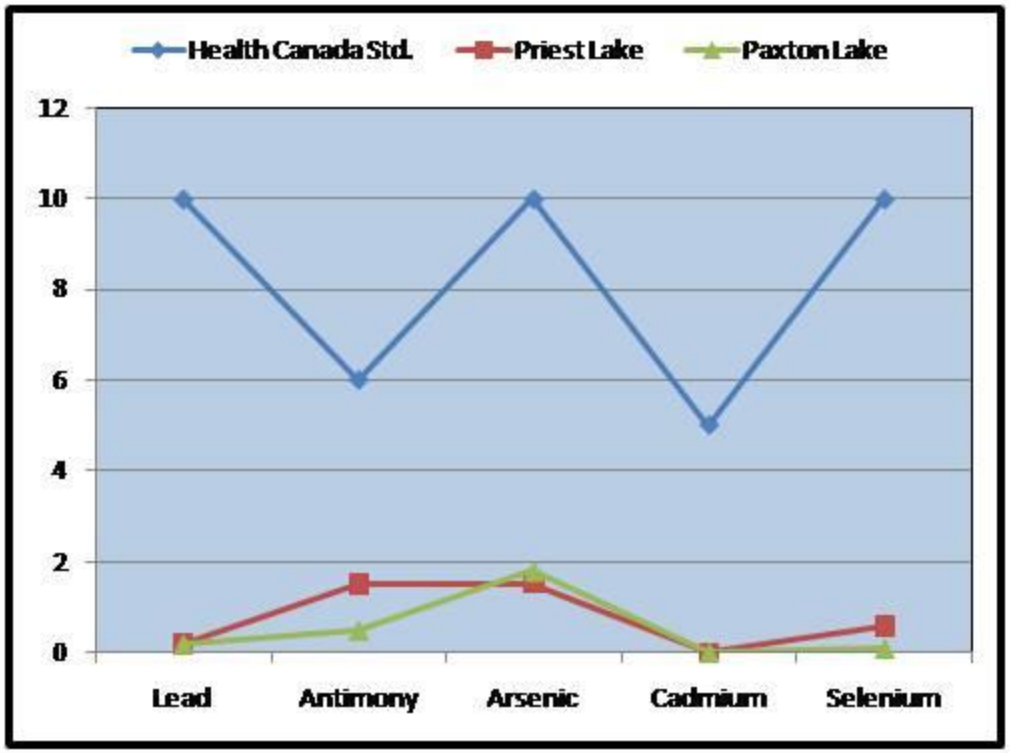
Priest Lake Water Quality Management Program

Priest Lake Water Quality Management Program

Background

Water quality monitoring carried out by Vancouver Coastal Health (VCH) indicated that levels of some metals in the lake water are elevated when compared with background concentrations in similar adjacent lakes such as Paxton Lake.

While the metal concentrations are elevated relative to adjacent water bodies it must be stressed that levels do not exceed water quality guideline concentrations, as specified in Health Canada's, Guidelines for Drinking Water Quality (Health Canada 2012).



Priest Lake Water Quality Management Program

Background

In addition to concerns related to potable water, the system also supports a group of fish known collectively as "stickleback species pairs" which are small, freshwater fish descended from the marine threespine stickleback (*Gasterosteus aculeatus)*

Priest Lake Water Quality Management Program

Background

Preliminary studies indicate that surface water and groundwater draining from Larfage's Texada Quarry into the Priest Lake catchment area via Van Anda Creek may be introducing elevated levels of some metals.

In the fall of 2013 a study was completed that focused on the preliminary characterization of the metal and mineral content of the intrusive formations found at the Texada Quarry and the influence of associated minerals on water quality draining from the quarry (Dillon 2013).

The report recommended Lafarge evaluate options for managing water quality.


Van Anda
Blubber Bay Road
Crescent Bay Road
Olive Street
Priest Lake
Kirk Lake
Spectacle Lake
Ironmine Road
High Road
Van Anda Creek
Lafarge Site
Paxton Lake
Paxton Road
Blair Road
Granby Lake Road
Airport Road

Priest Lake Water Quality Management Program

Approach to managing water quality

Based on the findings of the preliminary site assessment, a strategy session, and follow up technical discussions it was recommended that the following tasks be completed:

1. **Surface water assessment (quality and quantity);**
2. **Hydrogeological assessment; and**
3. **Bench scale treatment options assessment.**

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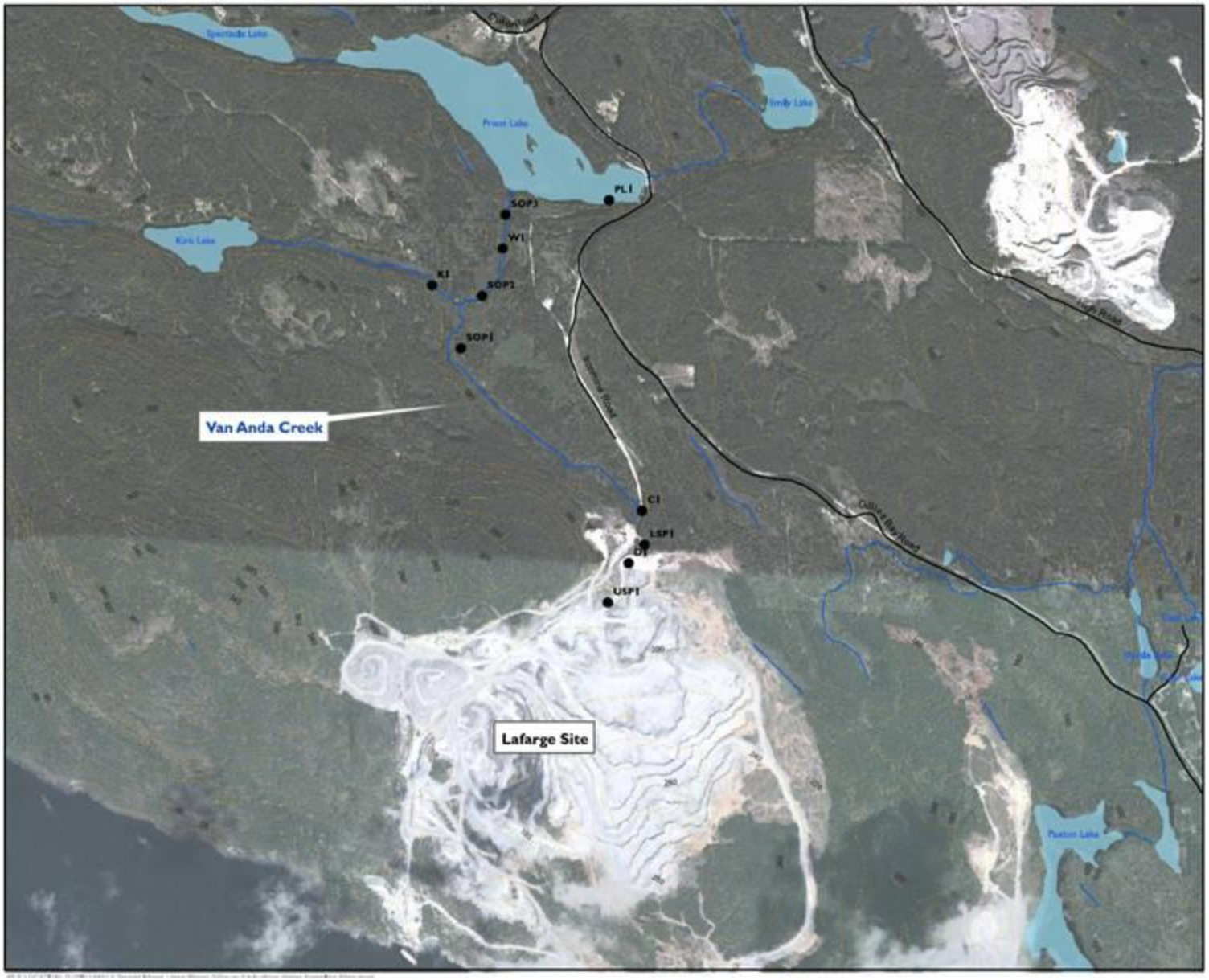
1. Surface water assessment (quality and quantity)



LAFARGE

Lafarge
Texada Island

Surface Water Sampling Sites
Figure 3

- Surface Water Sampling Sites
- Roads
- Watercourses
- Contours
- Waterbodies

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LAFARGE

Lafarge
Texada Island

Hydrometric Station
Figure 2

Station Type

- Climate Station
- Hydrometric Station
- Roads
- Watercourses
- Contours
- Waterbodies

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STATUS: DRAFT

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2. Hydrogeological assessment

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Lafarge
Texada Island

Ground Water Monitoring Wells
Figure 5

Groundwater Monitoring Site

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3. Benchscale treatment options assessment

Common treatment methods:

- Lime precipitation;
- Ferric or alum co-precipitation;
- Ion exchange;
- Reverse Osmosis;
- Anaerobic biological treatment, and
- Permeable reactive barriers.

- Lime precipitation;
- Ferric or alum co-precipitation; and,
- Permeable reactive barriers.

Purpose of benchscale testing:

- Treatment performance;
- Reagent demand;
- Reagent preparation;
- Reaction time and kinetics; and,
- Characteristics of treatment residuals.

Priest Lake Water Quality Management Program

Update on program

1. Surface water assessment

Quality

- four (4) rounds of surface water sampling completed to date (3 dry and 1 wet)
- next round of sampling scheduled to be a wet weather event in the fall (October)

Quantity

- v-notch/pipe structure successfully installed at the inlet to the lower pond to facilitate improved flow monitoring accuracy (Station S1)
- thus far 2 low flow gauging sessions (May and July) have been completed at the 4 monitoring sites
- the third low flow gauging session is scheduled for late September
- the first download of water level logger data was completed in July and a review of the logger data has shown we have a good record of water levels at the 4 sites
- following the upcoming September gauging session, low flow rating curves will be developed for the 4 monitoring stations to enable the development of preliminary hydrographs for the summer season.

Priest Lake Water Quality Management Program

Update on program

2. Hydrogeological assessment

- four (4) wells installed
- two (2) of four groundwater sampling events completed (Apr 14, and Aug 28).
- next sampling anticipated to occur in the fall (Oct to Nov)

3. Benchscale treatment options assessement

- benchscale testing and initial assessment complete
- results to be evaluated in association with the findings of other project components once complete

Priest Lake Water Quality Management Program

Program Timeline