(f)(1).

F. Conclusion

Our comments identified several potential significant direct, indirect, and cumulative impacts regarding the entire scope of the project that warrant detailed evaluation during the permit decision process. We recommend that the Corps request additional information from the applicant regarding mine construction, operations, maintenance, and reclamation, such as a Plan of Operations, Reclamation Plan, Transportation Plan, baseline water quality results, acid-base accounting, and other technical studies and reports. These information are necessary to address concerns regarding potential significant degradation to WOTUS, such as the Tanana River, Tok River and Tetlin Lake, resulting from potential discharges of mine contact wastewater, which may transport elevated levels of mercury, arsenic, and other toxic pollutants to these receiving waters.

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550 W. 7th Avenue, Suite 1430
Anchorage, AK 99501-3577
907/269-8732

Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709
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Re: Objection to Approval of Permit Applications
Request for Public Hearing
Request for Corrected Public Notice and New Public Comment Period
Reclamation Plan F20232626RPA
Integrated Waste Management Permit 2023DB0001 for Manh Choh Mining Operation

Dear Sirs:

I object to approval of the two permits listed above. I object to approval of any more permits on a piecemeal basis for the Manh Choh mining operation. There needs to be an EIS – or state equivalent - of the entire Manh Choh mining operation: extraction site, transportation sites, processing site, and all disposal sites. This operation is a large new mine and should be treated as such. It will generate acid mine Drainage (AMD).

I ask that a public hearing be conducted to explore all questions concerning the Manh Choh mining operation proposal. I ask for additional time for the public to comment on any proposed permit. The notice was confusing and incorrect. Many documents are not available online. They all should be available to the public online, and additional time for comment should be allowed for at least 30 days after all correct information is made available to the public, and a public hearing should be ordered.

I. An EIS of the entire Manh Choh mining operation is required

An EIS, an environmental impact statement, a look at the total cumulative impacts of the entire Manh Choh mining operation, is required before any single permit can issue. The state needs to stop piecemeal permitting tiny parts of the whole. The state needs to stop ignoring where problems go after leaving the extraction site, as well as stop ignoring the problems that will be left at the sites of extraction, transportation and disposal after mining ceases. But that is what the proposed waste management plan and proposed reclamation plan do. They both ignore all issues arising after ore, waste, trucks, etc. leave the extraction site.

This means the plans are incomplete and cannot be approved. Any truly "integrated" waste management plan and any reclamation plan for the Manh Choh mining operation must include the plan (not possibilities) of reclamation and of waste disposal at the extraction site, the transportation site, and the disposal site.

Since the state is constructing passing lanes and 5 new bridges to accommodate the trucking/transportation portion of the Manh Choh mining operation, that state/federal construction must also be included in waste and reclamation plans and in the overall environmental review/EIS of this proposed Manh Choh mining operation.

The area comprising the proposed Manh Choh mining operation is quite large. It includes over 1000 acres near Tetlin. But it also includes 248 miles of roads and city streets, and processing, waste disposal and tailings disposal sites north of Fairbanks at Fort Knox. The ore and potential problems associated with the ore do not disappear once they leave the extraction site. But that is what the review so far by ADEC and ADNR seems to indicate—that there is no need to look beyond the extraction site, or even examine what will be left at the extraction site.

Other examples of the type of review that should be required of a proposal for a large mining operation such as this one include: Red Dog, Greens Creek, Donlin and Pebble. Particularly here, where the ore is acid-generating and mineral-leaching, any reclamation plan must prevent the discharge of acid mine drainage (AMD).

What should be, but is not, happening here is that ADEC, ADNR, ADOT&PF are failing to undertake and complete a full and honest review of the entire Manh Choh proposal and applications for permits. What will the total Manh Choh mining operation's cumulative effects be to human health and safety, to the health and safety of fish and wildlife, and to the quality of the air, water and lands that will be affected by the operations, transport and disposal of rock and soil that will generate acid and leach heavy metals? This is why an EIS should be undertaken -- of the entire mining operation, and not just of one-third of it - the extraction site.

II. All permits and plans must include all parts of the Manh Choh mining operation: extraction, transportation and processing/disposal

To be complete, any proposed plan must include all parts of the Manh Choh mining operation, not just the ore extraction portion of the operation. This is required by statute, which defines a reclamation plan as covering the proposed "mining operation." The "mining operation" means each and every facility and activity in connection with the development, extraction and processing of a mineral deposit and each use reasonably

incident to the development, extraction and processing of the mineral deposit. AS 27.19.100 provides (emphasis supplied):

> AS 27.19.100. Definitions. In this chapter,
> **(5)** "mining operation"
> **(A)** means each function, work, facility, and activity in connection with the development, extraction, and processing of
> **(i)** a locatable or leasable mineral deposit except oil, gas, or coal;
> **(ii)** other materials or of a sand and gravel deposit; and
> **(iii)** each use reasonably incident to the development, extraction, and processing
> of a locatable or leasable mineral deposit or materials;
> **(B)** includes the construction of facilities, roads, transmission lines, pipelines, and other support facilities;
> **(6)** "reclamation plan" means a plan submitted by a miner under regulations adopted by the commissioner for the reclamation of a proposed mining operation;

Both plan proposals and applications are incomplete and inadequate, as they only discuss the extraction site. By law, they must include a plan for waste management and reclamation for every part of the mining operation: the extraction site, the 248 miles of roads that will be used between extraction and processing, and the processing and disposal site.

In the meantime, a public hearing should be held to allow public comment on the entire proposed mining operation, including the transportation operation and the processing/disposal operation.

Attached and incorporated into this comment are the comments of the Environmental Protection Agency (EPA) to the Army Corps of Engineers (ACOE) about one year ago. The comments are still very valid even though ACOE disregarded them all and chose to ignore anything but 5 acres of wetlands in Tetlin. I incorporate by reference the EPA's comments into my own. I direct the EPA's comments to the DEC and DNR and ask that the two plans under consideration also respond to these requests and suggestions outlined by EPA for better protecting public health, safety and the environment. I believe other agencies may comment and ask that their comments also be addressed before any permits are allowed.

III. The acid-generating nature of the Manh Choh ore requires special oversight and handling which is lacking in both plans.

Neither plan adequately addresses the type of ore that the Manh Choh mine operation will excavate, transport 248 miles across Alaska, and process and dump as tailings near Fairbanks, in the Chena River drainage. Attached and incorporated by this reference into my own comments are those of Randy Brown. Unlike ore at Fort Knox, the Manh

Choh ore will be acid-generating. It poses health and environmental additional issues at each portion of the mining operation.

A. Extraction

At the extraction site, the “reclamation” plan is to leave an open south pit. EPA recommended filling this pit just as the north pit will be filled and covered with an impermeable layer. Otherwise, the waste rock and pit walls can generate sulfuric acid. There are no measurements or studies to show this will not happen at the open pit at Tetlin, even if it were filled with water. The pit water level could fluctuate, could overfill, and could leach or drain as acid mine drainage (AMD) from the pit site. (See article written by Randy Brown.) There is no discussion of rainfall, global warming effects on rainfall in this area, or seismic activity and how they will affect drainage of AMD from both pits.

As noted, AMD can last for hundreds or thousands of years after the mineral prospect has been exhausted and requires perpetual mitigation and monitoring to preserve water quality downstream. The applicant admits that groundwater from the pit will seep into perennial streams that flow into Tetlin Lake and the Tok River. The seven years of monitoring contained in the reclamation plan is inadequate for the extraction site, as is the amount of the bond. But certainly, monitoring and reclamation at the transportation and disposal sites need to be included.

There is inadequate identification of lessors/owners/ lessees/operators/managers and parties liable under any permits affecting the extraction location.

B. Transportation

The Manh Choh mining operation includes all the territory within 248 miles of public roads and city streets between the Manh Choh extraction operation and the Manh Choh processing and disposal operation. These roads and city streets cross numerous wetlands, streams, lakes, ponds, sloughs and rivers. In addition, the sheer number and size of the trucks will create hazards to public health and safety of those travelling on, living or being near the roadway.

The ownership of the land for this portion of the operation is different from the extraction site. The ramifications of differing ownership interests should be explored when considering waste management and reclamation duties of the applicant.

The Manh Choh mining operation will create from 100 - 200 new point sources of contamination - every day – on and alongside the roads used to truck the ore from Tetlin to Fort Knox. Trucking ore on 248 miles of highway will release (1) solids: rocks, sands and debris, as well as the acid-producing ore escaping from the trucks; (2) gaseous pollutants: dust, silica, particulate contamination, and greenhouse emissions;

and (3) liquids. Liquids from ore and the trucks will include: process wastewater used in transportation (such as for dust mitigation and cleaning), surface runoff from precipitation falling onto the trucks, ore, and roadways used, and leakage from incidental water used for machinery cleaning, cooling and dust suppression. The solids, gases and liquids all have the potential of travelling across and overland to surface water systems and to percolate into aquifers. Solids, liquids and gaseous pollutants will be deposited directly onto roads and bridges, and from there, into creeks, ponds, sloughs, lakes and rivers. The highways will become sources for contaminating the waters nearby. The highways and adjacent waters will become a disposal site for the ore from Tetlin, and a source for contaminants to spread to land, air and water nearby.

The applications and plans are incomplete by failing to include waste management and reclamation for this transportation part of the Manh Choh mining operation.

C. Processing and disposal

The Manh Choh mining operation's processing and final disposal site is the Fort Knox gold mine, where the Applicant will process and dispose of Manh Choh tailings and wastewater. Fort Knox is a totally different location and watershed than Tetlin, with different ownership interests. Again, there is no identification of owners, lessors, lessees, operators, or managers for this portion of the Manh Choh mining operation.

The soils, ores, weather, pollutants and contaminants at Fort Knox are not the same as those at Tetlin. (See, Brown article.) The mine processes and disposal safeguards at Fort Knox are not adequate or appropriate for acid-generating ore that is brought from Tetlin. The applicant assumes that its mill and waste sites at Fort Knox can handle ore from a different location without undertaking any study, analysis or disclosures about this, and without planning any additional mitigation or protection from AMD and other potential problems.

The Manh Choh mining operation also will also cause soils and pollutants from Fort Knox to be spread along the highway route all the way back to the Tetlin Extraction Site. There needs to be full disclosure and study of the pollutants and contaminants coming from the Fort Knox Mine Site to the rest of the mining operation locations before any plan is permitted. There needs to be full disclosure and study of the pollutants, contaminants and ores coming from both Tetlin and from Fort Knox.

IV. Acid-Generating Ore Contaminants, Heavy Metals and Other Pollutants Will be Released from the Trucks and Deposited On the Highways and Adjacent Aquatic Ecosystems

The Manh Choh mining operation will transport acid-generating ore on 248 miles of public roads miles to the Manh Choh processing and tailings dump at Fort Knox. The remnants of the ore remaining in the trucks after they are off-loaded, will then be hauled back to Tetlin. The contaminants in the ore will be released at all three locations: extraction, transportation and disposal sites.

These releases will be substantial within the transportation corridor, and the cumulative effects of the releases must be considered. The applicant has given varying numbers for truck transits but it has generally remained at 3-4 deliveries of ore per hour, 24/7/365. With the return trip to the extraction site, that means 52,560 to 70,080 ore truck transits per year (3 x 2 x 24 x 365 = 52,560; or 4 x 2 x 24 x 365 = 70,080). The number is staggering.

The trucks and the road will become new point sources for pollution. This many ore truck transits will be a significant source of pollution along the route and cause the highway and surroundings to become new sources of pollutants. The highway and adjacent land and waters will become a "disposal site" for the ore extracted from the Tetlin Extraction Site. This cannot be permitted without a full evaluation, and factual findings that the discharges will not adversely affect aquatic ecosystems adjacent to the highway corridor. Unless the Applicant proves there will be no harm, we must assume there will be harm.

Until the Applicant proves that its discharges of ore, pollutants and contaminants all along the transportation route will comply with federal and state law and regulations, they cannot be permitted. In evaluating whether the highway systems can be used for an industrial ore hauling operation, the state should identify and evaluate the characteristics of the roads, including how they relate to their living communities and human uses, and whether they are suitable for such an industrial ore haul.

III. The Public Highways Proposed for Conversion to the Manh Choh Industrial Ore Haul Roads are not Suitable or Safe for Hauling Ore

The Manh Choh mining operation plan is to transport gold ore from the Tetlin Extraction Site to the Manh Choh processing and disposal site at Fort Knox, thereby incorporating into the Manh Choh mining operation footprint, the following highways:

- Alcan Highway, Tetlin to Delta Junction
- Richardson Highway, Delta Junction to Mitchell Expressway
- Mitchell Expressway, from Richardson Highway to Peger Road
- Peger Road, from Mitchell Expressway to Johansen Expressway
- Johansen Expressway to Steese Highway
- Steese Highway to Fort Knox

About 200 miles of these highways are two lanes only; about 40 miles from Eielson Air Force Base through Fairbanks to Fox, have four lanes. The Applicant provides no assessment of these roads for its proposed industrial ore haul operation. The applicant provides no transportation plan, no traffic counts, no traffic impact analysis, no traffic safety analysis. It provides no safety plan. It does not discuss hazards created by weather, including snow, ice, wind, fog, rain and ice fog. It ignores the lack of daylight for much of the year. Between Tetlin and Eielson, the route is a two-lane highway, with narrow or no shoulders, dangerous curves, steep hills and short sight distances. It has a very few, very short, passing lane areas. Even if additional passing lanes are built,

there is no explanation how the travelling public can safely pass vehicles that are 95 feet long, especially if two or more are travelling together.

The Applicant ignores the safety of school children that school buses pick up and drop off twice a day, every school day, at the 100+ school bus stops on the highway corridor. This factor alone makes the road corridor proposed unsuitable for hauling ore on an industrial level.

The last 8 miles to Fort Knox from Fairbanks are very challenging and dangerous to drive. The two-laned road ascends to Cleary Summit at a very steep grade and has a hairpin curve at Skoogie Gulch. Single loads cannot negotiate that curve without crossing over into the oncoming lane. Residents at Cleary are worried about the lack of safety of this stretch of road. During ski season, Skiland Resort brings many skiers to Cleary every weekend, holiday and at Christmas and Easter breaks. Twice a day, employees of Poker Flat Research Range will be forced to follow these large trucks as they slowly climb up to Cleary Summit. Even worse, they will have to avoid a head-on collision with a truck that has crossed over the center line to negotiate the curve at Skoogie Gulch. While the applicant posed the possibility of building a separate road to Fort Knox from Fox, that plan has not been confirmed.

The Applicant's transportation portion of its mining operation presents an unacceptable danger to highway users at this location and elsewhere along the proposed route. If the Proposal and Permit requests are not denied outright, then a hearing is desperately needed to understand these safety issues, have an independent review of them, and to protect the public.

Each truck is projected to weigh 80 tons loaded and 30 tons unloaded.

The Applicant provides no analysis of the roads and bridges it proposes to use, and whether they can accommodate and hold up to the equipment size, weight and number of trucks it proposes. Three bridges were built in 1944 along the route. Can they withstand the number of truck trips and weight the Applicant plans to haul? Since the state plans to replace 5 bridges along the route, it hardly seems suitable for such an industrial ore haul before the bridges have been replaced.

Will the weight and number of truckloads of ore and returning trucks cause the bridge structures to fail? What damage will be done to road surfaces by the weight and numbers of trucks across 248 miles? What plan for repairing this damage does the Applicant offer? What safety improvements does the Applicant propose, to shore up, maintain and restore the infrastructure? None.

Special skills are required to drive long wheelbase, double trailer trucks in Alaska. How will the Applicant find specialized drivers when there is a nationwide shortage of regular truck drivers? What will happen in case of an equipment breakdown, or need to stop on a highway that provides no space to pull over? In inclement weather, 17 AAC 25.014(e)(1) requires long combination vehicles, like those the Applicant will use, to

stop operations. There are very few places along the road where a truck can pull over and get off the road surface safely. Will they have to stop on the highway? During snow periods, think of how dangerous it will be for other drivers to meet or follow – much less pass - one of these trucks billowing snow.

How will the Applicant control the timing and spacing of the trucks on the highway? They will naturally bunch and stack up, as will traffic behind them. This will not only increase the likelihood of motorists being forced to pass one or more of these 95-foot trucks on the two-lane highway, but will be a genuine inconvenience to the motoring public. Within communities along the route, the additional traffic will undoubtedly cause traffic congestion, and more air pollution in the Fairbanks-North Pole serious non-attainment area.

The Applicant also fails to analyze how this number of additional truck trips can be accommodated in view of substantial construction projects planned for the same time period when the trucks will be operating. The Alaska Department of Transportation has announced the reconstruction of the bridges over the Robertson, Johnson and Gerstle Rivers, the northbound Richardson bridge over the Chena Flood Control Project, and the Steese bridge over Chena Hot Springs Road. There will also be construction on the Richardson and at the GARS and Steese/Johansen intersections. If the mining operation does not wait for these projects to be completed, how will traffic be accommodated? How will the Applicant deal with the delays and prevent traffic congestion and stack-up of vehicles at these locations? We doubt it would be possible.

The Applicant's mining operation plan is clearly contrary to the public interest and should be denied approval.

Before any determination is made concerning the traffic and public safety of this Plan, an independent review of all its aspects - a risk analysis, a highway safety analysis, a cost-benefits analysis – needs to be completed. One has commenced but may not be completed before the Manh Choh mining operation's hoped-for starting date in 2024. We submit that the dangers, adverse impacts and inconvenience of the Manh Choh mining operation to the public and the environment will clearly outweigh the benefits the mine owners hope to achieve. The Manh Choh mining proposal is contrary to the public interest, and all permits allowing it to proceed should be denied.

IV. Waters of the United States and Their Aquatic Ecosystems Will be Adversely Affected by the Manh Choh Mining Operation

The following are waters, including anadromous waters, that could easily be harmed by the Manh Choh mining operation.

A. Navigable Waters
   Chena River, Little Chena River and Noyes Slough
   Tanana River and its sloughs
   Chatanika River

B. Lakes. At least two of these are stocked with fish by the State of Alaska.
   Tetlin Lake
   Quartz Lake
   Birch Lake
   Lost Lake
   Harding Lake
C. Ponds
   Bathing Beauty Pond
   Gravel pits
D. Streams, Creeks, and Rivers with Bridges Across. ***** signifies those bridges to be replaced with state/federal funds for the "Tetlin to Fort Knox Corridor"
   Tok River
   Yerrick Creek
   Cathedral Rapids # 1, 2, 3
   Sheep Creek
   *Robertson River (bridge built in 1944)
   Bear Creek
   Chief Creek
   Berry Creek
   Sears Creek
   Dry Creek (bridge built 1957)
   *Johnson River (bridge built in 1944)
   Little Gerstle River
   *Gerstle River (bridge built 1944)
   Sawmill Creek
   Tanana River Big Delta
   Shaw Creek
   Banner Creek
   Salcha River
   Clear Creek
   Munson Slough
   Little Salcha River
   Moose Creek
   Chena Flood Channel
   Chena River
   *Richardson northbound bridge at Chena Flood Control Project
   *Steese bridge over Chena Hot Springs Road
E. Wetlands.

V. The Communities Along the Highways Will Be Adversely Affected by Dangerous Traffic, Noise and Pollution

The Manh Choh mine's transportation proposal using ore haul trucks will cause unnecessary and dangerous hazards for communities along the route, and for all

humans anywhere near the highways – the driving public, people living nearby, and anyone anywhere in the vicinity of the truck route. These communities include Tok, Tanacross, Dot Lake, Delta Junction, Whitestone Farms, Birch Lake, Lost Lake, Harding Lake, Salcha River, Eielson Air Force Base, Moose Creek, North Pole, Fairbanks and Fox.

What emissions and noise will each truck cause? What volume of emissions and noise will the large numbers of trucks and trips cause? The Applicant supplies no analysis of this. Yet, additional emissions will impact both North Pole and Fairbanks, which are listed as "Serious Non-Attainment Areas" for particulates. What effects will the additional particulates have on the status of each community with regard to air quality regulations? Will they cause the two communities to be limited as to other economic development because of the Manh Choh pollution? How much more ice fog will the trucks generate as they travel through the middle of North Pole and Fairbanks? No decision on the Manh Choh mining operation should be made without an analysis of the volume of particulates and other emissions that will be added to the communities along the highway route.

In addition to particulates, the communities should know what to expect in terms of additional noise and emissions: dust, particulates, greenhouse gases, silica, ice fog, etc. The Applicant needs to disclose what will be released within the communities along the highway route. Everyone near the route - schoolchildren at their 208 school bus stops twice a day, military personnel in open convoys, the motoring public, tourists and residents – all will be adversely impacted by the emissions from the huge volume of new industrial truck traffic.

The proposed huge increase in industrial ore haul traffic everywhere along the route will cause additional accidents and additional problems for emergency services providers. The Applicant provides no plan for addressing these concerns.

The Alcan and Richardson Highways are very important links in Alaska's limited road infra-structure. They provide links to the Lower 48 through Canada and to tidewater at Valdez and to Anchorage. Many communities rely upon this road corridor even though they sit some distance from it: Eagle, Healy Village, Fort Greeley, and Paxson, to name a few. The Alcan/Richardson is the only road link for some of these communities to food, medical and other services. A closure of the road or a bridge would be a devastating event for these communities, but the trucking plan proposed by the Applicant makes such a closure a very real possibility. What alternatives does the Applicant propose if one or more of its trucks or truck trips causes a bridge failure or road closure? None are suggested by the Applicant. To adequately analyze all safety aspects of the Applicant's ore hauling plan, we ask for an independent analysis to be undertaken of the Manh Choh transportation plan. All traffic, health and safety concerns must be analyzed, before any permits are approved for the Manh Choh mining operation, or any portion of it.

As mentioned previously, the Applicant supplies us with no reliable and comprehensive analysis of the impacts of the noise/vibration, traffic and pollution that the transportation portion of its mining operation will cause, whether upon human populations, fish and aquatic ecosystems, wildlife and vegetation along the route. These all will be impacted by noise, vibration and pollutants caused from the trucks. One only has to wonder how many moose and other animals, aquatic species and birds will be killed directly by 70,000 truck transits across 248 miles of Alaska. We doubt that figure will be insignificant. The Applicant should provide an answer to these questions, so that these impacts are analyzed and considered in any determination on any permits for the Manh Choh mining operation. Without the information and analysis, all applications must be denied.

VII. The Applicant Refuses to Consider Alternatives, But They Exist

We just asked, "How many moose will die?" But the real question for me is, "How many people will die?" How many people will die or be injured because of 70,000/year industrial ore haul truck trips across 248 miles of Alaskan highways? Even one would be too many. Yes, there are the environmental and health concerns. But for me, the public safety issue is uppermost. The Manh Choh mining operation's transportation operation will jeopardize human lives, human health and the environment. Because of this, any permits for the Manh Choh mining operation should be denied. The Applicant should be required to develop an alternate plan that does not put the public at such an unreasonable risk for adverse impacts.

There are several alternatives that the Applicant has advised it is not considering:

- **Process on or near Extraction Site.** The Applicant originally considered a plan to process the ore at the Tetlin Extraction Site. This would lessen the mining operation's Footprint by more than 248 miles, and eliminate the need to address AMD at the processing/disposal site at Fort Knox. Processing on site is the traditional method for dealing with gold ore, and usually proves to be the only economic way to mine for gold. The Applicant wants to use infrastructure it has developed at Fort Knox, 248 miles away. But to get there, the environmental footprint of its operation expands by that same 248 miles, putting communities at risk, adversely impacting human health and safety and the environment all along the way. Processing at or near the extraction site is the logical, better alternative to the mining operation proposed by the Applicant. The footprint would be much smaller. The land can be reclaimed. And residents and visitors all along the proposed corridor and in the drainage below Fort Knox will not have to face all the adverse effects that the proposed transportation and processing/disposal components of the Manh Choh mining operation.

  The Applicant has claimed that building a mill and tailings disposal facility near Tetlin would make the project unfeasible. This is not true. The enclosed notice of a 2018 feasibility study by the prior owner of Peak shows that such an

alternative is feasible, particularly since gold is now at about $1800/ounce, rather than $1250 when the study was completed.

- **Extend the Railroad to Tetlin.** The Alaska Railroad already has an approved Record of Decision from the Surface Transportation Board to extend the railroad from North Pole to Delta Junction. The Alaska Railroad could apply to further extend the railroad from Delta Junction to Tetlin. It has long been a dream of Alaskans to have a rail link to the Lower 48 and extending the line to Delta Junction and Tetlin would advance that goal. Railroads are traditionally the method of hauling ore, coal and similar materials, in a safer manner than highway trucking.
- **Create a Pioneer Road along the Railroad Right-of-Way, or Elsewhere, Between Fort Knox and Tetlin.** AIDEA is in the business of building industrial roads. It finances construction of roads to a new development, and then the developer repays AIDEA over time, as part of the cost of developing a viable, safe, and reliable transportation route to the mine or other operation. There are other potential gold mining sites in or off the Richardson Highway/Alcan road corridor. We understand these include prospects include Richardson, Shamrock, Eagle-Hona-Triple Z, and Lucky Shot. There may be others. These could be tied into such a development road, and all that traffic kept off the public highways. The Alaska Railroad right-of-way, already in existence, could be used for a pioneer road, and later built with a railroad line. Or, a spine road from Chicken to Fort Knox could be built. In this way, if trucking is preferred to rails, the trucks could operate on an industrial road and not put the public at risk by using public highways or converting them to ore haul roads.
- I have wondered what new technologies, used elsewhere, might more safely transport Manh Choh ore or concentrates than our public highways. Long distance conveyors have been used elsewhere. And one Canadian firm plans to use a hybrid air ship, to provide transportation for ore concentrates from the extraction to the processing site. But the most logical and common sense alternative is to process the ore at or near the Tetlin Extraction site, thereby eliminating any need to transport ore 248 miles at risk to the public.

In summary, I ask DEC and DNR to find that the proposed permits for, and the Manh Choh mining operation, consisting of the Tetlin extraction Site, 248 miles of public highway and adjacent waters, and the processing/disposal site at Fort Knox, would be contrary to the public interest. The permits must be denied.

In separate letters, I have outlined other reasons for denying the permits. But for this reason alone, they should be denied. The state should conduct an EIS of the entire proposed mining operation first. The EIS should include the state's plans to use federal and state money to construct bridges and passing lanes to accommodate Manh Choh. All supervisory agencies and the public should analyze the plans and the negative impacts they will have on public health, safety and the environment. When that is done,

and the alternative methods of conducting the mining operation are considered, this plan to transport acid-producing ore and dispose of it 248 miles away from the extraction site, should not be permitted, as it is contrary to the public interest.

I also ask for a public hearing and for additional time to comment after the public notice is corrected and all studies and reports are made available to the public online.

Sincerely,

Barbara Schuhmann

EPA Requests to ACOE
Randy Brown article
2018 Royal Gold press release re: Peak Gold

NEWS RELEASE

ROYALGOLD,INC

World Class Royalty Company

Royal Gold Announces Preliminary Economic Assessment for the Peak Gold Project

DENVER, COLORADO. SEPTEMBER 24, 2018: ROYAL GOLD, INC. (NASDAQ:RGLD) (together with its subsidiaries, "Royal Gold" or the "Company") is pleased to report that the Peak Gold, LLC joint venture ("Peak Gold"), of which our Royal Alaska, LLC subsidiary ("Royal Alaska") owns a 40% interest, has completed a Preliminary Economic Assessment ("PEA")[1] on the Peak Gold Project (the "Project") located near Tok, Alaska. The PEA presents a robust open pit mining operation with attractive economics at base case gold and silver prices. All results presented herein are on a 100% Peak Gold basis.

PEA Highlights

Highlights of the PEA results, assuming base case metal price parameters of US$ 1,250 per ounce of gold and US$ 17.00 per ounce of silver, include:

- Pre-tax NPV5% of US$ 393 million and IRR of 37.0%;
- After-tax NPV5% of US$ 283 million and IRR of 29.1%;
- Mine life of 8 years with a 24-month pre-production period;
- 9.3 million tonnes processed at an average grade of 3.99 g/t gold and 11.7 g/t silver;
- Average metallurgical recoveries of 91.6% for gold and 57.0% for silver;
- Life of mine recovered gold of 1.093 million ounces and 1.996 million ounces of silver;
- Life of mine strip ratio of 3.9 tonnes of waste to tonnes of material processed;
- Life of mine total cash cost of US$ 428 per ounce of gold recovered, and US$ 470 per ounce of gold recovered including sustaining capital;
- Life of mine capital cost of US$ 340 million, consisting of US$ 294 million of initial development capital, and sustaining capital and closure costs of US$ 46 million; and
- After-tax payback period for initial development capital of approximately 2 years.

The PEA was prepared by JDS Energy and Mining Inc. ("JDS") of Vancouver, British Columbia, Canada.

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[1] The results of the PEA are preliminary in nature and are based on various assumptions. These assumptions may be affected by environmental, permitting, geological, metallurgical, legal, title, taxation, socio-political, market or other relevant factors, including changes in metal prices. In addition, no decision has been made by Peak Gold to proceed with the mine plan described in the PEA. A decision to proceed with the mine plan would require further economic and resource study. No decision has been made by Peak Gold to proceed with a further economic and/or resource study. Accordingly, there is no certainty that the results of the PEA will be realized even if Peak Gold decides to proceed with the mine plan described in the PEA at any point in the future.

"The results of the PEA are a significant milestone and show that the Peak Gold Project is one of the most interesting emerging gold projects in the United States," commented Tony Jensen, President and CEO of Royal Gold. "The combination of robust grade, near-surface open-pit resource, and a large and prospective land package located close to existing infrastructure, makes the Peak Gold Project unique. Royal Gold is committed to this exciting Project over the long term and will focus on opportunities to realize the value of our interest in a manner more closely aligned with our core business model."

PEA Overview

The PEA considers a conventional truck and shovel open-pit mining operation covering the North, Main and West Peak deposits, feeding a 3,500 tonne per day processing plant with two-stage crushing, grinding and a carbon in leach ("CIL") recovery circuit, with production of gold-silver doré bullion on site. The PEA is based on an update of the mineral resource[2] estimate for the Peak and North Peak deposits previously announced by Royal Gold in our June 2, 2017 press release.[3]

PEA Parameters and Economic Results

The main parameters and results of the PEA are summarized in the following table:

Assumptions		
Gold price	$/ounce	$1,250
Silver price	$/ounce	$17.00
Production Profile		
Mine life	years	8
Total tonnes milled	million tonnes	9.3
Diluted gold grade	g/t	3.99
Diluted silver grade	g/t	11.7
Mill throughput	t/day	3,500
Gold recovery	%	91.6
Silver recovery	%	57.0
Recovered gold	million ounces	1.093
Recovered silver	million ounces	1.996
Average annual gold production	ounces/year	136,700
Average annual silver production	ounces/year	249,500

[2] The PEA was prepared in accordance with Canadian National Instrument 43-101 (NI 43-101). The terms "mineral resource", "measured mineral resource", "indicated mineral resource" and "inferred mineral resource" as used in the resource estimate, the PEA and this press release are Canadian mining terms as defined in accordance with NI 43-101. The U.S. Securities and Exchange Commission (SEC) does not recognize these terms. "Resources" are not reserves under the SEC's regulations but are categorized under the securities laws regulations of various foreign jurisdictions (including NI 43-101), in order of increasing geological confidence into "inferred resources", "indicated resources", and "measured resources". Investors are cautioned that resources cannot be classified as mineral reserves unless and until further drilling and metallurgical work is completed, until other economic and technical feasibility factors based upon such work have been resolved and it is demonstrated that they may be legally and economically extracted and produced, and, as a result, investors should not assume that all or any part of the mineralized material in any of these categories referred to in the resource estimate, the PEA and this press release will ever be converted into mineral reserves. In addition, the SEC normally only permits issuers to report mineralization that does not constitute mineral reserves as in-place tonnage of mineralized material and grade without reference to unit amounts of metal.

[3] The "Main Peak" and "West Peak" deposits were previously referred to as the "Peak" deposit in the June 2, 2017 resource estimate.

Operating Costs		
Life of mine average total cash cost	$/oz gold	428
Life of mine cash cost + sustaining cost	$/oz gold	470
Capital Costs		
Pre-production capital cost	$ million	294
Sustaining capital cost + Closure	$ million	46
Project Economics		
Royalties	% of NSR	5.75
Alaska State Tax / Federal Tax	%	9.4% / 21%
Pre-Tax:		
NPV5%	$ million	393
IRR	%	37.0
Payback period	years	1.5
Post-Tax:		
NPV5%	$ million	283
IRR	%	29.1
Payback period	years	2.0

Economic Sensitivities

Sensitivity of the estimated post-tax NPV5% to changes to significant value drivers is shown below:

Parameter varied:	Post-Tax NPV5% ($ million)				
	-20%	-10%	PEA Base Case	+10%	+20%
Gold price	129	206	283	358	433
Capital cost	348	315	283	250	217
Operating cost	327	305	283	260	236

Mineral Resource

The PEA is based on the resource estimate prepared by Independent Mining Consultants, Inc. and reported by Royal Gold on June 2, 2017. The resource estimate was updated using operating costs, pit slope estimates and metal recoveries consistent with the PEA parameters in September of 2018, resulting in a revised resource estimate, which is summarized in the table below:

Resource Classification	Tonnes	Grade			Contained Metal		
	(000)	Gold (g/t)	Silver (g/t)	Copper (%)	Gold (000 ounces)	Silver (000 ounces)	Copper (M lb)
Measured (M)	473	6.39	16.71	.148	97.1	254.0	1.5
Indicated (I)	8,728	3.96	14.06	.153	1,110.9	3,944.8	29.5
Total M + I	9,201	4.08	14.19	.153	1,208.1	4,198.8	31.0
Inferred	1,344	2.69	16.06	.151	116.4	694.1	4.5

The estimates of measured and indicated resources assumed metal prices of $1,400 per ounce gold and $20.00 per ounce silver for development of the pit shell. The cutoff grades used to define resources were 0.74 g/t gold equivalent for the Main Peak deposit and 0.66 g/t gold equivalent for the North Peak deposit.

Capital Costs

The PEA is based on a capital cost summary with an estimated accuracy of +/- 30%, which is shown in the table below:

Capital Item	Pre-Production ($ million)	Sustaining ($ million)	Total ($ million)
Mining	28.8	9.1	37.9
Site Development	4.9	-	4.9
Crushing and Reclaim	8.5	0.5	9.0
Tailings Management	8.9	20.3	29.2
Processing Plant	54.8	2.5	57.3
Infrastructure	56.3	5.0	61.3
Project Indirects	45.0	0.1	45.1
Engineering and Project Management	16.1	-	16.1
Owner's Costs	21.5	-	21.5
Subtotal	**244.8**	**37.4**	**282.2**
Contingency	49.0	-	49.0
Closure	-	8.4	8.4
Total Capital	**293.8**	**45.8**	**339.6**

Pre-production capital reflects the required investment to develop the Project through to production. Sustaining capital is for the entire life of mine and includes equipment, spare parts, expansion of the tailings management facility, water management and closure costs.

Mining

The PEA assumes conventional open pit truck and shovel mining, and production designed to achieve a processing rate of 3,500 tonnes per day. The average mining rate assumed by the PEA is 15,000 tonnes per day of total material mined, with a maximum of 22,000 tonnes per day occurring in years 3 through 6.

The mine design assumed by the PEA will consist of two pits, with a mining sequence intended to maximize grade in the early years, reduce stripping requirements and maintain the processing facility at full production capacity. Operations would begin at the North Peak deposit and transition in year three to a single pit comprising the Main and West Peak deposits for the remainder of the mine life.

The primary owner-operated diesel mine fleet is designed to consist of 64 tonne capacity haul trucks, 7.0 m^3 front shovels, a 7.0 m^3 front end loader and 127 mm diameter drills. The ancillary mine fleet would consist of track dozers, graders, wheel dozers and water trucks.

Processing

The PEA assumes mineralized material would be processed using a two-stage crushing circuit, a two-stage grinding circuit, and a CIL circuit. Run of mine material would be fed to a primary jaw crusher, after which oversize material would be fed to a secondary cone crusher. Fine mill feed would report to a primary rod mill to be mixed with cyanide, cement and milk of lime. The feed mixture would then proceed to a secondary ball mill, after which it would enter a grinding thickener followed by a five-stage leach/adsorption circuit. Gold and silver would be recovered from the leach solution and smelted in an induction furnace to produce doré bullion.

The PEA assumes CIL tailings would be pumped to a tailings thickener to remove process water and recover free cyanide for reuse in the plant. Thickened tailings would be detoxified and then pumped to the tailings management facility ("TMF") for storage. The TMF would be lined with a synthetic geomembrane liner and would have foundation and underdrain systems to minimize and control potential seepage. The tailings embankment would be raised continuously over the mine life and would be designed to allow capacity for future expansion, if required.

Project Infrastructure

The PEA assumes general infrastructure for the Project would support operations on a 24 hour per day, seven day per week basis. Major infrastructure items would include:

- Site access road connecting to the Tetlin Village road and the Alaska Highway, with upgrades to the existing site access road over a 10-kilometer distance;
- Haul roads for waste and mill feed materials sized to accommodate 65 tonne trucks;
- Maintenance, warehouse, administration, laboratory, security and first aid buildings;
- Plant facilities, including the crushing and grinding circuit, conveying equipment, and refinery;
- Ancillary facilities, including a truck shop, explosives storage and fuel storage;
- Power line from Delta Junction to a site substation (approximately 160 kilometers) to supply a total connected load of 8 MW;
- Camp accommodations in Tok for the portion of the workforce that does not come from Tok, Tetlin and the surrounding areas;
- Water supply and management system to minimize water discharge from the site;
- Lined TMF, constructed with an initial capacity for two years of tailings, with staged construction in subsequent years to increase storage capacity as required; and
- Waste rock storage areas to allow segregation of waste depending on its characteristics.

Operating Costs

The PEA is based on assumed life of mine operating costs by activity area, as shown in the table below.

Operating Costs	$/tonne Processed	$/ounce Gold
Mining	14.91	127
Processing	21.58	184
G&A	7.73	66
Royalties	8.58	73
Refining	1.10	9
By-product Credits	(3.64)	(31)
Total Cash Cost	**50.26**	**428**
Sustaining Capital + Closure	4.92	42
Cash Cost + Sustaining Capital	**55.18**	**470**

Under the mineral lease for the Project, Peak Gold would pay a production royalty based on net returns of mineral production from the lease area. The production payment rates under the lease for precious metals are currently 2.25% of net returns for the first four years of production, 3.25% of net returns for years five through seven inclusive, and 4.25% of net returns for year eight and any following years. These royalty rates can be increased at the option of the royalty holder to 3.0%, 4.0% and 5.0%, respectively, with the payment of an additional $150,000, $300,000 and $400,000 to Peak Gold for each respective royalty period, before July 15, 2020.

In addition, Peak Gold would pay a royalty to Royal Gold at a rate of 3.0% of net smelter returns on mineral production from the lease area underlying the project considered in the PEA.

Permitting

Peak Gold holds the required permits and approvals to continue exploring the areas comprising the Project. The collection of baseline water quality data, material characterization analysis and wetlands determination has progressed since 2012. A more comprehensive baseline data collection program is being contemplated for 2019.

Project Enhancement Opportunities

Several opportunities have been identified that could enhance the project considered by the PEA, including:

- Expansion of the mine through delineation or development of additional mineral resources;
- Pit slope steepening to improve the assumed waste to mill feed strip ratio;
- Optimization of the assumed mine plan and development schedule; and
- Potential recovery of copper.

About Peak Gold

Peak Gold is a joint venture between Royal Alaska and CORE Alaska, LLC ("CORE Alaska"), a wholly-owned subsidiary of Contango ORE, Inc. Peak Gold holds a 675,000 acre lease with the Native Village of Tetlin and an additional 175,000 acres of State of Alaska mining claims, all located near Tok, Alaska, on which Peak Gold explores for minerals. Royal Alaska holds a

40% membership interest in Peak Gold and is the manager of the joint venture. CORE Alaska holds a 60% membership interest in Peak Gold. Royal Gold also holds a 13.2% equity interest in Contango ORE, Inc., and royalties of 3.0% of net smelter returns on mineral production from the lease and certain State of Alaska mining claims held by Peak Gold and 2.0% of net smelter returns from certain other State of Alaska mining claims held by Peak Gold.

About Royal Gold

Royal Gold is a precious metals stream and royalty company engaged in the acquisition and management of precious metal streams, royalties, and similar production-based interests. As of September 1, 2018, the Company owns interests on 191 properties on six continents, including interests on 40 producing mines and 18 development stage projects. Royal Gold is publicly traded on the Nasdaq Global Select Market under the symbol "RGLD." The Company's website is located at www.royalgold.com.

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Cautionary "Safe Harbor" Statement Under the Private Securities Litigation Reform Act of 1995: With the exception of historical matters, the matters discussed in this press release are forward-looking statements that involve risks and uncertainties that could cause actual results to differ materially from projections or estimates contained herein. Such forward-looking statements include: statements about the PEA presenting a robust open pit mining operation with attractive economics at base case gold and silver prices; statements about highlights of the PEA results summarized in this press release regarding assumed gold and silver prices, after tax NPV, mine life, tonnage, grade, average metallurgical recoveries for gold and silver, life of mine recovered gold and silver, life of mine operating cash cost per ounce of gold recovered, per ounce of gold recovered including sustaining capital, life of mine capital cost, consisting of initial development capital, sustaining capital and closure costs, and after-tax payback period for initial development capital; statements about the PEA results being a significant milestone and showing that the Peak Gold Project is one of the most interesting emerging gold projects in the United States; statements about robust grade, near-surface open-pit resource, and a large and prospective land package located close to existing infrastructure, making the Peak Gold Project unique; statements about Royal Gold being committed to this exciting Project over the long term and focusing on opportunities to realize the value of our interest in a manner more closely aligned with our core business model; statements about the main parameters and results of the PEA summarized in this press release regarding assumed gold and silver prices, production profile, mine life, total tonnes milled, diluted gold and silver grade, mill throughput, gold and silver recovery, recovered gold and silver, average annual gold and silver production, operating costs, life of mine average total cash cost, life of mine cash cost plus sustaining cost, pre-production capital cost, sustaining capital cost plus closure cost, project economics, royalties, Alaska State tax and Federal tax, pre-tax NPV, IRR and payback period, post-tax NPV, IRR and payback period; statements about sensitivity of estimated post-tax NPV to changes to significant value drivers, including gold price, capital cost and operating cost; Estimates of measured, indicated

and inferred resources for the Peak Gold Project and assumed metal prices for gold and silver used to develop the pit shell, and cut off grades used to define the resource for the Main Peak and North Peak deposits; and statements about the PEA being based on a capital cost summary with an estimated accuracy of +/- 30%; and statements about mining, processing, project infrastructure, operating costs, permitting and project enhancement opportunities. Like any joint venture or other interest on a non-producing or not-yet-in-development project, our interests in the Peak Gold Project and the results in the PEA and related statements are subject to numerous and substantial risks, such as the ability of an operator to progress the project successfully to feasibility, develop the project into a mine and bring the project into production and operate in accordance with feasibility studies, and the ability of Royal Gold to obtain value for its interest in the Peak Gold Project. Additional factors that could cause actual results to differ materially include, among others, precious metals and copper prices; the ability to find an operator to develop the project and finance project construction to completion and bring the project into production as expected; operator's delays in securing or inability to secure necessary governmental permits; decisions and activities of the operator of the project; unanticipated grade, environmental, geological, seismic, metallurgical, processing, liquidity or other problems the operator may encounter; completion of feasibility studies; changes in the operator's project parameters as plans continue to be refined; changes in estimates of reserves and mineralization by the operator; risks associated with conducting business on Tribal lands ; changes in laws governing the project; and other subsequent events; as well as other factors described in the Company's Annual Report on Form 10-K, Quarterly Report on Form 10-Q, and other filings with the Securities and Exchange Commission. Most of these factors are beyond the Company's ability to predict or control. The Company disclaims any obligation to update any forward-looking statement made herein. Readers are cautioned not to put undue reliance on forward-looking statements.