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## Project CLEANS

(Cleanup of Abandoned Northern Sites)

# Gunnar Mine Site

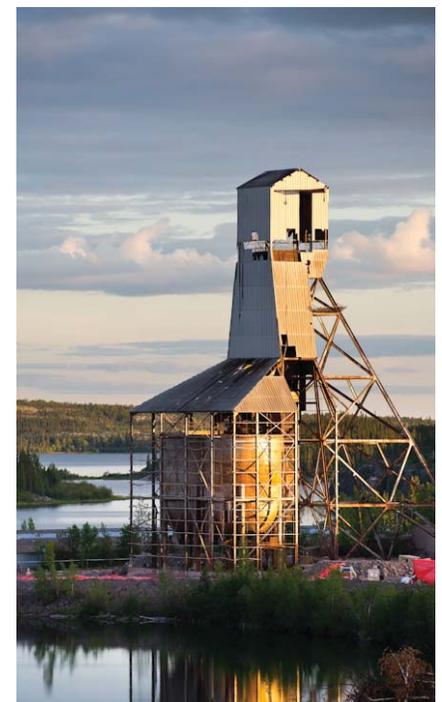
Project CLEANS (Cleanup of Abandoned Northern Sites) is a multi-year project to assess and reclaim Gunnar uranium mine and mill site, Lorado uranium mill site and 35 satellite uranium mine sites in northern Saskatchewan. The Saskatchewan Research Council (SRC) is managing Project CLEANS, which is funded by the governments of Saskatchewan and Canada.

### About the Gunnar Mine Site

The former Gunnar uranium mine and mill site is located on the north shore of Lake Athabasca, approximately 25 kilometres south of Uranium City, Saskatchewan. The mine was operational from 1955-1963 and officially closed in 1964 with little decommissioning. Due to the remote and isolated location of the site, numerous buildings (both industrial and residential) and facilities were developed. According to technical standards during that time, asbestos was widely used in all the buildings.

### The Gunnar mine and mill site consisted of:

- Open pit mine over 100 metres deep and 250x300 metres in size
- Underground mine 600 metres deep
- Uranium mill with a capacity of 2000 tonnes/day
- Two acid plants
- Uranium processing buildings
- A number of residential, public, administrative and technical buildings
- Approximately 4.4 million tonnes of tailings
- Approximately 2.7 million tonnes of waste rock deposits



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The open pit is separated from Lake Athabasca by a 50 metre narrow bedrock ridge. The underground mine was accessed by a shaft sunk 600 metres deep. When the mine closed, the open pit was filled by blasting a narrow trench in the rock to Lake Athabasca. Water flooded the pit and the underground workings. In 1966, the channel was filled with waste rock. Uranium concentrations in the pit water range from 320 to 960 µg/L.

Approximately 4.4 million tonnes of tailings deposited during operation of the mine and mill were left unconfined. Tailings were first deposited into Mudford Lake, approximately 500 metres north of the mill. For several years, the lake was filled with tailings deposits up to 14 metre deep. Once the approximately 40 hectare area, called Gunnar Main Tailings, was full, the tailings were directed to a small depression to the east of the main site. From there, the tailings moved further downhill into Langley Bay, Lake Athabasca.

There is also 2.2 to 2.7 million cubic meters of waste rock on the site. This material has a highly variable content of residual uranium (from <10 to over 15,000 ppm). The gamma dose rate at 1 metre above the rock surface varies from 0.5 to 10 µSv/h. A continuous surface seep, as well as a number of intermittent seeps, drain from the waste piles and discharge into Zeemel Bay, Lake Athabasca. The seep water contains over 9,000 µg/L of uranium on average with a registered maximum of 36,000 µg/L.

### Rehabilitation

SRC began demolition work at the site in the fall of 2010, which was successfully completed in 2012. Demolition activities included undertaking significant asbestos abatement of the buildings, followed by demolition of all residential and production structures, cleaning up site debris and constructing a barrier around the open pit. As project manager, SRC's first commitment is ensuring the health and safety of contractors, employees and others working to remediate the Gunnar mine site, as well as local residents and the public.

Further cleanup activities include:

- Disposing demolition materials
- Installing an appropriate cover on all, or a portion of, the exposed mill tailings and waste rock
- Re-vegetating and water treatment as required
- Monitoring during and after rehabilitation

Mine site cleanup is guided by provincial and federal regulatory bodies. The Canadian Nuclear Safety Commission (CNSC) and Saskatchewan Environment regulate aspects of the project to ensure people and the environment are protected.

### Community

An important part of the site remediation is engaging local communities. During the environmental assessment, the Prince Albert Grand Council was contracted to work closely with local residents to collect traditional knowledge and land use information. SRC has ongoing and regular contact with community members and their leadership to provide updates on the project and to seek their feedback and advice.



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