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TRIBES OF BRISTOL BAY



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By Email and Post

Col. Phillip Hibner
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RE: New Technical Information Relevant to the Environmental Review for the Pebble Mine

Dear Colonel Hibner:

We write to you on behalf of the undersigned member organizations (collectively, the “Bristol Bay Defense Alliance (“BBDA”)) regarding the United States Army Corps of Engineers’ (“USACE”) and the cooperating agencies’ environmental review under the National Environmental Policy Act (“NEPA”) for the Pebble Limited Partnership’s (“Pebble”) application to discharge fill material into waters of the United States for the purpose of developing a mine project in the Bristol Bay region of Alaska (the “Proposed Pebble Mine”). Specifically, we write to provide the USACE and the cooperating agencies with significant new information demonstrating that the analysis in the draft Environmental Impact Statement (“DEIS”)—and more recent supporting documentation provided by Pebble—fails to take the required hard look at seismic risks to the Proposed Pebble Mine and its massive tailings storage facilities (“TSFs” or “tailings dams”) and the impacts to the pristine Bristol Bay watershed.

A team of internationally recognized seismologists and geotechnical engineers who have consulted with governments and industry around the world made findings that include:

- The seismic studies conducted for the Proposed Pebble Mine are obsolete and are not adequate as basis for project environmental and permit review. Those studies use seismic models that are no longer in use and also failed to collect information about seismic activity at the location of the mine.
- Pebble’s tailings dam stability analysis drastically understates the risk related to dam stability because it falsely locates the water table in an impossible location far below the

tailings dam embankment. An earthen dam would present even greater stability concerns than a rockfill dam.

- Pebble's technical proposal violates standard tailings dam construction practices by using waste rock from the mine for construction. The proposed design creates a grave risk of river acidification and metal contamination in the normal operation of the facility.

To further the USACE's and cooperating agencies' review, we present a state of the art new analysis by widely recognized seismic experts. The new analysis has been peer reviewed by leading experts and is based on the best available science of the seismic issues at the location of the Proposed Pebble Mine. Given the serious flaws in Pebble's seismic hazard and tailings dam stability analyses for the Proposed Pebble Mine, this new analysis is the only credible information from which the USACE can evaluate seismic risks and the potential for and significant ecological impacts to the Bristol Bay watershed and its unrivaled salmon fishery from a catastrophic failure of the Proposed Pebble Mine's massive tailings dams.

Beyond its ecological importance, the Bristol Bay salmon fishery generates immense economic value. Each year, the Bristol Bay commercial sockeye fishery generates revenue of \$1.2 billion and employs nearly 15,000 people in Alaska. The undersigned organizations comprising the BBDA will be directly affected by the Proposed Pebble Mine's significant environmental impacts on their businesses, community, and way of life.

The BBDA requests that the USACE and the cooperating agencies meaningfully consider the information in this letter and its enclosures by issuing a Supplemental EIS that adequately discloses the seismic risks to the Proposed Pebble Mine's critical infrastructure, including its massive TSFs, and the likely catastrophic environmental harm that would result.

I. Introduction

TSF failures constitute a significant risk for *any* mining tailings dam in the world, regardless of site-specific geography, geohazards, and ecological values. But the risks posed by the Proposed Pebble Mine are unique, profound, and demand thorough examination by regulators and the public. In the heart of the pristine Bristol Bay watershed—responsible for producing the largest salmon runs in the world and for supporting a world-class, sustainable salmon fishery—Pebble proposes constructing one of the world's largest copper mines and highest earthen mine tailings impoundments to hold back toxic mine tailings waste in area with significant earthquake and other geohazards hazards. Given this reality, it should go without saying that proper NEPA environmental review of the Proposed Pebble Mine should undertake rigorous analysis of the serious potential for catastrophic failure of the Proposed Pebble Mine's TSFs and the devastating impacts such failure would have on the sensitive ecosystem and its salmon fishery.

Unfortunately, the record before the USACE is replete with inaccuracies and is not sufficient to support the proper evaluation of the extreme seismicity in the Project area and related risks and impacts to the Proposed Pebble Mine's infrastructure and operations and surrounding environment. It is therefore imperative that the USACE, the U.S. Environmental Protection Agency (EPA) and other cooperating agencies, consider the information contained in this letter and its enclosed technical reports—prepared by world-renowned seismic hazard experts—in evaluating the potential for significant and unacceptable impacts on the Proposed Pebble Mine's TSFs and the Bristol Bay watershed's pristine ecological system, including its unrivaled salmon fisheries.

Below, we provide the following information and analysis to help the USACE, EPA, and the cooperating agencies, conduct the necessary thorough examination of the Proposed Pebble Mine's potential for significant impacts:

- (1) A description of the undersigned organizations comprising the BBDA, their connection to the Bristol Bay watershed and its life-sustaining salmon fishery, and their collective concerns with the Proposed Pebble Mine's unacceptable impacts;
- (2) A summary of the new information in the attached technical reports prepared by world-renowned experts on seismic impacts to infrastructure and geotechnical engineering, which demonstrate that the analysis in the DEIS and its supporting documents dramatically underestimated the potential for catastrophic damage resulting from seismic activity; and,
- (3) In light of this significant new information, we urge the USACE, in coordination with the cooperating agencies, to meet its NEPA obligations and prepare and circulate for public comment a Supplemental EIS that takes the requisite hard look at the likely significant impacts from the Proposed Pebble Mine.

II. BBDA And Its Member Organizations

Collectively, BBDA and its members and supporters live and/or work in Bristol Bay and near the location of the Proposed Pebble Mine and have long-standing interests in the world-class fisheries of Bristol Bay. Below, we introduce each member organization comprising the BBDA and their interests relative to the Proposed Pebble Mine and Bristol Bay's pristine ecosystem and its one-of-a-kind salmon fishery.

Bristol Bay Economic Development Corporation ("BBEDC") is a 501(c)(4) non-profit corporation whose mission is to promote economic growth and opportunities for residents of its member communities through sustainable use of the Bristol Bay and Bering Sea resources. BBEDC undertakes programs and management to foster economic and social benefits for the residents and

communities of Bristol Bay in order to ensure sustainability of the region's renewable natural resources, including its salmon fisheries and other fish stocks and fisheries.

Bristol Bay Native Association, Inc. ("BBNA") is a non-profit corporation serving 31 federally recognized tribes in the Bristol Bay regions in southwest Alaska. BBNA's mission is to advance the social, cultural, and economic interests of the Tribes and Alaska Native people of the Bristol Bay Region, including by prioritizing protection of Bristol Bay's salmon fisheries (commercial, subsistence, and sport) and salmon habitat in all land management decisions.

United Tribes of Bristol Bay ("UTBB") is a tribally chartered consortium of 15 federally recognized tribal governments in Bristol Bay that represent over 80% of the population of Bristol Bay. UTBB's mission is to protect the Yup'ik, Dena'ina, & Alutiiq indigenous way of life from unsustainable development in Bristol Bay.

Bristol Bay Regional Seafood Development Association, Inc. ("BBRSDA") is a 501(c)(6) non-profit corporation with the mission of maximizing the value of the Bristol Bay commercial salmon fishery for the benefit of its members. BBRSDA's membership consists of all 1,863 Bristol Bay salmon driftnet permit holders and is funded by a self-assessment of 1% on the ex-vessel value from driftnet landings. BBRSDA operates a successful branding and marketing program for Bristol Bay Sockeye Salmon which relies heavily on the fishery's abundance and positive reputation for pristine habitat.

Bristol Bay Reserve Association ("BBRA") is a 501(c)(6) non-profit corporation with the mission of promoting the interests of its members who own commercial fishing vessels and participate in the Bristol Bay commercial salmon drift fishery. BBRA has approximately 350 member vessel owners. Approximately 25 percent of the vessels participating in the Bristol Bay commercial salmon drift fishery are BBRA member vessels.

The BBDA's concerns with the Proposed Pebble Mine have been well-documented, including via comment letters submitted during summer 2019 articulating the many inadequacies of the DEIS. The Proposed Pebble Mine poses unacceptable risks to the Bristol Bay watershed and to the Bristol Bay salmon fisheries. The Proposed Pebble Mine would, at minimum, directly impact at least 3,000 acres of wetlands and 24 miles of streams in the Bristol Bay watershed. It would induce salmon avoidance in up to 35 miles of streams and reduce aquatic reproduction in up to 38 miles of streams. As described in the EPA Region 10 Regional Administrator's May 28, 2020 letter to you, stream impacts are more likely to be greater than 100 miles, "along with secondary impacts to 1,647 acres of wetlands and other waters, including 80.3 miles of streams, associated with fugitive dust deposition, dewatering, and fragmentation of aquatic habitats."

Of particular relevance to this letter, a catastrophic failure of the TSFs would have disastrous impacts to the watershed—and well beyond—and its ability to produce its unrivaled salmon runs.

III. Significant New Information Regarding Seismic Risks At The Pebble Mine

The Proposed Pebble Mine and its massive TSFs are located in a highly seismic area. Accordingly, the environmental review for the Proposed Pebble Mine must adequately examine the risk of earthquakes in the Project Area and impacts on the stability of the TSFs, and the likely catastrophic environmental harm that would result from failure of the TSF. As discussed below, the current record before the USACE fails to do so. Therefore, to complete the legally required rigorous environmental review and permitting process for the Proposed Pebble Mine, the USACE must supplement the record with the information below and enclosed.

As part of the comment process for the DEIS, Dr. Thomas O'Rourke and Dr. Izzat M. Idriss—two world-renowned experts on seismic impacts to infrastructure and geotechnical engineering—provided technical reports (via July 1, 2019 comments submitted by BBRA) evaluating the DEIS's analysis and conclusions about seismic risks in the vicinity of the Proposed Pebble Mine and the associated impacts to the Proposed Pebble Mine's infrastructure, including its mine tailings impoundments. Dr. O'Rourke is the Thomas R. Briggs Professor of Engineering, Civil and Environmental Engineering at Cornell University. Dr. O'Rourke has been recognized with the highest international awards in the engineer profession and has been sought out as an expert the federal government as well as countries around the world on the impact of earthquakes on infrastructure and buildings. Dr. Idriss is a professor emeritus of geotechnical engineering at the UC Davis College of Engineering and also taught at UC Berkeley, UCLA, Arizona, and Stanford. Dr. Idriss has won the highest recognition in his profession and is an expert on dams and has been consulted by mining companies around the world for his expertise in earthquake engineering and analysis as well as design, implementation, and review of tailings storage facilities. Drs. O'Rourke's and Idriss's reports identified serious flaws with the methodologies used in the DEIS for assessing the risks and impacts of a failure of the proposed mine tailings impoundment. Dr. O'Rourke's and Dr. Idriss's reports are attached to this letter as **Exhibit A**.

Because of this deficient evaluation, it was—and is—clear that the failure to adequately consider seismic hazards and potential failure of the TSFs constitutes a glaring analytical gap in the DEIS for the Proposed Pebble Mine. Based on the findings and concerns raised in Dr. O'Rourke's and Dr. Idriss's reports, the BBRA engaged two additional seismic hazard experts, Dr. Nick Gregor and Dr. Linda Al Atik, to further evaluate and prepare an analysis of the seismic risks for the Pebble mine based on the best available science and the current industry standards for such an analysis. Attached as **Exhibit B** to this letter is Drs. Gregor's and Al Atik's expert report titled "Seismic Hazard Analysis for the Pebble Mine Project, Southwest Alaska" (hereafter the "2020 Seismic Hazard Analysis"). The study design and analysis by Drs. Gregor and Al Atik were reviewed and approved by Dr. Norm Abrahamson who is perhaps the most widely recognized expert in this field.

To validate the conclusions in the 2020 Seismic Hazard Analysis, Dr. O'Rourke and Dr. Idriss conducted a peer review of that work, which is attached to this letter as **Exhibit C** (the "2020 Seismic Hazard Analysis Peer Review" or "Peer Review report"). For completeness, the 2020 Seismic Hazard Analysis Peer Review includes an evaluation and comparison of the following seismic hazard and TSF stability studies prepared by Knight and Piésold, Ltd. ("KP") on behalf of Pebble:

- (1) A 2013 KP report on seismicity assessment and seismic design that helped formed the basis for the geohazard risk analysis in the DEIS ("2013 KP seismic report");
- (2) A 2019 KP report updating the 2013 KP seismic report, which was prepared in response to a request for information from the USACE and that has not been subject to public review or comment ("2019 KP seismic report"); and,
- (3) A 2019 KP report on TSF embankment stability, which was prepared in response to a request for information from the USACE and that has not been subject to public review or comment ("2019 KP stability report").

The conclusions of the 2020 Seismic Hazard Analysis Peer Review are unequivocal. The Peer Review report demonstrates that Dr. Gregor's and Dr. Al Atik's 2020 Seismic Hazard Analysis is state of the art and should be used to establish target earthquake ground motions for evaluating the seismic performance of all the components of the Proposed Pebble Mine. Moreover, the 2020 Seismic Hazard Analysis supersedes the 2013 and 2019 KP seismic reports in almost every way, demonstrating that the USACE, the EPA, and cooperating agencies, cannot use the KP reports as a sound scientific basis for environmental review of the Proposed Pebble Mine's critical infrastructure and its significant impacts on the surrounding environment. For example:

- The 2013 and 2019 KP seismic reports use out of date information (i.e., information that has not been used in the industry for decades) and apply information an internally inconsistent manner for its earthquake ground motions models;
- The results of the probabilistic seismic hazard analysis presented in the 2013 and 2019 KP seismic reports are not site specific and should not be used for design purposes for any critical structure, including the massive TSFs, at the Pebble mine site;
- The 2013 KP seismic report that serves as the foundation for geohazard risks presented in the DEIS fails to accurately reflect the longer duration of earthquakes in the vicinity of the Pebble mine site and the corresponding risk of liquefaction and damage to earthen structures such as the mine's TSFs.

- The hazard of volcanic eruption, ensuing tsunami, and inundation and damage at the Proposed Pebble Mine's port sites represents a real threat requiring minimum design standards that 2013 and 2019 KP seismic reports fail to address.

Ultimately, the 2020 Seismic Hazard Analysis Peer Review recommends that (1) only the results of the probabilistic and deterministic hazard analyses included in Dr. Gregor's and Dr. Al Atik's 2020 Seismic Hazard Analysis be used for evaluating the Proposed Pebble Mine and, in turn, (2) the results presented in the 2013 and 2019 KP Reports should not be used for the Pebble mine site.

As for the 2019 KP stability report, the 2020 Seismic Hazard Analysis Peer Review presents even more scathing assessment, concluding that "the results of the stability analyses presented in the 2019 KP Memo are unusable to assess the safety of the proposed design." The 2019 KP stability report suggests, without any scientific justification, that the water table at the TSF embankment is much lower than evidence would indicate. As a result, the 2019 KP stability report drastically overstates the stability of the Proposed Pebble Mine's critical infrastructure to earthquakes. To the extent Pebble proposes to use earthfill in addition to or instead of rockfill for tailings dam then the tailings dam will face even greater stability issues. Further, waste rock from the Pebble mine is proposed as rockfill to build the TSF embankment and there appears to be no corresponding analysis of the potential for waste rock to acidify major salmon rivers in the vicinity of the Proposed Pebble Mine. Based on the proposed TSF design, use of potential acid generating material as rockfill is unacceptable.

In short, the seismic risk and TSF stability analyses produced by KP lack scientific rigor, they dramatically underestimate the risk of catastrophic failure of the Proposed Pebble Mine's massive TSFs, and they cannot be relied on to support conclusions on the potential for significant environmental impacts in the NEPA environmental review of the Proposed Pebble Mine and subsequent permitting decisions, including permitting under the Clean Water Act section 404. By contrast, the 2020 Seismic Hazard Analysis is state of the art, is based on the best available science, and must therefore serve as the foundation for a hard look at the Proposed Pebble Mine's significant impacts stemming from seismic events and TSFs failures.

IV. USACE, in Coordination with the EPA and the Cooperating Agencies, Must Issue a Supplemental EIS to Account for this Significant New Information

USACE cannot escape the significance of the information in the attached expert reports by claiming that the DEIS disclosed the possibility of seismic activity and the potential for catastrophic failure of the TSFs. The incontrovertible fact is that the seismic analysis and disclosure in the DEIS and supporting documents (including KP's 2019 reports that have not been subject to public review and comment) is woefully inaccurate and unreliable, resulting in a misleading representation of the associated risks. Put simply, meaningful consideration of the expert reports attached to this letter could not result in the same conclusions as those in the DEIS

based on flawed data and scientifically indefensible methodologies. For USACE to conclude otherwise would be plainly arbitrary and capricious.

NEPA requires the USACE to take a “hard look” at the environmental issues related to the Proposed Pebble Mine and adequately inform the public of its decision-making process. The NEPA process will inform the USACE’s permitting decision under the Clean Water Act, which requires the USACE to evaluate—based on in-depth factual determinations and scientific studies—whether the Proposed Pebble Mine will cause or contribute to significant degradation of the waters of the United States, including significant adverse effects of the discharge of pollutants on fishery areas and economic values. NEPA’s purpose is to ensure that “the agency will not act on incomplete information, only to regret its decision after it is too late to correct.” *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 377 (1989). With these statutory obligations in mind, when faced with new information of the character and magnitude in the attached reports, information that contradicts a central element of the DEIS, the USACE cannot avoid analysis of that information in a Supplemental EIS. *See Friends of the Clearwater v. Dombeck*, 222 F.3d 552, 557 (9th Cir. 2000) (requiring agencies to take a “hard look” at whether new information requires a Supplemental EIS).

As a result, the USACE, in coordination with the cooperating agencies, must prepare and solicit comment on a Supplemental EIS that evaluates the seismic risks and impacts of a failure of the proposed mine tailings storage facilities in light of the acceptable scientific methodologies and the best available technical information. Further, this analysis is directly relevant to and necessary for the USACE’s obligations under the Clean Water Act’s section 404(b)(1), guidelines, 40 C.F.R. § 230.10(a), to evaluate and document the potential for impacts in the event of a tailings impoundment failure to support its determination regarding the Least Environmentally Damage Practicable Alternative.

In conclusion, the potential impacts from the construction and operation of the Proposed Pebble Mine on Bristol Bay’s salmon runs and the people that depend upon them, such as the members of the BBDA, are simply too great to ignore accepted scientific methodologies for assessing risks. The new information in attached expert reports makes clear that, at minimum, a more robust analysis of seismic risks, in a Supplemental EIS, is warranted. Otherwise, based on the current record before the USACE, “No Action” is the only justifiable alternative.

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On behalf of undersigned organizations comprising the BBDA, thank you for your consideration of the forgoing comments.

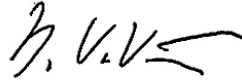
Sincerely,

BRISTOL BAY NATIVE ASSOCIATION



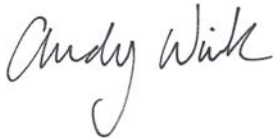
Ralph Andersen
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Andy Wink
Executive Director

UNITED TRIBES OF BRISTOL BAY



Robert Heyano
President

BRISTOL BAY RESERVE ASSOCIATION



Robert Kehoe
Executive Director

Attachments:

1. Exhibit A - Drs. O'Rourke's and Idriss's Initial DEIS Comment Reports
2. Exhibit B - Drs. Gregor's and Al Atik's Expert Report titled "Seismic Hazard Analysis for the Pebble Mine Project, Southwest Alaska" (June 2020)
3. Exhibit C - Drs. O'Rourke's and Dr. Idriss's Peer Review Report.

cc: Christopher W. Hladick, Regional Administrator, U.S. EPA, Region 10
Mathew LaCroix, U.S. EPA Region 10, Alaska Operations Office
Shane McCoy, Project Manager, USACE, Alaska District,
Lynne Richmond, Communications and Public Affairs Specialist, Advisory Council on
Historic Preservation
Thomas Tilden, First Chief and Courtenay Carty, Tribal Administrator, Curyung Tribal
Council
George Alexie, President, Nondalton Tribal Council

Kyle Moselle, Large Mine Permitting, Department of Natural Resources, State of Alaska

Nathan Hill, Borough President, Lake and Peninsula Borough

Guy Hayes, Public Affairs, U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement

Don Striker, Acting Regional Director, U.S. Department of the Interior, National Park Service

Stewart Cogswell, Field Supervisor, Anchorage Field Office, U.S. Department of the Interior, Fish and Wildlife Service

Alan Mayberry, Associate Administrator, U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration

David Seris, Waterways Management Branch, 17th Coast Guard District, U.S. Coast Guard