

Establishing an Ambient Air Quality Monitoring Program During the Giant Mine Remediation

October 14, 2015

Banff, AB



Air Quality Monitoring Program (AQMP) Objective

 Giant Mine's Air Quality Monitoring Program provides data to ensure that remediation activities at Giant Mine do not cause adverse effects to people or the environment.

Giant Mine Air Program Components

- **Community Program**: Completed at three community monitoring stations (in N'dilo, downtown Yellowknife and at the Yellowknife Cruising Club) to measure and assess air quality in the community and help to ensure the effectiveness of the fence-line air quality program.
- Fenceline Program is done using six monitors that are placed in six locations around the perimeter of an active work area and along the southeast shore of the site, at the townsite, the cruising club, and the southeast beach.
- Activity Specific Program is established to monitor potential impacts to air quality in the vicinity of workers. Both fixed and mobile monitors are placed near work such as roaster deconstruction or drilling.

How does it work?

- The programs measure concentrations of contaminants in the air such arsenic and other airborne dust.
- Many things can impact air quality, including construction, vehicle emissions, road dust, smoke, etc. If the established protective levels are exceeded at a given station, the alarm will trigger an investigation and corrective action is taken, as necessary, to ensure that the levels return to background levels. Whenever monitors surpass a certain point, site personnel take action by:
 - informing team members
 - watering to suppress dust
 - modifying or stopping work
 - investigating to look for the cause of the elevated levels, which may not be site-related (e.g. forest fires)
- In addition, the community monitors are used to check the effectiveness of the monitors on site.

Community Monitoring Stations Locations

- There are 3 community monitoring locations
- N'Dilo (NDL), Yellowknife Cruising Club (YCC), National Air Pollution Surveillance location (NAPS – downtown Yellowknife)
- Additional station being developed for Niven Community



Community Equipment



Asbestos filter sampler





BAM sampler



Hi-Vol filter sampler



Data Centre

PM10 Hi-vol filter sampler

Community Shelters



N'Dilo Shed



Community Shelter

Community Air Criteria

Parameter	Averaging Time	Value
TSP	Annual	60 μ g/m ³
TSP	24-hour	120 μg/m ³
PM10	24-hour	50 μ g /m ³
Arsenic	Annual	0.011 μg/m ³
Arsenic	24-hour	0.3 μg/m ³
Antimony	24-hour	25 μg/m³
Iron	24-hour	4 μg/m ³
Lead	24-hour	0.5 μg/m³
Nickel	24-hour	0.2 μg/m ³
Asbestos	24-hour	0.04 μg/m ³

Fenceline Program Overview

- Six fenceline (property boundary) real time monitors
- A (North Pond), B (Town), C (Northwest Pond), D (Beach), E (A1C1 Pits), and F (Marina)
- PM10 monitored continuously during work day
- TSP monitored continuously during work day

Fenceline Monitoring Station Locations



Fenceline Equipment





Dusttrak Real time monitors

Activity Specific Air Quality Monitoring Plans (AQMPs)

- Roaster Deconstruction 2013-14
- Underground and Surface Drilling 2014
- Interim Underground stabilization (IUS) 2014-2015
- Asbestos removal Boneyard and Boilers 2014
- Asbestos removal C-shaft, gantries and transfer buildings 2014
- Arsenic repackage 2014-2015
- C-Shaft Demolition 2015

Exceedances

- May 2, 2014: Dust suppression at South Tailings Pond
- On May 2, strong wind gusts stirred dust from the South tailings pond. This was detected at the fence-line monitor at the southeast beach.
- Following operating procedures, a water truck was sent quickly to dampen the dust and levels returned to acceptable levels and a surface seal was reapplied to the pond to prevent further dust blowing.
- The air monitoring sample gathered at the community station in N'Dilo registered a result that was higher than usual, but well below the established air quality standards. This sample was the first such elevated reading, and subsequent readings indicated a return to normal levels. Results were not elevated at the other community monitors.

Exceedances

- October 17, 2014: Arsenic levels investigated
- A sample collected from the activity-specific monitor to the north-west of the Giant Mine roaster complex showed a 24-hour arsenic average of 5.2 micron per cubic metre.
- While this amount is above the action level of 0.3 microns per cubic metre, this level is designed to be very conservative.
- The levels detected in this case were a trigger for further investigation, but did not pose any risk to workers, the public, or the environment.

Challenges

- Originally the intention was to develop a relationship between PM10 and arsenic. At this point there is no correlation
- Equipment challenges warm weather (fires) cold weather (ice fog).

Next Steps

- Activity-specific and fence-line stations will continue operating. Monitoring at the fence-line stations usually stops during winter periods when no active site work is happening. This year a number of projects were ongoing into winter, so the fence-line stations were extended into January.
- The community monitoring stations will continue throughout the winter on a reduced sampling schedule and will increase again during the active work period, around April. The community monitors at the Yellowknife Cruising Club and in N'dilo will remain at the same locations.

Questions?

