



Arsenic Levels in Lakes around Yellowknife

1. Where does the arsenic in the Yellowknife area come from?

Arsenic is found at naturally low levels in the water of many NWT rivers and lakes. However, past gold mining activities have resulted in additional quantities of arsenic being released in the immediate environment surrounding the city.

2. Are these arsenic levels dangerous?

Trace amounts of arsenic detected in the Yellowknife River and Yellowknife Bay, as well as in a majority of the lakes recently tested (green dots as shown on the Public Health Advisory map) are below Health Canada's Guidelines for Canadian Drinking Water Quality, and are similar to levels found in water supplies across Canada.

This April 2016 Public Health Advisory is meant to address concerns about the fewer number of lakes that have elevated arsenic levels (eg., over 52 parts per billion or 'ppb') that require some precautions, particularly for vulnerable populations such as pregnant women and very young children.

3. Is the tap water in Yellowknife safe to drink?

Yes. Yellowknife's tap water is safe to drink.

Residents of Yellowknife, Ndilo and Dettah receive their tap water from the City of Yellowknife. The drinking water is collected from the Yellowknife River upstream of the former Giant Mine, before the river enters Yellowknife Bay.

The City of Yellowknife also occasionally draws water directly from Yellowknife Bay when maintenance on the water pipe is required. Regular testing has shown that this practice does not affect the quality of our drinking water, including with regard to arsenic levels. Regardless of water source, levels of arsenic in drinking water remain below the national standard set by the Guidelines for Canadian Drinking Water Quality. This also includes trucked water.

4. Is it safe to drink water from lakes (including frozen lakes) surrounding Yellowknife?

It is recommended not to drink untreated water anywhere in the Northwest Territories, primarily because of harmful microorganisms (germs such as E. coli, Giardia, Cryptosporidium and viruses) in untreated water that could make people sick.

Individuals may, on occasion, boil water taken from lakes for personal use it is recommended to avoid doing so in lakes close to historical industrial activities. Boiling water, while killing harmful microorganisms, does not remove contaminants such as arsenic.

As the Chief Public Health Officer (CPHO) receives new data from water research or monitoring studies, the map of affected lakes and the associated health advice will be updated and the public notified.

It is also important to note that none of the lakes represented on the April 2016 public health advisory map are sources of drinking water for the City of Yellowknife, Ndilo or Dettah.

5. Is the water safe for recreational use in lakes surrounding Yellowknife?

Yes, based on available contaminants data, most of the lakes near Yellowknife remain safe for recreational use such as swimming, boating and fishing. Public health advice in the April 2016 advisory will be updated as new data generated from research or monitoring studies is assessed by the CPHO.

Health risks associated with arsenic exposure depend on the mode of exposure (ingestion, inhalation or skin absorption), the concentration of arsenic and the form of arsenic. The Advisory recommends that lakes with arsenic concentrations in water greater than 52 ppb not be used for regular recreational activities such as swimming. Research indicates that there is little uptake of arsenic through the skin, so occasional exposure through wading is not considered a significant health risk.

As an additional precaution, fish caught from such lakes should not be consumed but catch-and-release fishing can be done. The eating of sediments from all lakes should also be avoided.

6. Can playing on the shorelines cause the release of arsenic into the water?

At this time, based on available information, the CPHO advises, occasional and brief period wading would not release sufficient quantities of arsenic that may be contained in sediment to create a health hazard. However, toddlers and young children should always be supervised around shorelines so that they do not inadvertently ingest dirt or mud, as well as for water safety reasons.

Public health advice in the April 2016 public health advisory will be updated as new data generated from research or monitoring studies is assessed by the CPHO.

7. How safe is it to swim at Long Lake?

Long Lake is one of the lakes in which arsenic levels in water are below the 52 ppb threshold that has been set for caution (yellow dot on public health advisory map). Recreational exposure in water, such as through swimming or wading activities, are therefore considered safe in terms of potential arsenic exposure.

Over the years, sand has been routinely added to the beach area, effectively covering the natural sediment layer and further reducing concerns about arsenic exposure. Residents can continue to enjoy recreational activities at Long Lake and is also not a source of drinking water.

8. Is it safe to swim along the shore in Ndilo and Latham Island?

Testing results on water from Yellowknife Bay and Back Bay have consistently been well below drinking water guidelines for arsenic. Although there are some concerns about elevated arsenic levels in sediment sampled near the shore line, wading and swimming activities would not pose a significant health risk. Residents can continue to enjoy the Yellowknife River and local areas of Great Slave Lake for all types of recreational activities without restrictions.

9. What about Frame Lake?

Frame Lake is identified as having arsenic levels above 100 ppb (red dot on Public Health Advisory map). Studies done in the past had already indicated a significant level of arsenic contamination in the sediment of Frame Lake. The former beach area has been closed for swimming, wading and beach activities for many years due to bacteriological and other concerns.

Residents can continue to enjoy paddling on the lake and using the Frame Lake trail and nearby parklands.

10. Is it safe to eat fish from lakes in the Yellowknife area?

Based on studies that have been done to date, the arsenic levels in fish from Back Bay and Yellowknife Bay are considered safe to eat. Future studies are needed to test fish in smaller lakes with higher levels of arsenic, which is why the Advisory currently recommends to avoid eating fish from lakes with arsenic levels above 52 ppb.

11. What about people fishing at Jackfish Lake?

Jackfish Lake is identified as having arsenic levels that require some cautions with regard to recreational activities (orange dot). Fish caught in Jackfish Lake should not be consumed.

In 2015, the Department of Environment and Natural Resources (ENR) also identified blue-green algae in the lake. Some types of algae have toxins and cause bad rashes. As a precautionary measure, people should wear gloves when handling fish from any lake where blue-green algae are visibly present.

12. Is it safe to eat wild berries, mushrooms or other plants around Yellowknife?

In general, people should pick wild berries, mushrooms and plants in locations that are well away from human or industrial activities and roadways.

Although current information suggests it is unlikely that occasional consumption of such wild plants would pose any significant human health risks, in the April 2016 Advisory we recommended to avoid harvesting berries, mushrooms or other edible wild plants in the immediate vicinity of lakes with high concentrations of arsenic until more research data is available on this particular question. As more information is available, our recommendations may change.

13. What about garden vegetables grown in the Yellowknife area?

Studies done to date have demonstrated that garden vegetables grown within the City of Yellowknife do not contain significant levels of arsenic and can be enjoyed safely.

14. Does arsenic in dust affect the air quality in the Yellowknife area?

Elevated dust can affect the air quality in Yellowknife, regardless of whether it has arsenic or not. Exposure to dust can cause health problems or make current health conditions worse, such as asthma or other chronic respiratory problems.

The Air Quality Monitoring Program, which is part of the Giant Mine Remediation Project, is set up to monitor local air quality so that remediation activities at Giant Mine do not cause adverse effects to people or the environment. Several monitoring stations have been installed and measure concentrations of contaminants in the air such as arsenic. When monitors detect elevated levels, site personnel take action by informing team members, watering to suppress dust, modifying or stopping work, and investigating to look for the cause (which may be off-site from the Giant Mine).

15. Has there been a human health study on the effects of arsenic around Yellowknife?

Since 2000, several human health risk assessments have been completed to determine the health risks from arsenic contamination associated with Giant Mine. This includes a Tier 2 Risk Assessment completed by SENES Consultants in 2006, which was updated in 2010. No significant public health concerns were identified at the time.

In 2016-17, the Giant Mine Remediation Team is preparing to conduct three separate studies related to human health: a Human Health Risk Assessment, a Stress Study, and a Human Health Bio-monitoring Study.

1) Human Health Risk Assessment

This assessment will look at current and predicted future exposures to contaminants associated with Giant Mine. It will inform community members about the possible sources and pathways of exposure (e.g. fish consumption or soil intake). It will also document any health effects (ranging from skin lesions to cancer) that are associated with specific levels of exposure.

The end result will be a set of benchmarks against which the project is measured to ensure the protection of human health during and after remediation. It is expected that the proposed remediation will reduce contaminant levels and risks over time.

2) Stress Study

While the direct effects of arsenic exposure are being evaluated through the above-mentioned human health risk assessment, Measure 10 of the Environmental Assessment requires the Project Team to also evaluate the indirect effects of potential exposures to arsenic on wellness, including stress.

3) The Health Effects Bio-Monitoring Program

The Health Effects Bio-Monitoring Program is required to establish a baseline of health effects in Ndilo, Dettah and Yellowknife and ensure the remediation project does not negatively impact the health of the community. It is expected to involve biological sampling of residents from the three communities, and could include hair, nails, urine, or blood.

16. How does HSS notify the public of any risks associated with contaminants in soil, sediments, water etc?

Public health advice is provided to residents through a Public Health Advisory issued by the Chief Public Health Officer. This information is circulated to community governments, media and the public, and is posted on the Department's website in the advisory section. Signs may also be posted in locations with elevated contaminant levels, particularly in areas of regular public use.

We will continue to update our health messaging based on the latest available research and monitoring, and will continue to work with our partners to keep the public informed.