

# Callahan Mine Community Update

EPA Superfund Community Involvement

April 2009

This community update provides you with information on the activities ongoing at the Callahan Superfund site in Maine.



## The remedial investigation

(RI), human health risk assessment (HHRA), and baseline ecological risk assessment (BERA) for the Callahan Mine Superfund Site in Brooksville, Maine have been finalized and are available for public review at the Site repositories.

The Maine Department of Transportation (MaineDOT) was responsible for the completion of the studies and preparation of the RI Report. The United States Environmental Protection Agency (EPA) and Maine Department of Environmental Protection (Maine DEP) have provided oversight of the work at the Site.

## Remedial Investigation (RI)

From 2004 to 2008, a series of investigations were completed to define the type and extent of contamination that is present at the Callahan Mine Site. The major areas that were the focus of the RI are shown in Figure 1. The RI, HHRA, and BERA reports document the presence of contamination at the Callahan Mine Site at concentrations that may present a threat to human health and the environment.

## The key findings of the RI are:

- The highest concentrations of metals in soil and waste material are associated with the former Ore Pad, waste rock/tailing disposal areas, and other areas where waste rock was used as fill;
- Polychlorinated Biphenyls (PCBs) were detected in the area of the former Mine Operations Area;

- Areas of Dyer Cove, southern Goose Pond, and Goose Cove that were associated with the former mine operations and disposal activities were found to contain very high levels of copper, lead, and zinc and are shown in Figure 2, and
- Elevated levels of contaminants were also found in surface water, groundwater, and biota (clams, fish, salt grass).

## The key findings of the HHRA are:

- PCBs are present in the soil and waste material at levels that are unsafe for even occasional human contact in one small area of the former Mine Operations Area;
- Lead and arsenic concentrations in soil and waste material (waste rock, ore, and tailings) would be unsafe for long-term human contact;
- Groundwater beneath a portion of the Site is unsuitable for human consumption;
- The surface water and sediment of Goose Pond and Goose Cove were not found to represent a threat to human health and
- Figure 3 shows the area where PCBs are found above safe levels and Figure 4 shows the locations of contaminated bedrock groundwater.

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Although the clam tissue in Goose Pond contains high levels of lead, the HHRA did not identify a threat to human health because EPA assumed that individuals would be unlikely to consume clams from Goose Pond and those who did attempt to harvest clams would consume only 3-5 meals per year from the pond. As part of the evaluation of the clam tissue, EPA requested that the Agency for Toxic Substances and Disease Registry (ATSDR) review the information regarding the contamination in clam tissue at the Callahan Mine Site. ATSDR provided the following conclusions:

- Exposures to lead contaminated clams could potentially result in harmful health effects in children if current fishing restrictions are lifted in the area;
- The levels of lead in cooked clam tissue samples exceeded the FDA safety tolerance level and the maximum value of lead found in the total diet study and
- The average levels of lead in cooked clam tissue samples from the site ranged from 0.67-28 mg/kg. The maximum lead concentration in cooked tissue was 37.4 mg/kg in a single run. Those levels are within the same order of magnitude as the data ATSDR reviewed in June 2008.

Based on the above information, ATSDR recommends that individuals continue to adhere to the fish and shellfish consumption restrictions and advisories that already exist in the area.

ATSDR also evaluated the information regarding the lead contamination in the soil and waste material at the Site and recommended cleanup actions at the residential properties with lead levels identified as a threat in the Human Health Risk Assessment.

## The key findings of the BERA are:

- Sediments were found to be acutely toxic to benthic organisms in the area of southern Goose Pond that also contains mine waste along with high levels of copper, lead, and zinc;
- Surface water contains copper and zinc above levels that could adversely impact aquatic organisms;
- Lead, cadmium, copper, and zinc are accumulating in biota at the Site, including fish, crabs, clams, and salt grass;
- Salt grass contained up to 79 times more copper, 14 times more lead, and 54 times more zinc than the reference “clean” locations;
- Crabs contained up to twice the copper and zinc and 10 times the lead as reference locations;
- Fish tissue contained up to 10 times the copper, 62 times the lead, and 4 times the zinc as reference locations;
- Clam tissue contained up to 57 times more lead than reference locations.
- Benthic community studies revealed a low diversity for both the Site and reference locations suggesting that the physical stress of the estuary environment limits the type of organisms that can exist in this area. There was no major difference between the Site and reference locations based on the benthic community studies. However, based on data collected as part of the clam tissue collection program, the Southern Goose Pond area appears to have fewer clams and those found were of smaller size than the remaining areas of Goose Pond. This information suggests that some level of benthic impairment may be occurring;
- Food chain modeling identified a potential threat to insect feeding shore birds (Spotted Sandpiper) and fish eating birds (Great Blue Heron) in the southern Goose Pond area and
- Levels of contaminants in the source area were identified as a potential threat to predatory birds (Red Tailed Hawk), insectivorous birds (Robin), omnivorous mammals (mouse), and worm eating mammals (shrew).

## Operable Units

EPA often implements a cleanup action in phases or “Operable Units”. This allows for a focus on the portions of the Site where

more immediate risk reduction is necessary and can provide more time to better understand other areas of the Site. For the Callahan Mine Site, EPA is creating two Operable Units. The first operable unit (OU 1) will target the following areas:

- Soil and waste contaminated with PCBs;
- Soil and waste that represent the most significant threat to surface water, sediments, and groundwater. These areas are the former ore pad; portions of the mine operations area; the Waste Rock Area #3, and the Tailing Impoundment;
- Areas of sediment that were shown to be acutely toxic and represent a food chain threat. This is primarily the area of sediments and salt marsh in southern Goose Pond that resides adjacent to Waste Rock Area #3 and the Tailing Impoundment and
- Soil and waste contaminated with lead and arsenic in areas with current residential use.

The remaining areas of the Site will be further evaluated as part of a second operable unit (OU 2) Remedial Investigation and will be subject to a Feasibility Study in the future if it is determined that a response action is necessary for these areas. The recently finalized RI Report, Human Health Risk Assessment, and Ecological Risk Assessment apply to OU 1 only. The areas designated as OU 1 and OU 2 are shown in Figure 3.

## Feasibility Study Report

A Feasibility Study Report is being developed to evaluate a range of cleanup options for OU 1. The cleanup options range from no action to engineering controls (cover systems) and physical excavation and removal of the contamination. EPA uses a defined set of criteria to evaluate the cleanup options. Several technologies may be combined to form a comprehensive alternative to address the Site contamination. For example, land use restrictions, removal of certain contamination, and consolidation and covering of other contamination could all be combined to form one cleanup alternative.

To be considered an acceptable cleanup approach, a cleanup must be capable of protecting human health and the environment from the threats identified in the RI and risk assessments. The cleanup approach must also comply with federal and state regulations (called Applicable or Relevant and Appropriate Requirements or ARARs). An alternative that is not protective or which does not comply with ARARs, cannot be considered acceptable.

## Information and Contacts:

[www.epa.gov/superfund](http://www.epa.gov/superfund)

Site information can also be found at:  
Brooksville Free Public Library  
1 Town House Road  
Brooksville, Maine 04617

### EPA Contacts

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The alternatives that are protective of human health and the environment are then subject to an additional evaluation using the following five criteria:

- Long-term effectiveness and permanence;
- Short-term impacts;
- Implementability;
- Reduction in toxicity, mobility, or volume through treatment; and
- Cost.

The final two criteria are State and Community acceptance.

## Schedule

EPA will develop a Proposed Plan that summarizes the RI/FS and presents EPA’s recommendation for cleanup action for OU 1 at the Callahan Mine Site. The Proposed Plan is expected to be released in July 2009. EPA will seek public input during a 30 day public comment period. After consideration of the public comments, EPA will then sign a Record of Decision (ROD) to document the selection of the cleanup action for OU 1. After the ROD, EPA will also initiate discussions with the potentially responsible parties (PRPs) to seek their involvement in the design, implementation, and maintenance of the cleanup action. EPA could also perform the work itself if negotiations with the PRPs do not result in an agreement to perform the cleanup action.

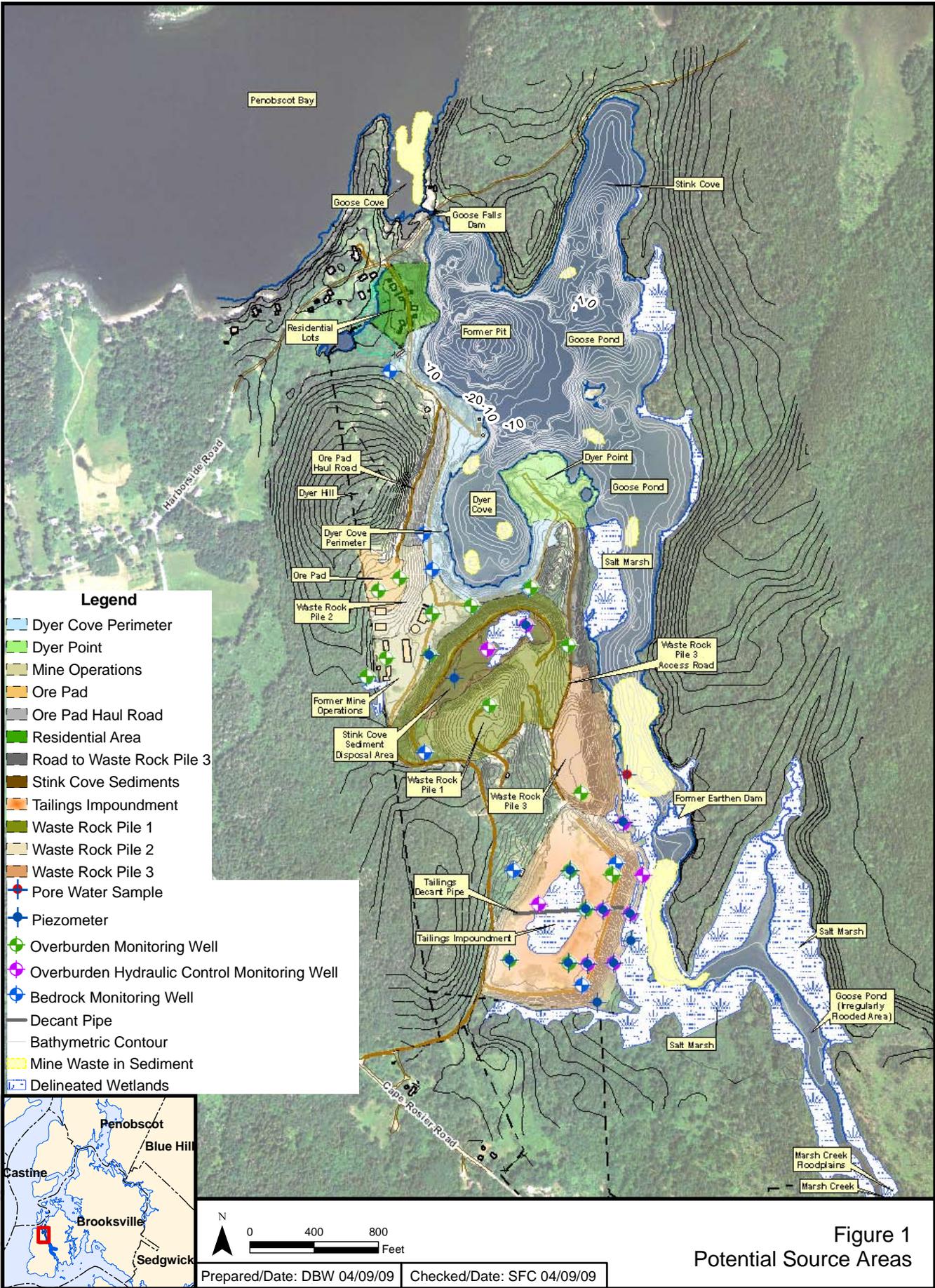
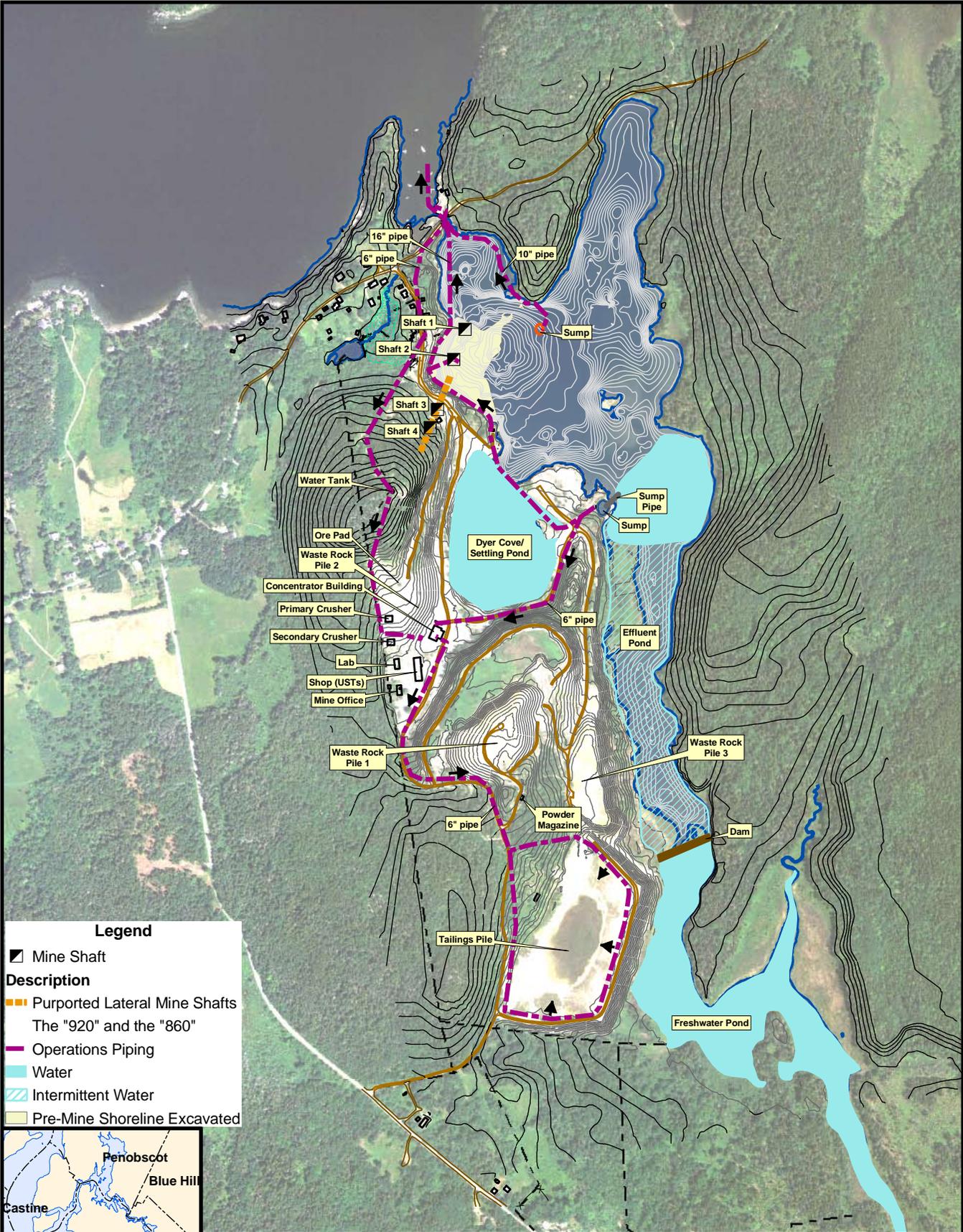


Figure 1  
Potential Source Areas



**Legend**

- Mine Shaft
- Description**
- Purported Lateral Mine Shafts  
The "920" and the "860"
- Operations Piping
- Water
- Intermittent Water
- Pre-Mine Shoreline Excavated



Prepared/Date: DBW 04/09/09 | Checked/Date: SFC 04/09/09

**Figure 2**  
Site Plan with Historic Features

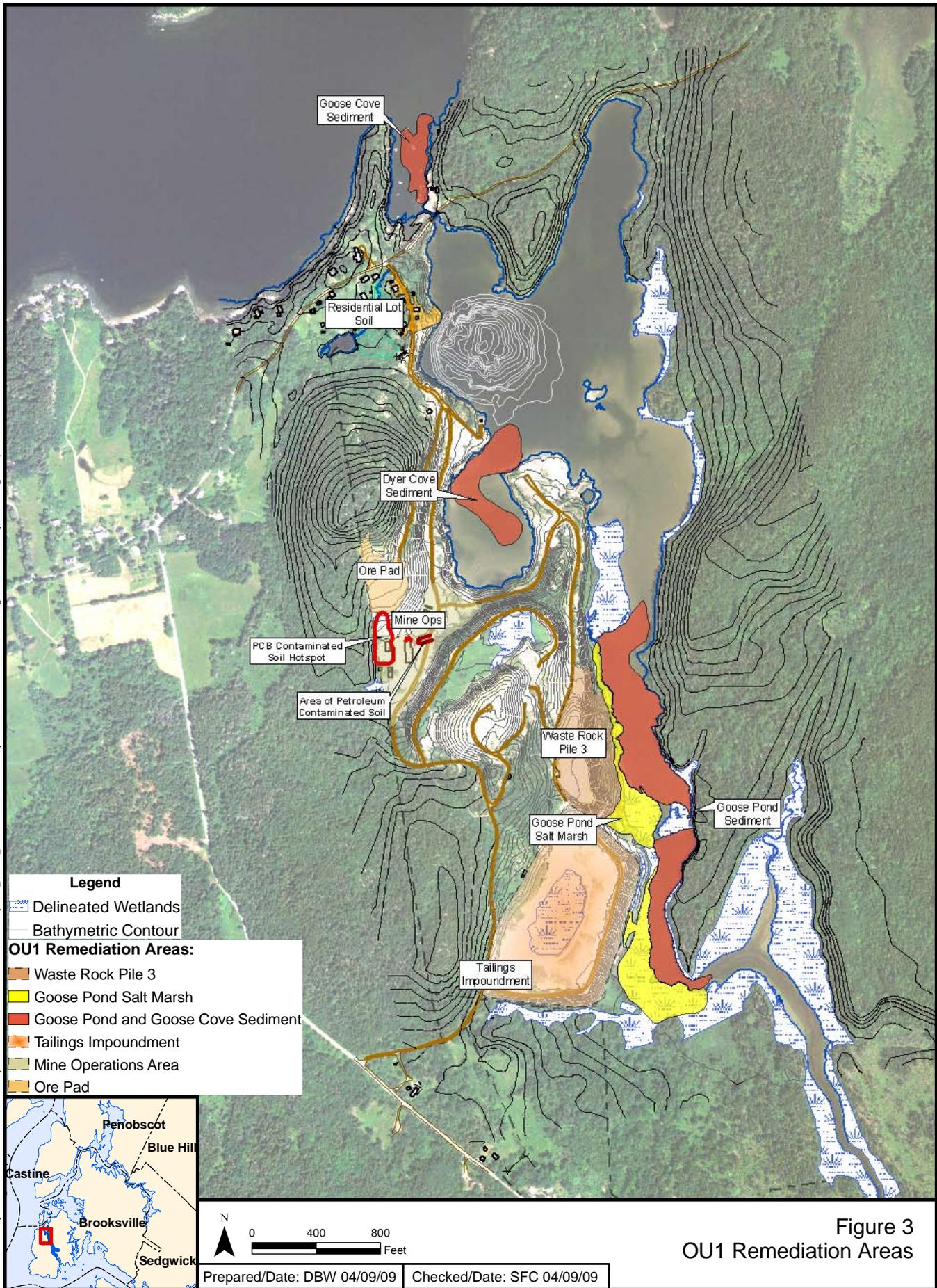


Figure 3  
OU1 Remediation Areas

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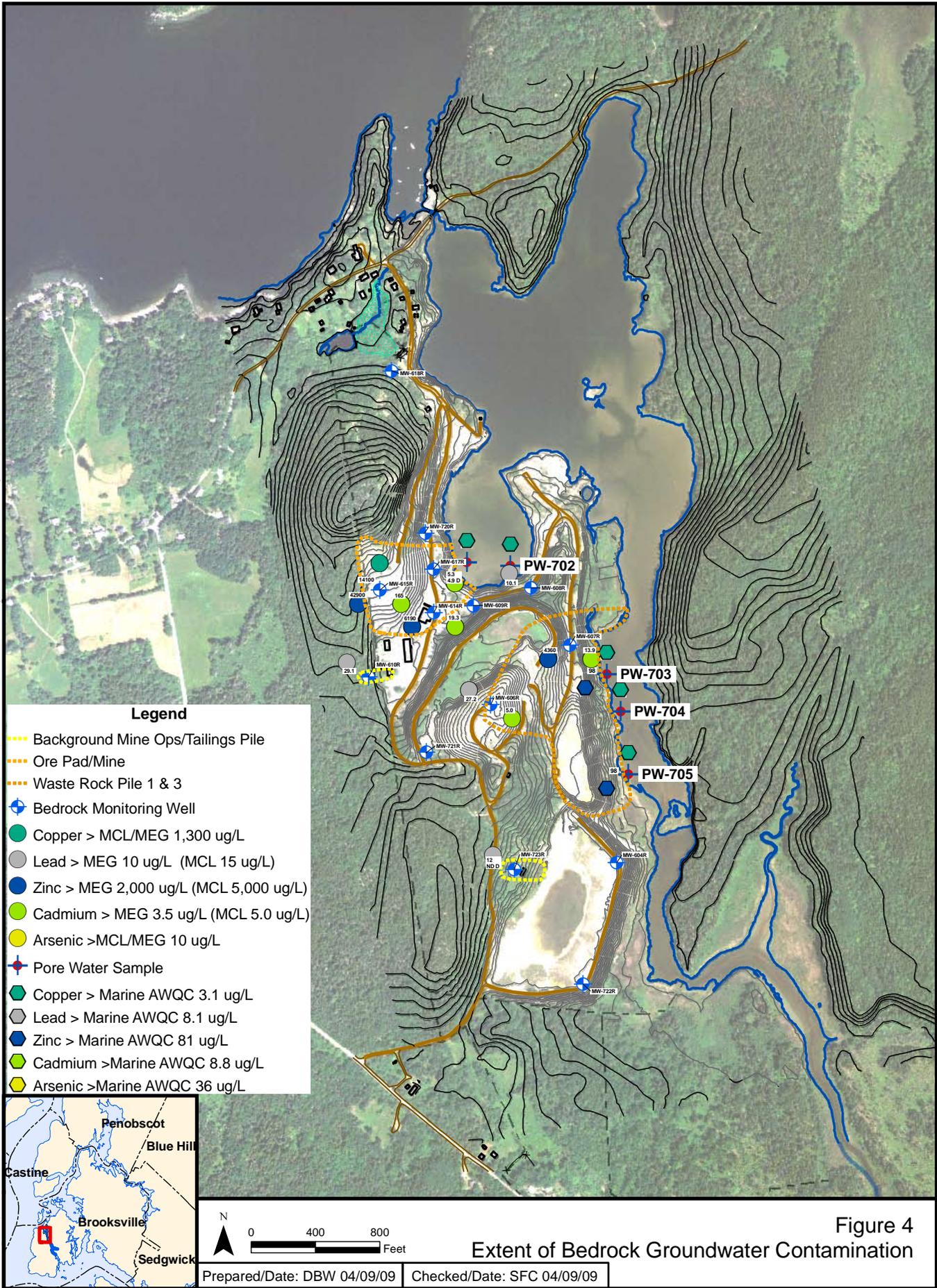


Figure 4  
Extent of Bedrock Groundwater Contamination