Phase I Environmental Site Assessment

Lot 114, 53919 CLSR YT, Ross River, YT

August 4, 2021

Prepared for:

Government of Yukon
Box 2703
Whitehorse, Yukon, Y1A 2C6

Prepared by:

Stantec Consulting Ltd.

Project Number: 123221774

Limitations and Sign-off

This document entitled Phase I Environmental Site Assessment was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Government of Yukon, Site Assessment and Remediation Unit (the "Client").

This report documents work that was performed in accordance with the scope, schedule and limitations set out in the contract between Stantec and its Client. Stantec does not represent, warrant, or guarantee that this work has uncovered all potential liabilities associated with the identified property, other than those liabilities which are reasonably discoverable based on our contractual scope.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the Client or third parties in the preparation of this report has been assumed by Stantec, acting reasonably, to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

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This report is limited by the following:

- Limited person(s) familiar with the Site history were available for interview during this assessment.

Prepared by _____
(signature)

Kim Wiese, Dipl. Tech.

Reviewed by _____
Digitally signed by Matthew Deane
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Matthew Deane, P.Ag., PMP

Approved by _____
(signature)

Matthew Redmond, P.Eng.

Executive Summary

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (ESA) on the property located at at Lot 114, 53919 CLSR YT, Ross River, Yukon (YT), herein referred to as the "Site". The Phase I ESA was prepared for the Site Assessment and Remediation Unit (SARU) of the Government of Yukon (YG, the "Client") for due diligence planning at the Site, prior to potential rezoning. The Site consists of approximately 0.6 hectares (1.4 acres) of undeveloped land. The Site is located in Kaska Dena Nation (Ross River and Liard). Surrounding properties are a mix of undeveloped parcels and residential homes. The purpose of the Phase I ESA was to assess if areas of potential environmental concern (APECs) are present at the Site, resulting from past and/or current activities on the Site and surrounding properties.

The Site appears to be vacant and vegetated since at least the late 1960s, with a temporary residence present for a short duration in the 2000s.

The Phase I ESA has revealed the following evidence of potential environmental contamination associated with the Site:

On-Site Former Residence: The temporary presence of what appears to be a residential structure on the southwest corner of the Site may have included a heating oil tank and has been identified as a potential environmental concern.

Off-Site Former Petro Bulk Plant: A former North 60 Petro Bulk Plant was located at Lot 118, located approximately 30 m north of the Site, from at least the mid-1970s to the mid-1990s. This property is listed in the Contaminated Sites Inventory of the Yukon Government, which indicates that a drilling investigation was conducted on Lot 118 in June 2009 during a Phase II ESA. Available information indicates that reported concentrations of select petroleum hydrocarbon parameters in soil and groundwater samples collected at the property were greater than the applicable standards. Based on the proximity to the Site and the information provided, this property is considered a potential environmental concern to the Site..

Stantec recommends that a Phase II ESA consisting of the collection of soil and groundwater samples be completed to confirm the presence or absence of contamination associated with the APEC identified above.

No other current or historical operations of potential environmental concern were identified on the Site or the surrounding properties.

The statements made in this Executive Summary are subject to the same limitations included in the Statement of Limitations section at the beginning of this report and are to be read in conjunction with the remainder of this report.

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

Abbreviations

ACM	asbestos containing material
APEC	area of potential environmental concern
AST	Aboveground storage tank
CNC	Comprehensive Neighbourhood Commercial
CSA	Canadian Standards Association
CSR	Contaminated Sites Regulation
EA	*Environment Act*
ESA	Environmental Site Assessment
EY	Yukon Department of Environment
ODS	ozone-depleting substance
PCB	Polychlorinated Biphenyls
PHC	Petroleum Hydrocarbons
SARU	Site Assessment and Remediation Unit
UFFI	Urea formaldehyde foam insulation
UST	Underground storage tank
YT	Yukon

1.0 GENERAL INFORMATION

Client Information:	Consultant Information:
Government of Yukon	Stantec Consulting Ltd. 500 – 4730 Kingsway Burnaby, BC V5H 0C6
Project Information: Lot 114 Phase I ESA Job Number 123221774	**Phone:** (778) 396-7003 **Fax:** (604) 436-3752 **E-mail Address:** Kim.Wiese@Stantec.com **Site Visit Date:** 27/05/2021 **Report Date:** 10/06/2021
Site Information: Lot 114 Ross River, Yukon	**Site Assessor:** Jeff Muirhead, P.Eng. **Report Preparer:** Kim Wiese, Dipl. Tech. **Senior Quality Reviewer:** Matthew Deane, P.Ag. **Senior Independent Reviewer**: Matt Redmond, P.Eng. (BC, YT, NT/NU)

2.0 INTRODUCTION

2.1 OBJECTIVES

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (ESA) on the property located at at Lot 114, 53919 CLSR YT, Ross River, Yukon (YT), herein referred to as the "Site". The Phase I ESA was prepared for the Site Assessment and Remediation Unit (SARU) of the Government of Yukon (YG, the "Client") for due diligence planning at the Site, prior to potential rezoning. The Site consists of approximately 0.6 hectares (1.4 acres) of undeveloped land. The Property is located in Kaska Dena Nation (Ross River and Liard) traditional territory. Surrounding properties are a mix of undeveloped parcels and residential homes. The purpose of the Phase I ESA is to assess if areas of potential environmental concern (APECs) for the Site are present as a result of past and/or current activities on the Site and surrounding properties.

Site plans are included in Appendix A, supporting documentation is included in Appendix B, selected representative Site photographs are included in Appendix C, and team qualifications are provided in Appendix D.

2.2 SCOPE OF WORK

The Phase I ESA carried out by Stantec on the Site was conducted in general accordance with the Canadian Standards Association's (CSA) *Phase I Environmental Site Assessment Standard Z768-01* (R2016).

The scope of work for this Phase I ESA included the following:

- A review of available records, including (if available):
  - Aerial photographs
  - Property Use Records—land titles, lease records, building file information
  - Existing Phase I ESAs or other environmental reports
  - Environmental monitoring data
  - Waste management records (such as waste manifests, polychlorinated biphenyls (PCBs) waste storage sites, etc.)
  - Inventory of underground storage tanks (USTs) and above ground storage tanks (ASTs)
  - Environmental audit reports
  - Prior relevant reports and studies (including air, surface water, and groundwater quality data)
  - Geological and Geotechnical reports
  - Regulatory information (permits, contaminated sites registry, waste generator registries, spills database and other approvals under the *Environment Act*)
  - Geology and soil maps
  - Topographic maps
  - Water Resources Branch, Government of Yukon - water well information database
  - Federal Contaminated Sites Inventory

  - Agreement of purchase and sale (where it exists)
  - Yukon Environmental and Socio-economic Assessment Board (YESAB) Online Registry
  - Land Use Documents
  - Local Information Sources
  - Borehole and/or water well logs
- A site visit to assess for actual or potential environmental contamination associated with the following:
  - current site operations
  - waste generation
  - fuel, chemical, and waste storage
  - exterior site conditions including surface features, fill material, and wells
  - hazardous materials including asbestos containing materials (ACMs), polychlorinated biphenyls (PCBs), lead, urea formaldehyde foam insulation (UFFI), and ozone-depleting substances (ODSs).
  - mold, radon, electromagnetic frequencies, noise, and vibrations
  - potential off-site sources of contamination
- Evaluation of information and preparation of this report

A Phase I ESA is a non-intrusive investigation and does not include sampling or testing of air, soil, groundwater, surface water, or building materials. For this Phase I ESA, no enhancements to the CSA standard were made.

City directories and fire insurance plans were not available for the Site and surrounding areas and were therefore not reviewed during this Phase I ESA. No previous environmental reports conducted for the Site were provided to Stantec for review. Person(s) familiar with the site history were not available for interviews at the time of this report.

This assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems, which may exist for the Site.

2.3 REGULATORY FRAMEWORK

Contaminated sites in YT are governed by the *Environment Act* (EA) and regulations thereto, including the *Contaminated Sites Regulation* (CSR) (Department of Environment, 2002), as well as protocols, procedures, and guidance documents established by the Government of Yukon, Department of Environment (Environment Yukon or EY). Under the EA, a contaminated site is defined as an area of land in which the soil, including any groundwater lying beneath it, or surface water including the sediment and bed below it, contains a contaminant which is in an amount, concentration, or level in excess of that prescribed by regulation or allowed under a permit. The CSR includes numerical standards for soil and groundwater quality for specific land and groundwater uses.

During a Phase I ESA samples are not collected; however, if there are previous soil or groundwater sample results available, the results are compared to applicable federal and provincial regulations and guidelines.

A Phase I ESA involves a review of any Site buildings for the potential presence of hazardous materials related to building components and materials. Specific federal or provincial regulations, guidelines or codes of practice exist for these individual hazardous materials. Where required, this documentation was utilized to determine appropriate conclusions and formulate appropriate recommendations.

3.0 SITE CONDITIONS AND PHYSIOGRAPHY

3.1 SITE DESCRIPTION

The Site is located on the south side of Ketza Road, a cul-de-sac street, west of Prospector Street, in the unincorporated community of Ross River, YT. The Site is currently vacant and vegetated. The Site is identified as follows:

Table 3.1 Site Identification

Civic Address	Lot 114
Current Owner	Untitled
Current Owner Address	N/A
PIN	N/A
Legal Description	N/A
Latitude/Longitude (approximate centroid of Site)	61°58'33.3"N 132°27'22.9"W
Property Area	0.6 hectares (1.4 acres)
Zoning	not zoned
Elevation	Approximately 680 m geodetic

The Site and Property are bordered by undeveloped lots and a residential property to the east. The Site and surrounding properties are shown on Figure 2 in Appendix A.

3.2 TITLE SEARCH

A current land title and legal plan for the Site was requested through West Coast Title Search. The lot was found to be untitled and therefore no current or past tiles are available.

3.3 TOPOGRAPHY AND REGIONAL DRAINAGE

The local topography at the Site is generally flat. Regional surface drainage (anticipated shallow groundwater flow direction) appears to be northerly toward the Pelly River which is located approximately 800 m northeast of the Site. Surface water drainage on the Site is anticipated to be by infiltration to the ground. Topographic information is provided in Appendix B.

3.4 ADJACENT WATER RESOURCES

The closest surficial water body to the Site is the Pelly River, which is located approximately 800 m northeast of the Site and flows westwards.

3.5 SURFICIAL GEOLOGY

Based on an available surficial geology map (see Section 8.0), the native surficial soils of the Site consist of

mainly fluvial sediments transported by streams and rivers and deposited as alluvial fans.

The characteristic permeability of these soils is moderate. A site-specific determination would be required to obtain detailed soil profiles and permeability information.

3.6 BEDROCK

A bedrock geology map was obtained from the Yukon Maps website. Bedrock geology for the Site and surrounding areas consist of:

psammite, quartzite and amphibolite metamorphosed to eclogite, blueschist.

3.7 AQUIFERS AND WATER WELLS

The Yukon Water Well Registry and Data Catalogue were accessed on March 3, 2021 for information on groundwater monitoring and drinking water wells, as well as aquifer information for the Site and surrounding properties. Two test wells (ID: TP14-07 and TP14-08) were identified approximately 350 m and 420 m north of the Site and were indicated to be drilled in 2014. No surface water monitoring sites or water licenses were identified on the Site or within approximately 500 m of the Site. The Site was indicated to be within the Pelly drainage basin area. A copy of the Water Well Registry and Data Catalogue search is attached in Appendix B.

Drinking water in Ross River is sourced from groundwater. According to recent information (Tetra Tech, 2017), the current municipal water supply well is located at the Fire Hall (approximately 760 m northeast of the Site). The well draws from a deep, confined aquifer which is overlain by approximately 100 metres of clay and silt which likely acts as a confining layer that separates the deep aquifer from the shallow aquifer that was investigated on the Site. Tetra Tech previously completed a vulnerability scoring of the

Ross River community water supply well and the results indicate that the aquifer used for drinking water purposes has a very low to extremely low vulnerability to surface-based contamination.

Several wells were previously reported to be used for either domestic or commercial/industrial purposes in the area (Gartner Lee Limited, 2003). These wells are the following:

- Firehall well: this is the current municipal water supply well commissioned in 1986. This well is reported to be screened between 105 and 110 mbgs. (approximately 760 m northeast of the Site)
- Robert Etzel private well: this well is interpreted to be the former municipal well that was reported to have been located near Pelly River. The former municipal supply well was decommissioned from municipal use in 1978. (approximately 1 km northeast of the Site)
- Church residence private well: this well is reported to have supplied water to the community, likely between 1978 - 1988. (approximately 950 m northeast of the Site)
- Dena First Nation (DFN) Administration building Well was installed in 1989 and completed to a depth of 110 mbgs. (approximately 640 m east of the Site)

3.8 LOCAL CLIMATE CONDITIONS

Climate information from the Site is based on Environment Canada climate normal data from the climate station Faro A (located approximately 55 km northwest of the Site). Select climate data are summarized below, and a copy of the climate data is presented in Appendix B.

Table 3.2 Historical Climate Information – Faro A

Annual Precipitation	319.7 mm
Annual Rainfall	218.4 mm
Annual Snowfall	114.0 mm
Extreme Daily Rainfall	29.4 mm (May)
Extreme Daily Snowfall	12.8 cm (November)

4.0 HISTORICAL RECORDS REVIEW SEARCH

4.1 YUKON CONTAMINATED SITES INFORMATION MAP

The Yukon Contaminated Sites Information Map was access on March 2, 2021 for information regarding contaminated sites on, and within 250 m of, the Site. The Site was not identified as a contaminated site. One property within 250 m of the Site was identified and is summarized in Table 4.1.

Table 4.1 Former North 60 Petro Bulk Plant - Ross River YT

Distance from Site	Approximately 30 m north
Classification	Contaminated
Contaminants of Concern	Petroleum hydrocarbons (PHC)
Primary Land Use	Commercial - Former North 60 Petro Bulk Plant, Ross River
Summary	This property (Lot 118) had drilling conducted in June 2009 during a Phase II ESA. The information indicates that reported concentrations of select hydrocarbon parameters in soil and groundwater samples collected were greater than applicable standards. No other information was provided on the property.

Based on the proximity to the Site and the information provided, this property is considered a potential environmental concern to the Site. A copy of the Yukon Contaminated Sites Information Map is included in Appendix B.

4.2 AERIAL PHOTOGRAPHS

Historical aerial photographs covering the Site and nearby properties were reviewed to identify past activities on the Site and surrounding properties. Observations made during the aerial photograph review are summarized in Table 4.2. Copies of the aerial photographs are included in Appendix B.

Table 4.2 Summary of Aerial Photograph Review

Year	Description
1968	The Site and surrounding properties are undeveloped land and residential.
1973	The Site appears to be similar to the 1968 aerial photo. A building is present at Lot 121 and is potentially a fuel storage tank and power generator for the community.
1974	The Site and surrounding properties are undeveloped land and residential. The bulk fuel facility at Lot 118 is visible in the aerial photo, as well as the ATCO diesel generator site.
1977	The Site appears to be similar to the 1974 aerial photo. Surrounding properties appear similar to the 1974 aerial photo.
1982	The Site appears to be similar to the 1977 aerial photo. Surrounding properties appear similar to the 1977 aerial photo.
1984	The Site appears to be similar to the 1982 aerial photo. Surrounding properties appear similar to the 1982 aerial photo.
1990	The Site appears to be similar to the 1984 aerial photo. Surrounding properties appear similar to the 1984 aerial photo.
1993	The Site appears to be similar to the 1990 aerial photo. Surrounding properties appear similar to the 1990 aerial photo.
2006	There is a small building located on the southwest boundary of the Site. Surrounding properties appear similar to the 1993 aerial photo.
2010	The Site appears similar to the 1993 aerial photo, the building is no longer present; however there appears to be a gravel patch in the vicinity of the former building. Surrounding properties appear similar to the 2006 aerial photo.
2014	The Site appears similar to 2010. The tanks on Lot 118 are no longer present. The remaining surrounding properties appear similar to the 2010 aerial photo.
2015	The Site appears to be similar to the 2014 aerial photo. Surrounding properties appear residential and undeveloped. A junkyard/auto wrecker appears to be on the aerial photo located approximately 240 m north of the Site.

The temporary presence of what appears to be a residential structure on the southwest corner of the Site may have included a heating oil tank and has been identified as a potential environmental concern. The former North 60 Petro Bulk Plant discussed in Section 4.1, visible in the 1974-1993 aerial photographs and the existing diesel tank and generator visible in the 1968-2015 aerial photographs, are considered potential environmental concerns to the Site. The observed ATCO diesel generator site is located approximately 80 m east (presumed down or cross gradient) of the Site and is not considered to be an environmental concern to the Site. The observed auto wrecking yard is located approximately 240 m north (downgradient) of the Site and is not considered to be an environmental concern to the Site.

4.3 ECOLOG ERIS REPORT INFORMATION

A request was made to Ecolog ERIS to complete database searches pertaining to environmental records of concern within 250 m of the Site. The Ecolog ERIS report is included in Appendix B**.**

The results of the search identified two listings for properties within 250 m of the Site. The identified listings are summarized below:

Former North 60 Petro Bulk Plant, Ross River YT – This property is listed in the Contaminated Sites Inventory. The property is located approximately 30 m north (inferred to be down-gradient) of the Site. This property (Lot 118) had drilling conducted in June 2009 during a Phase II ESA. Samples of groundwater and soil indicated that reported concentrations of select hydrocarbon parameters were greater than the applicable standards. No other information was provided on the property. Based on proximity to the Site and information provided, this is former facility is considered a potential environmental concern to the Site.

9 Prospector Street, Ross River YT (ATCO diesel generator site) – This property is listed for fuel storage tanks permitted from 2013 to 2016. The property is located approximately 100 m northeast (inferred to be down-gradient) of the Site. Commercial fuel tanks with a 11,000-litre capacity were identified to have contained heating fuel. No other information was provided for the database. Based on the down-gradient distance from the Site, the tanks identified on this property are not considered to be a potential environmental concern to the Site.

4.4 PHASE II SITE ASSESSMENT OF THE FORMER BULK PLANT

A request was made to the Yukon Government for information on the former bulk plant located on Lot 118 neighbouring the Site. A report was completed in 2010 by Westcan Watertec Inc. summarizing the findings of the Phase II assessment for North 60º Petro Ltd. Six test boreholes were drilled and four were completed as monitoring wells. RTH1, RMW2, RTH3, and RMW6 are located on the north side of the bulk plant. RMW4 is located in the bulk plant area on the east side and RMW5 is located outside the fence to the southwest of the plant.

Soil samples from the boreholes were collected from depth intervals ranging from 0.7 – 4.2 m below ground surface (mbgs). No soil samples were submitted for analysis from boreholes RMW4 or RMW6. Four soil samples (RTH1(S3), RTH2(S1 and S3) and RTH3(S1)) had reported concentrations of volatile petroleum hydrocarbons (VPH) and/or light extractable petroleum hydrocarbons (LEPH).

The groundwater monitoring in the report indicates that the water table is approximately 3 mbgs and reported that the groundwater flows to the east, though it is not conclusive. The reported analytical results from groundwater samples were:

- RMW2 - Concentrations of benzene, ethylbenzene, and total xylenes were greater than the drinking water standards. Concentrations of fluoranthene, naphthalene, phenanthrene and pyrene were greater than the aquatic life standards;
- RMW4 - Concentrations of ethylbenzene were greater than the drinking water standards. Concentrations of naphthalene, phenanthrene, pyrene, VPH and LEPH were greater than the aquatic life standards;
- RMW5 - Concentrations of VPH and LEPH were greater than the aquatic life standards;
- RMW6 - Concentrations of ethylbenzene were greater than the drinking water standards. Concentrations of naphthalene, phenanthrene, pyrene, VPH and LEPH were greater than the aquatic life standards.

RMW6 is located on the western side of the bulk plant and nearest to the Site. No analysis for soil contamination was completed on this borehole. There are no other boreholes on the western side to delineate possible contamination nearest the Site.

Based on the identified contamination on the western side of the property and the proximity to the Site, this property is considered a potential environmental concern to the Site.

5.0 SITE VISIT AND INTERVIEWS

The site visit was conducted by Jeff Muirhead on May 27, 2021. The Site was readily visible and publicly accessible portions of adjoining and neighbouring properties were observed for the presence of potential sources of environmental contamination.

An interview was conducted with Mr. Franklin Charlie, an employee with Dena Cho Environmental for 6 months, and further information was provided by Mr. Stuart Van Bibber, Manager of Dena Cho Environmental.

5.1 CURRENT SITE OPERATIONS

At the time of the site visit, the Site was undeveloped and vegetated. On-site operations of potential environmental concern were not observed.

5.2 ON-SITE BUILDINGS AND STRUCTURES

At the time of the site visit, no buildings and/or structures were present on the Site.

5.3 MUNICIPAL SERVICES

The Site was not observed to be currently connected to municipal services at the time of the site visit.

5.4 DRAINS, SUMPS, SEPTIC SYSTEMS, AND OIL/WATER SEPARATORS

Mr. Charlie noted that a septic system installation was attempted on the property immediately south of Lot 114; however, construction was halted when shallow groundwater was encountered approximately 1.5 – 2.0 m below ground surface. Three sections of white PVC pipes were observed vertically in the ground, approximately 1 m high, two just west of the Site and one on the western edge of the Site. A rectangular fibreglass tank with an approximate volume of 3,400 L was observed south of the southwest corner of the Site. It is unknown what the pipe sections or tank were for, although they may be associated with the attempted septic system installation.

No drains, sumps and/or oil/water separators were observed on the Site at the time of the site visit. Mr. Charlie indicated that he was unaware of any drains, sumps, or oil/water separators present on the Site.

5.5 FUEL/CHEMICAL HANDLING AND STORAGE (USTS AND ASTS)

One empty and presumed abandoned AST was identified on the Site. A cylindrical steel tank, with a volume of approximately 2,200 L, and an associated stand were observed on the east side of the Site, no odour or residue was observed.

No current fuel and chemical handing and/or storage, including underground or aboveground storage tanks (USTs or ASTs), was observed on the Site during the site visit.

5.6 WASTE, WASTEWATER, AND AIR DISCHARGES

No waste, wastewater, and/or air discharges were observed to be generated on the Site at the time of the site visit. Mr. Charlie indicated that there were no landfills, waste disposal, odours, air discharges or imported material on the Site.

5.7 HEATING AND COOLING SYSTEMS

No heating and/or cooling systems were observed on the Site at the time of the site visit.

5.8 SURFACE FEATURES AND FILL MATERIALS

The ground surface of the Site was observed to be unpaved and vegetated.

Evidence of fill material was not observed on the Site.

5.9 SPILL AND STAIN AREAS

No staining or evidence of spills were observed on the ground surface of the Site.

5.10 HAZARDOUS BUILDING MATERIALS

Hazardous building materials include ACMs, PCB-containing equipment, lead-based materials, ODS, and UFFI. No hazardous building materials are suspected to be present on the Site as the Site has remained undeveloped since at least the late 1960s.

5.11 SPECIAL ATTENTION ITEMS

5.11.1 Radon Gas

Radon is a radioactive gas associated with uranium rich black shale and/or granite bedrock. Radon emits alpha particles and produces several solid radioactive products called radon daughters. Harmful levels of radon and radon daughters can accumulate in confined air spaces, such as basements and crawl spaces.

No testing for radon gas products has reportedly been completed for the Site. In 2012, Health Canada completed a Cross-Canada Survey of Radon Concentrations in Homes. In the Yukon, 80.4% of survey participants reported radon gas concentrations below the Government of Canada guideline of 200 Bq/m^3.

As no buildings currently exist on the Site, radon gas accumulation is not expected to be an environmental concern at the Site at this time. Radon accumulation should be considered during the construction of the planned building on the Site.

5.11.2 Microbial Contamination (Mould) and Indoor Air Quality

The growth of mould in indoor environments is typically due to a moisture problem related to building envelope or mechanical systems deficiencies or design and can produce adverse health effects. There is no practical way to eliminate all mould and mould spores in the indoor environment. The way to control mould is to control moisture.

As no buildings or structures are currently on the Site, indoor mould growth is not currently a concern at the Site.

5.11.3 Electromagnetic Frequencies (EMFs)

No high-voltage transmission lines or electrical substations, which could generate significant electromagnetic fields, were identified on or adjacent to the Site.

5.11.4 Noise and Vibration

The effects of noise and vibration on human health vary according to the susceptibility of the individual exposed, the nature of the noise/vibration and whether exposure occurs in the working environment or in the home.

No major persistent sources of noise or vibration were identified on the Site at the time of the site visit.

6.0 NEIGHBOURING PROPERTY INFORMATION

The current activities on neighbouring properties observed at the time of the site visit and a summary of historical information for these properties, gathered through the records review, are presented below.

Table 6-1 Neighbouring Property Information

Direction from Site:	Relation to Site:	Current Use:	Across What
North	Neighbouring and adjacent	Undeveloped, commercial and residential	Ketza Road
Occupant Name:		**Address:**	
N/A		Lots: 115, 116, 117, 118, 119, 120, 121, 238, 240	
Current Activities:			
Vacant lots, community centre and ice rink, refuse storage, residential homes, ATCO diesel generator			
Historical Activities:			
• From at least the late 1960s to the mid-1970s: undeveloped or residential • From at least the late 1970s to the mid-1990s: undeveloped, residential, and commercial (including a bulk petrol plant) • From the mid-1990s to the mid-2010s: undeveloped, residential, and commercial (including ATCO diesel generator) • From the mid-2010s to the present: undeveloped, residential, and commercial (including ATCO diesel generator and potential junkyard/auto wrecker)			
Potential Environmental Concerns:			
• A potential junkyard/auto wrecker was identified in the 2015 aerial photograph appearing to be Lot 119 located approximately 240 m north of the Site. Based on the inferred down-gradient distance from the Site, this property is not considered a potential environmental concern to the Site. • The ATCO diesel generator and fuel storage is located at Lot 121 on Prospector Street. The property is listed for fuel storage tanks permitted from 2013 to 2016. The property is located approximately 80 m east (inferred to be cross or down-gradient) of the Site. Commercial fuel tanks with a 11,000-litre capacity were identified to have contained heating fuel. No other information was provided for the database. Based on the cross/down-gradient location and distance from the Site, the property is not considered to be a potential environmental concern to the Site. • Former North 60 Petro Bulk Plant was located at Lot 118 from at least the mid-1970s to the mid-1990s and is listed in the Contaminated Sites Inventory. The property is located approximately 30 m north (inferred to be down-gradient) of the Site. This property had drilling conducted in June 2009 during a Phase II ESA. Available information indicates that reported concentrations of select hydrocarbon parameters in soil and groundwater samples collected were greater than the applicable standards. No other information was provided on the property. Based on the proximity to the Site and information provided, this is considered a potential environmental concern to the Site. • No other current or historic tenants, activities, or operations were identified on neighbouring properties to the north that would be considered operations of potential environmental concern to the Site.			

Direction from Site:	Relation to Site:	Current Use:	Across What
East	Neighbouring and adjacent	Undeveloped and residential	N/A

Occupant Name:	Address:
Vacant lots and residential homes	Lots: 226, 256, 257, 258, 259, 260
Current Activities:	
Residential or undeveloped	
Historical Activities	
• From at least the late 1960s to the present: undeveloped, and residential	
Potential Environmental Concerns:	
No current or historic tenants, activities, or operations were identified on neighbouring properties to the east that would be considered operations of potential environmental concern to the Site.	

Direction from Site:	Relation to Site:	Current Use:	Across What
South	Adjacent	Undeveloped	No Road
Occupant Name:		**Address:**	
Undeveloped		Lots: 101, 112, 113, 227, 228 and unnumbered	
Current Activities:			
Undeveloped			
Historical Activities			
• From at least the late 1960s to present: undeveloped land			
Potential Environmental Concerns:			
No current or historic tenants, activities, or operations were identified on neighbouring properties to the south that would be considered operations of potential environmental concern to the Site.			

Direction from Site:	Relation to Site:	Current Use:	Across What
West	Adjacent	Undeveloped	No Road
Occupant Name:		**Address:**	
Undeveloped		Lots: 102, 103, 110, 111 and unnumbered	
Current Activities:			
Undeveloped			
Historical Activities			
• From at least the late 1960s to present: undeveloped land			
Potential Environmental Concerns:			
No current or historic tenants, activities, or operations were identified on neighbouring properties to the west that would be considered operations of potential environmental concern to the Site.			

7.0 CONCLUSIONS

The Phase I ESA identified one on-site APEC and one off-site APEC, summarized below.

On-Site Former Residence and Abandoned AST: The temporary presence of what appears to be a residential structure on the southwest corner of the Site may have included a heating oil tank, possibly the abandoned on observed on the Site, and has been identified as a potential environmental concern.

Off-Site Former Petro Bulk Plant: A former North 60 Petro Bulk Plant was located at Lot 118, located approximately 30 m north of the Site, from at least the mid-1970s to the mid-1990s. This property is listed in the Contaminated Sites Inventory of the Yukon Government, which indicates that a drilling investigation was conducted on Lot 118 in June 2009 during a Phase II ESA. Available information indicates that reported concentrations of select petroleum hydrocarbon parameters in soil and groundwater samples collected at the property were greater than the applicable standards. Based on the proximity to the Site and the information provided, this property is considered a potential environmental concern to the Site.

Stantec recommends that a Phase II ESA consisting of the collection of soil and groundwater samples be completed to confirm the presence or absence of contamination associated with the APEC identified above.

No other current or historical operations of potential environmental concern were identified on the Site or the surrounding properties.

8.0 REFERENCES

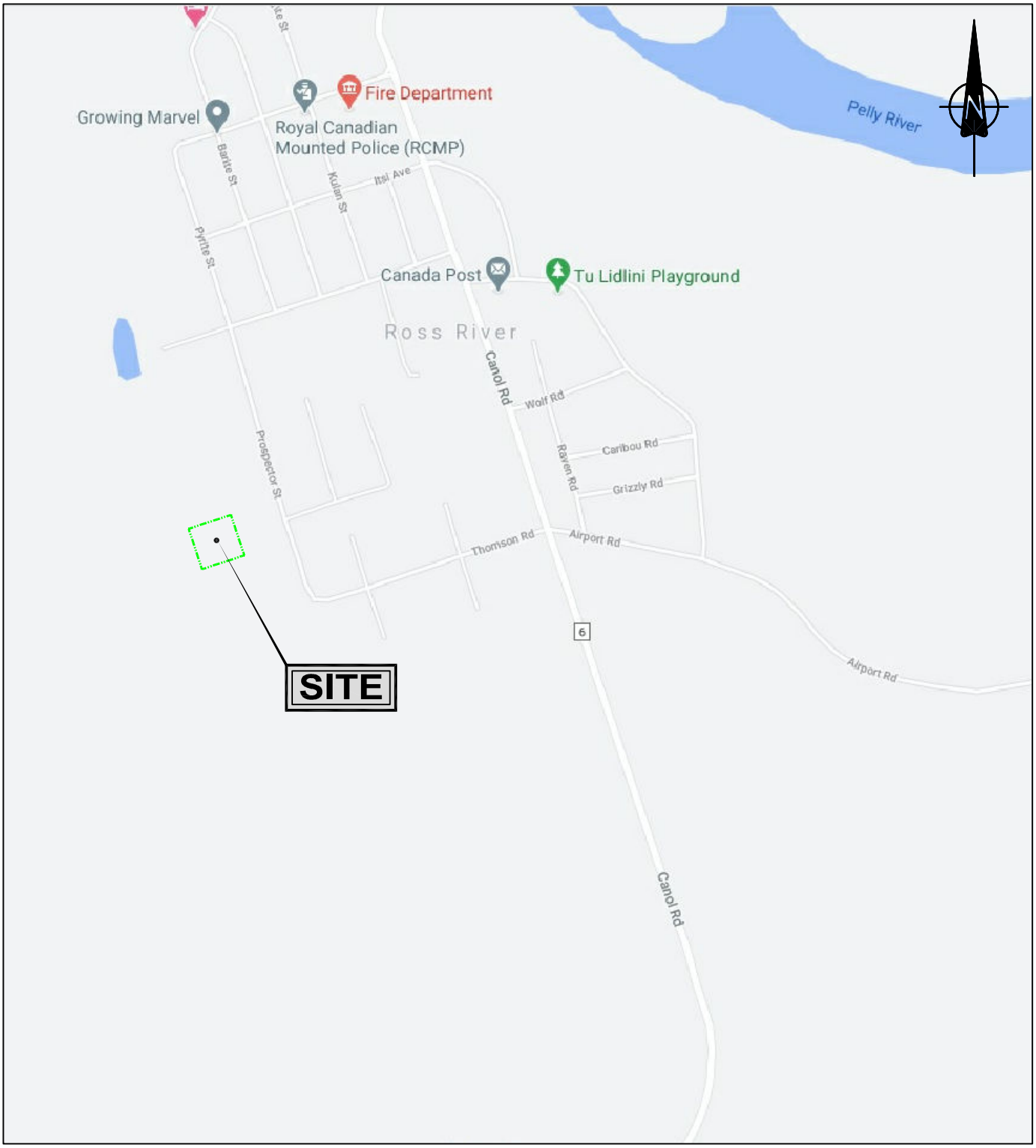
Table 8-1 Information Sources

SOURCE	INFORMATION/CONTACT
Aerial Photographs	1974, 1982, 1993, and 2015—Ecolog ERIS 1968, 1973, 1977, 1984, and 1990 – Government of Yukon Maps
Fire Insurance Plans	None Available
City Directories	None Available
Previous Environmental Reports	Phase II Site Assessment of The Former Bulk Plant, Ross River, Yukon. Prepared by Westcan Watertech Inc., prepared for North 60º Petro Ltd. Dated March 1, 2010.
Contaminated Sites Registry	Yukon Contaminated Sites Information Map: https://yukon.maps.arcgis.com/apps/webappviewer/index.html?id=d331e96802054e6aabc8f0d8ed61311a
Geological and Soil Maps	Geological Survey of Canada, Surficial Geology, Ross River, Parts of 105k/1 & 2 and 105F/15 & 16, scale 1:25 000 Bedrock Geology: https://yukon.maps.arcgis.com/apps/webappviewer/index.html?id=85c22a6d17384a24ad2700a36b8d15de Ross River, Yukon Territory Topographic Map, 105 F/16 Edition1 MCE, Series A 722, Scale 1:50,000
Land Title & Legal Plan	Government of Yukon Land Titles Office
Municipal Mapping	Yukon Online Mapping software (GeoYukon): https://mapservices.gov.yk.ca/GeoYukon/
Water Well Records	Yukon Water Well and Data Catalogue: http://yukon.maps.arcgis.com/apps/webappviewer/index.html?id=2365a4c0b8744f34be7f1451a38493d2

APPENDIX A

Figures

Appendix A FIGURES



0 250 500 750 1000m

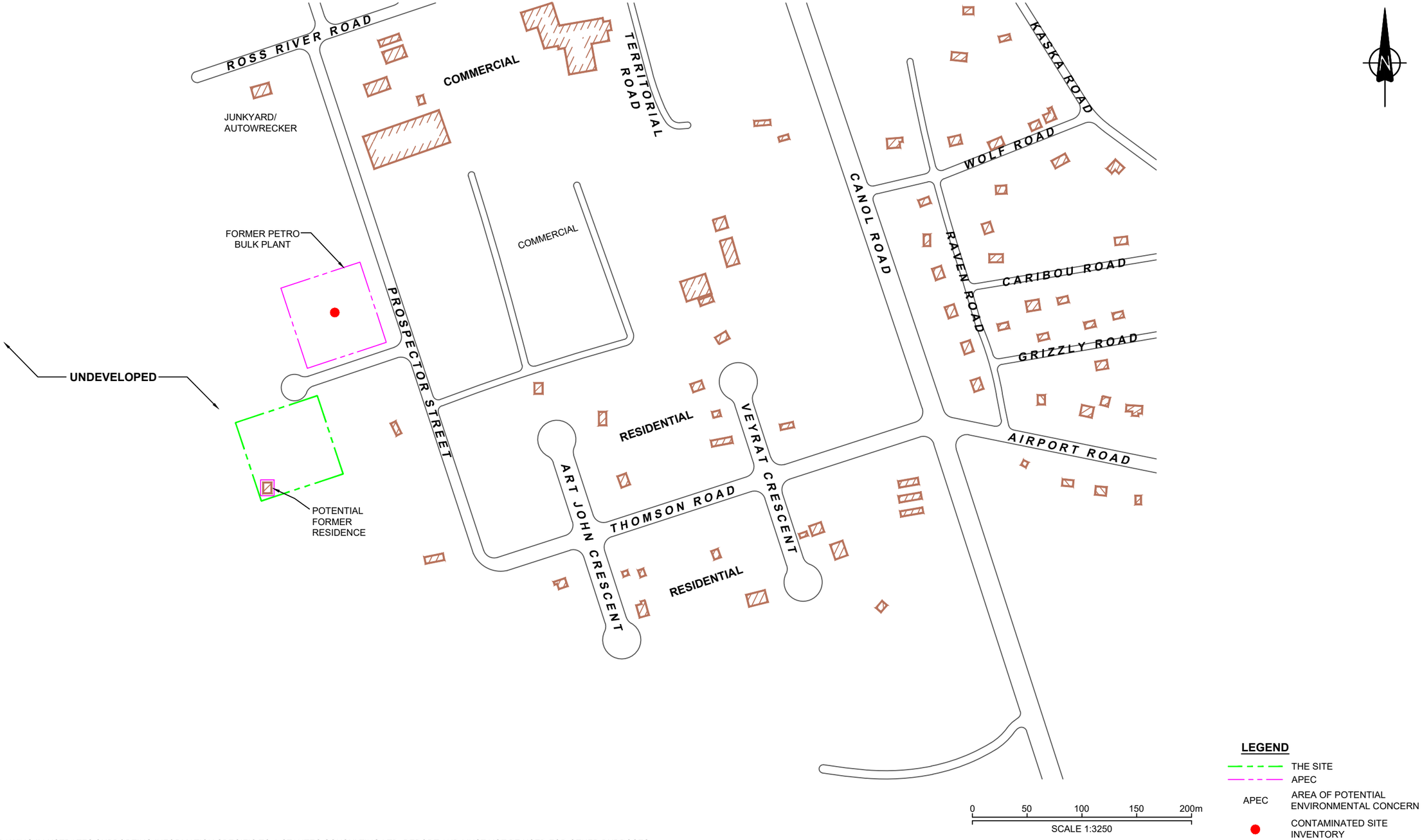
SCALE 1:10000

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

SITE LOCATION PLAN
PHASE I ENVIRONMENTAL SITE ASSESSMENT
LOT 114, ROSS RIVER, YT

Client:	GOVERNMENT OF YUKON
Project No.:	123221774.200
Scale:	1 : 10000
Date:	21/03/18
Dwn. By:	CD CS SL2021030083
App'd By:	MD
Dwg. No.:	1

Stantec



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:	**Project No.:** 123221774.200 **Scale:** 1 : 3250 **Date:** 21/03/18 **Dwn. By:** CD SL2021030084 **App'd By:** MD	**Client:** GOVERNMENT OF YUKON **Site Address** LOT 114 ROSS RIVER, YT	SITE PLAN AND SURROUNDING LAND USE PHASE I ENVIRONMENTAL SITE ASSESSMENT	**Dwg. No.:** 2

APPENDIX B

Records

Appendix B RECORDS

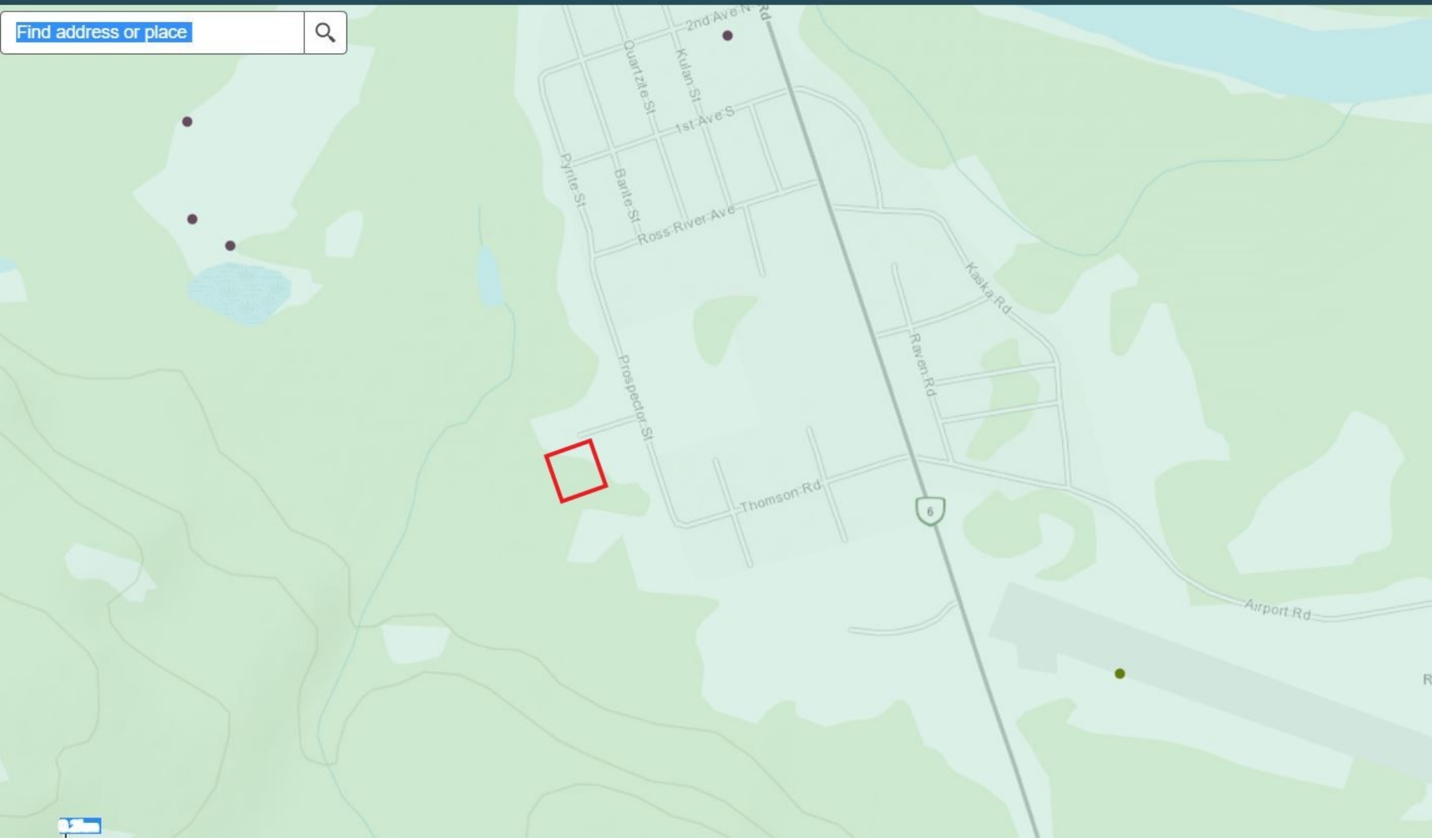
B.1 TOPOGRAPHIC MAP


Pelly River
Sawmill Road
Canol Road
Quartzite Street
Kulan Street
Ross River
Pelly River
Kaska Road
Raven Road
Prospector Street
Thomson Road
Airport Road
Canol Road
2300 ft
2900 ft
2500 ft
2500 ft
2500 ft
2500 ft
Ross River Access Road
6

B.2 YUKON WATER WELL AND DATA CATALOGUE SEARCH


980000052
980000053
980000054
Pyrite St
Barite St
Ross River Ave
Territorial Rd
Prospector St
6
Raven Rd
Veyral Cres
Art John Cres
Thomson Rd
Etzel Cres
Wood Cres
Canol Rd

Water data catalogue



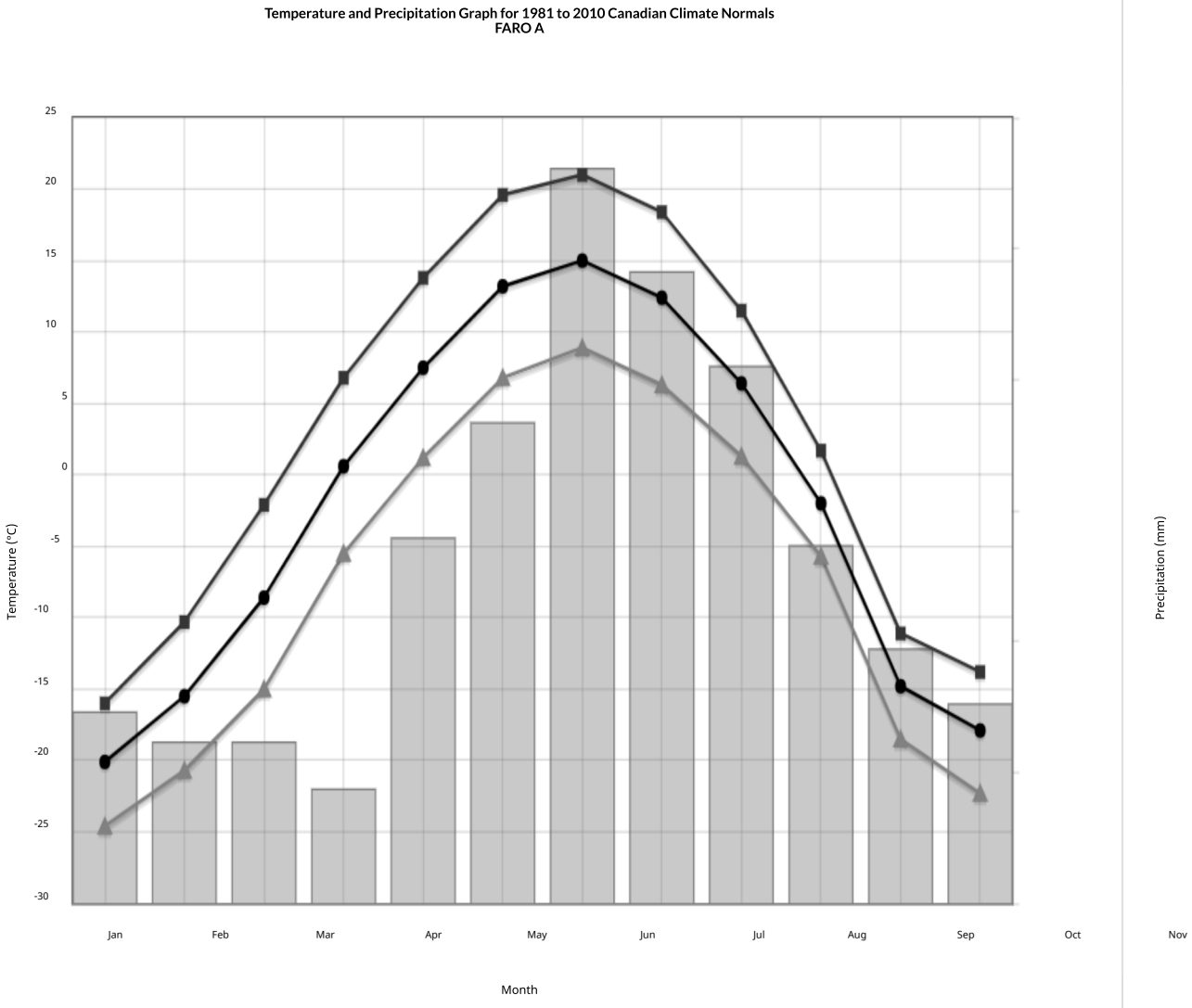
B.3 CLIMATE DATA

Government of Canada / Gouvernement du Canada

▶ Notices

Canadian Climate Normals 1981-2010 Station Data

▼ Temperature and Precipitation Graph



▼ Normals Data

The minimum number of years used to calculate these Normals is indicated by a code for each element. A "+" beside an extreme date indicates that this date is the first occurrence of the extreme value. Values and dates in bold indicate all-time extremes for the location.

Data used in the calculation of these Normals may be subject to further quality assurance checks. This may result in minor changes to some values presented here.

FARO A
YUKON TERRITORY

Latitude:	62°12'25.000" N	**Longitude:**	133°22'24.000" W	**Elevation:**	716.30 m
Climate ID:	2100517	**WMO ID:**		**TC ID:**	ZFA

▼ Temperature

Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Daily Average (°C)	-20.1	-15.5	-8.6	0.6	7.5	13.2	15.0	12.4	6.4	-2.0	-14.8	-17.9	-2.0	C
Standard Deviation	7.1	4.5	3.5	2.1	1.6	1.3	0.8	1.5	1.7	2.1	5.1	5.4	4.5	C
Daily Maximum (°C)	-16.0	-10.3	-2.1	6.8	13.8	19.6	21.0	18.4	11.5	1.7	-11.1	-13.8	3.3	C
Daily Minimum (°C)	-24.6	-20.7	-15.0	-5.5	1.2	6.8	8.9	6.3	1.3	-5.7	-18.5	-22.3	-7.3	C
Extreme Maximum (°C)	7.0	12.1	12.5	21.5	32.0	33.8	31.0	**33.9**	24.0	18.5	12.5	12.5		
Date (yyyy/dd)	1981/19	1992/26	1994/29	1989/26	1983/30	2004/20	1998/03	**1994/04**	1982/15	1988/04	2005/23	1999/22		
Extreme Minimum (°C)	-51.0	-51.0	-44.0	-30.5	-8.0	-2.5	0.0	-4.5	-15.5	-34.0	-46.0	**-52.0**		
Date (yyyy/dd)	1980/12	1979/10	1987/04	1986/10	1979/08	1991/04	1999/29	1986/24	1983/28	1982/28	1989/12	**1977/07**		

▼ Precipitation

Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Rainfall (mm)	0.0	0.0	0.1	2.6	27.3	36.7	56.1	47.5	38.4	9.4	0.2	0.1	218.4	C
Snowfall (cm)	16.7	14.6	13.1	6.3	0.6	0.0	0.0	0.7	2.4	20.4	21.7	17.6	114.0	C
Precipitation (mm)	14.6	12.3	12.3	8.7	27.9	36.7	56.1	48.2	41.0	27.3	19.4	15.2	319.7	C
Average Snow Depth (cm)	25	29	27	11	0	0	0	0	0	3	13	19	11	D
Median Snow Depth (cm)	25	28	27	11	0	0	0	0	0	1	13	19	10	D
Snow Depth at Month-end (cm)	26	29	23	1	0	0	0	0	0	7	17	22	10	C
Extreme Daily Rainfall (mm)	0.0	0.2	2.4	9.2	**29.4**	22.6	23.8	19.0	21.0	14.4	1.4	2.6		
Date (yyyy/dd)	1978/01	2006/12	2004/29	1997/27	**1993/28**	1995/05	1991/27	1990/06	2000/26	1994/03	1987/01	1999/27		
Extreme Daily Snowfall (cm)	8.0	9.0	12.4	12.6	3.2	0.0	0.0	8.4	6.5	10.6	**12.8**	8.0		
Date (yyyy/dd)	1993/31	1987/25	1996/09	2000/06	2004/07	1978/01	1978/01	1991/25	1980/22	1999/15	**1991/30**	1985/31		
Extreme Daily Precipitation (mm)	7.6	9.0	12.4	12.6	**29.4**	22.6	23.8	19.0	21.0	14.4	12.8	8.0		
Date (yyyy/dd)	1993/29	1987/25	1996/09	2000/06	**1993/28**	1995/05	1991/27	1990/06	2000/26	1994/03	1991/30	1985/31		
Extreme Snow Depth (cm)	57	60	**64**	57	11	0	0	4	4	26	35	41		
Date (yyyy/dd)	1983/15	1990/23	**1983/27**	1983/01	1986/01	1981/01	1981/01	1984/28	2000/29	1982/30	1989/21	1982/12		

▶ Days with Maximum Temperature

▶ Days with Minimum Temperature

▶ Days with Rainfall

▶ Days With Snowfall

▶ Days with Precipitation

▶ Days with Snow Depth

▶ Wind

▶ Degree Days

▶ Humidex

▶ Wind Chill

▶ Humidity

▶ Frost-Free

Legend

- A = WMO "3 and 5 rule" (i.e. no more than 3 consecutive and no more than 5 total missing for **either** temperature **or** precipitation)
- B = At least 25 years
- C = At least 20 years
- D = At least 15 years

▼ Station / Element Metadata

Statistics listed below are provided as a guide to determine the validity of Normals and Extremes calculations. For example, a station with 30 years of record between 1981 and 2010 with no missing years would be a more reliable normal than a station with 15 years of record and 2 missing years. Less than 100% possible observations indicates that out of the total number of observations used, some records were missing.

FARO A

Province/Territory	YT
Latitude (dd mm):	62 12 N
Country	CAN
Longitude (ddd mm):	133 22 W
Time Zone	PST
Latitude (decimal degrees):	62.21 N
Climate ID:	2100517
Longitude (decimal degrees):	133.37 W
WMO ID:	

Elevation (m):	716.3
TC ID:	ZFA

▼ Temperature

Temperature

	Begin Year	End Year	Total Number of Years	Missing Years	Total Count of Observations	% of Possible Observations
Daily Average (°C)	1981	2007	26	3	8690	98.8
Standard Deviation	1981	2007	26	3	8690	98.8
Daily Maximum (°C)	1981	2007	26	3	8701	99
Daily Minimum (°C)	1981	2007	26	3	8723	99.2
Extreme Maximum (°C)	1977	2007			9875	99.6
Extreme Minimum (°C)	1977	2007			9909	99.9

▼ Precipitation

Precipitation

	Begin Year	End Year	Total Number of Years	Missing Years	Total Count of Observations	% of Possible Observations
Rainfall (mm)	1981	2007	26	3	8792	100
Snowfall (cm)	1981	2007	26	3	8792	100
Precipitation (mm)	1981	2007	26	3	8792	100
Average Snow Depth (cm)	1981	2007	26	4	8334	95.1
Median Snow Depth (cm)	1981	2007	26	4	8334	95.1
Snow Depth at Month-end (cm)	1981	2007	26	3	284	98.6
Extreme Daily Rainfall (mm)	1978	2007			9859	100
Extreme Daily Snowfall (cm)	1978	2007			9860	100
Extreme Daily Precipitation (mm)	1978	2007			9859	100
Extreme Snow Depth (cm)	1980	2007			8708	98

▶ Days with Maximum Temperature

▶ Days with Minimum Temperature

▶ Days with Rainfall

▶ Days With Snowfall

▶ Days with Precipitation

▶ Days with Snow Depth

▶ Wind

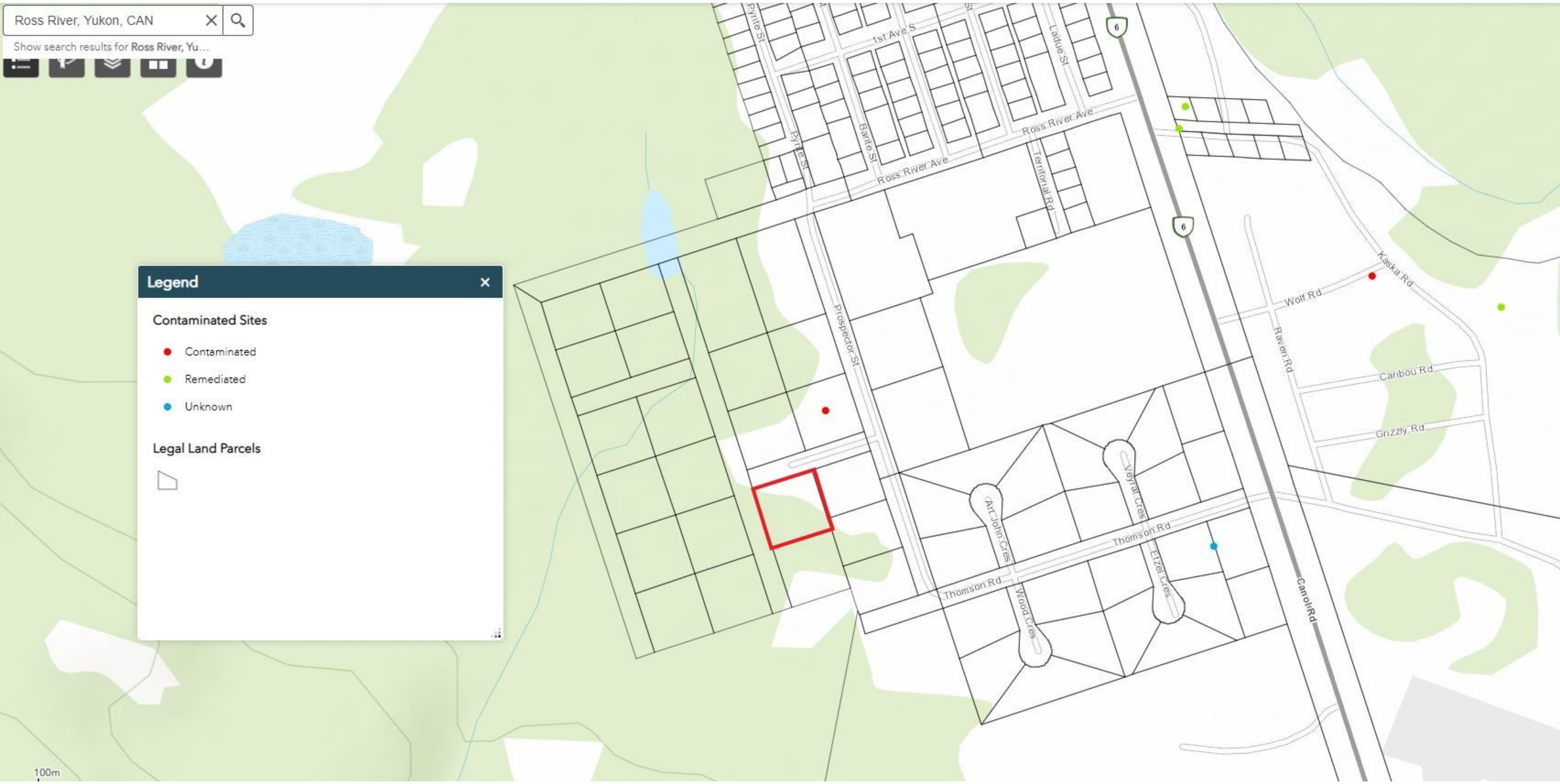
▶ Degree Days

▶ Humidex

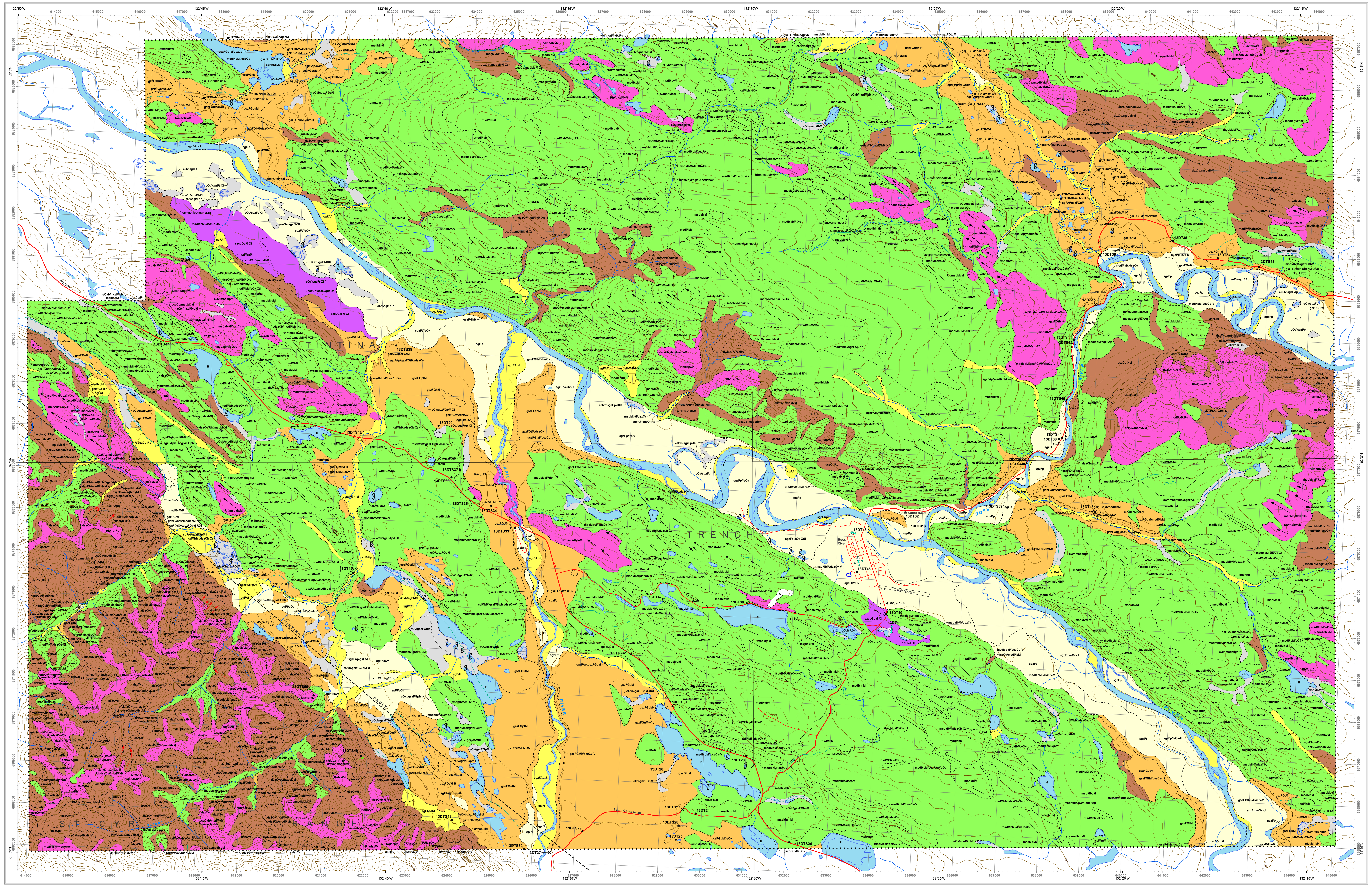
▶ Wind Chill

▶ Humidity

B.4 YUKON CONTAMINATED SITES INFORMATION MAP SEARCH


Ross River, Yukon, CAN
Show search results for Ross River, Yu...
Legend
Contaminated Sites
Contaminated
Remediated
Unknown
Legal Land Parcels
Pyrite St
1st Ave S
Ladue St
Ross River Ave
Barite St
Territorial Rd
Prospector St
Kaska Rd
Wolf Rd
Raven Rd
Caribou Rd
Grizzly Rd
Art John Cres
Veyral Cres
Thomson Rd
Etzel Cres
Wood Cres
Canol Rd
100m

B.5 SURFICIAL GEOLOGY



105K/02 SWIM LAKES	105K/01 TENAS CREEK
105F/15	105F/16

MAP LOCATION

1:50 000 scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION, NATURAL RESOURCES CANADA

ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection
North American Datum 1983
Zone 8

CONTOUR INTERVAL 100 FEET
Elevations in feet above Mean Sea Level

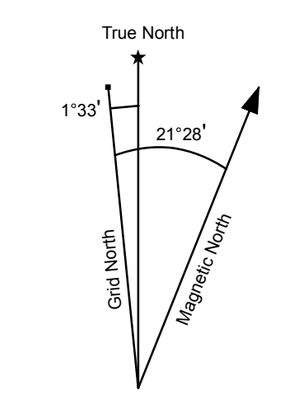
SURFICIAL GEOLOGY

ROSS RIVER REGION

PARTS OF 105K/1 & 2 AND 105F/15 & 16

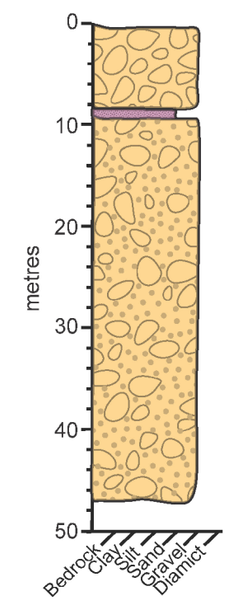
SCALE 1:25 000

0 1 2 3 4 5
kilometres



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION NOVEMBER 2014
FOR CENTRE OF MAP

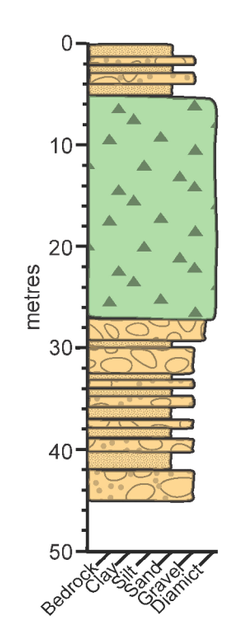
13DT027



Unit 2 (0-9 m): interbedded, well-sorted sand and gravel; pebble to boulder-sized, well-rounded to subangular clasts (average well-rounded); mostly open framework with coarse-grained sand matrix; some beds dip steeply to the NNE and are potential foresets; some deformed beds are potentially glaciotectonized; lower contact is undulating and gradational with a 60 cm thick sand bed, possibly representing a lake environment

Unit 1 (9-47 m): poorly sorted gravel; pebble to boulder-sized clasts, 50% clasts, closed framework, dark grey, silty fine-grained sand matrix, massive, no imbrications; maximum clast size is ~70 cm and are all well-rounded felsic intrusives

13DT037

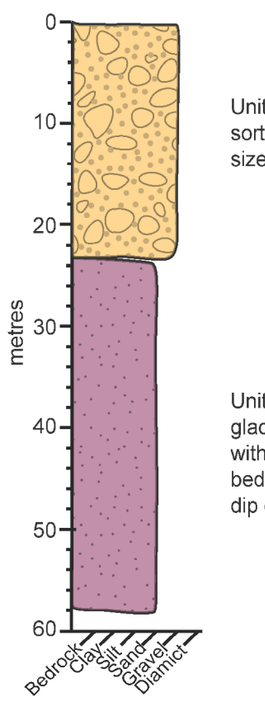


Unit 3 (0-5 m): interbedded, well-sorted sand and gravel

Unit 2 (5-27 m): consolidated till

Unit 1 (27-45 m): interbedded sand and gravel; injection features of bedded and laminated sand crosscut horizontally bedded gravel; very poorly sorted near upper contact

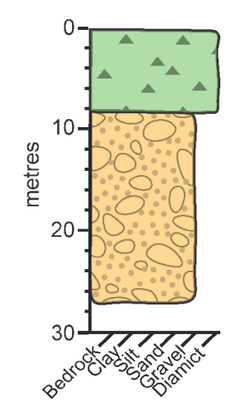
13DT039



Unit 2 (0-23 m): interbedded, moderately to poorly-sorted gravel; fine-grained sand matrix; maximum clast size is approximately 35 cm

Unit 1 (23-58 m): interbedded, well-sorted, fine-grained glaciolacustrine sand; mostly horizontally planar beds with flame structures, climbing ripples and some cross beds; near the bottom of the exposure the sand beds dip eastwards towards the river and are faulted

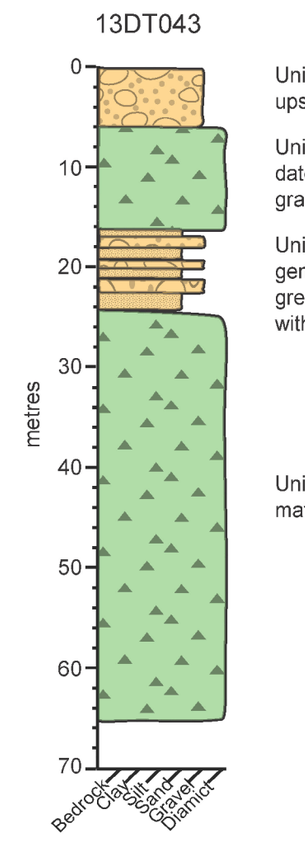
13DT042



Unit 2 (0-8 m): silty sandy till with well-rounded to angular, pebble to boulder-sized clasts

Unit 1 (8-27 m): oxidized gravel; supported by fine-grained sand matrix with minor silt; pebble to cobble-sized clasts (average pebble); well-rounded to subangular clasts (average well-rounded); gravel is interbedded with 13-17 cm thick silt to medium-grained sand beds near upper contact; sand beds undulate and are entrained into the gravel; interbedded gravel is 4 m thick; unit contains possible ice-wedge pseudomorph with bedding and potential tephra draped vertically along walls; bottom 11.5 m of this unit is obscured by slump

13DT043



Unit 4 (0-6 m): moderately sorted gravel; pinches out upstream and thickens downstream

Unit 3 (6-16 m): light brown to grey, massive, consolidated till; pebble to boulder clasts; some ~1 m thick gravel lenses; lower contact is sharp and likely erosive

Unit 2 (16-24 m): interbedded sand and gravel; beds gently dip to the west with a maximum angle of 39 degrees; at least one of the gravel beds is poorly sorted with large well-rounded boulders

Unit 1 (24-65 m): grey consolidated till; silty sand matrix; maximum clast size is 40 cm

TERRAIN CLASSIFICATION SYSTEM

This surficial geology map was classified using the Terrain Classification System for British Columbia (Howes and Kenk, 1997), with minor modification to meet standards set by the Yukon Geological Survey. For example, we have added some permafrost process subclasses to accomodate the wider variety of permafrost features found in Yukon. We have also added an age classification to distinguish materials deposited during different Pleistocene glaciations.

A sample map unit label is shown below to illustrate the terrain classification system. Surficial materials form the core of the polygon map unit labels and are symbolized with a single upper case letter. Lower case textures are written to the left of the surficial material, and lower case surface expressions are written to the right. An upper case activity qualifier (A = active; I = inactive) may be shown immediately following the surficial material designator. The glacial qualifier "G" may alternatively be written immediately following the surficial material to indicate glacially modified materials. Age is indicated by a capital letter that follows the surface expression but precedes the process modifiers. Geomorphological processes (capital letters) and subclasses (lower case letters) always follow a dash symbol ("-").

sgFGptM-Xs

- GEOMORPHOLOGICAL PROCESS(ES) (-X = permafrost)
  SUBCLASS(ES) (s = sheetwash)
- AGE (M = McConnell)
- SURFACE EXPRESSION (pt = plain, terrace)
- QUALIFIER (G = glacial; A = active; or I = inactive)
- SURFICIAL MATERIAL (F = fluvial)
- TEXTURE (sg = sand, gravel)

COMPOSITE SYMBOL DELIMITERS:

Due to scale limitations, up to 4 terrain units may be included in a single map unit label (*e.g.*, sgFGptM.dsmMbM/xsCv\zcLGpM-XsV). Each component is separated by a delimiter that indicates relative proportions between the components (".", "/", "//") or a stratigraphic relationship "\").

"." - terrain units on either side of the symbol are of approximately equal proportion
"/" - terrain unit(s) before the symbol is more extensive than the one(s) following
"//" - terrain unit(s) before the symbol is considerably more extensive than the one(s) following
"\" - terrain unit(s) before the "\" symbol stratigraphically overlies the one(s) following

1st terrain unit (>50% of map unit) / 2nd terrain unit (30-49% of map unit) // 3rd terrain unit (10-29% of map unit) \ Underlying terrain unit

SURFICIAL MATERIALS

Surficial materials are non-lithified, unconsolidated sediments. They are produced by weathering, sediment deposition, biological accumulation, and human and volcanic activity. In general, surficial materials are of relatively young geological age and they constitute the parent material of most (pedological) soils. Note that a single polygon will be coloured only by the dominant surficial material, but other materials may exist in that unit.

A — Anthropogenic: Materials produced or significantly modified by human activity, such as landfills, mine tailings, and open-pit mines.

O — Organic: Organic materials are produced by the accumulation of decomposing vegetative matter and contain at least 30% organic matter by weight. They are generally found at the surface in areas of little to no slope or in poorly drained depressions. Poor drainage associated with these deposits inhibits decomposition and results in fibric textures (eO), although mesic (uO) and humic (hO) textures were observed. Shallow permafrost is commonly encountered in or beneath these materials due to their insulating effect. Organic deposits form veneers (Ov) where they are <1 m thick and blankets (Ob) where they are >1 m thick. Thin veneers (Ox), <20 cm thick, are widespread and unmapped.

C — Colluvium: Material transported and deposited on or at the foot of slopes by gravity-driven processes such as creep, solifluction, landslides, and snow avalanches. Colluvium is common in areas of high relief with moderately steep to steep slopes, particularly in the Pelly Mountains. It typically comprises poorly sorted sediment ranging in size from clay to boulders, depending on the parent material. On gentle to moderate north-facing slopes, colluvium is composed of fine-grained material and is deposited by periglacial processes such as sheetwash (-Xs) and active layer detachment slides (-Xf). Coarse-grained colluvium is more typical on steeper slopes where landslides (-R and -F) are the primary transport mechanisms. Colluvium is also found in fans (Cf), cones (Cc), and aprons (Ca) at the base of slopes where it has been deposited by hazardous mass movement processes such as rockfall (-Rb), rockslides (-Rr), slumps (-Fu), debris slides (-Rs), and debris flows (-Rd). Permafrost presence is highly variable and dependent on soil texture, topographic position, and surface expression.

F, **FA** — Fluvial: Sediments transported by streams and rivers and deposited as floodplains (Fp), alluvial fans (Ff) and terraces (Ft). Fluvial deposits typically consist of well-sorted, stratified sand and rounded gravel with varying amounts of silt and organic materials. Silt, sand, and organic deposits make up thinly laminated or massive overbank deposits that are commonly interbedded with coarser gravel deposits. Floodplain sediments are widespread adjacent to the Pelly River where they reach thicknesses greater than 13 m (Environment Yukon, 1976). Fans are common where streams enter broad valleys. Higher elevation, narrow floodplains typically contain coarser-grained deposits than large, lower elevation floodplains. Steep bedrock canyons have also been cut along the Lapie River. Permafrost is uncommon in active fluvial deposits, but may be found at depth in inactive deposits. Active fluvial deposits (FA) have recently flooded or are subject to regular flooding.

FG^M — Glaciofluvial (late Wisconsin/McConnell): Glaciofluvial sediment is deposited by glacial meltwater either directly in front of, or in contact with, glacial ice. The sediment is typically poorly to well-sorted, rounded, and stratified gravel and sand. Glaciofluvial materials in the study areas were deposited as hummocky, ice marginal sediment, sub and englacial eskers, and kettled outwash plains (FGp) that were subsequently eroded into terraces (FGt) in valley bottoms. Several large glaciofluvial fans were formed as sediment was deposited from the Pelly Mountains into the Tintina Trench during, or immediately following, deglaciation. These fans are typically partly covered by smaller Holocene fans. The high porosity of glaciofluvial materials results in largely ice-free deposits or deep active layers. Sediments may be more ice-rich in areas with discontinuous, fine-grained sand and silt beds.

M^M — Morainal (late Wisconsin/McConnell): Morainal deposits, also referred to as till, are deposited directly by glacial ice without modification by any other transportation agent. These deposits are widespread, both in valley bottoms and across gentle to moderate slopes in the Tintina Trench. Till is typically a poorly sorted and consolidated mixture of silt, sand, and rounded to angular, pebble to boulder-sized clasts. Many of these clasts are heavily striated and have keels, lee-end fractures, and other evidence of glacial erosion. Till may be thin (<15 cm) in high elevation areas but reaches thicknesses >50 m across the study area (Environment Yukon, 1990). Morainal deposits are typically found as veneers (Mv) or blankets (Mb) that follow the underlying topography. Streamlined drumlins and flutings (Mm and Mr) composed of heavily compacted basal till are abundant across the Tintina Trench. These features were formed from sediment deformation at the ice-bed interface below the ice sheet and typically comprise >5 m of till. Morainal deposits also form undulating (Mu) and hummocky topopgraphy (Mh). Till is generally colluviated when found on slopes, and permafrost is commonly found within morainal deposits with varying amounts of ice.

LG — Glaciolacustrine (late Wisconsin/McConnell): Glaciolacustrine material primarily consists of interbedded and interlaminated clay, silt, and sand deposited in glacial lakes during deglaciation. Glaciolacustrine deposits are widespread in the Tintina Trench, reaching >10 m in thickness. Many of these deposits are covered by glaciofluvial, colluvial, lacustrine, and organic sediment. A notable exception to this is the large glaciolacustrine terraces on the southwest side of the Pelly River. These terraces are ~30 m above the Pelly River floodplain and have a plain (LGp) to undulating (LGu) expression. Glaciolacustrine terraces also exist on the northeast side of the river, but they have been covered by 5-10 m of glaciofluvial sediment and are therefore mapped as glaciofluvial deposits. The low permeability of glaciolacustrine deposits promotes thin active layers. Thermokarst lakes (-Xt) and segregated ice lenses (-Xl) are common in these deposits, indicating the presence of ice-rich permafrost near the surface.

R — Bedrock: Bedrock is exposed mostly on alpine summits, ridges, and spur crests and on steep valley sides. Lower elevation exposures in the Tintina Trench are streamlined to the northwest, in the down-ice flow direction. Bedrock is also exposed in valleys where streams have eroded through valley-bottom sediments (*e.g.*, where the Robert Campbell Highway crosses the Lapie River). Steep bedrock exposures are mapped as hummocky (Rh) to reflect their irregular surface. Bedrock is commonly associated with colluvial deposits and can be the source of rockfall and rockslide activity.

SYMBOLS

GEOLOGICAL BOUNDARIES:
- defined
- approximate
- assumed
- limit of mapping

GLACIAL FEATURES:
- cirque
- crevasse filling
- esker
- moraine ridge
- major meltwater channel escarpment
- minor meltwater channel, known direction of flow
- minor meltwater channel, unknown direction of flow
- drumlin or drumlinoid
- streamlined bedrock

OTHER GEOLOGICAL FEATURES:
- landslide headwall scarp
- landslide direction of movement:
  - debris flow
  - debris slide
- Tintina Fault (approximate location)

TOPOGRAPHIC FEATURES:
- contours
- streams
- roads
- trails
- lakes
- wetlands

GROUND OBSERVATION SITES:
(labelled with site number, *e.g.* 13DT001)
- field station
- stratigraphic section
- permafrost borehole
- electrical resistivity tomography (ERT) profile station
- striations

OTHER FEATURES:
- thermokarst pond

BACKGROUND NOTES

This map was produced as a base layer for community landscape hazard assessment and climate change adaptation planning. An accompanying report providing additional detail on local surficial geology, stratigraphy, glacial history, and landscape hazards will be available from Yukon College's Northern Climate ExChange in April 2015.

The study area is located within the Yukon Plateau and includes the Pelly and lower Ross River floodplains, the lower Lapie River to the south and a portion of the St. Cyr Range (Pelly Mountains) to the southwest. The Pelly River occupies the Tintina Trench, which is the physiographic expression of the Tintina fault, a major strikeslip fault now considered inactive.

Most of the surficial materials and glacial landforms in the study area were formed during the most recent, late Wisconsinan McConnell (Cordilleran) glaciation (ca. 25-10 ka). At its maximum, the Cordilleran Ice Sheet reached elevations between 1550–1900 m over Faro and Ross River (Jackson, 1994), covering all but the highest peaks.

Much of the area is underlain by till up to or exceeding 50 m in thickness. Streamlined drumlins and flutings composed of McConnell till are abundant across the Tintina Trench. In many places, the till is covered by glaciolacustrine (glacial lake) sand, silt and clay, and glaciofluvial sand and gravel (outwash) units of variable thicknesses. A complex deglacial history, including active retreat, possible re-advances and final stagnation of the ice sheet resulted in interbedding of these units, with repeated layers of till, glacial lake, and outwash sediments. See accompanying stratigraphic section figures for more details on site-specific surficial geological units.

GEOLOGIC HAZARDS

The primary geologic hazards in the study area are thawing ice-rich permafrost, landslides, and flooding. Permafrost is discontinuous across the study area and may be masked beneath coarser-grained unfrozen surface sediments. At Ross River School, ice-rich permafrost is 17 m thick within glaciolacustrine sediments, which are buried beneath 6 m of unfrozen surface sand and gravel (EBA, 2007). Mean annual ground temperatures of -0.4°C (Hoggan, 1989) and -0.3°C (Lipovsky & Yoshikawa, 2009) have been reported in or near the community. Permafrost was not directly observed in any soil pits (<1 m depth) in the Ross River study area. However, periglacial features such as thermokarst collapse pits (-Xt), sheetwash (-Xs), and active-layer detachment slides (-Xf) indicate the presence of near-surface permafrost. Permafrost is most common and ice-rich in finer-grained sediment, such as glaciolacustrine deposits or finer-grained till, especially on north-facing slopes. Permafrost was only mapped in areas with observable periglacial processes. However, it is interpreted to exist in most materials at ≥2 m depth.

Landslides are created by the downslope movement (mass wasting) of surficial materials and bedrock fragments, mixed with vegetation and debris. This includes both rapid and slow-moving events. The most common landslides in the study area are debris flows and rock slides and falls, all of which occur in steeper areas of high relief. Permafrost-related landslides, such as retrogressive thaw slumps and active-layer detachments also occur, the latter commonly triggered by forest fires.

Flooding is an ongoing concern near Ross River, where evidence of regular flooding was seen in test pits and water well drill logs. Channel migration and exposure of ice-rich permafrost on eroded cutbanks may also be significant hazards to the community. Parts of Ross River were most recently flooded in late spring 2013 due to ice-jams and freshet flows.

DATA SOURCES

This map was interpreted from high resolution digital stereo imagery (1:15 000 and 1:40 000 scale scanned aerial photographs* from 1982, 2003, and 2007) using PurView/ArcGIS softcopy software. Some map features may therefore not exactly match physiographic and hydrologic features displayed on the underlying, 1:50 000-scale topographic base map. Field checking was performed in September 2013.

*National Air Photo Library aerial photographs:
A26158: 1-7 and 18-24 (1982, 1:15 000 scale)
A28502: 210-218 (2003, 1:40 000 scale)
A28547:158-167, 179-189 and 228-239 (2007, 1:40 000 scale)

TEXTURE

Texture refers to the size, shape, and sorting of particles in clastic sediments, and the proportion and degree of decomposition of plant fibre in organic sediments. Texture is indicated by up to three lower case letters, placed immediately before the surficial material designator, listed in order of decreasing abundance.

Specific clastic textures
a - blocks: angular particles >256 mm in size
b - boulders: rounded particles >256 mm in size
k - cobbles: rounded particles >64-256 mm in size
p - pebbles: rounded particles >2-64 mm in size
s - sand: particles between >0.0625-2 mm in size
z - silt: particles 2 μm-0.0625 mm in size
c - clay: particles ≤2 μm in size

Common clastic textural groupings
d - mixed fragments: a mixture of rounded and angular particles >2 mm in size
x - angular fragments: a mixture of angular fragments >2 mm in size (*i.e.*, a mixture of blocks and rubble)
g - gravel: a mixture of two or more size ranges of rounded particles >2 mm in size (*e.g.*, a mixture of boulders, cobbles, and pebbles); may include interstitial sand
r - rubble: angular particles between 2 and 256 mm; may include interstitial sand
m - mud: a mixture of silt and clay; may also contain a minor fraction of fine sand
y - shells: a sediment consisting dominantly of shells and/or shell fragments

Organic terms
e - fibric: the least decomposed of all organic materials; it contains amounts of well-preserved fibre (40% or more) that can be identified as to botanical origin upon rubbing
u - mesic: organic material at a stage of decomposition intermediate between fibric and humic
h - humic: organic material at an advanced stage of decomposition; it has the lowest amount of fibre, the highest bulk density, and the lowest saturated water-holding capacity of the organic materials; fibres that remain after rubbing constitute less than 10% of the volume of the material

SURFACE EXPRESSION

Surface expression refers to the form (assemblage of slopes) and pattern of forms expressed by a surficial material at the land surface. This three-dimensional shape of the material is equivalent to 'landform' used in a non-genetic sense (*e.g.*, ridges and plain). Surface expression symbols also describe the manner in which unconsolidated surficial materials relate to the underlying substrate (*e.g.*, veneer). Surface expression is indicated by up to three lower case letters, placed immediately following the surficial material designator, listed in order of decreasing extent.

a - apron: a wedge-like slope-toe complex of laterally coalescent colluvial fans and blankets. Longitudinal slopes are generally less than 15° (26%) from apex to toe with flat or gently convex/concave profiles

b - blanket: a layer of unconsolidated material thick enough (>1 m) to mask minor irregularities on the surface of the underlying material, but still conforms to the general underlying topography; outcrops of the underlying unit are rare

c - cone: a cone or sector of a cone, mostly steeper than 15° (26%); longitudinal profile is smooth and straight, or slightly concave/convex; typically applied to talus cones

d - depressions: circular or irregular area (hollow) of lower elevation than the surrounding terrain and delimited by an abrupt break in slope; depression side slopes are steeper than surrounding terrain; depressions are two or more metres deep; typically applied to kettle holes, karst, or piping depressions

f - fan: sector of a cone with a slope gradient less than 15° (26%) from apex to toe; longitudinal profile is smooth and straight, or slightly concave/convex

h - hummock: steep sided hillock(s) and hollow(s) with multidirectional slopes dominantly between 15-35° (26-70%) if composed of unconsolidated materials, whereas bedrock slopes may be steeper; local relief >1 m; in plan, an assemblage of non-linear, generally chaotic forms that are rounded or irregular in cross-profile; commonly applied to knob-and-kettle glaciofluvial terrain

l - delta: landform created at the mouth of a river or stream where it flows into a body of water; gently sloping surfaces between 0-3° (0-5%), and moderate to steeply sloping fronts between 16-35° (27-70%); glaciofluvial deltas in the map area are typically coarse-grained with steep sides and gently inclined kettled or channeled surfaces

m - rolling: elongate hillock(s); slopes dominantly between 3-15° (5-26%); local relief >1 m; in plan, an assemblage of parallel or sub-parallel linear forms with subdued relief (commonly applied to bedrock ridges and fluted or streamlined till plains)

p - plain: a level or very gently sloping, unidirectional (planar) surface with slopes 0-3° (0-5%); relief of local surface irregularities generally <1 m; applied to (glacio)fluvial floodplains, organic deposits, lacustrine deposits, and till plains

r - ridge: elongate hillock(s) with slopes dominantly 15-35° (26-70%) if composed of unconsolidated materials; bedrock slopes may be steeper; local relief is >1 m; in plan, an assemblage of parallel or sub-parallel linear forms; commonly applied to drumlinized till plains, eskers, morainal ridges, crevasse fillings, and ridged bedrock

t - terrace: a single or assemblage of step-like forms where each step-like form consists of a scarp face and a horizontal or gently inclined surface above it; applied to fluvial and lacustrine terraces and stepped bedrock topography

u - undulating topography: non-linear rises and hollows with slopes generally less than 15° (26%)

v - veneer: a layer of unconsolidated materials too thin to mask the minor irregularities of the surface of the underlying material; 10 cm - 1 m thick; commonly applied to eolian/loess veneers and colluvial veneers

w - mantle of variable thickness: a layer or discontinuous layer of variable thickness, typically 0 to 3 m, that fills or partly fills depressions in an irregular substrate; generally too thin to mask irregularities in the underlying material

x - thin veneer: a very thin layer up to 20 cm thick

GEOMORPHOLOGICAL PROCESSES

Geomorphological processes are natural mechanisms of weathering, erosion, and deposition that result in the modification of the surficial materials and landforms at the earth's surface. All processes, except for deglacial processes, are assumed to be active unless the qualifier "I" (inactive) is used. All deglacial processes are assumed to be inactive unless the qualifier "A" (active) is used. Up to three upper case letters may be used to indicate processes. These are listed in order of decreasing importance and placed after the surface expression symbol, following a dash (-) symbol.

Subclasses are used to provide more specific information about a general geomorophological process, and are represented by lower case letters placed after the related process designator. Up to two subclasses can be associated with each process. Process subclasses used on this map are defined with the related process below.

EROSIONAL PROCESSES

V - gully erosion: running water, mass movement, and/or snow avalanching, resulting in the formation of parallel and sub-parallel, long, narrow ravines

FLUVIAL PROCESSES

I - irregularly sinuous channel: a clearly defined main channel displaying irregular turns and bends without repetition of similar features; backchannels may be common, and minor side channels and a few bars and islands may be present, but regular and irregular meanders are absent

J - anastamosing channel: a channel zone where channels diverge and converge around many islands. The islands are vegetated and have surfaces that are far above mean maximum discharge levels

M - meandering channel: a clearly defined channel characterized by a regular and repeated pattern of bends with relatively uniform amplitude and wave length

MASS MOVEMENT PROCESSES

F - slow mass movements: slow downslope movement of masses of cohesive or non-cohesive surficial material and/or bedrock by creeping, flowing or sliding

L - mass movement at an unspecified rate

R - rapid mass movements: rapid downslope movement by falling, rolling, sliding, or flowing of dry, moist, or saturated debris derived from surficial material and/or bedrock

Subclasses: (") initiation zone; (b) rockfall; (d) debris flow; (r) rockslide; (s) debris slide; (u) slump in surficial material

PERIGLACIAL PROCESSES

C - cryoturbation: movement of surficial materials by heaving and/or churning due to frost action (repeated freezing and thawing)

S - solifluction: slow gravitational downslope movement of saturated non-frozen overburden across a frozen or otherwise impermeable substrate

X - permafrost processes: processes controlled by the presence of permafrost, and permafrost aggradation or degradation

Z - general periglacial processes: solifluction, cryoturbation and nivation, possibly occuring in a single polygon

Subclasses: (e) thermokarst erosion; (f) thaw flow slides; (l) segregated ice; (n) pingo; (t) thermokarst subsidence; (r) patterned ground; (s) sheetwash; (w) ice-wedge polygons

DEGLACIAL PROCESSES

E - channeled by meltwater: erosion and channel formation by meltwater alongside, beneath, or in front of a glacier

H - kettled: depressions in surficial materials resulting from the melting of buried glacier ice

T - ice contact: landforms that developed in contact with glacier ice such as kames

HYDROLOGIC PROCESSES

U - inundation: terrain seasonally under standing water for greater than one month per year and resulting from a high watertable

REFERENCES

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Jackson, L.E., Jr., 1994. Terrain inventory and Quaternary history of the Pelly River area (105 F, G, J, K), Yukon Territory. Geological Survey of Canada, Memoir 437, 41 p.

Lipovsky, P.S. and Yoshikawa, K., 2009. Initial results from the first year of the Permafrost Outreach Program, Yukon, Canada. *In:* Yukon Exploration and Geology 2008, L.H. Weston, L.R. Blackburn and L.L. Lewis (eds.), Yukon Geological Survey, p. 161-172.

ACKNOWLEDGEMENTS

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RECOMMENDED CITATION

Turner, D.G., 2014. Surficial geology, Ross River region, Yukon, parts of NTS 105K/1 & 2 and 105F/15 & 16 (1:25 000 scale). Yukon Geological Survey, Energy, Mines and Resources, Government of Yukon, Open File 2014-13.

Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.

Paper copies of this map may be obtained from Yukon Geological Survey, Room 102 - 300 Main St., Whitehorse, Yukon, Y1A 2B5. Phone: 867-667-3201, E-mail: geology@gov.yk.ca.

A digital PDF (Portable Document Format) file of this map may be downloaded free of charge from the Yukon Geological Survey website: http://www.geology.gov.yk.ca.

Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

Open File 2014-13

Surficial Geology, Ross River Region, Yukon
Parts of NTS 105K/1 & 2 and 105F/15 & 16
1:25 000 scale

by

Derek G. Turner

B.6 AERIAL PHOTOGRAPHS

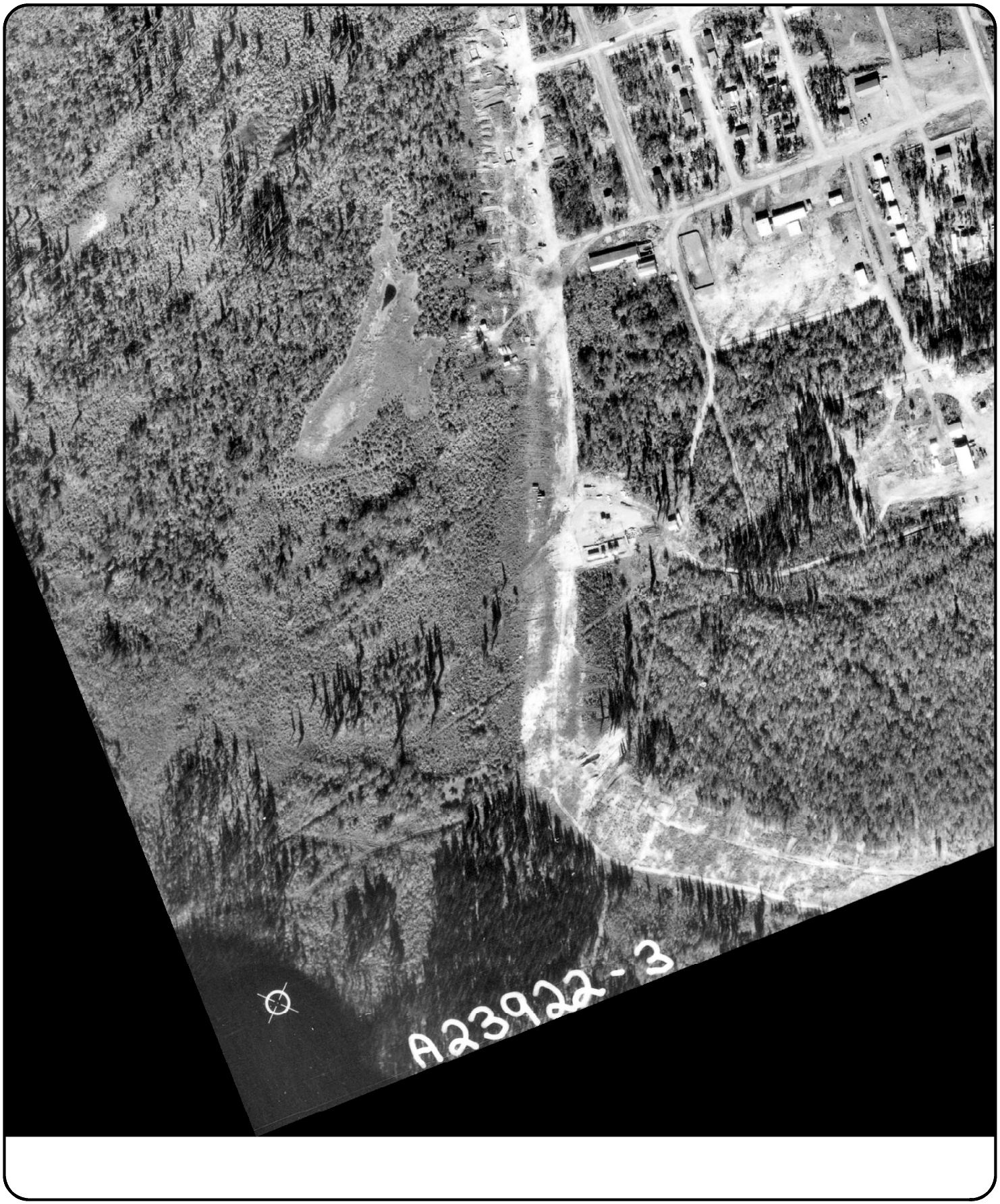
ENVIRONMENTAL RISK INFORMATION SERVICES

HISTORICAL AERIALS

Project Property:	Phase I ESA - SARU Ross River Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT Canada YT
Project No:	SIR21_004
Requested By:	Stantec Consulting Ltd.
Order No:	21022300126
Date Completed:	March 02, 2021

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Decade	Year	Image Scale	Source
1920	Not Available		
1940	Not Available		
1960	Not Available		
1970	1974	20000	NAPL
1980	1982	15000	NAPL
1990	1993	20000	NAPL
2000	Not Available		
2010	2015	13000	DigitalGlobe



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Order Number: 21022300126

Year: 1974
Source: NAPL
Map Scale: 1: 10000
Comments:

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

0 0.125 0.25 0.5 Kilometers

Order Number: 21022300126

Year: 1982
Source: NAPL
Map Scale: 1: 10000
Comments:

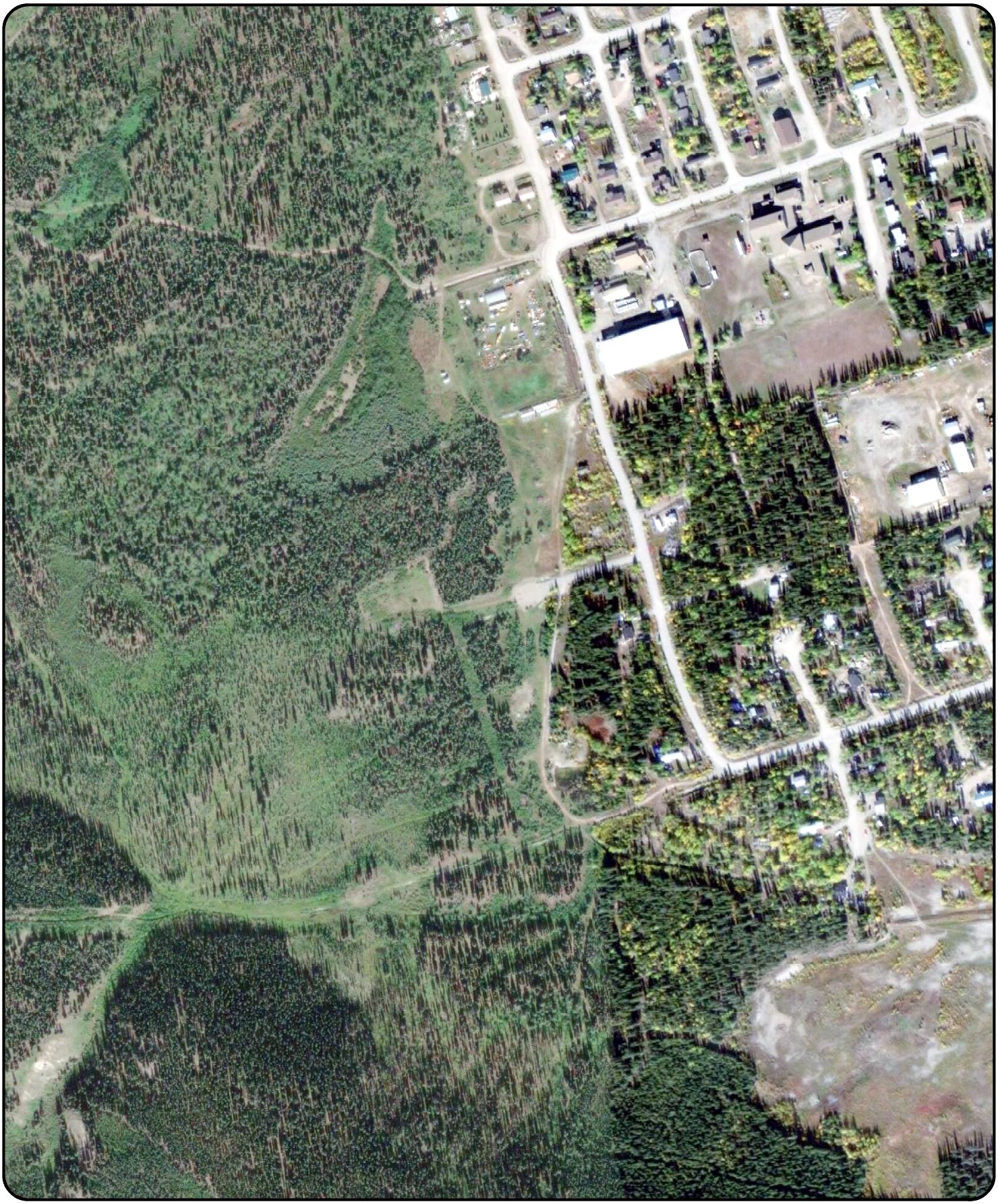
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

0 0.125 0.25 0.5
Kilometers

Order Number: 21022300126

Year: 1993
Source: NAPL
Map Scale: 1: 10000
Comments: Best Adjacent Decade Available

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



0 0.125 0.25 0.5
Kilometers

Order Number: 21022300126

Year: 2015
Source: DigitalGlobe
Map Scale: 1: 10000
Comments:

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

B.7 ECOLOG ERIS REPORT

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Phase I ESA - SARU Ross River* *Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT* *Canada YT*
Project No:	*SIR21_004*
Report Type:	*Standard Report*
Order No:	*21022300126*
Requested by:	*Stantec Consulting Ltd.*
Date Completed:	*February 26, 2021*

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Table of Contents

Executive Summary

Property Information:

Project Property:	*Phase I ESA - SARU Ross River* *Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT Canada YT*
Project No:	*SIR21_004*

Coordinates:

Latitude:	*61.9762039*
Longitude:	*-132.4568494*
UTM Northing:	*6,874,141.02*
UTM Easting:	*633,282.76*
UTM Zone:	*8V*

Elevation:	*2,178 FT* *663.95 M*

Order Information:

Order No:	*21022300126*
Date Requested:	*February 23, 2021*
Requested by:	*Stantec Consulting Ltd.*
Report Type:	*Standard Report*

Historical/Products:

Aerial Photographs	*Aerials - National Collection*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Within 0.25 km	Total
AIR	Air Emission Permits	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
CDRY	Dry Cleaning Facilities	Y	0	0	0
CHM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
CS	Contaminated Site Inventory	Y	0	1	1
DMP	Designated Material Permits	Y	0	0	0
EHS	ERIS Historical Searches	Y	0	0	0
EIIS	Environmental Issues Inventory System	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	Y	0	0	0
FST	Fuel Storage Tanks	Y	0	1	1
GEN	Waste Generators	Y	0	0	0
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
HIS	Historic Sites Inventory	Y	0	0	0
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
LTF	Land Treatment Facilities	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBT	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
ODS	Ozone Depleting Substances & Other Halocarbons	Y	0	0	0
OGWE	Oil and Gas Wells	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	0	0
REC	Waste Receivers	Y	0	0	0
REL	Relocation Permits	Y	0	0	0
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	0	0
SPL	Spills	Y	0	0	0
SWP	Special Waste Permits	Y	0	0	0

Database	Name	Searched	Project Property	Within 0.25 km	Total
WDS	***Waste Disposal Sites***	*Y*	*0*	*0*	*0*
YOGW	***Yukon Oil and Gas Wells***	*Y*	*0*	*0*	*0*
		Total:	*0*	*2*	*2*

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	CS	Former North 60 Petro Bulk Plant, Ross River	Ross River YT	ENE/102.9	-4.95	12
2	FST	Budget Plumbing & Heating	9 Prospector Street Ross River YT	ENE/162.6	-4.95	12

Executive Summary: Summary By Data Source

CS - Contaminated Site Inventory

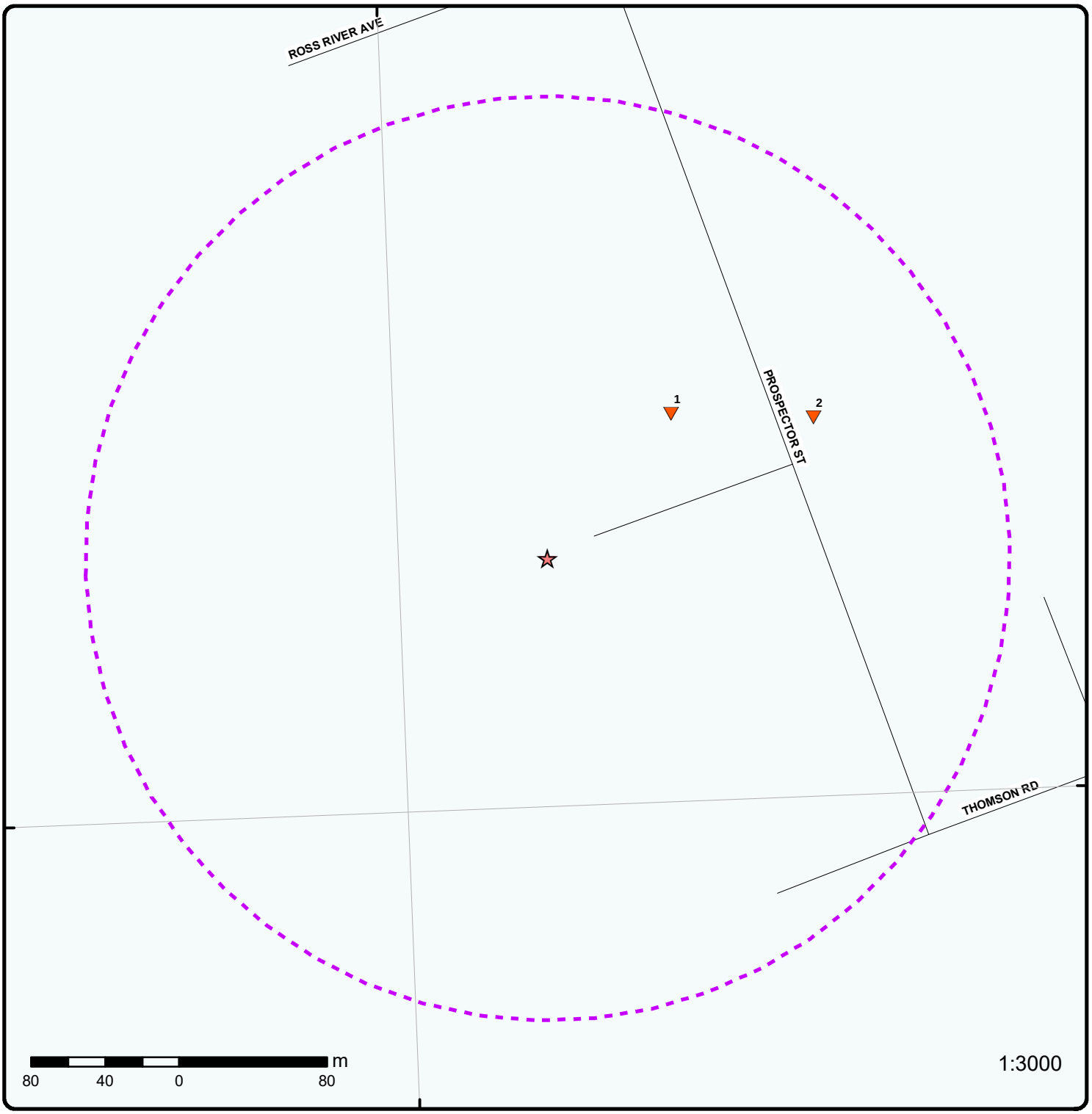
A search of the CS database, dated 1998-Jun 2020 has found that there are 1 CS site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
Former North 60 Petro Bulk Plant, Ross River	Ross River YT	ENE	102.86	1

FST - Fuel Storage Tanks

A search of the FST database, dated 1997-Jul 2020 has found that there are 1 FST site(s) within approximately 0.25 kilometers of the project property.

Lower Elevation	Address	Direction	Distance (m)	Map Key
Budget Plumbing & Heating	9 Prospector Street Ross River YT	ENE	162.60	2



Map: 0.25 Kilometer Radius

Order Number: 21022300126

Address: Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT, Canada, YT

ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Expressway
- Principal Highway
- Secondary Highway
- Major Road
- Local road
- Trail
- Proposed Road
- Ferry Route/Ice Road
- Industrial and Resource - Regions
- Main Line
- Sidetrack
- Transit Line
- Abandoned Line
- National Park
- Provincial or Territorial Park
- Other Park
- Golf Course or Driving Range
- Park or Sports Field
- Other Recreation Area

Source: © 2015 DMTI Spatial Inc.

132°27'W

61°58'30"N

61°58'30"N

Aerial

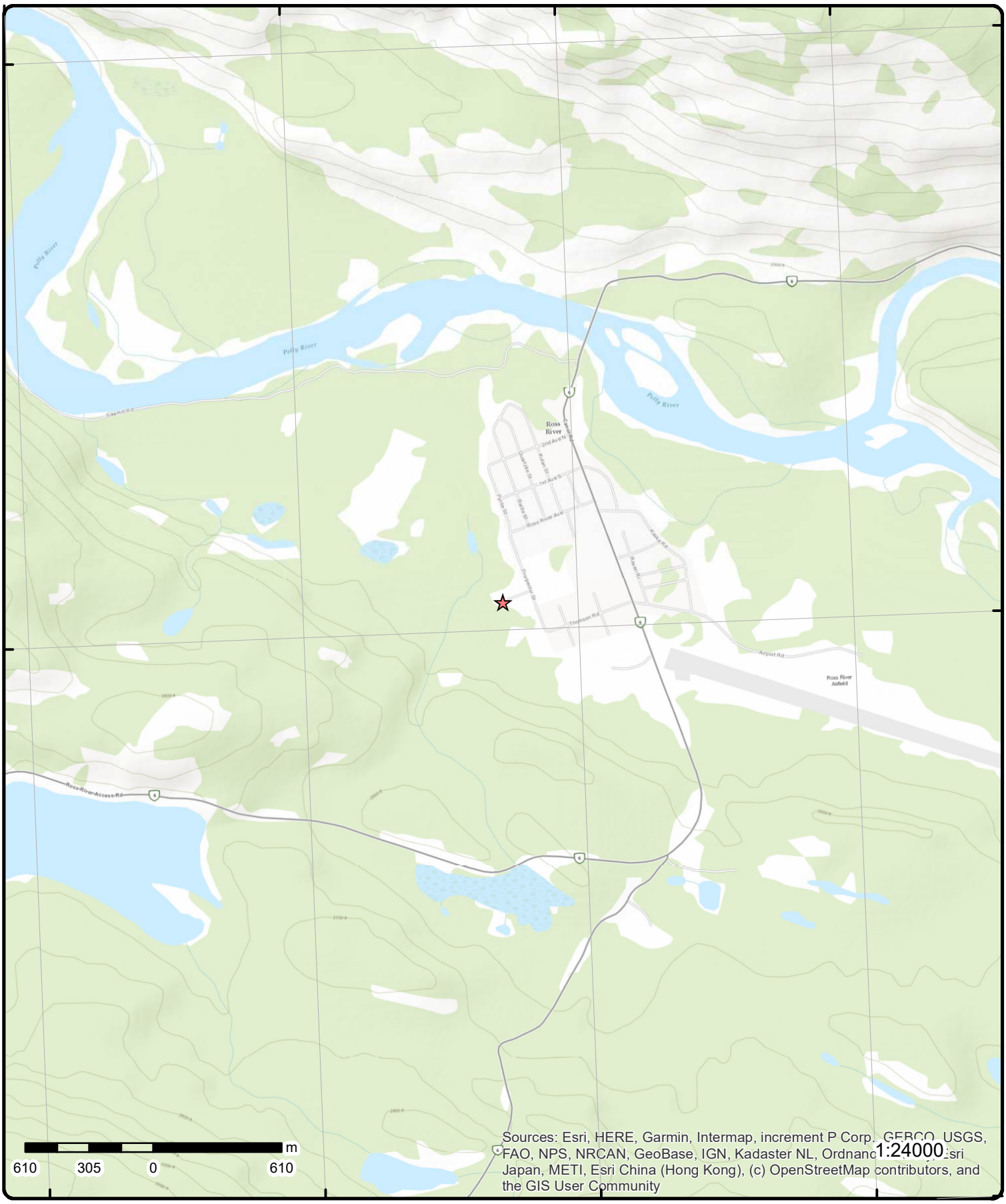
Year: 2014

Order Number: 21022300126

Address: Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT, Canada, YT

ENVIRONMENTAL RISK INFORMATION SERVICES

Source: ESRI World Imagery



Topographic Map

Address: Lots 114 and 115, 53919 CLSR YT, 29969 LTO YT, YT

Source: ESRI World Topographic Map

Order Number: 21022300126

ENVIRONMENTAL RISK INFORMATION SERVICES

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	ENE/102.9	659.0 / -4.95	Former North 60 Petro Bulk Plant, Ross River Ross River YT	CS

ID:	
Site File No:	
Responsible Party:	
RP:	
Classification:	Contaminated
Prim Land Use:	Commercial
COCS:	PHCs
Creation Date:	
Occurrence:	
Spillfile:	
Date Stat Change:	
Review Date:	
Reviewer:	
Water Standard Exc:	
Soil Standards Exc:	
CLSR:	53919
LTO:	29969
Legal Add:	Lot 118 Ross River
Community:	Ross River
Geometry X:	502332.05
Geometry Y:	831276.2137
Coord Source:	
Land Use:	
Land Tenure:	
Water Use:	
Loc. Contaminants:	
Public Summary:	In June 2009, a consultant conducted a Phase II ESA, which involved drilling test holes and completing four as monitoring wells. Soil samples indicated that four of the samples contained levels of hydrocarbons above the applicable standards. Groundwater samples indicated that selected hydrocarbon parameters were also above the applicable standards in all of the wells.
Summary:	
Contaminants:	
Info Source:	
Legal Description:	
Estimated Quantity:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	1 of 1	ENE/162.6	659.0 / -4.95	Budget Plumbing & Heating 9 Prospector Street Ross River YT	FST

Permit No:	2013-16	**Inspection Status:**	
Permit Status:	Issued	**Inspection Date:**	
Permit Type:	Install	**Inspection By:**	
Permit Expiry:	6/30/2016	**Fee:**	26
Permit Issued:	7/4/2013	**RENEXP:**	
App Received:	5/15/2013	**Contact:**	Noel Mason
Permit Received:		**Phone:**	867-633-5646
Tank Type:		**Source Year:**	
Tank Size:	11,000 L	**File Type:**	Commercial Fuel Tanks
Product:	Heating Fuel	**Update Type:**	

Legal Desc: Lot 238; Plan 88-123
Column 1:
Extra:
Record Source:

Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal

Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Air Emission Permits: Territorial AIR

The Department of Renewable Resources maintains a database of companies/organizations who have acquired a permit under the "Air Emissions Regulation", for the operation of the following types of activities. These include the manufacturing of asphalt; production and exploration of oil and natural gas; quarrying, crushing and screening of stone/clay/ shale /coal/ minerals; processing or handling of coal; equipment capable of generating/burning/using heat energy; use of incinerators; the use of equipment for incineration of special waste; electrical generating facilities; and the storage/other handling of solid, liquid or gaseous materials. The database provides information pertaining to the permit number, expiry date, status and the type of permit.

Government Publication Date: 1998-Nov 30, 2020

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Dec 31, 2020

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2018

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Dec 31, 2020

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Dec 2020

Contaminated Site Inventory: Territorial CS

Yukon INAC Contaminated Sites Inventory is an inventory of sites of potential environmental concern compiled by Indian and Northern Affairs Canada. These sites on this inventory may or may not be contaminated and some might also be sites with solid waste/debris, old mining structures, etc. Inclusion on this list should not be taken as confirmation of contamination. Similarly, sites not included on this list should not be assumed to be free of contamination. For information on any of the sites listed below, contact the Environmental Programs Branch.

Government Publication Date: 1998-Jun 2020

Designated Material Permits: Territorial DMP

The Designated Material Regulations, under the Yukon Environment Act, mandates that anyone who is a retailer or depot operator of "designated materials" must obtain a permit. Where a depot operator has acquired a Solid Waste permit and it addresses the deport location, a designated materials permit is not required. As of May 2004, only tires are considered "designated materials". The provincial inventory provides information on the registered facility, location, permit number, status and expiry date.

Government Publication Date: Jul 2003-Nov 30, 2020

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Oct 31, 2020

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Sep 2020

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tanks: Territorial FST

The Yukon Department of Renewable Resources maintains an inventory of fuel storage tanks within the Territory. The tanks are registered to the department pursuant to Storage Tank Regulations, Environment Décret 1996/194 with permits. The Storage Tank Regulations came into effect on January 1, 1997. The regulations include requirements for the storage of hazardous substances, including petroleum products, pursuant to Part 10 of the Environment Act. This database applies to new tanks that are being installed or constructed; and existing tanks that undergo major renovations after January 1, 1997. Fuel storage tanks not found in this database include: those that have a capacity of 4,000 litres or less and are used to supply comfort heating systems; tanks that are used to store crude oil, and tanks used for aboveground storage of hazardous substances (other than petroleum products) with a capacity of less than 2000 litres.

Government Publication Date: 1997-Jul 2020

Waste Generators: Territorial GEN

List of waste generators included in waste manifest data made available by Environment Yukon.

Government Publication Date: 1997-Nov 2019

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2018

Historic Sites Inventory: Territorial HIS

The Heritage Branch of the Yukon government maintains an inventory of historic sites within the Territory. The database provides information on history, condition, ownership, location, resource type, and date of construction. Please note that even though the inventory was initiated in 1987, the database does contain records where the date of construction of a historic site was previous to 1895. The list of historic sites is no longer available from the Yukon government.

Government Publication Date: 1987-Aug 2002*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Land Treatment Facilities: Territorial LTF

The Yukon's Contaminated Sites Regulation mandates that permits must be acquired for the construction and operation of Land Treatment Facilities - for the purpose of restoring and rehabilitating contaminated soil, sediment, snow or other similar media. The provincial inventory provides information on the registered facility, location, permit number, status and expiry date.

Government Publication Date: 2002-Nov 30, 2020

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Territorial MNR

The Yukon Geology Program maintains an inventory of 2577 separate mineral occurrences in the Yukon, which document metallic, industrial mineral and coal deposits. Information within the database pertains to owner/operator, year, name, claim name, status, deposit type, mining district, tectonic element and commodity.

Government Publication Date: 1900-Jul 2017

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Dec 31, 2020

National Energy Board Wells: Federal NEBT

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Ozone Depleting Substances & Other Halocarbons: Territorial ODS

The Yukon's Ozone Depleting Substances & Other Halocarbon (ODS) Regulations regulate the handling, use and sale of Ozone Depleting Substances (ODS) in the Yukon. The release of ODS's are prohibited, with certain exemptions found in s.2 (2) of the Regulations. Ozone depleting substances are considered to be CFC's, Halons, Chlorocarbon compounds and Hydro chlorofluorocarbons. Other Halocarbons refer to Hydrofluorocarbons and Perfluorocarbons. The provincial inventory provides information on the registered facility, location, permit number, status and expiry date.

Government Publication Date: 1998-Nov 30, 2020

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Aug 31, 2020

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Territorial PES

This is a database of individuals who apply for a "service", "vendor" or "usage" license for those specific pesticides and fertilizers that require a permit. The database is maintained by the Department of Renewable Resources, and provides information pertaining to the permit number, expiry date, status and the type of permit.

Government Publication Date: 1998-Nov 30, 2020

Waste Receivers: Territorial REC

The Department of Renewable Resources maintains a "Waste Manifest" which details information regarding waste transfers from generating facilities to registered Receivers. The provincial inventory provides information on the waste receiving facility name, location, physical state (solid/liquid), waste type, amount/quantity received and the degree of danger.

Government Publication Date: 1997-Nov 2019

Relocation Permits: Territorial REL

The Yukon's Contaminated Sites Regulation mandates that permits must be acquired in order to move contaminated material from one site to another. The provincial inventory provides information on the registered facility, location, permit number, permit type, and status.

Government Publication Date: May 2004- Nov 2020

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Dec 31, 2020

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Spills: Territorial SPL

Environment Canada maintains an inventory of known spills that have occurred throughout the Yukon and are reported under the Yukon Spills Regulations. The database identifies spill source, substance discharged, amount of discharge, reason for spill and approximate location of occurrence within the Yukon.

Government Publication Date: 1972-2000

Special Waste Permits: Territorial SWP

The Special Waste Regulations, under the Yukon Environment Act, mandate that anyone who generates, stores, handles, mixes, transports, disposes or releases special wastes is to acquire a "Special Waste" permit. Permits are required for both special waste generators and special waste facilities. The provincial inventory provides information on the generating/waste receiving facility, location, permit number, permit type (generator, facility), status and types of waste generated/received.

Government Publication Date: 1998-Nov 2020

Waste Disposal Sites: Territorial WDS

This inventory pertains to active, regulated waste disposal sites within the Yukon, where registered sites hold a permit for acceptance of different forms of solid waste. This database provides information in regard to permit number, type of waste accepted, status and permit type. Please note that references within the database to SPW and AER, are in regard to the Special Waste Regulation and Air Emissions Regulation respectively.

Government Publication Date: 2000-Nov 30, 2020

Yukon Oil and Gas Wells: Territorial YOGW

The Yukon Oil and Gas Resources Branch is responsible for maintaining a database of all oil and gas wells drilled in the Yukon. All well locations were provided by the National Energy Board and verified through branch field inspections. The database details information on well owner/operator, well name, location, drill date, well id, status, elevation, class, and depth of the well.

Government Publication Date: Apr 1957-Jun 2020

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

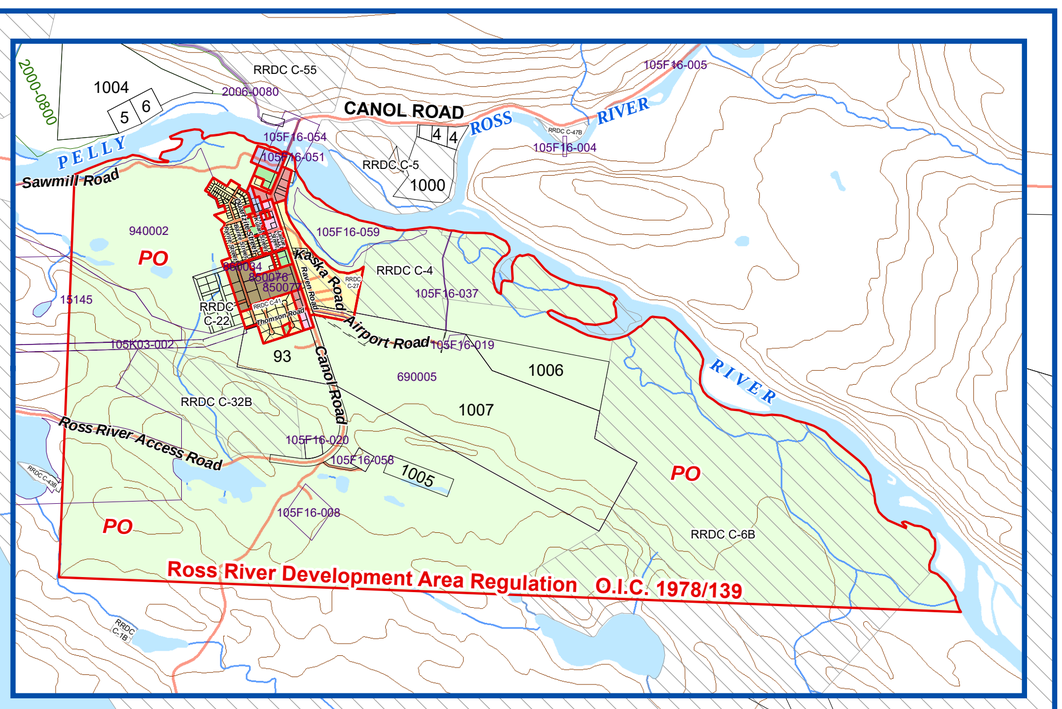
'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

B.8 ZONING MAP



Ross River

DEVELOPMENT AREA REGULATION

Zoning Map

SCHEDULE B

C.O. 1978/139

Legend:

- R-1 — RESIDENTIAL
- C-1 — COMMERCIAL GENERAL
- C-2 — HIGHWAY COMMERCIAL
- M — INDUSTRIAL
- I — INSTITUTIONAL
- PO — PARK and RECREATION
- DC — DEVELOPMENT CONTROL

Ross River Dena Council Interim Land Protection
(For information purposes only)

AMENDMENTS

Date	C.O./ O.I.C.	Nature of Amendment
1979 06 29	1979/125	Rezone Lot 118, G 905 from DC to C-2
1983 03 31	1983/60	Rezone lots 43, 44, 45 & 99 from R-1 to I
1987 06 01	1987/119	Repeal Schedule B in it's entirety and Substitute with this map dated 1986-03-04
1988 06 24	1988/117	That portion of Lot 122 which was consolidated with Lot 123-2 (to be resurveyed as Lot 239) is to be rezoned Parks and Recreation and Open Space
1989 08 18	1989/137	Rezone portion of Lot 215 from PO to R-1
1995 12 05	1995/199	Rezone Lots 227, 228, 251-263 & Lots 265-270 from M to R-1 Rezone Lots 247-250 from M to C Rezone Lot 264 from M to I
1998 09 09	1998/163	Rezone vacant Commissioners Land from PO to R-1
2001 07 30	2001/117	Rezone Lot 241 from M to PO Rezone Lots 247 & 248 from C-1 to C-2 Rezone that Portion of Lot 273 not lying within Lots 127 to 129 from PO to R-1
2007 02 01	2007/21	Rezone Lot 112 from R-1 to I
2010 05 20	2010/98	Rezone Lots 37 & 38 from R-1 to I
2016 07 15	2016/20	Rezone 0.38 ha of Yukon Land west of Lot 200 from PO to R-1

Yukon

Energy, Mines & Resources
Sustainable Development Division
Land Planning Branch

db 06 March, 2019

N W E S

0 500 1,000 m

B.9 SITE INTERVIEW NOTES

ERFF1.01Phase I Environmental Site Assessment
Pre-Site Visit Questionnaire

Project Number

Client Name

Site Address

Questionnaire completed by:

Name Franklin Charlie Position Employee

Company Dene Cho Years with company 1/2

Signature [signature] Date June 10, 2021

To the best of your knowledge, have any of the following ever existed and/or currently exist on the Site:

	Yes	No	?
1. Hazardous solid waste generation or disposal	☐	☑	☐
2. Hazardous liquid waste generation or disposal	☐	☑	☐
3. Floor drains	☐	☑	☐
4. Hazardous waste collection sumps	☐	☑	☐
5. Dewatering sumps	☐	☑	☐
6. Oil water separator	☐	☑	☐
7. Spills or Leaks (oil, water, etc.)	☐	☑	☐
8. Air discharges	☐	☑	☐
9. Odours	☐	☑	☐
10. Oil Heating System	☐	☑	☐
11. Underground storage tanks	☐	☑	☐
12. Aboveground storage tanks	☐	☑	☐
13. Other chemical storage	☐	☑	☐
14. Hydraulic hoists/elevators/compactors/loading platform	☐	☑	☐
15. Surface staining	☐	☑	☐
16. Imported fill materials	☐	☑	☐
17. Landfills	☐	☑	☐
18. Wells (water, oil, gas, disposal, monitoring)	☐	☑	☐
19. Septic system	☐	☑	☐
20. Asbestos containing materials	☐	☑	☐
21. Polychlorinated biphenyls (PCBs)	☐	☑	☐
22. Lead containing materials	☐	☑	☐
23. Urea formaldehyde foam insulation (UFFI)	☐	☑	☐
24. Ozone depleting substances	☐	☑	☐
25. Radon gas	☐	☑	☐
26. Mold	☐	☑	☐
27. Indoor air quality issues	☐	☑	☐
28. High voltage electrical transmission lines	☐	☑	☐
29. Electrical substations	☐	☑	☐
30. Noise	☐	☑	☐
31. Vehicle service facility	☐	☑	☐
32. Drycleaner	☐	☑	☐
33. Gas station	☐	☑	☐
34. Rail lines	☐	☑	☐
35. Previous environmental reports or investigation	☐	☑	☐

Please return to Matt Deane at matthew.deane@stantec.com

From: svanbibber@denacho.ca
To: Deane, Matthew
Cc: Muirhead, Jeff
Subject: RE: Dena Cho Task - Phase 1 ESA"s in Ross River
Date: Wednesday, June 16, 2021 2:59:42 PM
Attachments: 21-06-10 - Franklin Charlie Interview.pdf

Good afternoon,

We were able to get one person who had information on the two sites. Everyone else I spoke with either did not feel comfortable chatting about the site or giving information about some of the specific information asked for in the questionnaire.

What I did gather from my several discussions was that there is likely only one known contaminated site north east of the two properties in question, that of the North 60 Petro yard. There are a number of other notables for the two sites:

- Franklin mentioned that Hammond Dick once tried to install a septic system on one of the properties to the south of the two properties in questions, and ran into ground water 5 to 6 feet below the surface – Mr. Dick immediately stopped construction and forestalled the installation of the system;
- There is supposedly an underground creek running in a north easterly direction through the properties (perhaps a ephemeral creek?);
- There is also a lot of near surface groundwater and permafrost in the area; and
- This is considered an area not suitable for building on because of the above issues.

I wish I could have taken in more interviews but the questions were perhaps too specific for the type of property being reviewed.

Please let me know if you need anything else.

Stu

From: Deane, Matthew <Matthew.Deane@stantec.com>
Sent: June 16, 2021 9:20 AM
To: svanbibber@denacho.ca
Cc: Muirhead, Jeff <Jeff.Muirhead@stantec.com>
Subject: RE: Dena Cho Task - Phase 1 ESA's in Ross River

Hi Stu,

Jeff's in the field, so I thought I would follow up, as we'd like to close out these reports with YG. Has your team been able to conduct the interview and/or fill out the questionnaires?

Matt

From: Muirhead, Jeff <Jeff.Muirhead@stantec.com>
Sent: Wednesday, May 19, 2021 4:05 PM

APPENDIX C

Selected Site Photographs

Appendix C SELECTED SITE PHOTOGRAPHS

Stantec

Photographic Log

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 1

Photo Location:
Lot 114

Direction:
South

Survey Date:
5/27/2021

Comments:
Lot 114 viewed from cul de sac of Ketza Road

Photograph ID: 2

Photo Location:
Lot 114

Direction:
West

Survey Date:
5/27/2021

Comments:
Northwest portion of Lot 114 (background) viewed from southern edge of Lot 115 (foreground)

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 3

Photo Location:
Lot 114

Direction:
South

Survey Date:
5/27/2021

Comments:
Southern treed area of Lot 114

Photograph ID: 4

Photo Location:
Lot 114

Direction:
South

Survey Date:
5/27/2021

Comments:
Lot 114

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 5 **Photo Location:** Lot 114 **Direction:** South **Survey Date:** 5/27/2021 **Comments:** Former cylindrical AST	

Photograph ID: 6 **Photo Location:** Lot 114 **Direction:** South **Survey Date:** 5/27/2021 **Comments:** Former cylindrical AST	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 7 **Photo Location:** Lot 114 **Direction:** South **Survey Date:** 5/27/2021 **Comments:** Former cylindrical AST stand	
Photograph ID: 8 **Photo Location:** Lot 114 **Direction:** West **Survey Date:** 5/27/2021 **Comments:** Unknown PVC pipes on western edge of Lot 114 and west of Lot 114	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 9 **Photo Location:** Lot 114 **Direction:** West **Survey Date:** 5/27/2021 **Comments:** Unknown PVC pipes on western edge of Lot 114 and west of Lot 114	
Photograph ID: 10 **Photo Location:** South of Lot 114 **Direction:** South **Survey Date:** 5/27/2021 **Comments:** Former heating oil AST	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 11 **Photo Location:** South of Lot 114 **Direction:** Southeast **Survey Date:** 5/27/2021 **Comments:** Former heating oil AST	

Photograph ID: 12 **Photo Location:** South of Lot 114 **Direction:** West **Survey Date:** 5/27/2021 **Comments:** Former heating oil AST	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 13 **Photo Location:** Lot 114 **Direction:** West **Survey Date:** 5/27/2021 **Comments:** Clearing where former building was located in southwest corner of Lot 114	
Photograph ID: 14 **Photo Location:** Lot 115 **Direction:** North **Survey Date:** 5/27/2021 **Comments:** Western cleared portion of Lot 115 looking north from Ketza Road	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 15 **Photo Location:** Lot 115 **Direction:** Northeast **Survey Date:** 5/27/2021 **Comments:** Lot 115 viewed from the southwest	
Photograph ID: 16 **Photo Location:** Lot 118 **Direction:** Southwest **Survey Date:** 5/27/2021 **Comments:** Former North 60 Petro Bulk Plant	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 17 **Photo Location:** Lot 118 **Direction:** West **Survey Date:** 5/27/2021 **Comments:** Ketza Road and southern boundary of Lot 118	
Photograph ID: 18 **Photo Location:** Lot 121 **Direction:** East **Survey Date:** 5/27/2021 **Comments:** Current ATCO Electric diesel generator	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 19 **Photo Location:** Lot 121 **Direction:** East **Survey Date:** 5/27/2021 **Comments:** Current ATCO Electric transformer	
Photograph ID: 20 **Photo Location:** Lot 118 **Direction:** Northwest **Survey Date:** 5/27/2021 **Comments:** Southeast corner of Lot 118 and Lot 115 in background, viewed from Prospector Street	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 21 **Photo Location:** Lot 115 **Direction:** East **Survey Date:** 5/27/2021 **Comments:** Southwestern portion of Lot 115 and Ketza Road	

Photograph ID: 22 **Photo Location:** Lot 117 and Lot 119 **Direction:** Northwest **Survey Date:** 5/27/2021 **Comments:** Lots 117 and 119 viewed from the southeast on Prospector Street	

Client:	**Yukon Government**	**Project:**	**Lot 114, Ross River - Phase I ESA**
Site Name:	**Lot 114**	**Site Location:**	**Lot 114, Ross River, YT**

Photograph ID: 23

Photo Location:
Lot 119

Direction:
West

Survey Date:
5/27/2021

Comments:
Lot 119 viewed from Prospector Street

APPENDIX D

Qualifications

Appendix D QUALIFICATIONS

Matthew Deane B.Sc., P. Ag.

Environmental Scientist

PROFILE

Matthew Deane has been conducting Phase I Environmental Site Assessments (ESA) since 2011. Matt has researched and prepared more than 50 Phase I ESA reports for commercial, industrial, and undeveloped properties in British Columbia, Alberta, and Yukon Territory. He is a Senior Project Manager and Team Lead for Stantec's Burnaby Site Investigation and Remediation Group, and has completed environmental assessments for financial institutions, property developers, property managers, and government facilities across British Columbia. Mr. Deane also has experience in managing, directing, and composing reports for Phase II ESAs, Stage 1 and 2 Preliminary Site Investigations, Detailed Site Investigations and Site Remediation.

EDUCATION

B.Sc. – University of British Columbia, 2004
Vancouver, BC
Biology

COMPETENCY

Site Visit
Report Writer
Project Manager
Report Reviewer

Kimberley Wiese Dipl. Tech.
Environmental Technologist

PROFILE

Kimberley is a Kwantlen Polytechnic University Graduate with a Diploma in Environmental Protection Technology. Her responsibilities at Stantec have included research and preparation for Phase I ESA reports, field work and report writing for hazardous building materials assessment projects (for substances including, but not limited to, asbestos, lead, mould, polychlorinated biphenyls, mercury and ozone-depleting substances), and monitoring of hazardous building materials abatement projects (air monitoring and inspections, typically for asbestos abatement). Prior to Stantec, Kimberley's work experience has included working at Selwyn Chihong Mining LTD where she conducted stream surveys, collected water samples and completed report writing.

EDUCATION

Diploma in Environmental Protection Technology
Kwantlen Polytechnic University, Langley, British Columbia, 2014

COMPETENCY

Site Visits
Report Writer

** denotes projects completed with other firms*

Matthew Redmond P.Eng.

Senior Associate, Environmental Services

PROFILE

Matthew Redmond has been working on Contaminated Sites Investigations since 2003. He has completed Phase I ESAs for commercial sites throughout British Columbia. He is a Senior Environmental Engineer for Stantec's British Columbia Environmental Site Investigation and Remediation Group, and has completed environmental assessments for financial institutions, property developers, property managers and government facilities across British Columbia. Mr. Redmond has extensive experience in managing, directing and composing reports for Phase I ESAs, Phase II ESAs, Stage 1 and 2 Preliminary Site Investigations, Detailed Site Investigations, Site Remediation, Hazardous Materials Surveys, and Mold Investigations.

EDUCATION

B.A.Sc. – University of British Columbia, 1999
Vancouver, BC
Bio-Resource Engineering

COMPETENCY

Site Visit
Report Writer
Senior Reviewer