



## ATHABASCA WORKING GROUP

2016-2017 Environmental Monitoring Program in:

# Wollaston/Hatchet Lake



# Changes to the AWG Program

The Athabasca Working Group (AWG) environmental monitoring program began in 2000 and continued for 18 years in 7 northern Saskatchewan communities: Wollaston Lake/Hatchet Lake, Black Lake, Fond du Lac, Stony Rapids, Uranium City, and Camsell Portage. Northern community members were involved with choosing the sampling locations, the types of plants and animals sampled, and with the sample collections themselves each year.

In consultation with the Athabasca Joint Engagement and Environmental Subcommittee, the AWG program ended in 2017 and has been replaced by the Community Based Environmental Monitoring Program (CBEMP) moving forward. The CBEMP will consist of a community-specific traditional foods study completed in one or two communities per year, and rather than a region wide sampling program, samples will be collected in areas known to be used by traditional users of each community. Going forward, a traditional foods study will be conducted, starting in Black Lake and Stony Rapids in 2018.



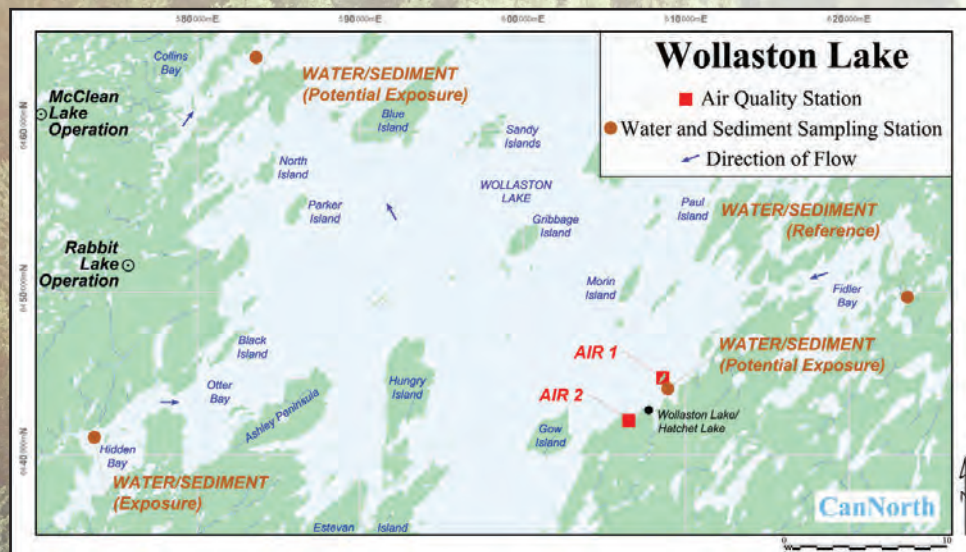
Photo credit: Doug Chisholm



# Purpose

The purpose of this brochure is to inform the public of the 2016 and 2017 AWG program results in the Wollaston Lake and Hatchet Lake area, and additionally, to conclude the findings of the AWG Program as a whole.

The map shows the Wollaston Lake/Hatchet Lake study area. Water, sediment, and fish were sampled from a reference site, an exposure site, and two potential exposure sites. Fidler Bay was chosen as the reference site because it is not influenced by uranium operations. Hidden Bay is an exposure site because it is located downstream of the Rabbit Lake Operation. Welcome and Collins bays are potential exposure sites because it is possible they may receive parameters from uranium operations, but are not expected to. Two locations were also monitored for air quality near the communities and plant and wildlife samples were collected when available.





# Key Parameters

The focus of the AWG program was to monitor certain parameters related to uranium operations that were of concern to human and environmental health. These included: copper, lead, nickel, molybdenum, zinc, radium-226, uranium, selenium, and arsenic. All of these parameters occur naturally in the environment and in parts of northern Saskatchewan they can sometimes be found in high amounts.

In order to help establish whether the key parameter levels found in samples were naturally occurring, whether they may have been from uranium operations, and whether they posed a risk to the environment, the amounts measured were compared: 1) between reference and potential exposure sites, 2) to past results, and 3) to available guidelines.

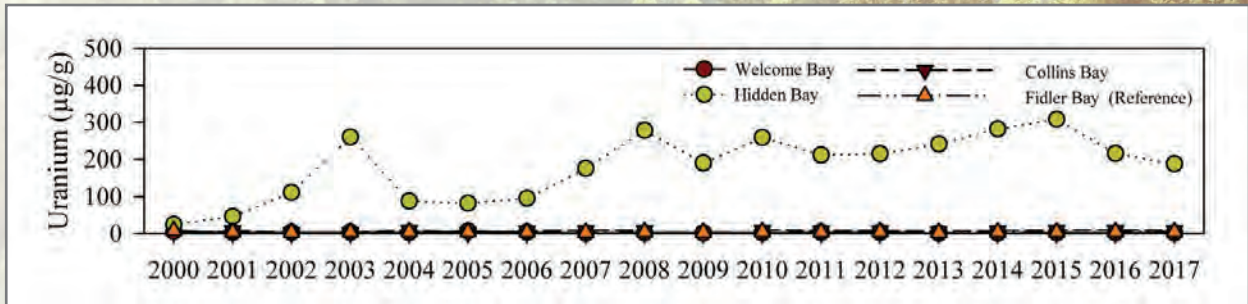






# Sediment

Sediment is the mud on the lake bottom. Parameters from uranium operations may be carried by flowing water to lakes where they may be left in the sediment on the lake bottom. In 2016 and 2017, sediment samples were collected from the same locations used for water sampling in the Wollaston Lake/Hatchet Lake area.



Hidden Bay has shown higher levels of some of the key parameters compared to the other bays in Wollaston Lake and compared to some of the available guidelines. Molybdenum in Hidden Bay was higher than all of the recommended guidelines in 2016 and 2017. Nickel, selenium, and uranium in Hidden Bay, and arsenic in Hidden and Collins bays, were higher than some of the available guidelines in 2016 and 2017.

In 2016, the Rabbit Lake Operation entered into safe care and maintenance mode. Treated effluent from the site is released upstream of Hidden Bay. A treatment process to reduce uranium levels in the final effluent began in 2007, and in 2010, a molybdenum-selenium reduction circuit was completed. As a result, the amount of metals in the final effluent was reduced and this should eventually result in lower levels in Hidden Bay sediment.



# Fish



Lake whitefish and northern pike were targeted in all AWG sampling bays of Wollaston Lake in 2016 and 2017; however, lake whitefish were not captured in Hidden Bay in 2016, nor Collins Bay in 2017. Over the course of AWG program history, the levels of key parameters in fish were often lower than the levels the laboratory could measure and were similar from year to year.

Mercury is an important parameter for human health. Though mercury is not related to uranium mining and milling, it is recommended that the “Mercury in Saskatchewan Fish: Guidelines for Consumption” document be consulted prior to fish consumption in all areas of Saskatchewan. Larger and older predatory fish generally contain more mercury than smaller fish of the same species from the same waterbody. To view the document, go to [www.publications.gov.sk.ca](http://www.publications.gov.sk.ca) and search “mercury in fish”.

Canada’s Food Guide recommends eating at least two servings of fish per week and the benefits of eating fish far outweigh any risks from consuming fish that contain low levels of contaminants (such as mercury). These benefits include:

- 1) fish are an excellent source of high-quality protein and valuable vitamins and minerals, including vitamin D, which helps the body use calcium to build strong bones and teeth; and
- 2) fish are low in saturated fat and cholesterol and are a very good source of omega-3 fats, which help reduce the risk of cardiovascular disease and promote healthy brain development in infants.



# Wildlife



According to the Population Health Unit of the Athabasca Health Authority (2005), wild game are an important source of vitamins, minerals, and protein and are low in saturated fats. The AWG program collected samples of meat from moose, barren-ground caribou, and lynx for testing from the AWG communities when available.

A barren-ground caribou sample was obtained from the Wollaston Lake/Hatchet Lake area in each of 2016 and 2017, and a moose sample was obtained in 2017. The results of these samples as well as the mammal samples (barren-ground caribou, moose, and lynx) from the other AWG communities in 2016 and 2017 showed low levels of key parameters that were similar to previous results throughout the AWG program's past.

For hunters: it is recommended to always use lead-free ammunition when hunting wildlife to prevent potentially harmful exposure to lead. Lead bullets may fragment into tiny pieces upon impact, which may then be eaten unknowingly.



# Plants

Plants such as blueberries, cranberries, and Labrador tea are good sources of Vitamin C, fibre, and carbohydrates (MacKinnon et al. 2009).

Wild plants are important because they have traditionally been used for both food and medicine. Samples of blueberry, bog cranberry, and Labrador tea were collected in 2016 and 2017 from the Wollaston Lake/Hatchet Lake area.

The analysis results from the beginning to the end of AWG monitoring showed low levels of the key parameters in all three plant types.

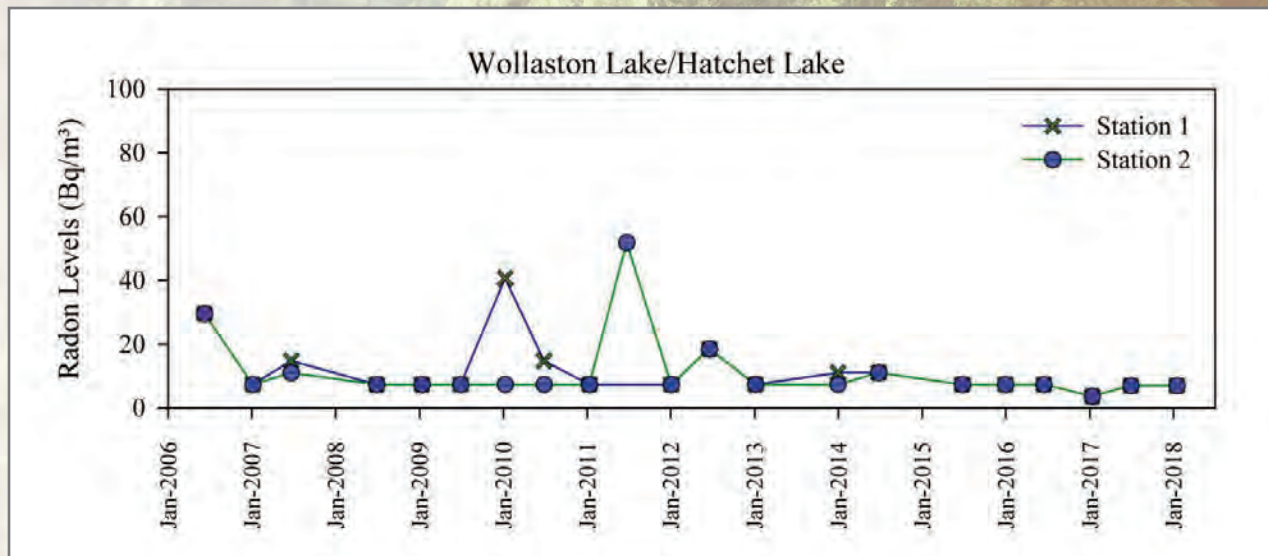




# Air

Air quality was monitored at two locations near Wollaston Lake and Hatchet Lake in 2016 and 2017 by measuring radon levels. Radon is an odourless and tasteless gas produced by the natural breakdown of uranium and radium-226 in the soil and water. As a result, radon levels are naturally higher in areas where uranium is found in the ground. Seasonal differences may occur because the ground thaws and releases radon gas into the air during the summer months.

Wollaston Lake/Hatchet Lake radon levels have been low over the entire duration of the AWG program. The graph displays the results since 2006.





# Conclusion

Over the 18 years of sampling that made up the AWG Program, there were no concerns regarding the amounts of key parameters in the water, fish, mammals, and air in the Wollaston Lake/Hatchet Lake area. Some parameters in sediment from Hidden Bay were higher than available guidelines during AWG monitoring.



# Thank You for 18 Years

The AWG program was made possible thanks to the involvement of northern residents. Special thanks to George St. Pierre and his family who did a great job collecting AWG samples from the Wollaston Lake and Hatchet Lake area for all 18 years!

Thank you to the AWG members, including representatives from the seven northern communities and industrial partners, Cameco Corporation and Orano Canada Inc. (formerly AREVA Resources Canada Inc.).



Pictured: Ryan Froess, Program Manager (top); George St. Pierre (bottom).





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