Government of
Northwest Territories

Canol Trail Miles 0-8 Remediation Project

ENVIRONMENT AND CLIMATE CHANGE

History and Background of the Canol Trail

The Canol Trail is a 355 km road along a former petroleum pipeline built between 1942 and 1944 to transport oil and other refined petroleum products from Norman Wells, Northwest Territories to Whitehorse, Yukon during World War II. Local Dene and Métis people played an important role by guiding builders and establishing the route through the mountainous terrain. Oil started flowing through the pipeline in 1944 until it was abandoned about one year later. After the pipeline was abandoned, various pieces of infrastructure and materials were left behind, including vehicles and buildings.

Miles 0-8 of the Canol Trail became the responsibility of the Government of the Northwest Territories (GNWT) in 1973 through a block land transfer. Mile 0-1 was the location of Pump Station #1, a tank farm, and the initial construction camp (Camp Canol). In 1943, Camp Canol was moved to Mile 8 and contained several buildings including a hospital, two nose hangers, living quarters, a garage, storage buildings, horse stables and other miscellaneous buildings. The camp was reportedly demolished by Imperial Oil Limited in 1977, however, some infrastructure and buildings were left in place.

Miles 8–222 of the trail were retained by the Government of Canada at devolution for the purpose of conducting remediation activities. The Government of Canada has completed environmental studies and remediation work at 22 sites along the Canol Trail between Miles 8-222 and are currently carrying out a long-term monitoring program. Canada continues to hold responsibility for this section of the trail.

Furthermore, the *Sahtu Dene and Métis Comprehensive Land Claim Agreement* (1994) sets out the objective for the creation of a Territorial Park on lands comprising of the Canol Trail. This initiative is advancing separately from the remediation project.

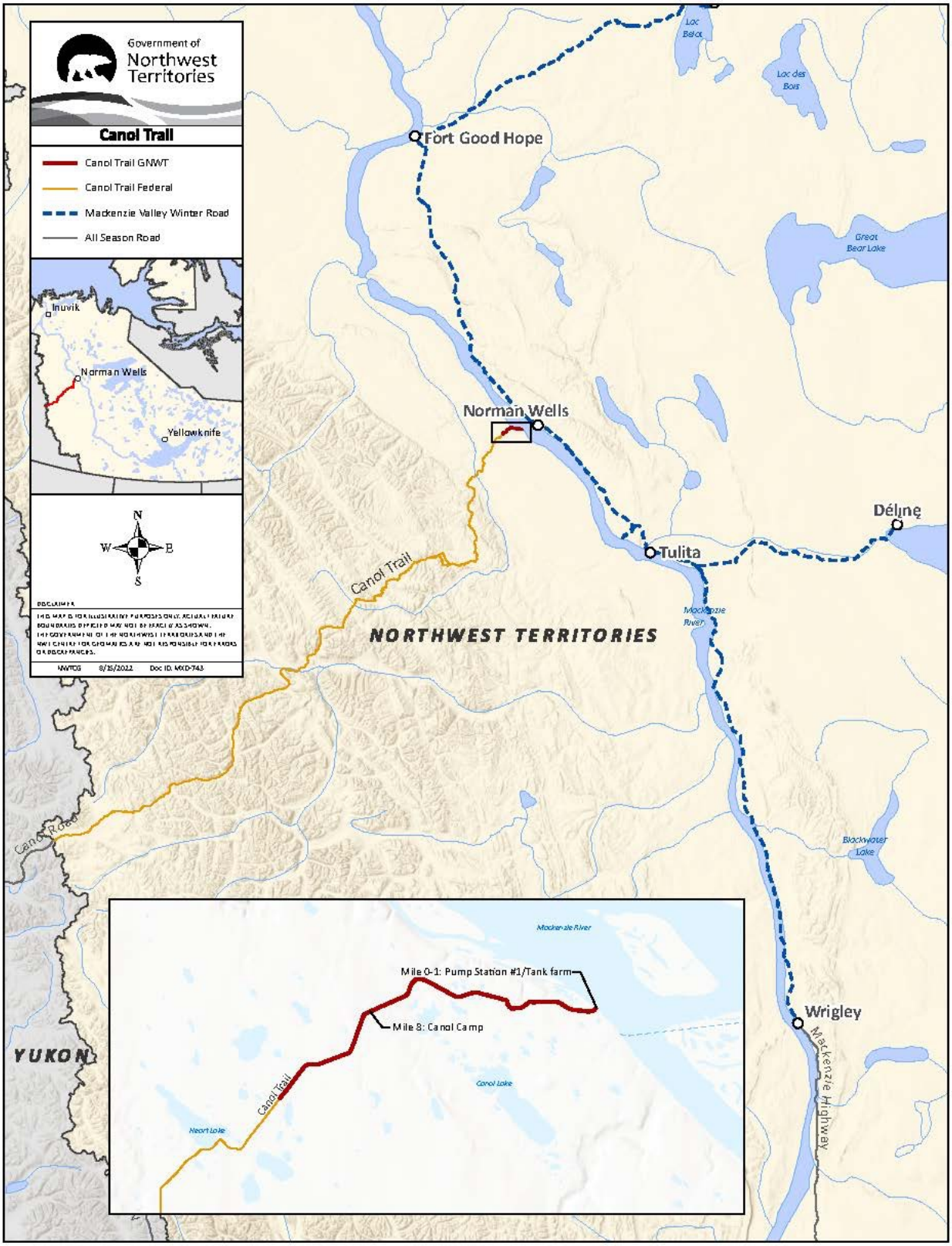

Figure 1: Map of the Canol Trail; inset: Miles 0-8.

Project Summary

Between 2017 and 2020, the Department of Environment and Climate Change (ECC) completed various assessments of the Canol Trail Miles 0–8, including a Phase I/II Environmental Site Assessment (ESA) (2017), a Phase III ESA (2019), and a Human Health and Ecological Risk Assessment (HHERA) (2020). A high-level Remedial Options Analysis (ROA) was also completed in 2019.

To better inform the work going forward, in 2023 and 2024 ECC completed additional sampling and archaeology assessments, as well as a community workshop in June 2023. In October 2023, ECC installed signage along the trail and on existing structures to warn trail users of potential risks. This was followed by a supplemental Phase III ESA report (2025) and an updated HHERA report (2024).

The objectives of the Canol Trail, Miles 0-8, Remediation Project for the GNWT are:

- To implement a remediation approach that is supported by key stakeholders while also reducing risks to trail users and being fiscally responsible.
- To remediate the site to an acceptable level to support the creation of a territorial park.

This pamphlet outlines the work completed to date on Mile 0-1 and Mile 8 of the Canol Trail:

The GNWT would like to thank all partners, stakeholders, and the public supporting the project to date. Between 2016 and 2024, community members joined our environmental, archaeological, and drone field programs. Our sincere gratitude goes to the contributions of those who participated in the field work, as well as those who participated in our Archaeological Workshop in 2023.

PHOTO: K'ALO-STANTEC

Awaiting a boat back to Norman Wells after a long field day at Mile 0.

PHOTO: K'ALO-STANTEC

Staging area for the 2019 field program at Mile 8.

Archaeological Overview Assessment (AOA)

What is an AOA and why did we do one?

An Archaeological Overview Assessment (AOA) is a desktop evaluation that looks at the likelihood that land contains significant archaeological resources. The evaluation assessed areas of historic activity and landforms (such as lakes, rivers, vegetation, terrain, and historical documentation) to build an understanding of the archaeological site potential of the project area.

What were the findings of the AOA?

Findings of the AOA for Mile 0-1 and Mile 8 of the Canol Trail were split into three categories for archaeological potential:

1. Precontact Period High Potential Areas
2. Historic Period High Potential Areas
3. Low Archaeological Site Potential Areas

Within the Mile 0-1 and Mile 8 areas, the team identified locations of high archaeological potential for both precontact and historic periods. It was recommended that a field-based Archaeological Impact Assessment (AIA) be completed prior to any environmental sampling activities that would disturb the surface and/or subsurface.

The AOA results and recommendations were reviewed and approved by the territorial archaeologists at the Government of Northwest Territories – Department of Education, Culture and Employment (GNWT-ECE).

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Aerial view of Canol Camp, 5 August 1943 [Mile 0-1].

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Remains of Canol Camp shortly after [Imperial Oil remediation], 14 September 1977.
[Mile 8 - quonsets (left), stables (middle) and nose hangers (right)]

Archaeological Community Workshop

The GNWT-ECC held a one-day engagement session facilitated by K'alo-Stantec Limited (K'alo-Stantec) in Norman Wells in June 2023. Elders and land users from Norman Wells and Tulita, as well as representatives of the Doi T'oh Territorial Park Corporation participated in the archaeology workshop.

The purpose of the archaeology workshop was to gather information on past and present land use and access.

What we heard at the Archaeology Workshop

- The Canol Trail was used for traditional activities, including hunting, fishing, trapping, recreation, and spiritual/cultural activities. Now, access is limited due to overgrown vegetation in the area.
- Specific place names are used, such as Mackenzie Mountain Trail, instead of Canol Trail.
- People want the area to be healthy so they can use the trail for traditional and cultural activities.

Information gathered during the workshop supported the environmental and archaeological fieldwork and reporting planned for the site.

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Abandoned equipment at Mile 8.

Archaeological Impact Assessment (AIA)

What is an AIA and why did we do one?

Fieldwork conducted by an archaeologist in the territory is called an Archaeological Impact Assessment (AIA). An AIA is completed under an Archaeology Permit, issued by the Culture and Heritage Division of the GNWT-ECE.

An AIA was completed to avoid or reduce potential impacts of the 2023 environmental assessment work and to inform future risk management and remedial activities.

The fieldwork included aerial and ground surveys, including examining the ground surface and hand digging, and detailed recording of any findings. Field Assistants and Wildlife Monitors from Norman Wells and Tulita assisted K'alo-Stantec with the field program.

What were the findings of the AIA?

The AIA:

- Confirmed areas with precontact and historical potential that were identified in the AOA.
- Identified various historical structures at the historical areas.
- Noted historical debris in the areas and along the trail.

Collected cultural materials (artifacts) were sent to the Prince of Wales Northern Heritage Centre (PWNHC) in Yellowknife, including containers (pop can, jars), a vehicle key, building material (nails, window pane), and a brass information plate. A fire extinguisher found along the trail by a Wildlife Monitor was donated to the Norman Wells Historical Centre.

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Miss America Coffee can, circa World War II, found at Mile 1.

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General Motors Co. vehicle key collected from the maintenance shop foundation at Mile 8.

K'ALO-STANTEC

Fire extinguisher, found by wildlife monitor at Mile 8 and donated to the Norman Wells Historical Centre.

K'ALO-STANTEC

1970s Pepsi-Cola pop can found at Mile 8 which may be related to the initial clean-up of Canol trail by Imperial Oil Ltd in 1977.

Environmental Site Assessment

What is an Environmental Site Assessment (ESA)?

Environmental Site Assessments (ESAs) are generally conducted in phases and are intended to identify what contaminants are present and the location of the contaminants. This information is used to inform decisions about remediation or management of the contamination.

Contaminants are any substances that can endanger the health of people, wildlife, or plants when discharged to the environment.

The phases of the site assessment process are described below.

Identify

The purpose of a Phase I ESA is to identify potential contamination based on a review of current and historical activities at the site. If potential contamination is identified, the area is referred to as an Area of Potential Environmental Concern (APEC).

Assess

A Phase II ESA is completed if the Phase I ESA identified the presence or potential presence of contamination. A Phase II ESA involves the collection of samples (soil, groundwater, surface water, and/or sediment) from APECs to confirm if contamination is present, and determine the concentration of contaminants, where the contaminants are located and what media (soil/groundwater/surface water/sediment) are impacted.

Delineate

A Phase III ESA is completed when the Phase II ESA did not find the boundary of the contamination. Additional samples are collected to determine the boundary of the contamination and to collect additional data or information needed to support a risk assessment.

Phase I ESA

What were the findings of the Phase I ESA?

The Phase I ESA identified 17 APECs at Mile 0-1 and 6 APECs at Mile 8. Examples of the APECs and the potential sources of contamination are provided below.

EXAMPLES OF APECS AT MILE 0-1 AND MILE 8	POTENTIAL SOURCES OF CONTAMINATION
Camp Areas, Barracks, Wall Tent Areas	Heating fuel storage, domestic waste disposal, treated lumber
Tank Farms, Fuel Storage Areas	Fuel storage, spills, heavy equipment operation
Waste Areas	Waste disposal, batteries, metal debris
Maintenance Areas	Waste oil disposal, fuel storage, cleaning and degreasing of equipment, equipment refueling
Utilidor and Pipeline	Fuel spills, sewage spills, pipeline operation
Staging and Storage Areas	Fuel storage, treated lumber, material storage
Airstrip Area	Material storage, aircraft operation, refueling and maintenance

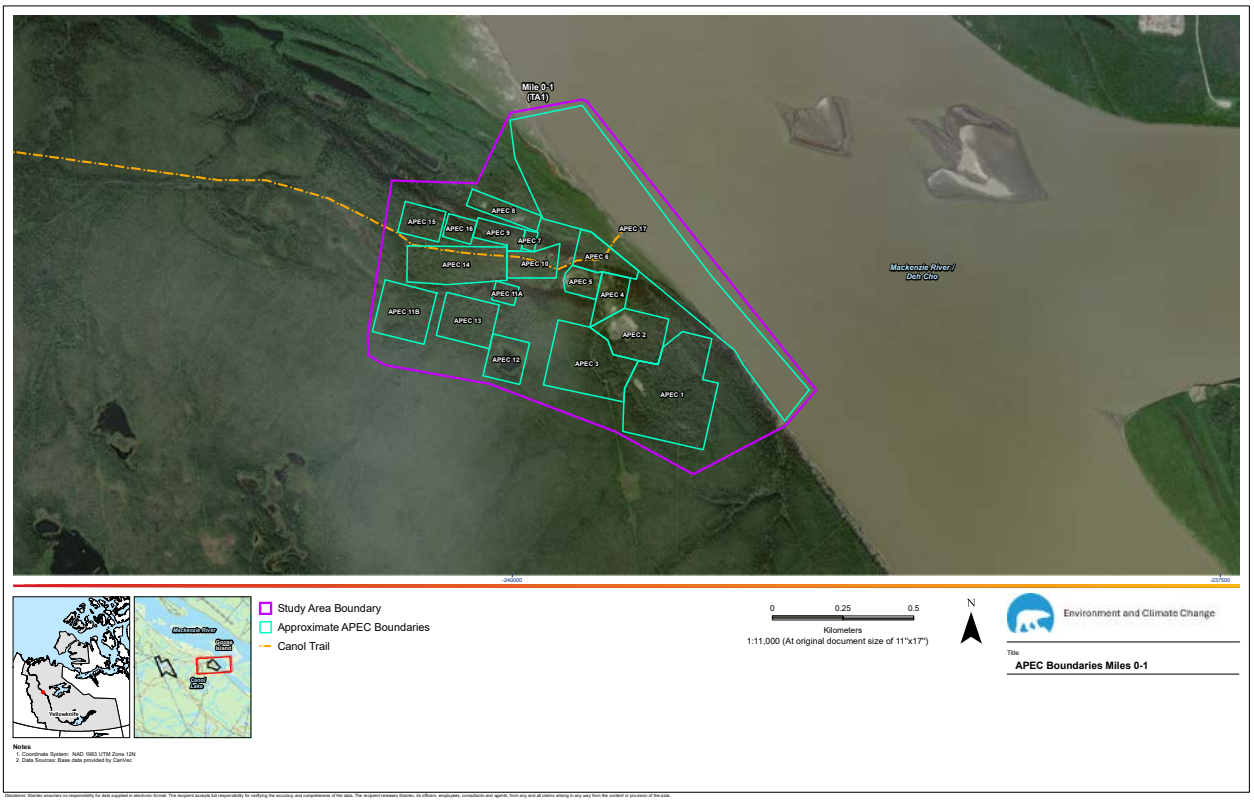

Figure 2: Location of APECs at Mile 0-1.

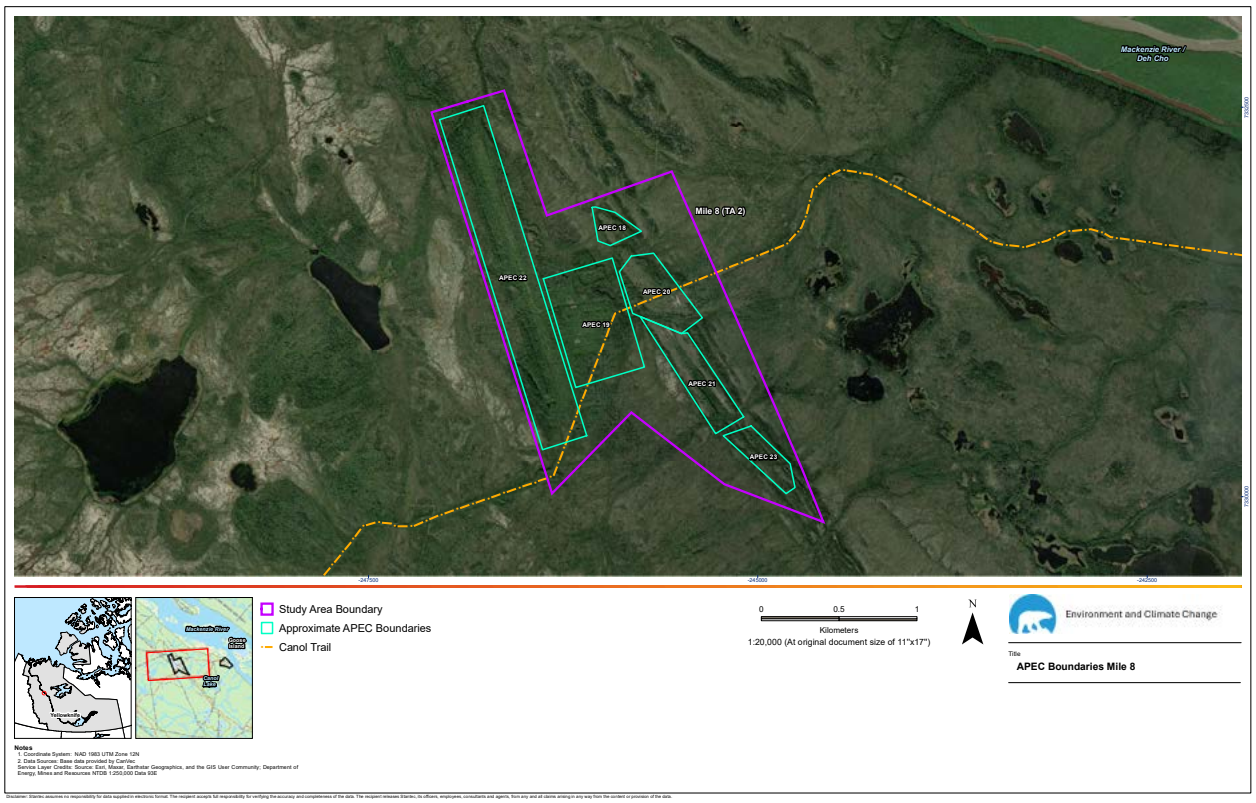

Figure 3: Location of APECs at Mile 8.

Phase II ESA

Why did we do Phase II ESAs?

Phase II ESAs were completed to collect samples of soil, groundwater, surface water, and sediment at all 23 APECs at Mile 0-1 and Mile 8. Building material assessments were also completed to determine if hazardous materials were present.

What were the findings of the Phase II ESAs?

Contamination was confirmed to be present at several locations throughout Mile 0-1 and Mile 8, including petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and metals.

- Petroleum Hydrocarbon products, such as fuel (gasoline or diesel) or oil (lubricating oil, greases), can be made up of over 100 different chemical components. To confirm whether they are present at a site, we only need to test for three select groups of these chemicals – Petroleum Hydrocarbons (PHCs); Benzene, Toluene, Ethylbenzene, and Xylene (referred to as BTEX); and Polycyclic Aromatic Hydrocarbons (PAHs).
- Metals occur naturally in the environment but can be present as contaminants through human caused sources such as battery disposal, leaded fuel, metal debris, and lead paint.
- Asbestos and lead paint were found in some building materials at Mile 0-1 and Mile 8. Surface debris including drums, abandoned vehicles, scrap metal, and abandoned buildings have been documented.

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Barrel dump at Mile 8.

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Soil sampling near barrel at Mile 8.

Phase III ESA

Why did we do Phase III ESAs?

Phase III ESAs were completed to collect soil, surface water, and sediment samples to gather more data and to find the boundary of contamination for areas identified in the Phase II ESAs.

Soil, surface water and sediment samples were also collected outside of the project area to understand natural concentrations and how they compare with concentrations within the site. This helps us understand if high concentrations of contaminants can be natural rather than human-caused.

As well, Plant Health Assessments were completed to understand if the contamination on site has impacted plants. Aquatic Habitat Assessments were completed to determine if any waterbodies onsite support aquatic life.

What were the findings of the Phase III ESA?

The Phase III ESAs were able to find the boundaries of contamination in soil in some locations, but not all.

The Plant Health Assessments revealed good plant health at most APECs, except for at:

- Mile 0-1: location of former storage tanks (APECs 1 and 2).
- Mile 8: location of the former maintenance garage at APEC 20 (concrete pad remains in place) and small patches of land in APEC 21.

The Aquatic Habitat Assessment found that there are no surface waterbodies that naturally support aquatic life at Mile 0-1 or Mile 8, therefore there are no concerns related to aquatic life.

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Soil sampling completed during the 2023 field program.

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Labeling sample containers during the 2023 field program.

Drone Program

What was the drone program and why did we do it?

In the drone program, a camera and a magnetometer were attached to a drone to collect photographs and videos, and to measure magnetic data at Mile 0-1 and Mile 8. Photos and videos were used for assessment reports and to create a computer-based model of the site.

The magnetic survey was used to help identify areas of buried debris at Mile 0-1 and 8. A magnetic survey was also completed at Canol Lake as concerns about debris in the lake were raised during the Archaeology Workshop.

What were the findings?

The drone field program was completed in October 2023 and May 2024.

The magnetic survey identified areas of surficial and buried metal debris at both Mile 0-1 and Mile 8. Most of the areas identified were areas associated with known surface debris, such as structures and metal debris.

However, the magnetic survey also identified five areas that were not linked to observations of surficial debris and require additional investigation to confirm the presence of buried debris. These included three areas around the former tank farm area at Mile 0-1 and two areas at the former Camp Area located at Mile 8.

There was no metal debris identified in Canol Lake or along the shore.

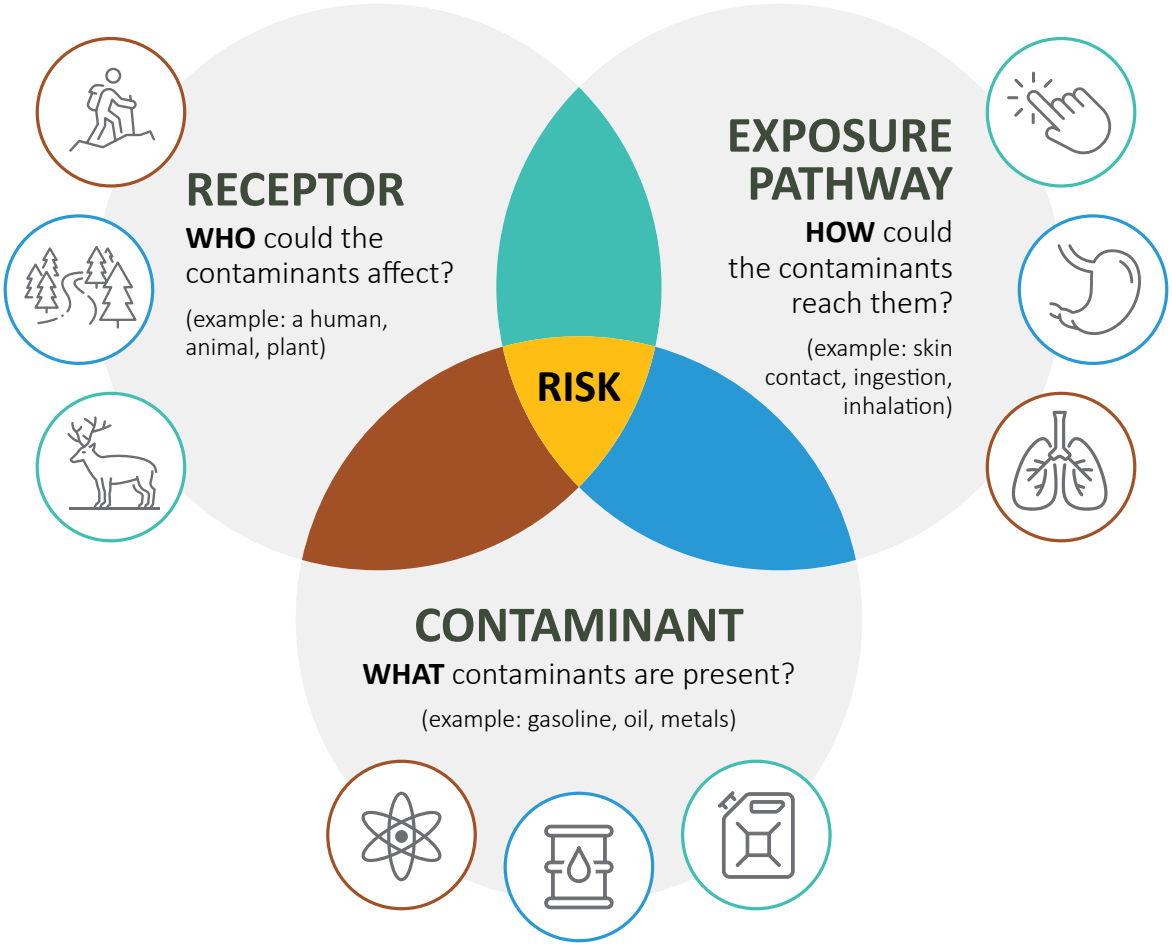
K'ALO-STANTEC

Drone program in October 2023.

Human Health and Ecological Risk Assessment

What is a Human Health and Ecological Risk Assessment (HHERA) and why did we do them?

A Human Health and Ecological Risk Assessment (HHERA) determines whether or not there is risk to people and the environment if exposed to the contaminants identified by the ESAs.



The data collected from the ESAs, as well as information collected about potential receptors and exposure pathways, are used to complete the HHERA.

A risk is considered to be present if all three elements (a receptor, a contaminant, and an exposure pathway) are present. Without one of these three elements present, there is no risk.

What were the findings of the HHERAs?

HHERAs were completed to determine if there is any risk to hikers, recreational users (e.g. hunters, campers), wildlife, and plant life at the sites.

HUMAN HEALTH

The risk assessments concluded that human health risks from contaminants at Mile 0-1 and Mile 8 were low, with the exception of four areas of lead contaminated soil at Mile 8. The areas of lead contaminated soil pose a risk to the health of trail users that come in contact with the soil. These areas should be remediated or managed.

Locations of the lead contaminated soil are shown in Figures 5 and 6.

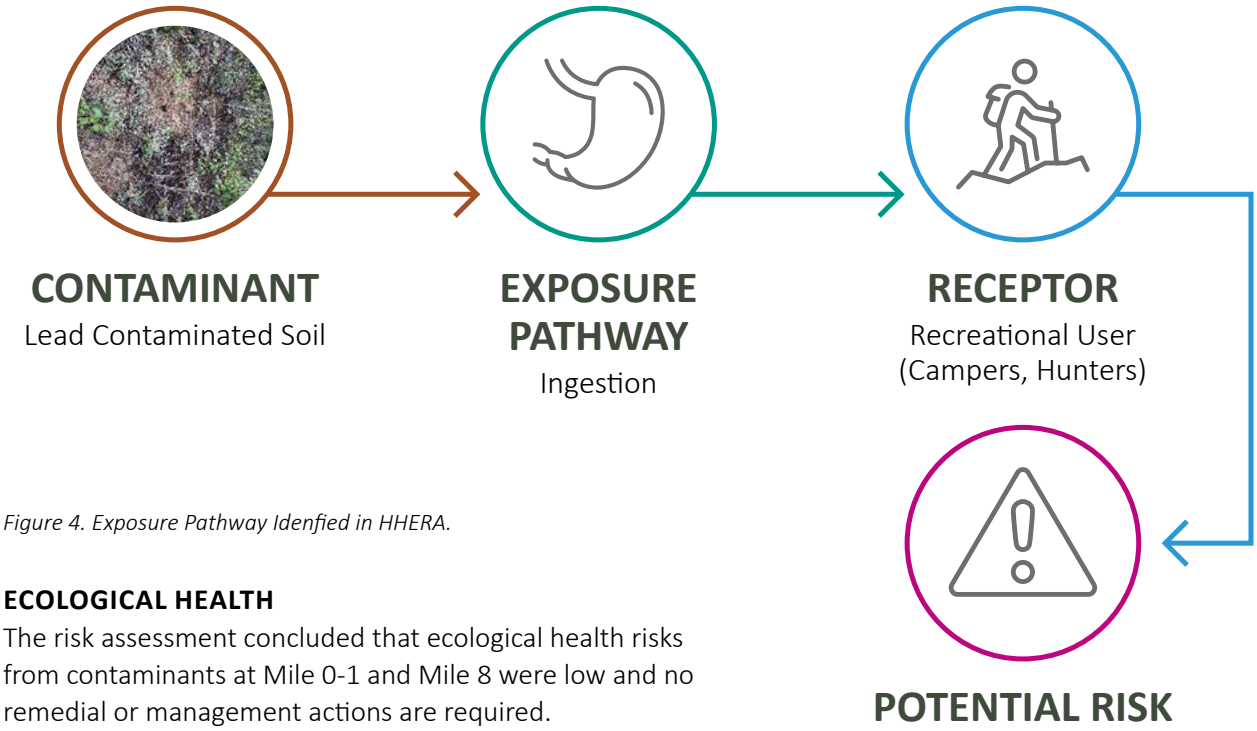


Figure 4. Exposure Pathway Idenfied in HHERA.

ECOLOGICAL HEALTH

The risk assessment concluded that ecological health risks from contaminants at Mile 0-1 and Mile 8 were low and no remedial or management actions are required.

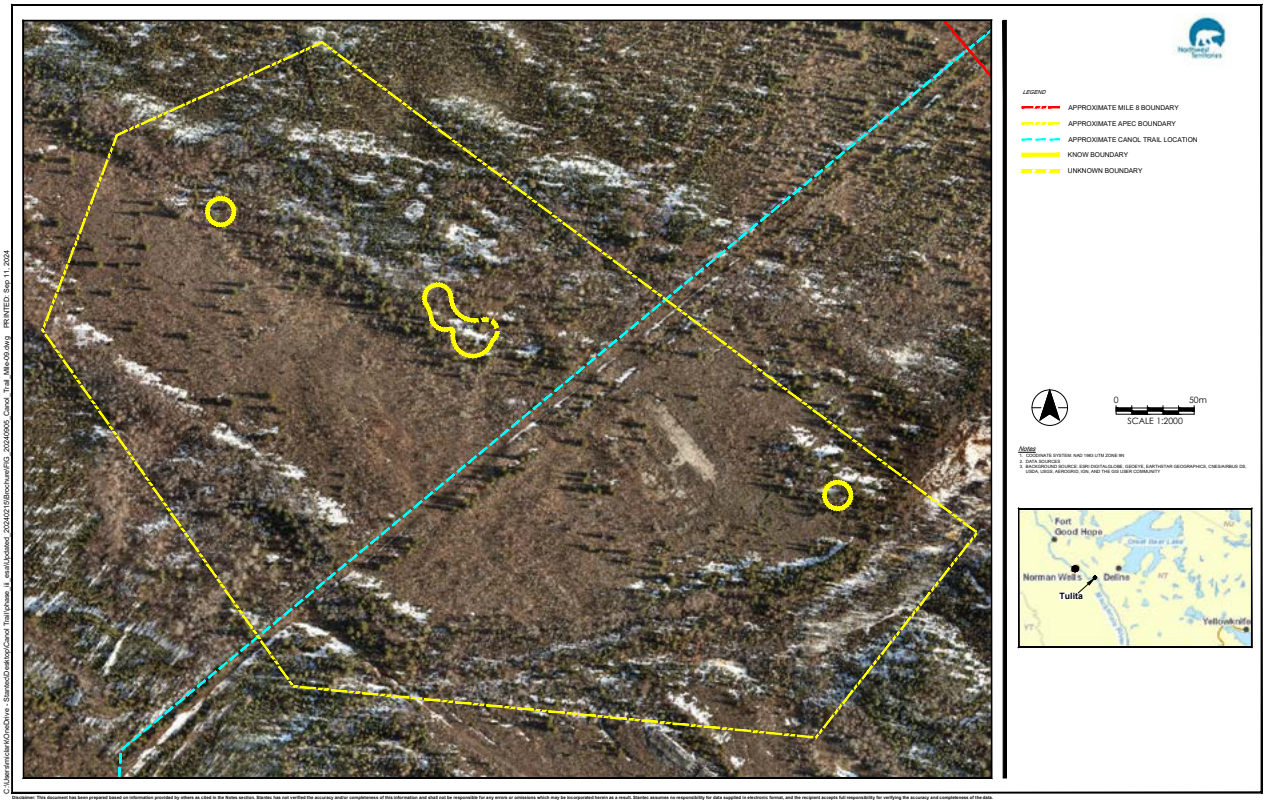


Figure 5: Three (3) areas of lead contaminated soil in APEC 20 (Camp Area 1).

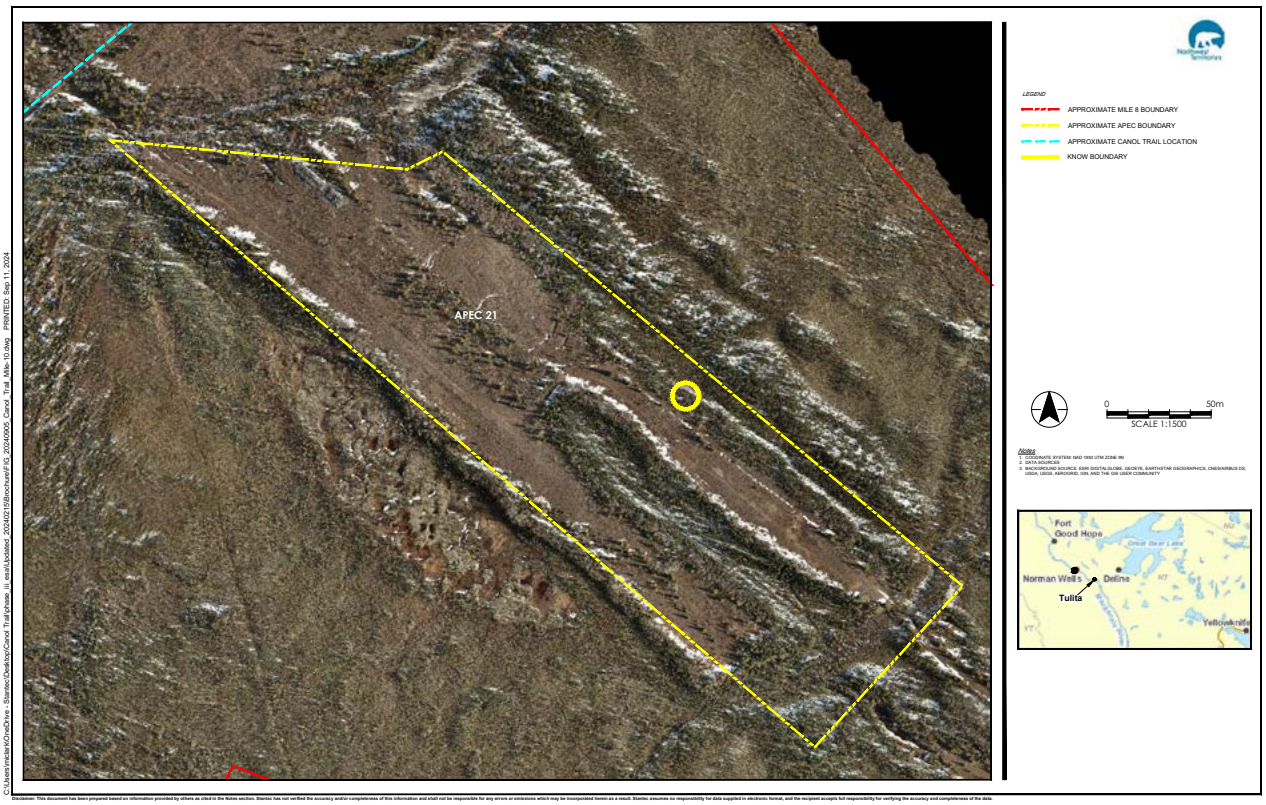


Figure 6: One (1) area of lead contaminated soil in APEC 21 (Camp Area 2).

Signage at Mile 0-1 and Mile 8

In response to the 2020 HHERA, the GNWT designed and installed signs at Mile 0-1 and Mile 8 to warn trail users of potential risks at the sites. Three potential risks were identified.

1. **Lead in soil at Mile 8** – Lead was identified at Mile 8 as a potential risk to human health (2020 HHERA and 2024 HHERA). ***The GNWT advises trail users to avoid disturbing the soil at Mile 8***.
2. **Manganese in surface water at Mile 0-1** – At the time the signage was installed, it was unclear whether manganese in surface water at Mile 0-1 was a risk. To be cautious, a sign was installed on site advising users not to drink the surface water. The 2024 HHERA determined that manganese is not a risk, however, ***the GNWT advises trail users to avoid using surface water as a source of drinking water***. Surface water from lakes and rivers can contain dirt and microorganisms that can make you sick.
3. **Building stability and asbestos** - There are some buildings at the site which remain standing. Most of these buildings are in disrepair and are at risk of collapsing. As well, asbestos has been identified in buildings onsite. Due to concerns regarding building stability and asbestos, ***trail users should not enter buildings***. If you require shelter while travelling along the trail between these areas, there are two emergency shelters, one at Mile 0 and one at Heart Lake.

Signage was installed in October 2023. Signage for Mile 0 and Mile 8 was placed along the entrances to the trail. Building signs were affixed to the sides of buildings.

Mile 0 Sign

Mile 8 Sign

Building Sign

Figure 7: Signage installed on the trail in October 2023.

Next Steps

To date, we have completed:

- Archaeological Overview Assessment (AOA)
- Archaeological Impact Assessment (AIA)
- Environmental Site Assessments (ESAs)
- Human Health and Ecological Risk Assessments (HHERAs)

The data we have gathered from the AOA, AIA, ESAs and HHERAs will support the development of a remedial options analysis (ROA) and a remediation and risk management plan (R/RM).

AOA/ AIA	• Completed in 2024. • Additional AIA work may be required prior to carrying out any remediation or risk management activities.
ESA	• Completed in 2025.
HHERA	• Completed in 2024.
CLOSURE OBJECTIVES	• Current step. • The closure objectives describe the goals we are aiming to achieve when remediation and risk management are carried out at the site.
ROA	• Compare different remedial and risk management options (remedial options analysis, ROA). The selected option(s) should meet closure objectives.
R/RM PLAN	• Develop a remediation and risk management plan (R/RM) that will describe how the selected remedial and risk management options will be carried out.
R/RM WORK	• Complete remediation and risk management activities as outlined in the R/RM Plan.
MONITORING	• Monitoring requirements will be determined in the R/RM and will be carried out as required following the completion of the remediation program.

ENGAGEMENT

Engagement will take place throughout the project so that the GNWT can provide updates to Indigenous Governments and Indigenous Organizations, the public and stakeholders as work progresses.

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