

# Investigation Under the *Environmental Rights Act*

Ptarmigan Mine

September | 2021



# Investigation Under the *Environmental Rights Act* – Ptarmigan Mine

## Introduction

A request for an investigation under the *Environmental Rights Act* (ERA) was received by the Minister of Environment and Natural Resources (ENR) on January 5, 2021. The request was in regards to the tailings containment areas at the former Ptarmigan Mine site along the Ingraham Trail. Of specific concern was the dust and debris that can be carried by the wind from the tailings ponds and deposited on the surrounding land. The mine site was abandoned in the late 1990's.

## Nature of Request

The official request for investigation was submitted under section 8 of the *Environmental Rights Act* regarding the safety and management of the tailings ponds at the Treminco/Ptarmigan Mine site along Territorial Highway 4, also known as the Ingraham Trail. The applicant noted that “It is a frequent occurrence when driving past that area that there are clouds of dust and debris that the wind carries into the air from the old ponds. The dust is likely all over land around the Treminco/Ptarmigan mine, not only is a person exposed to the likely unhealthy dust when driving past in a vehicle, on a motorcycle or a bicycle, but any use of the land near the old Treminco/Ptarmigan mine site seems it would result in unnecessary exposure to this dust. Plants, fish, mammals, birds and insects are also potentially affected.”

The applicant also noted that “It is distressing to know that the Treminco/Ptarmigan mine site, which Treminco Resources Limited took control of in 1985, then abandoned in the late 1990's, which was later acquired by Terra X Minerals Inc. in 2018-19 minus the old environmental liabilities, and now seems to be a GNWT responsibility but as an “excepted site”, still has dust from the ponds blowing around from it now, over 35 years later.”

## Investigation Methodology

The investigation was initiated on January 5, 2021 and consisted of a review of the most recent environmental reports available for the former Ptarmigan Mine site. This included:

- Ptarmigan Mine Phase III Environmental Site Assessment (ESA), July 2017
- Remedial Action Plan for Ptarmigan Mine, Northwest Territories (RAP), May 2017.

The review also included a site visit to the tailings containment areas on June 23, 2021 by ENR staff.

## Background

The former Ptarmigan Mine is located on Commissioner's Land, approximately 16 kilometres northeast of Yellowknife along the Ingraham Trail. The former mine site includes a historical tailings containment area and buildings east of the Ingraham Trail and another tailings containment area west of the Ingraham Trail. A map showing the location of the former Ptarmigan Mine in relation to Yellowknife and the Ingraham Trail is included in Figure 1.

Ptarmigan Mine is one of six mine sites designated as Excepted Waste Sites in the 2014 Devolution Agreement. These sites are abandoned waste sites (also known as "contaminated sites") located on Commissioner's Land that have environmental liabilities caused by historic third-party mining and mining exploration activity. Under the terms of the Devolution Agreement, management responsibilities for these sites, including the Ptarmigan Mine, has yet to be determined and is pending the outcome of negotiations between Canada and the Government of the Northwest Territories (GNWT) as committed to as part of Devolution.

The GNWT completed detailed Phase III ESAs and conceptual RAPs for each of the Excepted Waste Sites, including Ptarmigan Mine to inform negotiations. Negotiations with Canada are on-going.

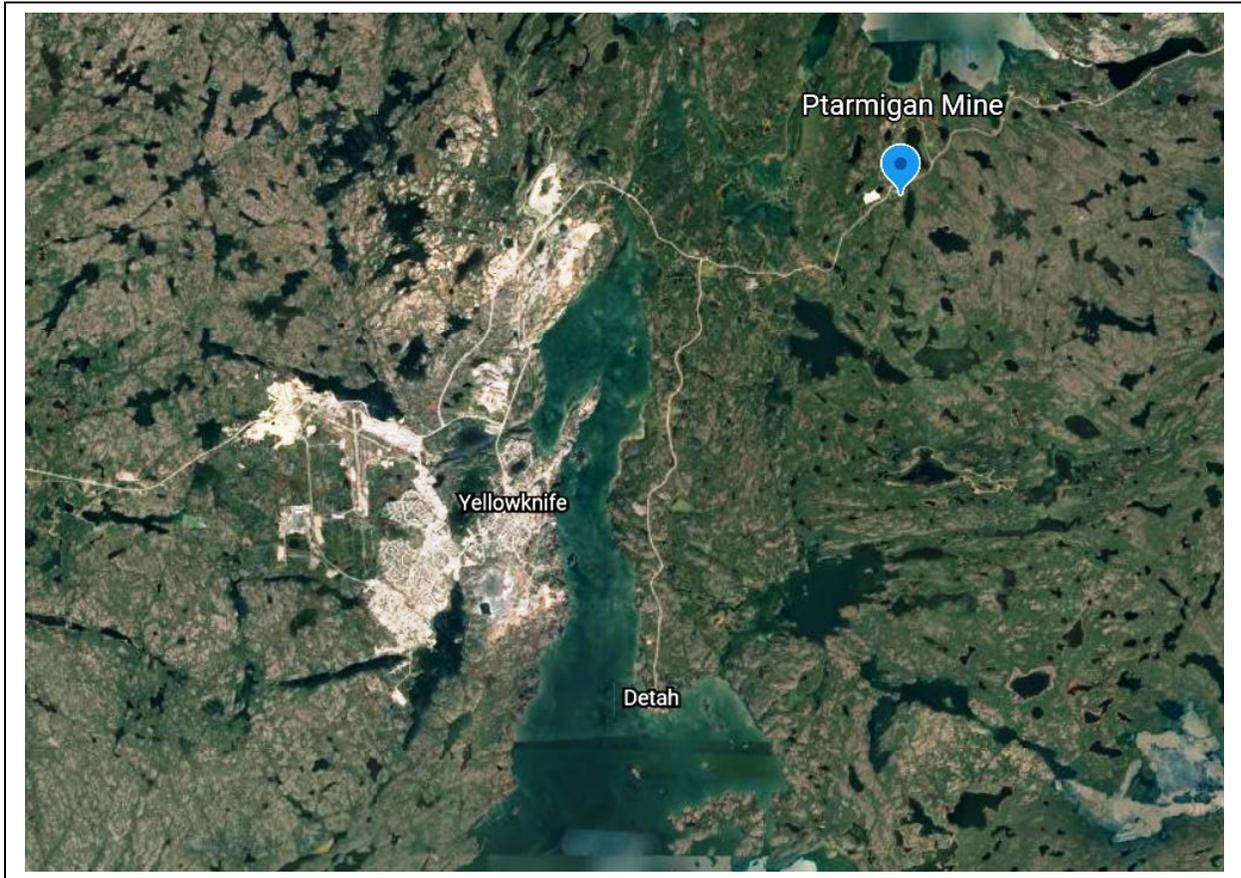


Figure 1: Map of Former Ptarmigan Mine

## Summary of Data Collected and Reviewed

### Phase III Environmental Site Assessment

A Phase III ESA is a comprehensive assessment designed to delineate the physical extent of contamination based on recommendations made in earlier assessments. It involves further testing with the goal of determining the extent and magnitude of contamination on site. Data from samples taken are compared to guidelines. The results and findings from the Phase III ESA support the development of the remedial action plan. A summary of the tailings containment areas from the Phase III ESA is presented in the following sections.

## Tailings Containment Area

Approximately 262,000 tonnes of uncovered tailings are present on-site in the tailings containment area (referred to as AEC 3 Tailings in Figure 2). The tailings containment area and dam was constructed in November/December 1988 and was in operation until 1994.



Figure 2: Map of Former Ptarmigan Mine Showing Locations of Tailings Containment Areas

As part of the Phase III ESA, soil samples from in and the around the tailings containment area were analyzed for a suite of 22 metals. It should be noted that soil samples collected in the tailings containment area are tailings. The results were compared to the following guidelines:

- Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of the Environment and Human Health (CCME CSQG) – Agricultural
- Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of the Environment and Human Health (CCME CSQG) – Residential/Parkland
- Government of the Northwest Territories Environmental Guideline for Contaminated Site Remediation (GNWT-CSR) – Agricultural

The results indicated that soil samples in and around the tailings containment area had elevated concentrations of arsenic, cadmium, lead and zinc (see Table 1 in Appendix A). All 9 samples had levels of arsenic above guidelines, 3 of 9 samples had cadmium levels above guidelines, one sample had lead levels above guidelines, and 2 had levels of zinc above guidelines. All exceedances of guidelines for cadmium (sample 1,2,3), lead (sample 2) and zinc (sample 1,3) were associated with 3 samples that also has the greatest arsenic concentrations of the 9 samples collected.

### **Historical Tailings**

Approximately 34,000 tonnes of the original 1940's tailings are being stored in the area bisected by the Ingraham Trail (referred to as AEC 4 Historical Tailings in Figure 2). The historical tailings area was in operation between 1941 and 1942 during the original mining operations.

Soil samples collected from in and around the historical tailings area were analyzed for 22 metals. The results of the Phase III ESA indicate that some soil samples taken from in and around the historical tailings area contain elevated concentrations of arsenic, cadmium, copper, lead, mercury, nickel and zinc (Table 2 in Appendix A).

Soil results were compared to the following guidelines:

- Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of the Environment and Human Health (CCME CSQG) – Agricultural
- Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of the Environment and Human Health (CCME CSQG) – Residential/Parkland

- Government of the Northwest Territories Environmental Guideline for Contaminated Site Remediation (GNWT-CSR) - Agricultural

18 of 19 soil samples exhibited levels of arsenic above guidelines. 9 of 19 samples had levels of cadmium above one or more guidelines and 4 of 19 samples had levels of copper above one or more guidelines. Elevated levels of lead were observed in 12 of the 19 samples that exceeded one or more guidelines. Mercury and nickel concentrations were above guidelines in one sample each and zinc concentrations were above guidelines in 6 samples.

## Remedial Action Plan

A review of the remedial action plan (RAP) for the site was also undertaken. A RAP is a guideline that proposes a series of engineering and geological procedures to return a contaminated site to the desired end point. It is based on the results of the Phase III ESA, best practices in mine closure, current use of the area, and community values. The plan takes the environmental status of the site, precedent practice, regulatory requirements, and site goals into consideration.

The recommended remediation option for the Ptarmigan Mine site as presented in the RAP is to first develop site-specific criteria based on statistical analysis and human health and ecological risk assessment (HHERA). The purpose of the HHERA is to better understand the potential risks to human and ecological receptors associated with the former mine site. The HHERA will inform the remediation activities.

## Summary of Investigation

The results of the investigation indicate that some samples from both tailings containment areas contain levels of arsenic and other metals that exceed guidelines. This was determined by the Phase III ESA.

## Analysis and Determination Findings

Section 9(2.1) of the ERA states that “In determining whether an alleged act or omission has caused or is likely to cause significant harm to the environment, the Minister shall consider the following factors:

- a) The magnitude of the effect;
- b) The geographical area of the effect;
- c) The duration of the effect;
- d) The degree of reversibility of the effect;
- e) The nature of the effect;
- f) The likelihood that the effect will occur;
- g) The sensitivity of the receiving environment;
- h) Any other factors that the Minister considers relevant, taking into account the purposes of the Act.”

In consideration of the above criteria, the investigation has determined that while there are levels of arsenic and other metals that exceed some guidelines at the former Ptarmigan Mine, the risk to human health and the environment cannot be fulsomely determined until an HHERA is completed for the site, similar to what was completed for Giant Mine. Two risk assessments were completed for Giant Mine, one onsite ([Giant Mine Human Health and Ecological Risk Assessment](#)) and one offsite around the Yellowknife area ([Human Health Risk Assessment for Legacy Arsenic Contamination Around Yellowknife](#)). Both risk assessments found that the risk levels to human health and the environment were low. As such, an HHERA will need to be completed by the government that is responsible for the site. An HHERA is a scientific process used to describe and estimate the likelihood of potential risks (i.e., adverse health effects) to humans and wildlife and plants resulting from exposure to environmental contaminants. Part of the assessment is to determine contaminants of concern, who or what is being exposed, and how they are being exposed. All three of these components are considered in the assessment of risk.

It is important to note that the existence of a contaminant that is above guidelines does not necessarily mean that there is a risk to human health and the environment. Certain areas around Yellowknife, particularly associated with gold mining, exhibit higher background levels of arsenic than the guidelines. ENR is in the process of

revising its remediation criteria. The amendments to the arsenic remediation criteria takes into account new data from recent scientific research while also recognizing the background levels of arsenic around the Yellowknife area.

## Minister's Response

As the Ptarmigan Mine site is a designated Excepted Waste Site under the Devolution Agreement, the government responsible for the ongoing management of the site is under negotiation. However, the Minister of ENR recognizes the need to addressing the dust blowing over the Ingraham Trail as some samples from the tailings containment areas contain levels of arsenic and other metals that exceed some guidelines.

As an interim measure, a dust suppression control program at the mine site will be implemented to minimize dust from the tailings containment areas. Work is already underway to research an appropriate chemical to use as a dust suppressant, investigate regulatory approvals needed to complete the work, and find a qualified contractor to complete the dust suppression work. We anticipate that the application of the dust suppressant will begin in the spring of 2022.

Further determination of risks to people and the environment require the completion of an HHERA. The department will recommend at the negotiations table that an HHERA be carried out by the responsible government.