



PEBBLE WATCH



August 2010 | BBNC

Inside: Soil & Sediment Sampling

This first issue of *Pebble Watch* focuses on "Report Series E: Trace Elements (Sediments & Soils)," an overview of soil and sediment sampling, 2004-2007 at the proposed sites of the Pebble mine, port and transportation corridor. Inside, our team summarizes the results for copper and arsenic, and shows how the data may begin to answer questions community members first asked Pebble developers in 2005 ("Rewind: Revisiting 180 Questions," page 4).

About Pebble Watch

Pebble Watch is an impartial, educational and fact-based initiative of the BBNC Land Department to disseminate information regarding the proposed Pebble Mine project to BBNC shareholders and interested parties. Pebble Watch does not attempt to integrate or interpret data; this would occur during an Environmental Impact Statement process. Instead, we seek to help BBNC shareholders better understand data by providing summaries as well as context, such as how the data may be used in the permitting process and how it relates to regulatory benchmarks.

*Produced by
the BBNC Land Department*

**Questions? Call
(800)426-3602**

BB Bristol Bay
NC Native Corporation

Letter from the President of BBNC

Bristol Bay Native Corporation is pleased to present the first issue of Pebble Watch, a BBNC-produced newsletter designed to help present the volumes of data and scientific information now beginning to emerge from the Pebble Mine Project in an easy-to-understand format.



The Pebble Watch initiative seeks to provide impartial, educational and fact-based information, an effort that is integral to the support of responsible resource development. As outlined in the BBNC Land Resources Policy, BBNC supports responsible resource development on the lands we own—as well as on other lands within the region—that

Pebble Watch and its team of experts—including environmental scientists and science communicators employed by BBNC and its subsidiaries—provide in these pages a valuable educational resource for our shareholders and others interested in learning more about the proposed Pebble Mine Project. The Pebble Watch initiative will include a regular printing and mailing of this newsletter. A website, to be launched later this year, will provide the same information online, plus new material, such as blog posts and surveys.

is consistent with our shareholders' values.

BBNC has a long history of responsible development, from sand and gravel sales, to renewable energy and transportation projects, to education and training opportunities. The Corporation continues to work hard to find and develop opportunities that meet our high standards of fiscal, environmental and social sustainability—and which best reflect our corporate mission, "Enriching our Native way of life."

The BBNC Board's decision in December 2009 to oppose development of the Pebble Mine Project has not changed our commitment to our shareholders. BBNC is committed to remaining engaged in the project's permitting process as an advocate on behalf of its shareholders and the corporation's mission and values. We continue to request, gather and review information regarding the proposed project.

Keeping shareholders and other interested parties informed through resources such as Pebble Watch is only one of many ways we show our respect for the great responsibility we hold—to our corporation, our people, and all others whose lives may be touched by decisions made in the name of regional resource development.

Jason Metrokin
President & Chief Executive Officer

Aerial view over wetlands in proposed mine area.



Photo: Bristol Environmental Remediation Services

SOIL & SEDIMENT SAMPLING AND THE PEBBLE MINE PROJECT

Among the reports project developers have released to the public is "Report Series E: Trace Elements (Sediments & Soils)," an overview of three years of soil and sediment sampling at the proposed mine, port and transportation corridor sites, from 2004-2007. Though the report is called Trace Elements, more than just "elements" were part of the sampling analysis; organic compounds, like benzene, and inorganic compounds, like ammonia, were also included.

Summary

The report includes details on where, when, and how often soils and sediments were sampled, as well as how sampling locations were determined. It explains that the trace elements studied occur naturally in very small amounts, and that the primary objective of the sampling is to identify and characterize their naturally occurring levels in sediments and soils. According to the report, "The studies will establish background levels for the purpose of long-term monitoring of project operations."

Other information from the report includes:

- Sampling results from the proposed mine site, Iliamna Lake, the proposed port area, and along the proposed

transportation corridor (Figure 1).

- Sampling frequency (twice a year in most cases).
- The total number of samples collected, listed by site, including more than 200 sediment samples and 257 soil samples from the proposed mine site, and an additional 177 samples from the other studied areas.

Maps and data accompany the report, available online at www.pebblepartnership.com/environment/data-releases. The datasheets provide detailed results for the dozens of elements and other constituents sampled; these are listed by date and by "Sample Station Location ID."

Pebble Watch Says...

Trace elements studied may be safe in very small amounts, but in larger amounts are toxic to plants, animals and people. For this reason, information on the presence and concentrations of these and other "naturally occurring constituents" is often collected prior to development of a mine where accidental or unintentional release is of concern.

In total, sampling included more than 30 constituents, including ammonia, arsenic, chloride, fluorine, and sulfates, as well as mercury, copper and other

metals. Organic compounds, such as petroleum hydrocarbons, were also sampled in sediments at the proposed port site.

In addition to providing data of interest to the public, such sampling provides baseline data that will later contribute to the permitting process. The long-term monitoring referenced in the report will likely be required by state or federal agencies, or both. Such monitoring can take place before, during—and even after—mine operations.

DEFINITIONS:

Baseline data: Information that offers a "snapshot in time" of the conditions that existed at a particular place and time, as a point of reference / comparison.

Certificate of Reasonable Assurance: A state-issued certificate that provides the state assurance that a project will not harm water quality. The certificate, required by Section 401 of the federal Clean Water Act, is submitted as part of the Federal permitting process.

National Pollutant Discharge Elimination System (NPDES): A provision of the Clean Water Act that prohibits discharge of pollutants into waters of the United States, unless a special permit is issued by EPA, a state, or another delegated agency.

Organic/Inorganic: In biology, "organic" refers to matter from living sources, and "inorganic" refers to matter from nonliving sources. However, in chemistry, the same terms are used to reference a compound's molecular structure, and do not necessarily suggest a living or nonliving source.

Sections 402, or 404: Parts of the EPA's Clean Water Act.

Sediment: Organic or inorganic matter suspended in water and transported by streams, eventually settling as a layer of solid particles.

Trace Elements: Elements and compounds that occur naturally in very small amounts in the environment.



FIGURE 1. MAP OF PROPOSED MINE AREA

Map: BBNC Pebble Watch



UNDERSTANDING THE DATA:

To help interpret the large number of site-specific data, our Pebble Watch Team calculated the average concentrations of copper (Cu) and arsenic (As) found in 250 soil samples taken from 133 locations found in the proposed mine area. We also highlighted the highest concentrations collected for each.

State and federal agencies use scientific studies and risk analysis to determine "safe" concentrations of such constituents for humans, animals, plants, and other life, and they have developed numerous benchmarks for comparison. In the graphic (Figure 2), using the data for copper and arsenic as

examples, we show how the amounts sampled compared to two such benchmarks: the Alaska Department of Environmental Conservation (ADEC) maximum allowable soil concentration for migration to groundwater level considered safe for human ingestion and the Environmental Protection Agency (EPA) Ecological Soil Screening Levels.

Shareholders with questions about these and other data may request Pebble Watch assistance by contacting the BBNC Land Department.



Gary Martilla from Nondalton collects stream sediment samples.

PERMITTING:

Data summarized here may be used in applying for the following permits:



Under the Clean Water Act, Section 402:

- Section 404 Permit (for construction impacting waters of the United States, including wetlands; issued by US Army Corps of Engineers)
- Section 401 Certificate of Reasonable Assurance (a subset of the 404 permit application; issued by ADEC, overseen by EPA)
- National Pollutant Discharge Elimination System (NPDES) construction-related water discharge permit (issued by ADEC, overseen by EPA)
- Storm Water Pollution Prevention Plan (EPA)



Fish Habitat Permit (issued by ADFG, under Alaska Statute 16.05.871)

- Fish Passage Permit (issued by ADFG under Alaska Statute 16.05.841).

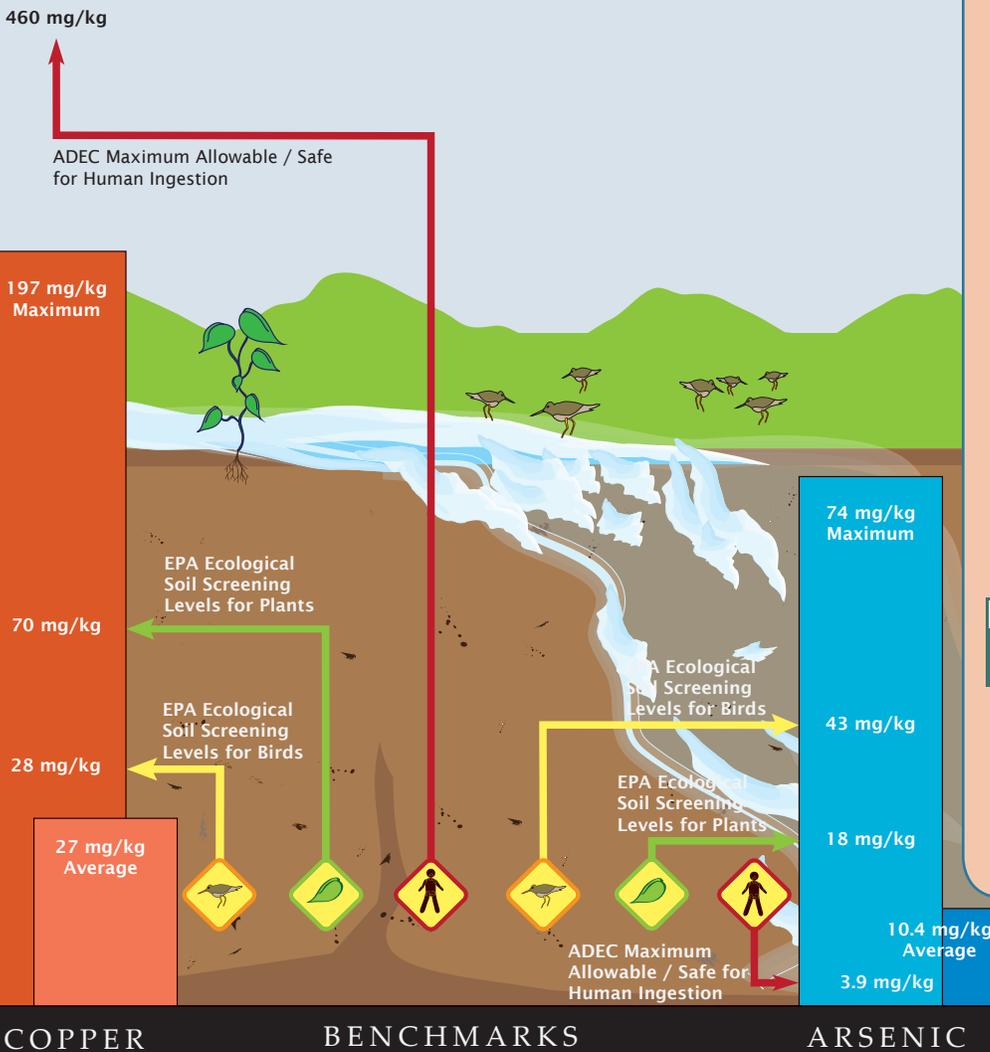
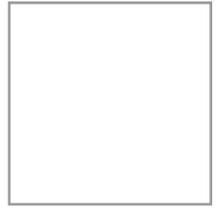


Photo: Bristol Environmental & Engineering Services Corporation

Graphic: BBNC Pebble Watch

FIGURE 2: COPPER AND ARSENIC CONCENTRATIONS FOUND IN PROPOSED MINE AREA IN MILLIGRAMS/KILOGRAM (MG/KG)



REWIND: REVISITING '180 QUESTIONS'

In 2005, the report "Response to the Nushagak-Mulchatna Watershed Council: 180 Questions About the Pebble Project," was created, with answers supplied by Northern Dynasty Minerals (NDM), the project developer at the time. To help connect past discussion to current data, the BBNC Pebble Watch team has selected some of the Q&A's that we believe best relate to the trace elements research.

Q. 44 - What are the potential sources of contamination to subsistence food resources as a result of the Pebble operation?

In general, the sources of potential contamination that could affect subsistence food resources include various chemicals and metals, as well as dust from the mining and milling process. It is Northern Dynasty's goal to protect all subsistence resources from significant contamination.†

Pebble Watch Says: *Data collected during the trace elements study will be among the information used by the state to establish baseline measurements for later evaluating whether dust, chemicals or metals from development or operation have contributed contamination to subsistence food resources.*

Q. 46 - What is the relative toxicity of potential contamination sources?

The relative toxicity of potential contaminant sources at the proposed Pebble mine are still being studied, as well as the manner in which they will be managed. All of this information will be provided within the mine planning materials to be submitted for permit application sometime next year.

Pebble Watch Says: *ADEC soil cleanup levels and EPA soil screening levels offer two examples of how relative toxicity may be determined for elements such as copper and arsenic. But numerous state and federal benchmarks exist that establish "safe" concentrations of potential contaminants*

for humans, animals, and plants.

Q.48 - During the life of the operation and beyond, what will NDM do to assure subsistence resource consumers that their resources have not been contaminated?

[NDM's] mine plan will include operating plans, closure plans, environmental monitoring plans, as well as relevant safeguards to ensure that the project does not affect subsistence resources in the project area. These plans will be comprehensively described within the mine planning materials to be submitted for permit application sometime next year.

Northern Dynasty has already begun an extensive environmental monitoring program for such resources as water, plants and soils. An environmental monitoring plan will be employed at every phase of mine development to detect any unexpected environmental changes before such changes pose a threat to humans, air, water, or fish and wildlife.

Pebble Watch Says: *Based on current regulations, continued soil, sediment and water quality monitoring would likely be required by state and federal government, from construction to beyond the end of mine operations.*

Q.75 - What are the potential sources of contamination that could affect the health of plants in the mine area and along the transportation corridor? /

Q.76 - How will this contamination be avoided?

[Q.75] In general, the sources of potential contamination that could affect the health of plants include various chemicals and metals, as well as dust from the mining and milling process. †

[Q.76] In general, Northern Dynasty will ensure that any water that does leave the mine area during operations or after closure meets Aquatic Life Standards and human consumption standards.

The company is also studying different

ways to avoid and reduce project-related dust. These include: blasting techniques that do not create large dust plumes; keeping tailings material saturated or under water; containing dust from the crushing and grinding process within the mill building; undertaking all concentrate handling within enclosed areas; utilizing a concentrate pipeline, rather than concentrate trucks; road watering; and a truck-wash system at the mill site and the port site.

Additionally, an environmental monitoring plan will be employed at every phase of mine development to detect any unexpected environmental changes before such changes pose a threat to plant health.

Pebble Watch Says: *EPA Ecological Soil Screening Levels for plants are among the benchmarks used to determine safe levels of potentially harmful contaminants. Data collected in this trace elements study and continued long-term monitoring are likely to be used to compare with such regulatory benchmarks.*

Q.81 - What are the potential sources of contamination that could affect air quality in the mine area, along the transportation corridor, at the power generation facility, or at any other mine-related infrastructure?

Potential sources of air pollution associated with power generation facilities developed to support the Pebble Project will be addressed within the Homer Electric Association's energy plan.

In general, potential sources of air pollution associated with the Pebble Project include dust and certain particulates from heavy equipment. †

Pebble Watch Says: *Trace elements data collection may also be used to establish baseline data for air quality, because it helps establish what constituents might have been introduced through dust or other sources.*

† The original answer further states that the matter is still being studied and more information will be provided within mine planning materials to be submitted with the permit application.