



a wholly-owned subsidiary of NorZinc Ltd

POST-EA INFORMATION PACKAGE INCLUDING AN UPDATED PROJECT DESCRIPTION ALL SEASON ROAD TO PRAIRIE CREEK MINE



APPENDIX 16-1

SUBMITTED IN SUPPORT OF:

Water Licences MV/PC2014L8-0006, and
Land Use Permits MV/PC2014F0013

SUBMITTED TO:

Mackenzie Valley Land and Water Board
Yellowknife, NT X1A 2N7

Parks Canada,
Nahanni National Park Reserve
Fort Simpson, NT X0E 0N0

SUBMITTED BY:

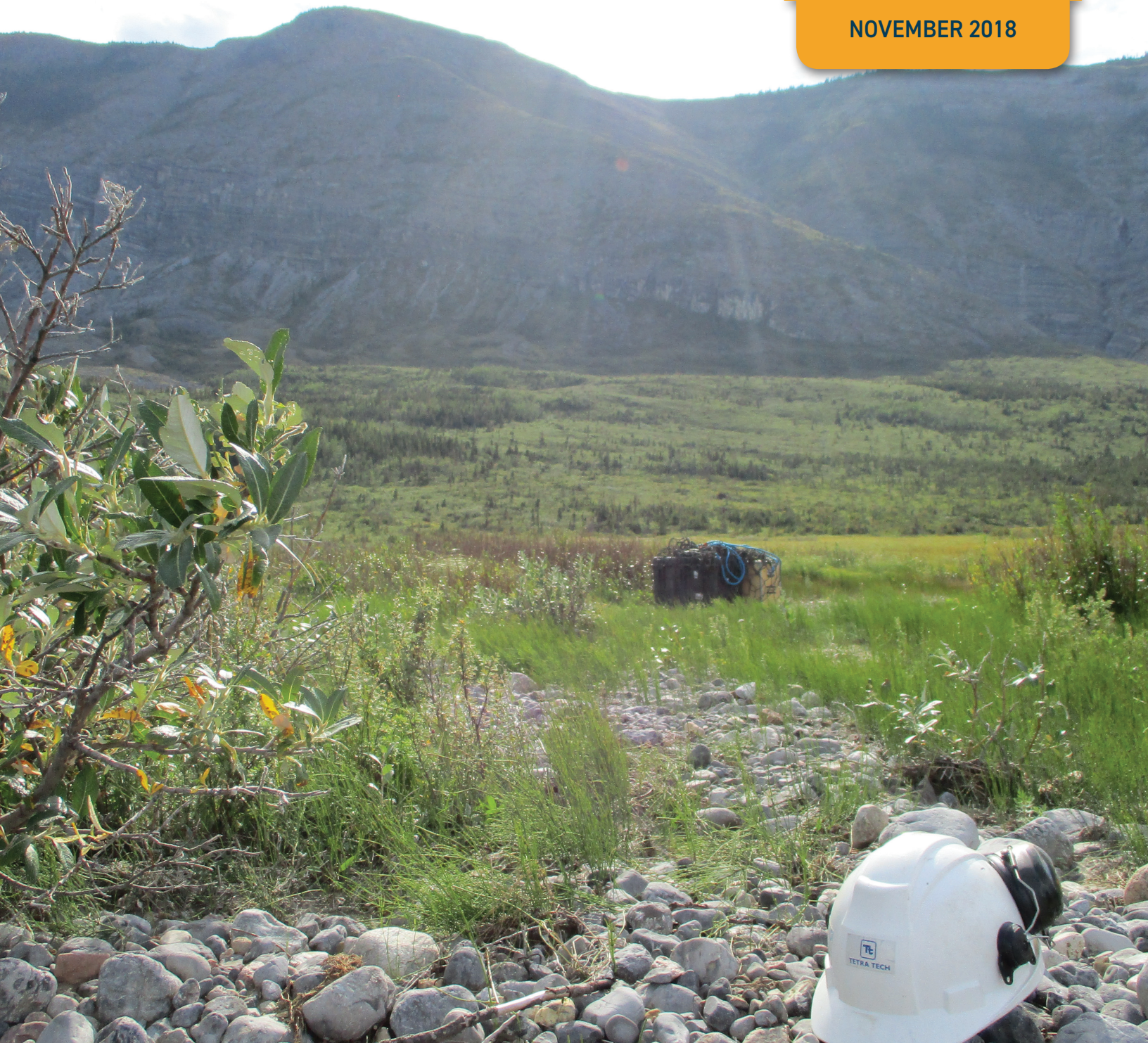
Canadian Zinc Corporation
Vancouver, BC, V6B 4N9

February 2019

PRAIRIE CREEK ACCESS ROAD

EXPLOSIVES MANAGEMENT PLAN

NOVEMBER 2018



This page intentionally left blank.

Revision History

Revision	Description	Revised By (Initials)	Revision Date
A	Initial Version	Tetra Tech	2018-10-24
B	Updated Content		2018-11-30

Review and Approval

The following signatures indicate that the undersigned have read and agreed to the contents of this document, and that they approve and accept its distribution and use.

Description	Authority	Signature	Date
Document Owner	David Harpley VP Environment & Permitting		2018-11-30
Reviewed by: Full Name, Job Title			
Approved by: Full Name, Job Title			

Distribution List

This Plan and the most recent revisions have been distributed to:

Copy #1 –

Copy #2 –

PLAIN ENGLISH SUMMARY

The purpose of the Canadian Zinc Corporation (CZN) Explosives Management Plan (EMP) is to describe the safe, secure, and environmentally-sound practices for the handling, storage, and use of explosives needed for the construction of the Prairie Creek All-Season Road (ASR) leading to the Prairie Creek Mine.

The ASR construction project plans to use emulsion stick explosives to conduct blasting operations at certain specific road, quarry and borrow sites as necessary during the construction period.

This EMP is at a preliminary stage as suppliers have not been identified. For the ASR construction phase, explosives supply, management and use is expected to be contracted to a licensed contractor or contractors who will provide an operations manual for the safe transportation, storage, and handling of explosives.

Before carrying out a blasting program at a particular site, CZN's Environmental Monitor assigned to the program will undertake wildlife reconnaissance by scanning nearby slopes, ponds, and surrounding areas with binoculars to help determine whether blasting should be permitted to proceed at that time.

Consistent with CZN's commitments made during the Environmental Assessment Process the following mitigation measures will be undertaken to protect wildlife, birds and fish:

- Blasting within Boreal Caribou range is prohibited from May 1 to July 15 to avoid disturbance to potential Boreal Caribou calving and post-calving, unless a ground survey confirms the absence of animals within 1 km.
- Blasting is prohibited if Dall's sheep lambs are present within 1 km of the proposed Project from May 1 to June 15 or if Dall's sheep or wolverine are observed at any other time within 1 km of the blast site until the animal(s) moves out of the area.
- Blasting is prohibited from April 1 to September 30 if Trumpeter Swans are located within 1 km of the blast site. Additional construction-related monitoring activities may be required during the Trumpeter Swan restricted activity period and will be conducted with the assistance of the CZN Environmental Monitor.

Blasting activities located close to fish-bearing water bodies will be required to follow Department of Fisheries and Oceans (DFO) Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO 1998) as modified by Cott & Hanna (2005) and DFO's NWT fish spawning timing window (<http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/nwt-eng.html>).

TABLE OF CONTENTS

PLAIN ENGLISH SUMMARY	II
LIST OF ACRONYMS	VI
GLOSSARY	VII
1.0 INTRODUCTION	1
1.1 Company Name, Location and Mailing Address	1
1.2 Purpose and Scope	1
1.3 CZN Health and Safety Policy	2
2.0 PROJECT DESCRIPTION	2
2.1 Project Setting.....	3
2.1.1 Terrain Physiography and Vegetation	3
2.1.2 Surface Waters	4
2.1.3 Fish and Wildlife	4
2.2 Borrow Sources and Blasting	7
3.0 EXPLOSIVES MANAGEMENT PROGRAM.....	10
3.1 Regulatory Requirements	10
3.2 Description of Explosives.....	10
3.3 Explosives Contractor	11
3.4 Explosives Transportation	11
3.5 Explosives Storage	12
3.6 Explosives Use	13
3.7 Training & Certification	13
4.0 BLASTING OPERATIONS.....	14
4.1 Blasting Safety Measures	14
4.2 Environmental Monitoring & Adaptive Management	15
4.3 Spill Prevention	16
4.4 Disposal of Explosives	17
5.0 EMERGENCY CONTACT INFORMATION	17
5.1 Mine Site Phones.....	17
5.2 Medical Services	17
5.3 Incident Assistance	18
5.4 Air Charters Services	18
5.5 Reporting	18
REFERENCES	19

LIST OF TABLES IN TEXT

Table 1: Summary of ASR Borrow Sources Requiring Blasting..... 8

LIST OF PHOTOS IN TEXT

Photo 1: Example of an Emulsion Stick Explosive..... 10
Photo 2: Example of a Nonel Delay Detonator 11
Photo 3: Example of Detonating Cords 11
Photo 4: Example of a Portable Explosives Storage Magazine 13

LIST OF FIGURES IN TEXT

Figure 1: Prairie Creek Mine Overview 5
Figure 2: Proposed All-Season Road Alignment 6

APPENDIX SECTIONS

APPENDICES

Appendix A All-Season Road Map Book
Appendix B NT-NU Spill Report Form
Appendix C Immediate Reportable Spill Quantities
Appendix D Limitations on the use of this Document

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Canadian Zinc Corporation (CZN) and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than CZN, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

LIST OF ACRONYMS

Acronyms/Abbreviations	Definition
AANDC	Aboriginal Affairs and Northern Development Canada
AN	Ammonium Nitrate
ASR	All Season Road
CZN	Canadian Zinc Corporation
DFO	Department of Fisheries and Oceans
EMP	Explosives Management Plan
GNWT	Government of the Northwest Territories
ha	hectare
km	kilometre
KP	kilometre post
kPa	An unit of pressure measurement widely used throughout the world that has largely replaced the pounds per square inch (psi) unit
m	metre
m ³	cubic metre
M	million
Mine	Prairie Creek Mine
NNPR	Nahanni National Park Reserve
NWT	Northwest Territories
NWT WHSAR	NWT Mine Health and Safety Act and Regulations
ROMP	Road Operations and Maintenance Plan
TDG	Transportation of Dangerous Goods
WHMIS	Workplace Hazardous Materials Information System
WSCC	Worker's Safety & Compensation Commission

GLOSSARY

Colluvium	General name for loose, unconsolidated sediments that have been deposited at the base of hillslopes by either melting snow, rainwash, sheetwash, slow continuous downslope creep, or a variable combination of these processes.
Bedrock	Exposed solid rock or rock underlying loose deposits such as soil or alluvium.
Borrow Pit	Pit created to provide earth materials to be used as fill at another site.
Emulsion explosives	All-purpose, water resistant, pre-packaged emulsion explosives that are recommended for quarry and construction blasting applications in medium rock types.
Rip Rap	Layer of large stones or broken rock placed on an embankment for erosion control and protection.
Talus	A slope or deposit formed by an accumulation of broken rock debris, typically at the base of a cliff or other high place, also called scree.
Permafrost	Ground frozen for at least two consecutive years. Continuous permafrost is defined as an area where at least 90 percent of the land area is underlain by permafrost. Discontinuous permafrost is defined as an area where 10 to 90 percent of the land area is underlain by permafrost.
Prill	A prill is a small pellet or globule of a material (ammonium nitrate), most often a dry sphere, formed from a melted liquid.
Quarry	A type of open-pit development from which building materials are often extracted.

1.0 INTRODUCTION

This Explosives Management Plan (EMP) was prepared for Canadian Zinc Corporation (CZN) by Tetra Tech Canada Inc. (Tetra Tech). The EMP serves to outline the explosives management practices to be employed during the construction of the Prairie Creek All-Season Road (ASR).

This EMP is at a preliminary stage as suppliers have not been identified. For the ASR construction phase explosives supply, management and use is anticipated to be contracted to a licensed contractor or contractors who will provide an operations manual for the safe transportation, storage, and handling of explosives.

1.1 Company Name, Location and Mailing Address

Head Office:

Suite 1710-650 West Georgia Street, Vancouver, BC, V6B 4N9

Phone: 604-688-2001

Fax: 604-688-2043

Email: David.Harpley@canadianzinc.com

Prairie Creek Mine:

Iridium 9555 Satellite Phone 1 (yellow) 011-8816-315-30998

Iridium 9505A Satellite Phone 2 (black) 011-8816-315-30997

Iridium 9505A Satellite Phone 3 (orange) 011-8816-315-30996

Ground-To-Air Radio Handheld FREQ 122.800

1.2 Purpose and Scope

The purpose of the EMP is to describe the safe, secure, and environmentally-sound practices for the handling, storage, and use of explosives needed for the construction of the Prairie Creek ASR leading to the Prairie Creek Mine.

The ASR construction project plans to use emulsion stick explosives to conduct blasting operations at select quarry and borrow sites and along the ASR alignment as necessary during the ASR construction period.

The EMP is linked to a number of other CZN environmental management plans including:

- Health, Safety and Emergency Response Plan
- Spill Contingency Plan
- Sediment and Erosion Control Plan
- Wildlife Management and Monitoring Plan
- Road Operations and Maintenance Plan
- Specific Borrow Pit Development Plans
- Reclamation and Closure Plan.

Details of the road, together with the schedule of road construction and operations, are provided in the CZN Road Operations and Maintenance Plan (ROMP). A map book of the road is provided in Appendix A.

1.3 CZN Health and Safety Policy

It is CZN's policy to achieve and maintain a high standard of health and safety in conducting its business as a resource company, and through its developments, contribute to sustaining society's material needs. Canadian Zinc's approach to health and safety seeks continuous improvement in performance by incorporating evolving knowledge and community expectations into its operations.

Canadian Zinc is committed to providing a safe and healthy work environment for all people working within the organization. The Health and Safety Program developed by CZN is the foundation upon which we will work to promote positive health and safety attitudes in all employees, contractors and visitors, and to comply with legislative and regulatory standards.

The responsibility for health and safety lies jointly with the employer and the worker. Management will provide leadership in the Health and Safety Program with directive documentation to implement health and safety policies, identify and assess workplace hazards, develop and enforce safe work practices, provide education and training and ensure that equipment is adequate for the job and meets appropriate standards.

Workers will ensure that all work is done in a manner consistent with the health and safety of all employees, follow all rules and guidelines outlined in the company's Health and Safety Program, work with management to identify and eliminate hazards, and participate in the health and safety meetings and inspections.

We are committed to creating a safe and healthy work environment by fostering participation at all levels and working together to continually improve the Health and Safety Program.

Safety is everyone's business.

2.0 PROJECT DESCRIPTION

Canadian Zinc is planning to operate the Prairie Creek Mine. The Mine is located at approximately 61° 33' north latitude and 124° 48' west longitude adjacent to Prairie Creek, a tributary of the South Nahanni River, south-west Northwest Territories (NWT) (Figure 1).

A 170 km All Season Road (ASR) connecting the Mine (at Km 0) to the Liard Highway via the Nahanni Butte access road (Figure 2) will generally follow the alignment of a previously permitted Winter Road, while reflecting the terrain, site characteristics, and road specifications suitable and preferred for the ASR. Approximately half of the proposed ASR (85 km between Km 17 and Km102) is located within the Nahanni National Park Reserve (NNPR). The NNPR, a world heritage site, is known for its globally-significant karst terrain, as well as the South Nahanni River, a Canadian Heritage River. Approximately half of the ASR alignment will directly overlap with the alignment of the permitted Winter Road.

Construction of the ASR will take approximately three years to complete. Initial winter roads will be built to gain access to the Mine, allow further investigation of the ASR alignment in order to complete detailed design, and to provide access for ASR construction. CZN's intent is to build the initial winter roads on the ASR alignment as much as possible to minimize the total extent of disturbance

The ASR will cross approximately 18 major streams with clear span bridges or large diameter culverts, and 85 minor streams with culvert diameters ranging from 800 mm to 2,000 mm based on the size of the stream. Construction of the ASR will be supported by temporary camps at Km 23 (Sundog), Km 39 (Cat Camp), Km 65, Km 87, Km 121 (Grainger Gap), Km 151 or Km 158, and Km 177.5. The camps at Km 39, Km 87, and Km 121 will likely be retained in a reduced form to support on-going road maintenance.

Borrow sources have been identified all along the road route to provide material for the road sub-grade (fill) and surfacing (gravel). 86 borrow sources have been defined for use in road construction, with another 30 as back-up in the event any of the 86 are subsequently found to be unsuitable. Currently, approximately 44 of the 86 borrow sources are considered preferred locations and about nine of these sources may require blasting and/or crushing activities. Blasting may also be required along the ASR alignment at a number of locations such as Km 5, Km 23, Km 25 to Km 29, Km 32, and Km 36 to Km 37. Some of the surfacing borrow sources will be retained to support road maintenance. The remainder will be closed and reclaimed immediately after road construction. Most borrow sources are proximal to, or within the road corridor. Some will require short access roads.

Water sources will be utilized in winter for winter road construction and during summer for dust control. Water sources have been defined at Km 0 (the Mine), Km 39 (Cat Camp), Km 60 (Mosquito Lake), Km 70, Km 100, Km 121 (Gap Lake), Km 139, Km 141 and the Liard River. Winter water extraction from lakes will be conducted in conformance with Department of Fisheries and Oceans (DFO) water withdrawal protocol, limiting extraction to less than 10% of lake volume. Summer water extraction from lakes will similarly be limited to avoid significant water level drawdown and will be monitored using installed staff gauges.

2.1 Project Setting

The currently permitted Winter Road and approximate location of the proposed ASR, including major realignments, is shown in Figure 2. The access road will be located in the southwestern NWT. The road will begin at the Nahanni Butte access road and pass through the Mackenzie Mountains and the NNPR to the Prairie Creek mine site. Approximately half of the 170 km access road will pass through NNPR (Figure 2). From the Nahanni Butte access road, the ASR crosses lowland terrain and the Liard River before passing through a gap in the Front Range (Grainger Gap), crossing the Silent Hills (Wolverine Pass), Fishtrap Creek and the Tetcela River before ascending and crossing the Ram Plateau. Thereafter, the road enters the Mackenzie Mountains and follows Sundog Creek, Funeral Creek and Prairie Creek to reach the Mine.

2.1.1 Terrain Physiography and Vegetation

The proposed route of the ASR passes through a variety of natural regions including valleys, Sub-Alpine Shrub and Alpine Tundra (max elevation of 1,530 m AMSL), Riparian Alluvial habitat, open-forest parkland, muskeg, and mixed forest. The road alignment crosses terrain that includes discontinuous permafrost and karst, with the potential occurrence of thermokarst, sinkholes, debris flows and thaw slumps, as well as rock fall, rock slides and snow avalanches in mountainous terrain. The route is underlain by sedimentary rock sequences generally consisting of combinations of limestone, dolostone, siltstone, shale and mudstone.

The road area is located primarily within the Taiga Cordillera and Taiga Plains Ecozones of the NWT and is characterized by several significant topographic features (e.g., Mackenzie Mountains, the Nahanni Range and the Liard floodplain). This has resulted in an array of growing conditions, and consequently, numerous vegetation species assemblages (Ecosystem Classification Group 2007). Wildfires occasionally occur in the region and have influenced forested ecosystems throughout much of the landscape.

2.1.2 Surface Waters

The main surface water basins crossed by the ASR alignment are, from west to east, Prairie Creek, Sundog Creek, Tetcela River, Fishtrap Creek, an unnamed creek, Grainger River, and the Liard River (Figure 2).

Seasonal hydrological characteristics of the various larger streams crossed by the ASR generally mirror the pattern of Prairie Creek, for which there is a good and lengthy record. Higher monthly flows occur in the spring and summer coincident with freshet and summer storms. The annual low flow month is typically March when flows are approximately 50 times less than in June. Peak flows observed in the area occur during intense summer rainfall events. Freeze-up usually begins in mid-October, and spring thaw in mid-April.

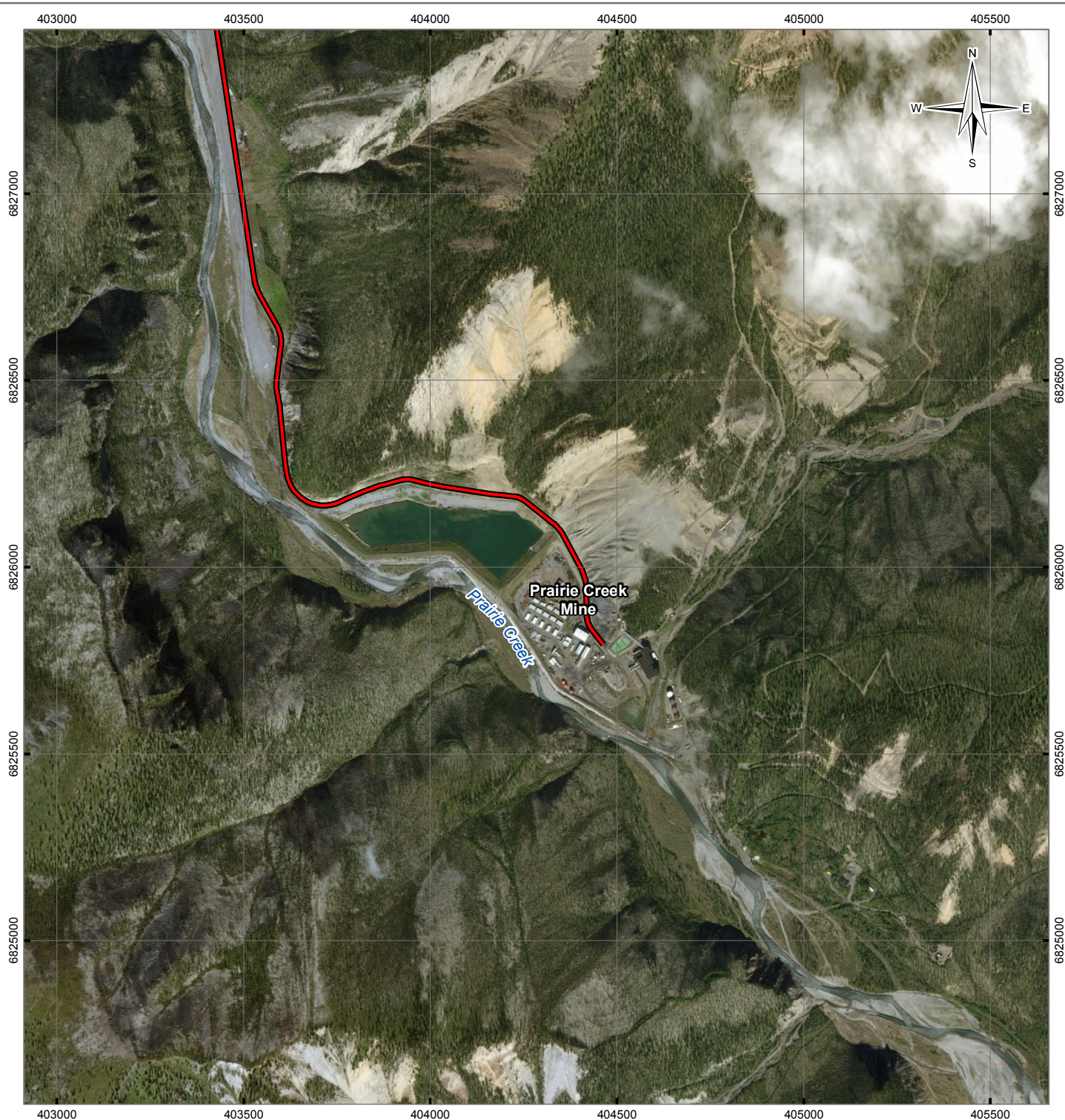
2.1.3 Fish and Wildlife

Both bull trout and mountain whitefish spawn in Prairie Creek upstream of the mine site, the former most likely in Funeral Creek. Arctic grayling are known to inhabit lower Prairie Creek and many other creeks and rivers in the area. Bull trout have not been found east of the Prairie basin. In total, there are 13 stream crossings along the ASR alignment where the presence of fish has been confirmed or is suspected.

Wildlife species at risk or may be at risk that are potentially present along the ASR corridor include boreal woodland caribou, northern mountain woodland caribou, wood bison, grizzly bear and collared pika. In addition, five bird species at risk occur or may potentially occur in the area including Peregrine Falcon, Short-eared Owl, Common Nighthawk, Olive-sided Flycatcher, Bank Swallow, and Canada Warbler.

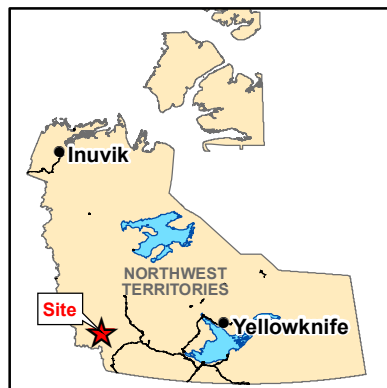
Additional wildlife species that have known distributions along or near the ASR include Dall's sheep, moose and furbearers (including grey wolf, beaver, marten and wolverine). A number of waterfowl species, including Trumpeter Swan, frequent the area of the ASR alignment; the Project area contains habitat for breeding and/or staging for short periods during annual migration. In addition to waterfowl, raptors are expected to occur and nest near the entire ASR alignment, and documented occurrences include Golden Eagle, Bald Eagle, Peregrine Falcon, American Kestrel, Red-tailed Hawk, Northern Harrier, and Gyrfalcon.

Q:\Vancouver\GIS\ENGINEERING\EARC03145-01\Maps\EARC03145-01_Figure1.mxd modified 11/21/2018 by megan.verburg



LEGEND

 Proposed Prairie Creek Access Road



NOTES

Base data source:
Imagery from ESRI; DigitalGlobe (2016).

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Prairie Creek Mine Overview

PROJECTION

NWT Lambert

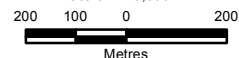
DATUM

NAD83

CLIENT



Scale: 1:15,000



FILE NO.

EARC03145-01_Figure1.mxd



OFFICE

Tt-VANC

DWN

SL

CKD

BB

APVD

RH

REV

0

DATE

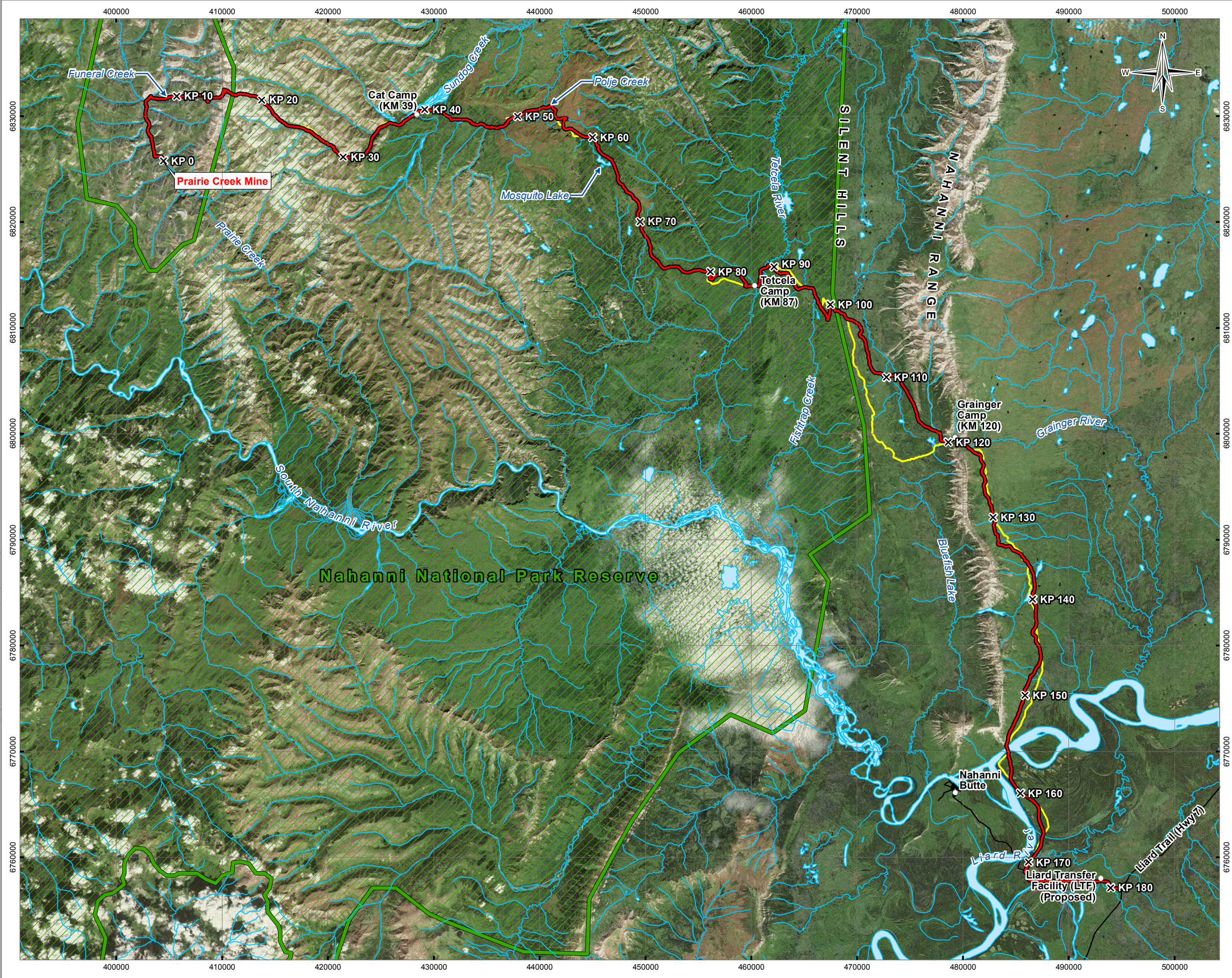
November 21, 2018

PROJECT NO.

ENG.EARC03145-01

Figure 1

Q:\Vancouver\GIS\ENGINEERING\EARC\03145-01\Maps\EARC03145-01_Figure2.mxd modified 11/21/2018 by megan.verburg



LEGEND




- ✕ Access Road Kilometre Marker
- Proposed Prairie Creek Access Road
- Proposed Winter Road Alignment
- Existing Road
- Nahanni National Park Reserve Boundary
- Watercourse
- Waterbody

NOTES
Base data source:
Road alignment provided by AllNorth (July 2018)
Existing roads from CanVec (1:50,000)
Watercourses from CanVec (1:250,000)

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Proposed Access Road Alignment

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT <div> CANADIAN ZINC CORPORATION</div>	
<div>Scale: 1:350,000</div> <div><div>52.505</div></div> <div>Kilometres</div>				<div> TETRA TECH</div>	
FILE NO. EARC03145-01_Figure2.mxd					
OFFICE TL-VANC	DWN SL	CKD BB	APVD RH	REV 0	Figure 2
DATE November 21, 2018		PROJECT NO. ENG.EARC03145-01			

2.2 Borrow Sources and Blasting

As noted previously, blasting will be required at an estimated nine (9) borrow sources and will be required along the ASR alignment at a number of locations such as at Km 5, Km 23, Km 25 to Km 29, Km 32, and Km 36 to Km 37. Table 1 provides further details of each of the nine borrow sources that are anticipated to require some blasting.

In all cases where blasting is required, blasts will be infrequent and of short-duration (seconds), extending over a period of two to four weeks at each borrow site, and a shorter period at the other sites. Crushing operations will be continuous but of short-duration, extending to approximately one month at each borrow site. Blasting and crushing operations may occur throughout the year, and activities at one borrow source will conclude before blasting is initiated at another site.

Table 1: Summary of ASR Borrow Sources Requiring Blasting

Source Number	Material Type	Term	Road KP	Application	UTM X/Y	Potential Volume (m³)	Demand Volume (m³)	Gross Area (ha)	Net Area (ha)	Comments
BP 47A	Colluvium and Bedrock Limestone	short	47.0	Subgrade, Riprap, Surfacing	434745 6828744	23,000	Back-up	0.77	0.0	More volume available with increased blasting. A 400-m access road required.
BP 47C	Colluvium and Bedrock Limestone	short	47.7	Surfacing, Riprap armoring	435550 6828997	20,000	5,000	0.38	0.1	Assume similar material as BP 47A however adjacent to the road. Requires blasting.
BP 123B	Bedrock Limestone	short	123.7	Surfacing, Riprap	477960 6799174	90,000	10,000	2.34	0.29	Exposed rock outcrop knob. Blast rock.
BP 125A BP 125B	Bedrock Limestone	short	125	Surfacing, Riprap Subgrade	479315 6799489 479483 6799159	160,000	Back-up	2.04	0.0	Exposed rock outcrop knob for rock quarry. Would work excellent for overland subgrade borrow from KP 124.8 to KP 127.2.
BP 126	Colluvium Limestone	short	126.4	Subgrade, Riprap	480215 6798190	76,000	Back-up	7.64	0.0	Could be rock glacier. Requires additional testing to confirm material and check any potential geotechnical concerns.
BP 138	Bedrock Limestone	short	138.2	Surfacing, Riprap	484,101 6788499	100,000	Back-up	3.89	0.0	Exposed rock outcrop knob for rock quarry. A 1.2-km access road is required.
BP 158	Limestone/Carbonate Talus Rock Deposit	long	158.2	Surfacing, Riprap armoring	483731 6772187	250,000	110,000	29.31	4.0	Final area must be defined and will be much smaller. Excellent source of mixed talus rumble at the base of limestone/carbonate rock face. A very strategic source to supply from KP 155 to KP 184. Requires 1.5 km access road.

Source Number	Material Type	Term	Road KP	Application	UTM X/Y	Potential Volume (m³)	Demand Volume (m³)	Gross Area (ha)	Net Area (ha)	Comments
BP 159A B	Carbonate Rock	long	159.3	Surfacing, Riprap armouring	484123 6771167 484080 6770474	30,000	Back-up	4.3	0.0	More investigation required but looks like excellent source of large deposit of fragmented carbonate/limestone rock (part of an old landslide broken off mountain face). Geotechnical concerns will regulate and limit the availability.

3.0 EXPLOSIVES MANAGEMENT PROGRAM

3.1 Regulatory Requirements

Canadian Zinc and its explosives contractor will adhere to the federal and territorial legislation, regulations and guidelines related to explosives management including:

- NWT *Mine Health and Safety Act* and Regulations (NWT MHSAR), specifically Part XIV
- NWT Worker's Safety & Compensation Commission (WSCC) Occupational Health and Safety Regulations
- NWT *Explosives Act* and Regulations
- *Transportation of Dangerous Goods Act* and Regulations (Canada)
- Workplace Hazardous Materials Information System (WHMIS)
- DFO Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO 1998).

3.2 Description of Explosives

The explosives to be used for ASR construction blasting activities will be emulsion sticks which will be transported to the ASR site by the supplier by truck or by aircraft. All packaged emulsion explosive products are detonator or booster sensitive with excellent water resistance. Examples of such products include DYNO AP, DYNO AP PLUS and BLASTEX.

The pre-packaged explosives use an optimally-mixed hydrophobic emulsion compound that works to repel water and keep ammonium nitrate (AN) out of the surrounding ecosystem. Industry best practices will be adopted to maximize source control and to minimize the potential for AN dissolution to downstream waters.

The pre-packaged emulsion sticks, detonators, and primers, will be shipped to site as explosives and be stored in site magazines. All explosives products will be provided by a reputable explosives supplier. Upon arrival of the explosives products on site, the explosives contractor or authorized Construction personnel will be responsible for transporting and safely storing them in the dedicated magazine(s) immediately.

Photos 1 (stick emulsion), Photo 2 (detonators) and Photo 3 (detonating cord) illustrate the main explosives products to be used for construction of the ASR.



Photo 1: Example of an Emulsion Stick Explosive



Photo 2: Example of a Nonel Delay Detonator



Photo 3: Example of Detonating Cords

3.3 Explosives Contractor

The ASR explosives contractor(s) will have an operations manual for for the safe transportation, storage and handling of explosives. The explosives contractor(s) will also be responsible for explosives management including for employee training, hazardous operational analysis, and quality control. CZN will evaluate contractor performance against the management plan, applicable regulations, and industry best practice.

The explosives contractor(s) will be responsible for the delivery of the explosives products to the specified quarry and borrow sites and along the ASR alignment where blasting will be undertaken.

3.4 Explosives Transportation

The explosives contractor(s) will be responsible for transporting the explosives products to site and will be required to provide procedures for the safe transportation of explosives. The transportation of the explosives products and detonators will only be carried out by trained personnel under rigorous supervision.

The transportation of explosives to the quarry areas will be conducted in such a manner as to safeguard human health and prevent impacts on the environment. The transfer will be arranged such that:

- delays between the points of transfer are minimized;
- explosives are not left at any location other than designated locations, and
- explosives are not left unattended during transportation.

The transportation of explosives will be undertaken in accordance with the NWT *Mine Health and Safety Act* and Regulations. In addition, all explosives transport must comply with the *Canadian Explosives Act* & Regulations (1985) and the *Transport of Dangerous Goods Act* and Regulations. The explosives contractor and personnel are responsible for ensuring compliance with these regulations.

3.5 Explosives Storage

Explosives will be stored in portable explosives magazines permitted by the Inspector in accordance with the NWT *Mine Health and Safety Act* and Regulations.

The portable explosives magazines will adhere to the following regulatory requirements:

14.03.

- 1) Subject to subsection (2), the site for a surface magazine shall be selected in accordance with the Quantity-Distance Table For Blasting Explosives.
- 2) The manager may apply to the chief inspector for a variance where it is not possible to comply with the Quantity-Distance Table For Blasting Explosives.
- 3) The manager shall ensure that a surface magazine ceases to be used if the conditions under which the explosives magazine permit was issued no longer exist.
- 4) The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted at all approaches to a magazine.
- 5) (5) No person shall smoke, take an open flame or produce sparks within 20 m of any place where explosives are stored or handled.
- 6) Explosives stored on the surface shall be kept in a magazine with "DANGER EXPLOSIVES" signs conspicuously posted at all approaches to the magazine and on each side of the magazine.

All explosives magazines will be fully licenced and equipped with a security reader system and proper locking system as per ERD Federal and Territorial regulations. Photo 4 illustrates a typical example of a portable explosives storage magazine.

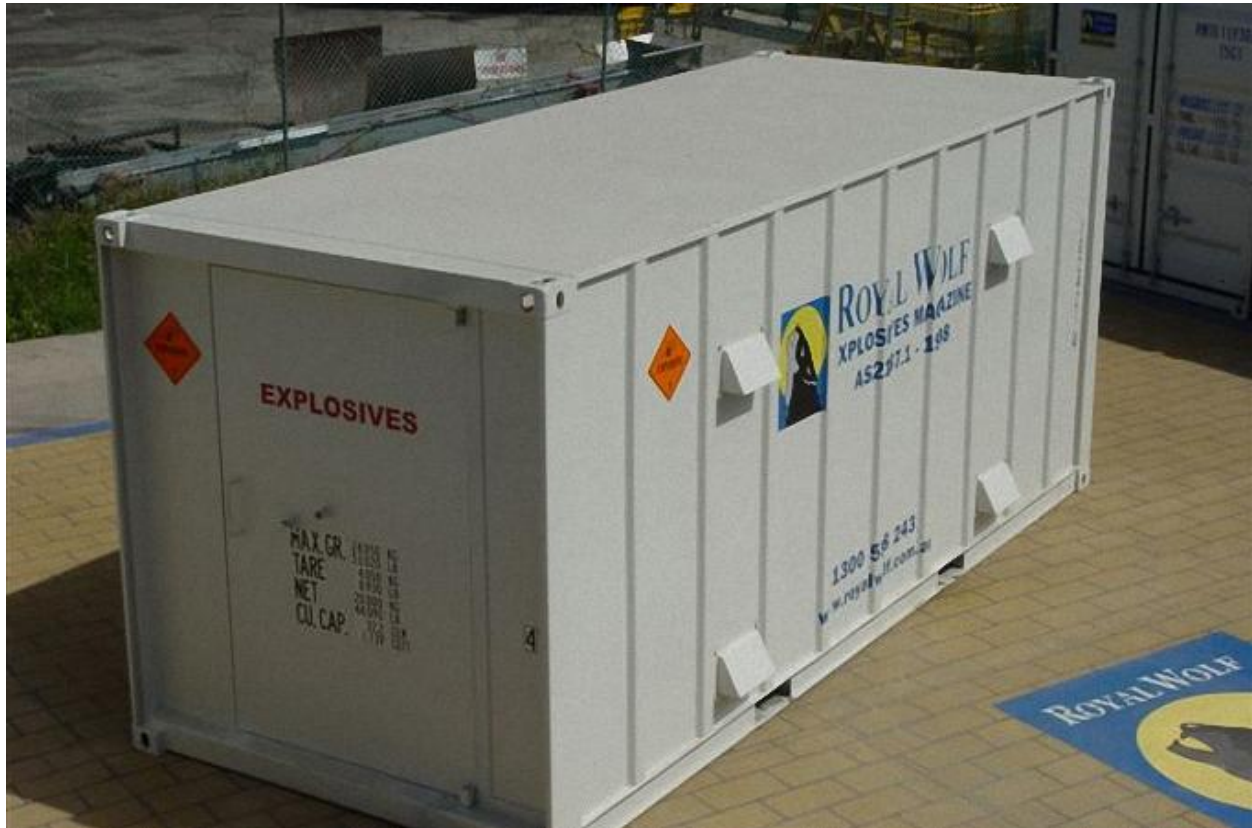


Photo 4: Example of a Portable Explosives Storage Magazine

3.6 Explosives Use

Explosives use will adhere to the following practices:

- Only properly trained and certified employees or contractors will be permitted to handle explosives.
- All explosives shall be handled according to the manufacturer's specifications.
- Defective explosives shall not be used. Defective explosives shall be immediately reported to a supervisor. Defective explosives will be reported to the manufacturer.
- Explosives shall not be abandoned (use it or store it).
- Unused explosives will be shipped off site or burned or destroyed according to the manufacturer's specifications.
- Detonators, if not used, shall be returned to the detonator magazine or shift box or shift container but the number of detonators in a shift box or shift container must not exceed 50.

3.7 Training & Certification

Only trained and certified personnel will work with explosives. The explosives personnel will undertake formal training and on-the-job training to ensure compliance with legislation. Internal audits and inspections of all components related to the explosives management will be conducted on a regular basis by qualified personnel, and

the results recorded according to quality and safety standard operating procedures. All recommendations and orders made by regulators and inspectors will be responded to and acted upon accordingly.

Training requirements will include (but not be limited to):

- Specific fire procedures as per the Federal *Explosives Act*;
- First Aid;
- Transportation of Dangerous Goods (TDG);
- Blasting Certificate; and
- Workplace Hazardous Materials Information System (WHMIS).

Canadian Zinc will maintain training records for all employees.

Blasters require a certificate from the chief inspector or a provisional blasting certificate from their manager, in accordance with the NWT Mine Health and Safety Regulations.

Hot work procedures will be instituted which will prevent hot work from being performed without a permit. This prevents hot work happening within 20 m of the place where any explosive is stored or is being transported.

4.0 BLASTING OPERATIONS

Blasting will be carried out by the certified explosives contractor(s) following blasting regulations and safety protocols and under the supervision of the ASR General Contractor. Project-specific detailed operations manual for the safe transportation, storage, and handling of explosives will be developed by the explosives contractor and reviewed by the ASR General Contractor. The explosives contractor(s) will also be responsible for the inspection of all explosives facilities and the safe operation of all explosives equipment.

The explosives contractor will be required to provide weekly reports to the ASR General Contractor detailing total explosives consumption, inventory of AN onsite, other explosives, and safety concerns or incidents.

The drilling of blast holes will be completed by the blasting contractor(s). Appropriate precautions will be taken to secure the area prior to blasting to ensure the safety of personnel. In addition, precautions will be taken to minimize damage from fly-rock.

4.1 Blasting Safety Measures

The following blasting safety procedures will be implemented at all quarry and borrow sites and along the ASR alignment where blasting is to be undertaken:

- No unauthorized personnel will be allowed inside a posted blast area whether the holes have been loaded or not;
- The Blasting Supervisor and the Blaster are responsible for the safe handling, loading and connection of a blast;
- The ASR general contractor's Shift Supervisor is responsible for the evacuation of all personnel and equipment from the blast area and site security during blasting;

- Security personnel will be posted prior to blast time, and must remain there until they are told verbally by the Shift Supervisor that they can leave their position;
- Once Security personnel are posted, the blast area must be inspected by the Shift Supervisor to ensure that no personnel or equipment remain inside the blast area;
- A blast-warning siren will be sounded for one (1) minute; three (3) minutes after this, the blast will be fired;
- The Blaster will only fire the blast when given a direct verbal order to do so by the Shift Supervisor;
- Before firing a shot, the Blaster must ensure the immediate area is clear (i.e. aircraft, etc.); and radio silence is maintained;
- The Shift Supervisor and Blaster will inspect the fired shot for indications of any problems such as misfires or cut-offs;
- Areas in which charged holes are awaiting firing shall be secured or posted against unauthorized entry;
- Downhole initiation lines must be attached to a stake planted in the cuttings on all holes;
- All loaded patterns, in addition to being marked with blasting signs, shall be clearly delineated to outline the pattern;
- Re-drills shall be marked with a plastic cone and be designated by a member of the blasting crew; the plastic drill cone shall be firmly implanted in the cuttings of the hole to be re-drilled; the cone should be removed by the driller before drilling and inverted in the hole after drilling for pickup by the blasting crew;
- Where re-drills are required on loaded patterns, the drill must be guided by the Blasting Supervisor, or Blaster or a responsible person designated by them;
- Service vehicles and fuel trucks are not allowed on a loaded pattern; the drill must pull well clear of the loaded holes before work be done on it; where the drill cannot be moved and service is required, it may be done only under the direct supervision of the Blast Supervisor or designate and all loaded holes must be covered; and
- Vehicles containing explosives shall not be taken to the repair shop or any other building for any purpose; no open flames or welding are to be used for field repairs unless explosives are first removed.

4.2 Environmental Monitoring & Adaptive Management

Blasting operations are expected to take place from time to time throughout the ASR construction program but will typically be infrequent in nature and of short-term-duration (seconds), extending over a period of two to four weeks at certain quarry sites, and shorter periods of time at other sites. Blasting activities are expected to be limited to one site at a time. All blasting activities will be scheduled to take place during daylight hours.

Prior to undertaking a blasting program at a particular site, CZN's Environmental Monitor assigned to the program will undertake wildlife reconnaissance by scanning adjacent slopes, ponds, and surrounding areas with binoculars to assist in determining whether blasting should be permitted to proceed.

In accordance with CZN's commitments made during the Environmental Assessment Process the following mitigation measures will be undertaken:

- Blasting within Boreal Caribou range is prohibited from May 1 to July 15 to avoid disturbance to potential Boreal Caribou calving and post-calving, unless a ground survey confirms the absence of animals within 1 km.

- Blasting is prohibited if Dall's sheep lambs are present within 1 km of the proposed Project from May 1 to June 15 or if Dall's sheep or wolverine are observed at any other time within 1 km of the blast site until the animal(s) moves out of the area.
- Blasting is prohibited from April 1 to September 30 if Trumpeter Swans are located within 1 km of the blast site. Additional construction-related monitoring activities may be required during the Trumpeter Swan restricted activity period and will be conducted with the assistance of the CZN Environmental Monitor.
- Blasting activities located in proximity to fish-bearing water bodies will be required to adhere to DFO Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO 1998) as modified by Cott & Hanna (2005) and DFO's NWT fish spawning timing windows (<http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/nwt-eng.html>).

Cott and Hanna (2005) recommends that the Developer utilize an instantaneous pressure threshold limit of 50 kPa, which may require appropriate setback distances, in order to develop adequate mitigation measures to address the effects of blasting on fish and reduce the risk of serious harm to fish arising from the Project.

Any lessons learned from the environmental monitoring to be conducted in conjunction with the blasting activities will be applied to subsequent environmental monitoring and management actions.

4.3 Spill Prevention

When handling, transporting or storing explosives, care will be taken to avoid spillage. Protecting water-soluble products from rain, snow and the elements is particularly important. This is primarily an environmental concern to avoid runoff of the soluble product, which could adversely affect fish-bearing waters.

In general, the following procedures will be implemented to prevent or mitigate incidents involving spills, fire, or explosion:

- Explosives will be pre-packaged emulsion sticks.
- Pallets of emulsion sticks are all shrink-wrapped.
- If a spill occurs, the **CZN Spill Contingency Plan** and **Health, Safety and Emergency Response Plan** must also be activated and implemented as appropriate.
- All spills will be reported immediately to the ASR Shift Supervisor for follow-up reporting to the NT-NU 24-hour Spill Report Line (**867-920-8130**). See Spill report form and Reportable Quantities in Appendices B and C.
- All spills are to be cleaned up immediately, if/when upon occurrence.
- A spill report form will be completed, documenting the spill (Appendix B).
- Explosives not immediately utilized must be returned to the explosives magazine.
- Ensure that fire extinguishers are available for use in the event of a fire; fire extinguishers must be compatible with flammable materials (water-based where AN is involved).
- A "NO SMOKING" sign will be posted on visible walls of the facility.
- Ensure that lighters, matches, mobile phones, or radio transmitters or any item that might conduct electricity is not used at the explosives storage area.

- Follow all transportation, storage, use, and handling procedures outlined in this EMP.
- Report incidents of “near-miss” and actual accidents to appropriate personnel. Incidents will be investigated to help identify trends and reduce future reoccurrence

4.4 Disposal of Explosives

Explosives and explosive materials can be disposed of by burning, detonation, dissolution in water or solvent, or by chemical destruction. The selected disposal method will depend on the type of explosive, quantity, condition, and the manufacturers specifications.

All destruction of explosives will be carried out by licensed blasting personnel. Destruction of large quantities of explosives will be carried out at a designated location at least 500 m from any infrastructure that could be damaged by the detonation. Personnel and other property damage will be avoided by sheltering the detonation area. Small quantities of waste explosives may be added to production charges in blast-holes for destruction.

Blasting personnel will adhere to the following procedures:

- Only a licensed person, or a person under the supervision of a licensed person (Explosives Contractor) is allowed to dispose of or destroy explosives.
- Use a method of disposal that provides the greatest degree of safety to personnel, protection of property and the environment; take adequate precautions to protect against injury or damage to property.
- Ensure that the method of disposal is appropriate to the type and condition of explosives.
- Follow recommended disposal method indicated by manufacturer or responsible authorities.
- Unused explosives and explosive waste must be removed and disposed of under the supervision of or by the Explosives Contractor.

5.0 EMERGENCY CONTACT INFORMATION

5.1 Mine Site Phones

- Office 778-724-2512
- Kitchen 778-725-2513
- Iridium 9555 Satellite Phone 1 (yellow) 011-8816-315-30998
- Iridium 9505A Satellite Phone 2 (black) 011-8816-315-30997
- Iridium 9505A Satellite Phone 3 (orange) 011-8816-315-30996
- Ground-To-Air Radio Handheld FREQ 122.800

5.2 Medical Services

- BC Ambulance, Fort Nelson 250-774-2344
- Fort Nelson General Hospital 250-774-8100

- Fort Simpson Health Centre 867-695-7000
- Alberta Poison & Drug Information Service (24-hour line) 1-800-322-1414

5.3 Incident Assistance

- RCMP Fort Simpson Detachment 867-695-1111
- RCMP Fort Nelson Detachment 250-774-2777 (Emergency) 250-774-2700
- Fort Nelson Fire Department 250-774-2222 (Emergency) 250-774-3955
- Fort Simpson Fire Department 867-695-2222
- Rowe's Construction Ltd. – Owen Rowe 867-695-3243, Cell: 867-445-8462
- Northwest Territories Power Corp. – Boyd Mallaley / Todd Roche 1-855-575-6872 / 867-695-7100
- Western Canadian Spill Services (24-hour information) 1-866-541-8888, 403-516-8160
- Kleido Construction Ltd. – Paul Davidson 250-774-2501, Cell: 250-500-2674

5.4 Air Charters Services

- Villers Air Service, Fort Nelson – Peter Viller 250-774-2072, Cell: 250-500-2072
 - Wolverine Air Service, Fort Simpson – Jacques Harvey 867-695-2263, 1-888-695-2263
 - Canadian Helicopter, Fort Nelson – Kevin Rogers 250-774-6171, Cell: 250-361-1666
- Great Slave Helicopter, Fort Simpson – Colin Munro 867-695-2326, Cell: 780-278-9615; Home: 867 695 3749

5.5 Reporting

- Worker's Safety & Compensation Commission (WSCC) [24-hour] 1-800-661-0792
- Aboriginal Affairs & Northern Development Canada (AANDC) 867-669-2500, 867-669-2691
- Environment Canada Spill Line [24-hour] 867-920-8130
- Alan Taylor, Chief Operating Officer, Canadian Zinc Corp. 604-688-2001, Cell: 778-837-2973
- Wilbert Antoine, Northern Development Manager, Canadian Zinc Corp. 867-695-3963, Cell: 867-446-2149

REFERENCES

Canadian Explosives Act & Regulations. 1985.

Canadian Standards Association. 2002. Emergency planning for industry: A national standard for Canada (CAN/CSA-Z731-95 [R2002]). Toronto: Canadian Standards Association.

Cott, P.A., and Hanna, B. 2005. Monitoring explosive-based winter seismic exploration in waterbodies, NWT 2000-2002. In Proceedings of the offshore oil and gas environmental effects monitoring workshop: approaches and technologies, 26–30 May 2003. Edited by S.L. Armsworthy, P.J. Cranford, and K. Lee. Battelle Press, Columbus, OH. pp. 473–490

DFO. 1998. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.

Ecosystem Classification Group. 2007 (rev. 2009). Ecological Regions of the Northwest Territories – Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. Viii + 173 pp. + folded insert map. NWT Consolidation of Mine Health and Safety Regulations R-125-95. <https://www.canlii.org/en/nt/laws/regu/nwt-reg-125-95/latest/part-1/nwt-reg-125-95-part-1.pdf>

NWT Worker's Safety & Compensation Commission (WSCC) Occupational Health and Safety Regulations R-002-2018 In force January 15, 2018.

NWT Explosives Regulations, R.R.N.W.T. 1990, c.E-27.

Transportation of Dangerous Goods Act and Regulations (Canada). Last amended on January 1, 2017.

Workplace Hazardous Materials Information System (WHMIS).

APPENDIX A

ALL-SEASON ROAD MAP BOOK



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- ~ Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: DigitalGlobe, 2016

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION			
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH				
FILE NO. EARC03145-01_FigureA.mxd		A1				
OFFICE TI-VANC	DWN MRV			CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01					

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\Maps\EARC03145-01_FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ⬮ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬮ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✖ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- ⤵ Contour (40 m)
- 🔵 Watercourse
- 🔵 Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: DigitalGlobe, 2016

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000				TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE TI-VANC		DWN MRV	CKD SL	APVD TB	REV 4
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01			

A2

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan verburg



LEGEND

- Access Road Kilometre Marker
- ◆ 2018 Borehole (Tetra Tech, 2018)
- ⊕ 2014 Borehole (Tetra Tech EBA, 2014)
- ◆ 2012 Borehole (SNC-Lavalin, 2012)
- ⊕ 2014 Testpit (Tetra Tech EBA, 2014)
- ⊕ 2014 Testpit (Allnorth, 2014)
- ⬠ Camp/Laydown
- ✕ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- Nahanni National Park Reserve Boundary
- Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES




Base data source: CanVec; GeoBase.
Base imagery source: DigitalGlobe, 2016

STATUS

ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		<div>CLIENT</div> <div> CANADIAN ZINC CORPORATION</div>		
<div>Scale: 1:20,000</div> <div>400 200 0 400</div> <div></div> <div>Metres</div>						<div> TETRA TECH</div>
FILE NO. EARC03145-01_FigureA.mxd						
OFFICE Tt-VANC	DWN MRV	CKD SL	APVD TB	REV 4	A3	
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01					

O:\Vancouver\GIS\ENGINEERING\EARC03145-01\Maps\EARC03145-01_FigureA.mxd modified 11/29/2018 by megan.veturg



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬢ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬢ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬢ 2014 Testpit (Allnorth, 2014)
- 🏠 Camp/Laydown
- ✕ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▬ Nahanni National Park Reserve Boundary
- ▬ Potential Borrow Source
- ~ Contour (40 m)
- ~ Watercourse
- ~ Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: DigitalGlobe, 2016

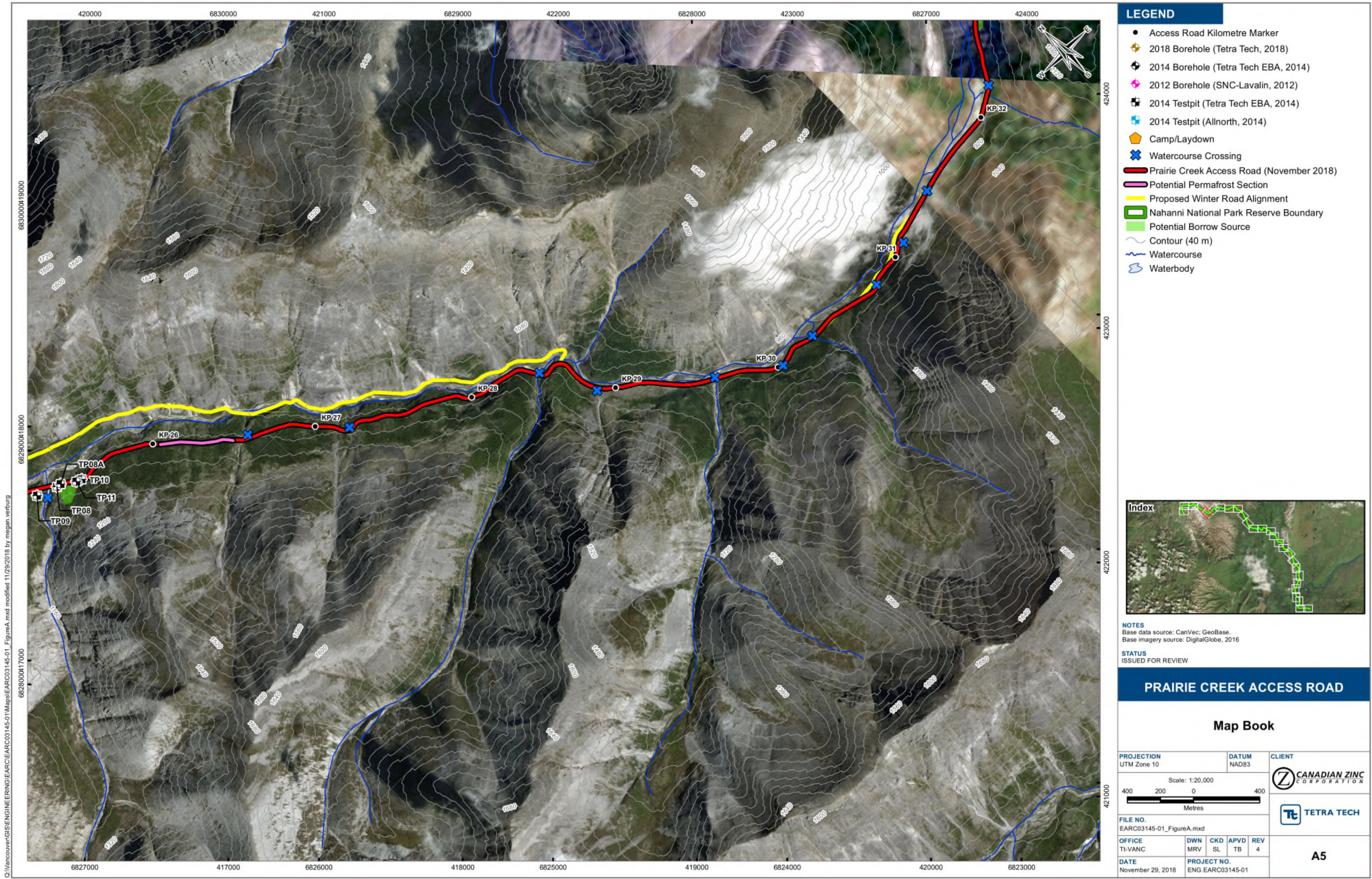
STATUS

ISSUED FOR REVIEW

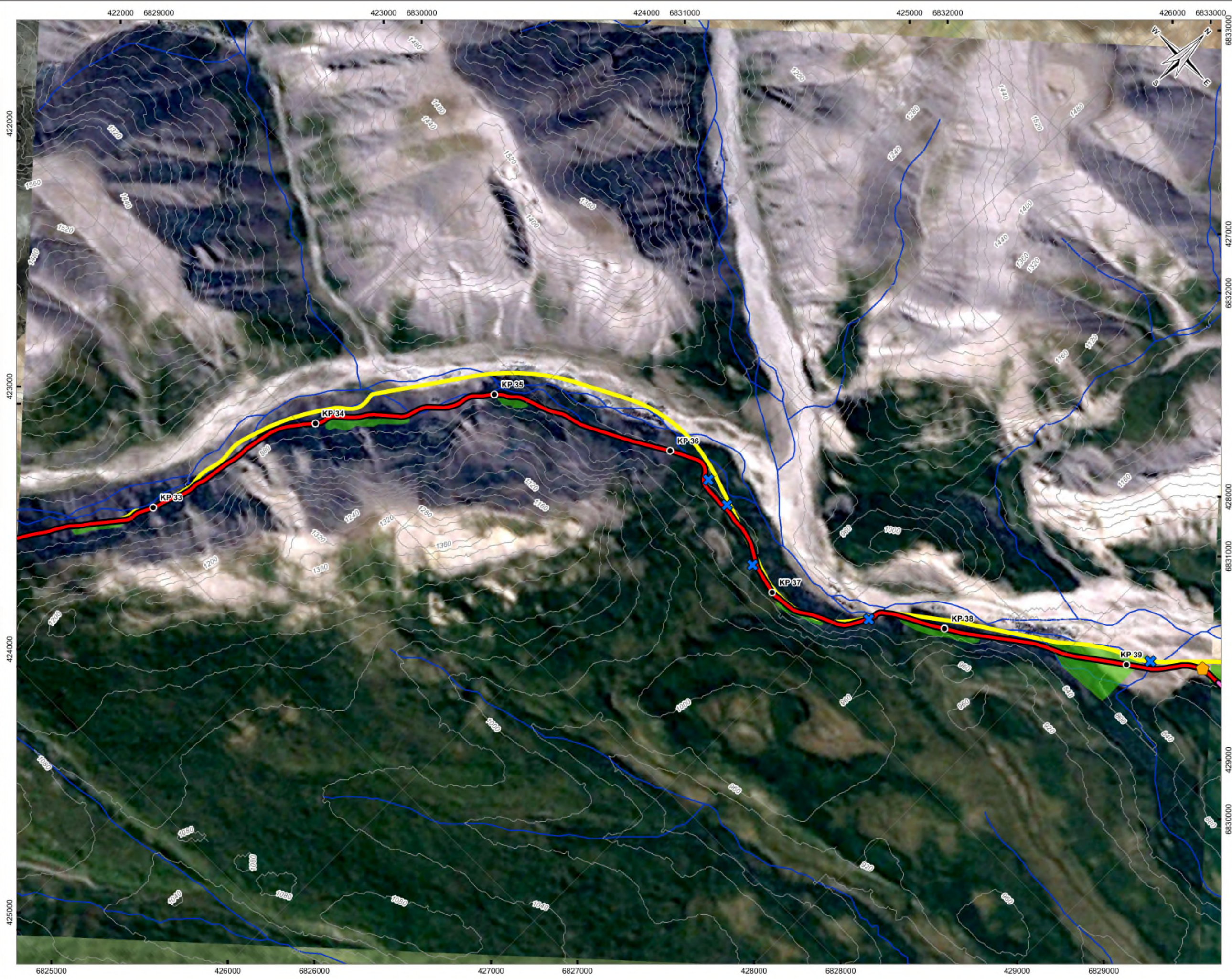
PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH
FILE NO. EARC03145-01_FigureA.mxd		
OFFICE TI-VANC	DWN MRV	CKD SL
DATE November 29, 2018	APVD TB	REV 4
PROJECT NO. ENG.EARC03145-01		A4



Q:\Vancouver\GIS\ENGINEERING\EARC\03145-01\MapA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ✦ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ✦ 2014 Testpit (Tetra Tech EBA, 2014)
- ✦ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- Contour (40 m)
- 🌊 Watercourse
- 🌊 Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2016

STATUS

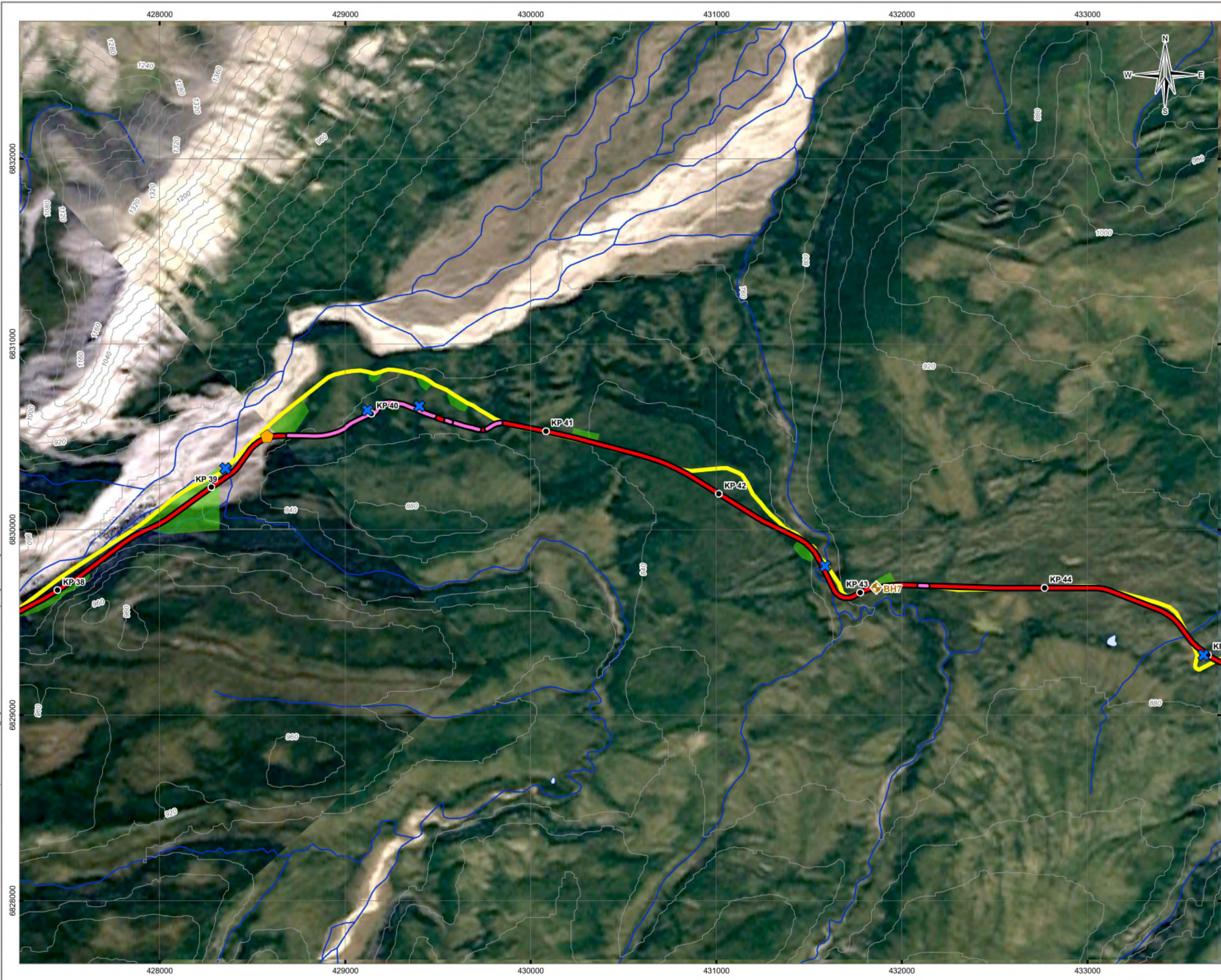
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION
Scale: 1:20,000 400 200 0 400 Metres				
FILE NO. EARC03145-01_FigureA.mxd				
OFFICE T1-VANC	DWN MRV	CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01			

A6



LEGEND

- Access Road Kilometre Marker
- ◆ 2018 Borehole (Tetra Tech, 2018)
- ⊗ 2014 Borehole (Tetra Tech EBA, 2014)
- ⊠ 2012 Borehole (SNC-Lavalin, 2012)
- ⊞ 2014 Testpit (Tetra Tech EBA, 2014)
- ⊞ 2014 Testpit (Allnorth, 2014)
- ⬡ Camp/Laydown
- ⊗ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
 Base data source: CanVec; GeoBase.
 Base imagery source: Google Earth, 2016

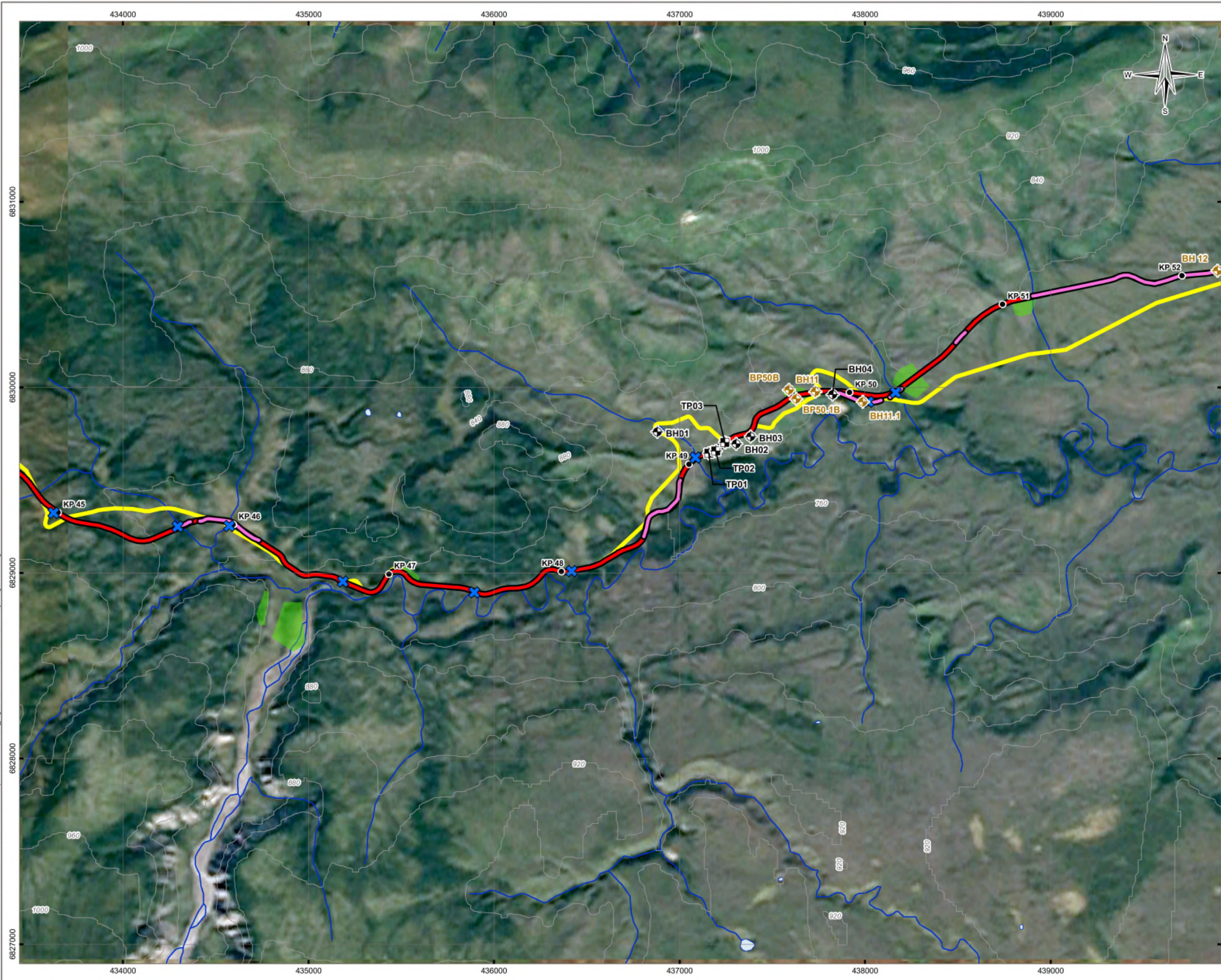
STATUS
 ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

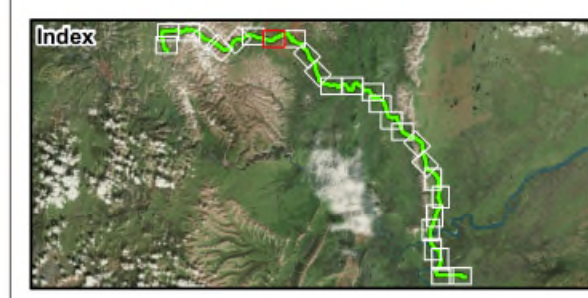
PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000 400 200 0 400 Metres				TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE TI-VANC	DWN MRV	CKD SL	APVD TB	REV 4	A7
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01			

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\Maps\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ◆ 2018 Borehole (Tetra Tech, 2018)
- ◆ 2014 Borehole (Tetra Tech EBA, 2014)
- ◆ 2012 Borehole (SNC-Lavalin, 2012)
- ◆ 2014 Testpit (Tetra Tech EBA, 2014)
- ◆ 2014 Testpit (Allnorth, 2014)
- ◆ Camp/Laydown
- ◆ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- Nahanni National Park Reserve Boundary
- Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2016

STATUS
ISSUED FOR REVIEW

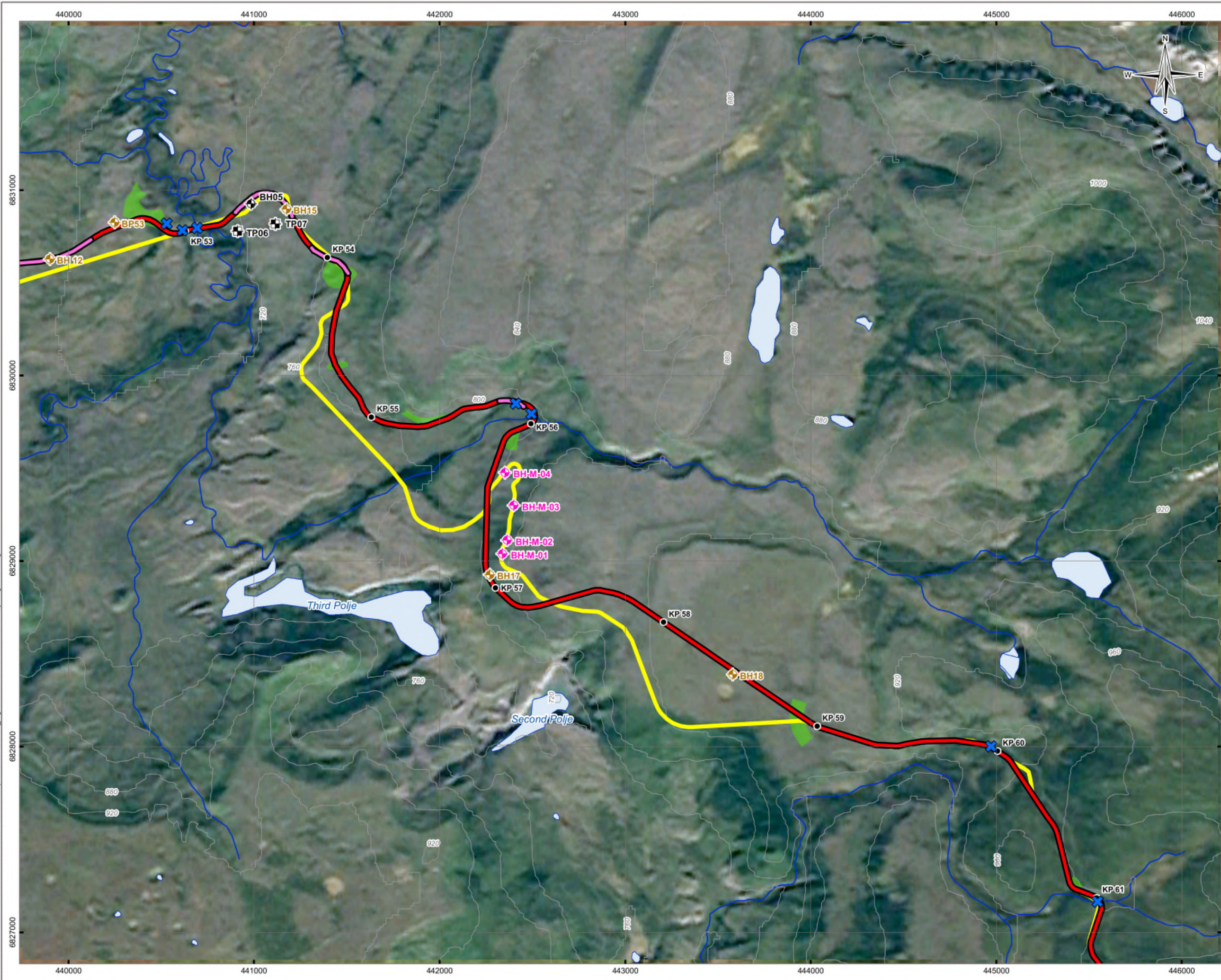
PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION		
Scale: 1:20,000 400 200 0 400 Metres				
FILE NO. EARC03145-01_FigureA.mxd		TETRA TECH		
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01			

A8

Q:\Vancouver\GIS\ENGINEERING\EARC\03145-01\FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ◆ 2018 Borehole (Tetra Tech, 2018)
- ◆ 2014 Borehole (Tetra Tech EBA, 2014)
- ◆ 2012 Borehole (SNC-Lavalin, 2012)
- ◆ 2014 Testpit (Tetra Tech EBA, 2014)
- ◆ 2014 Testpit (Allnorth, 2014)
- ◆ Camp/Laydown
- ✕ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2016

STATUS

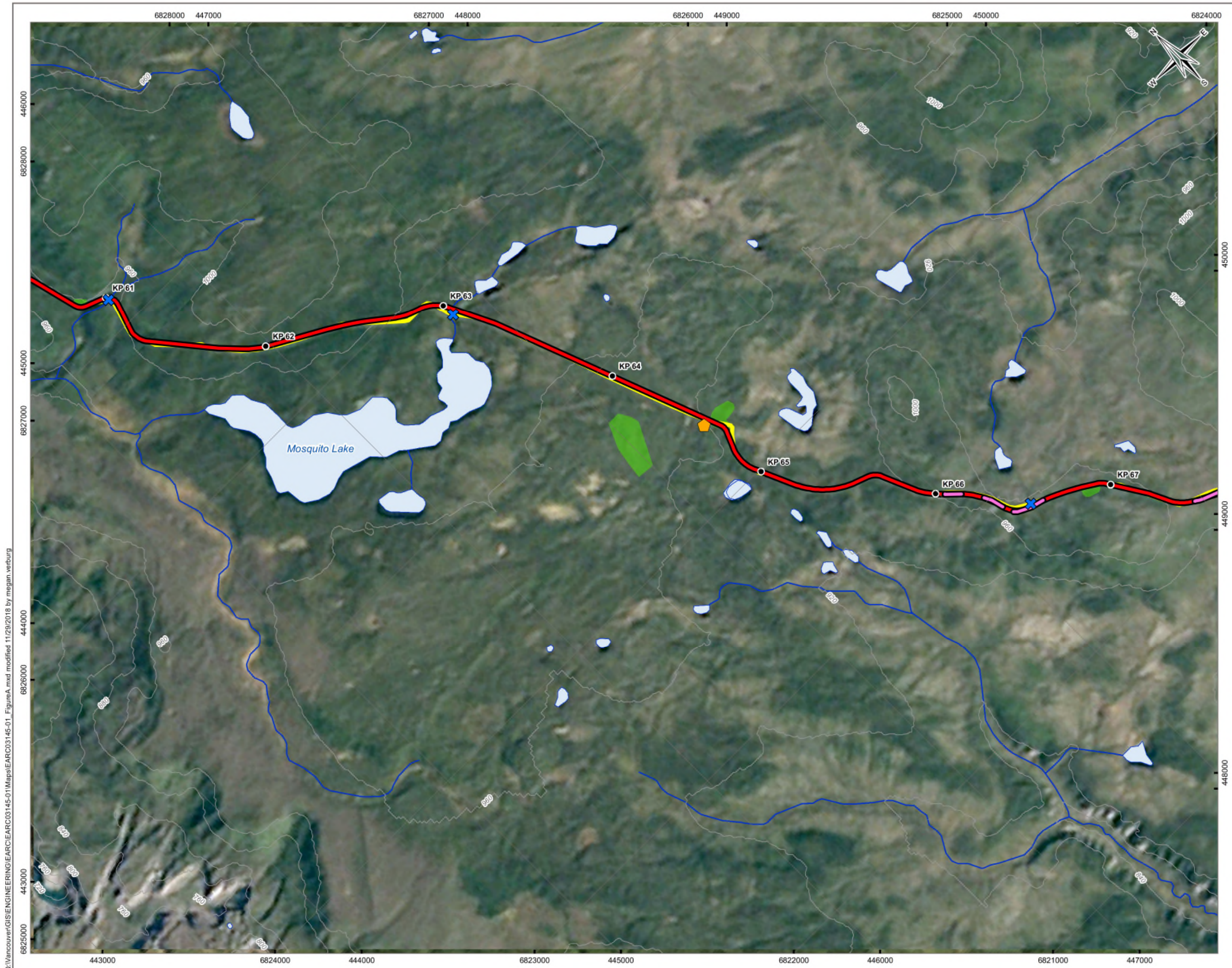
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION			
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH				
FILE NO. EARC03145-01_FigureA.mxd		A9				
OFFICE TI-VANC	DWN MRV			CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01					

O:\Vancouver\GIS\ENGINEERING\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ⬢ 2018 Borehole (Tetra Tech, 2018)
- ⬢ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬢ 2012 Borehole (SNC-Lavalin, 2012)
- ⬢ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬢ 2014 Testpit (Allnorth, 2014)
- ⬢ Camp/Laydown
- ⬢ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▬ Nahanni National Park Reserve Boundary
- ▬ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2016

STATUS

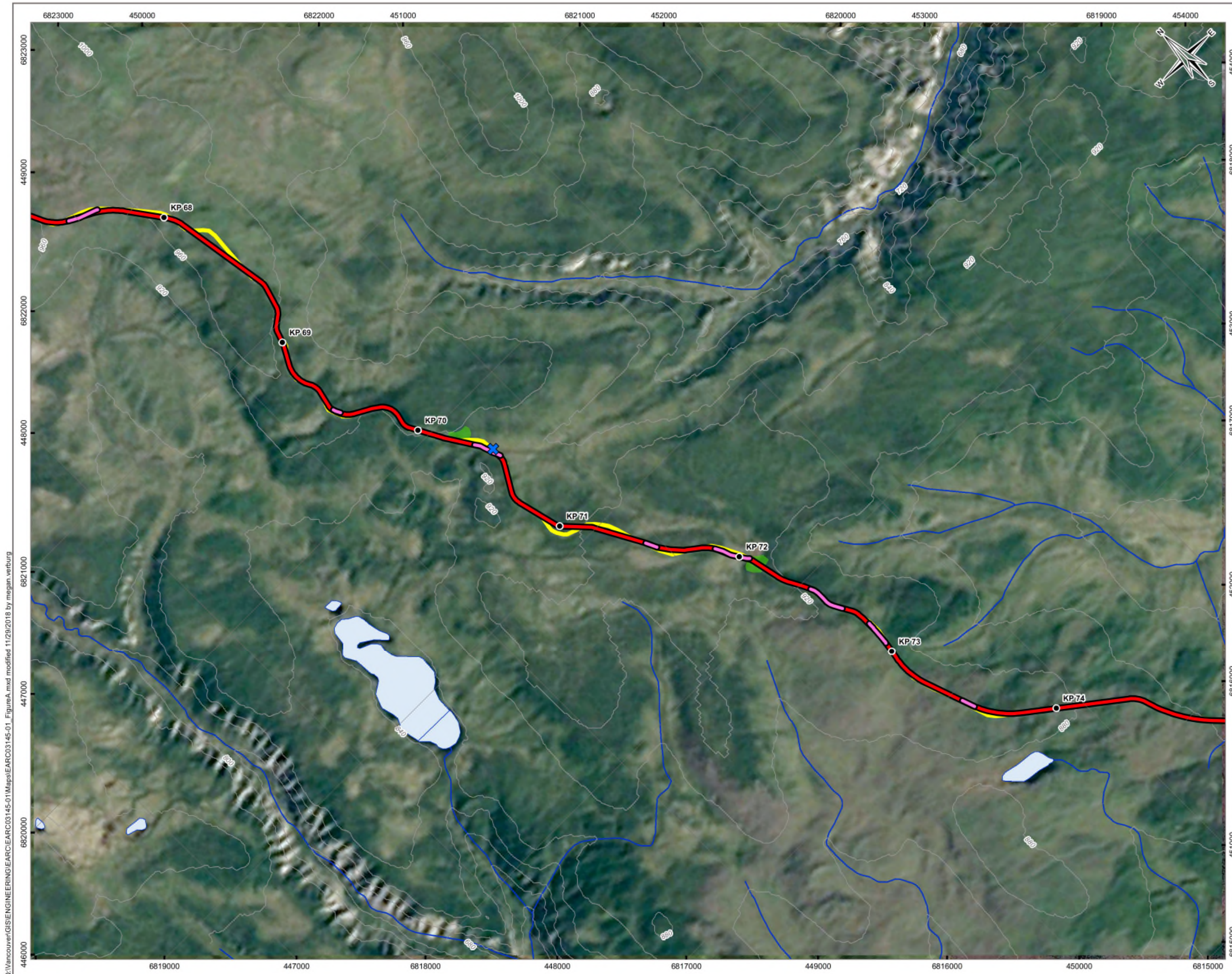
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000 400 200 0 400 Metres				TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE TL-VANC		DWN MRV	CKD SL	APVD TB	REV 4
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01			

A10



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬢ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬢ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬢ 2014 Testpit (Allnorth, 2014)
- 🏠 Camp/Laydown
- ✕ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2016

STATUS

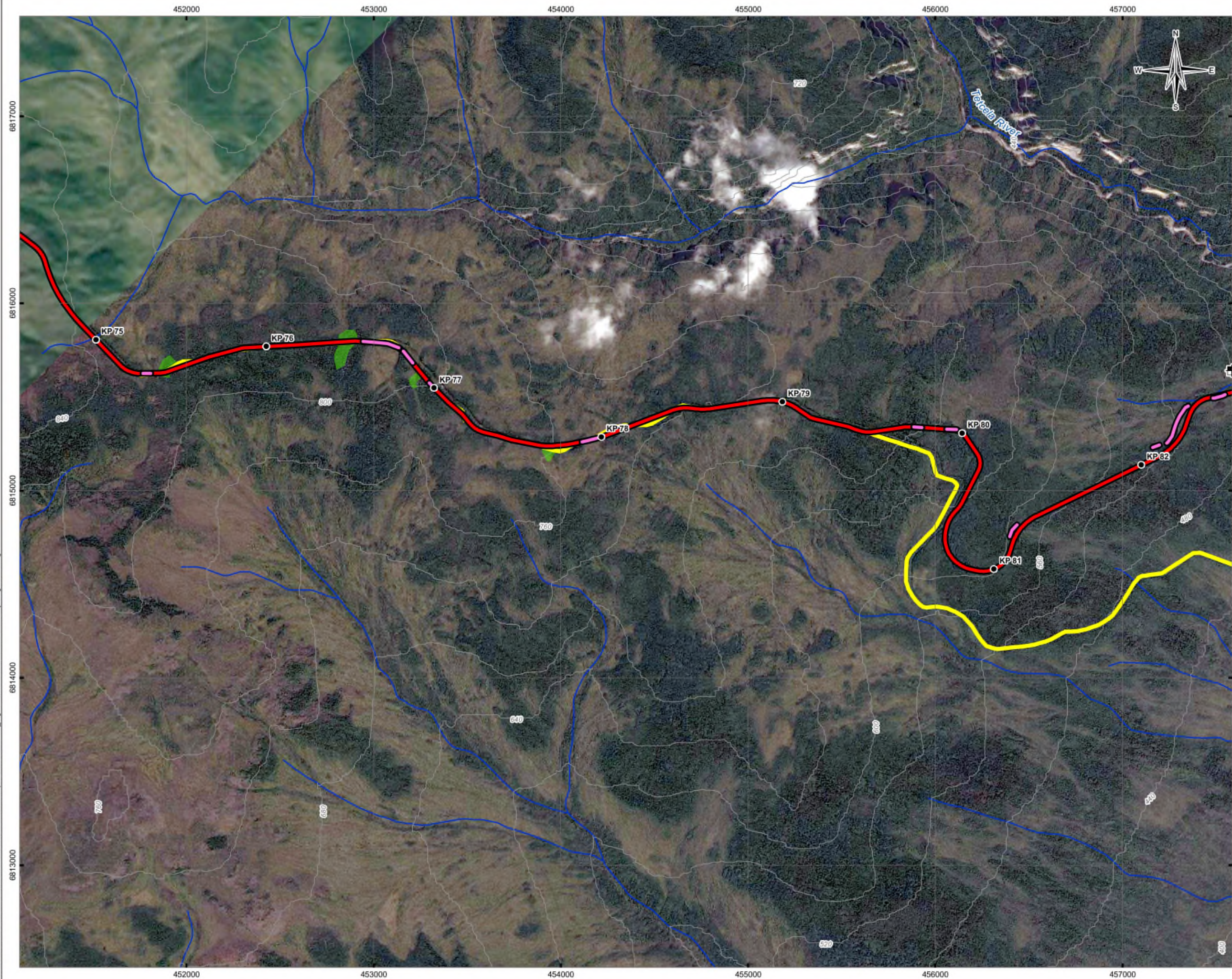
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH
FILE NO. EARC03145-01_FigureA.mxd		
OFFICE TI-VANC	DWN MRV	CKD SL
DATE November 29, 2018	APVD TB	REV 4
PROJECT NO. ENG.EARC03145-01		A11

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan verburg



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- ⬮ Camp/Laydown
- ✦ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▬ Nahanni National Park Reserve Boundary
- ▬ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody






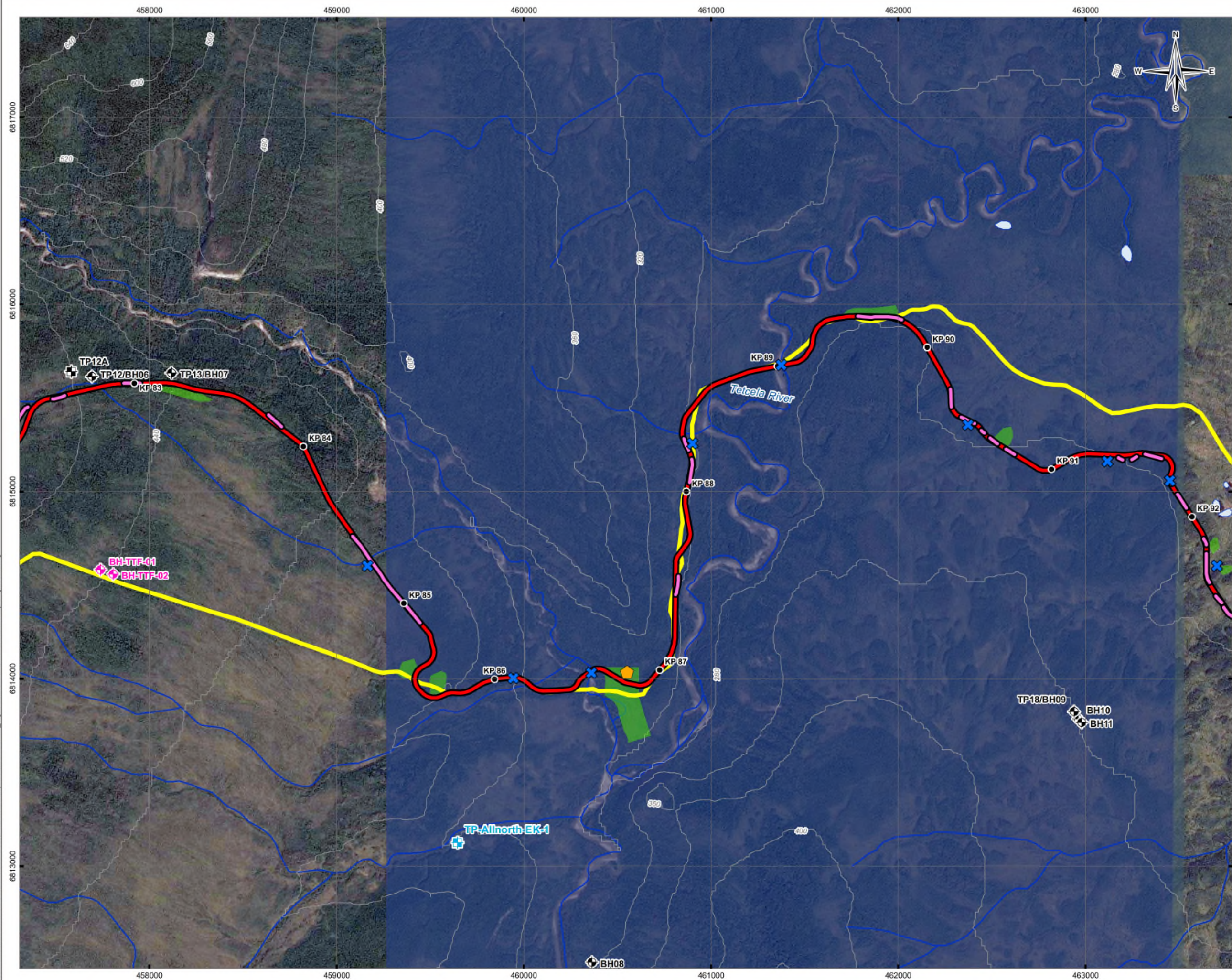
NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

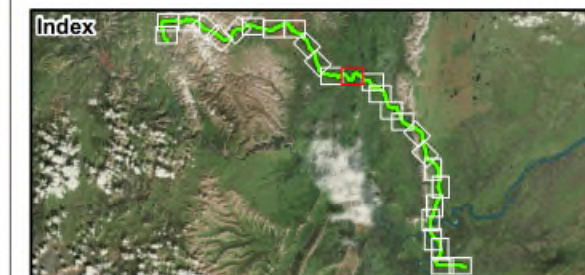
Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT 	
Scale: 1:20,000  Metres					
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE Ti-VANC	DWN MRV	CKD SL	APVD TB	REV 4	A12
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				



LEGEND

- Access Road Kilometre Marker
- 🚧 2018 Borehole (Tetra Tech, 2018)
- ⚡ 2014 Borehole (Tetra Tech EBA, 2014)
- 🌸 2012 Borehole (SNC-Lavalin, 2012)
- 🏠 2014 Testpit (Tetra Tech EBA, 2014)
- 🏠 2014 Testpit (Allnorth, 2014)
- 🏠 Camp/Laydown
- 🌊 Watercourse Crossing
- 🚧 Prairie Creek Access Road (November 2018)
- 🚧 Potential Permafrost Section
- 🚧 Proposed Winter Road Alignment
- 🏠 Nahanni National Park Reserve Boundary
- 🏠 Potential Borrow Source
- 🌊 Contour (40 m)
- 🌊 Watercourse
- 🌊 Waterbody



NOTES

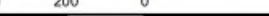


Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

STATUS

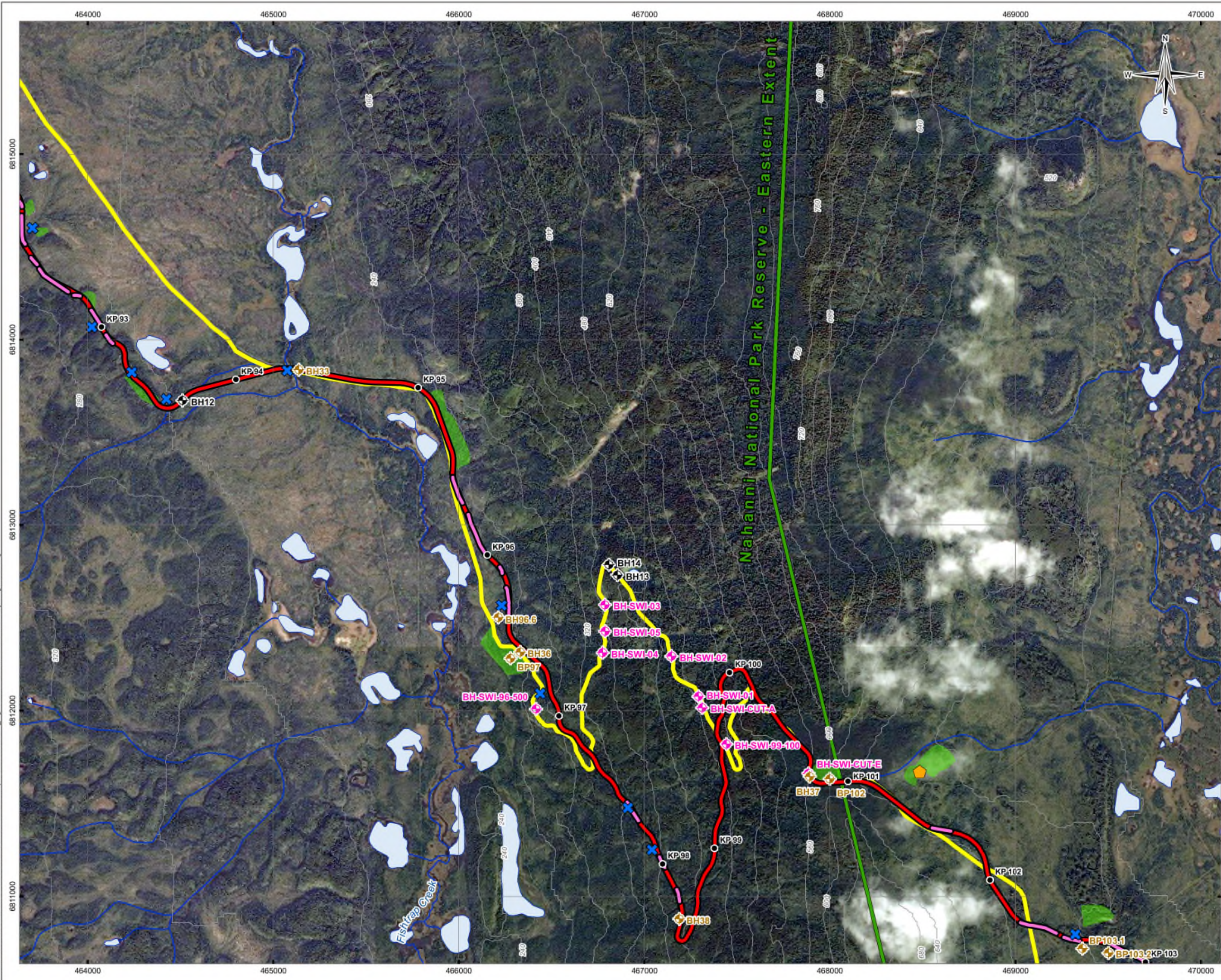
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT	
<p>Scale: 1:20,000</p> <p>400 200 0 400</p>  <p>Metres</p>				 CANADIAN ZINC CORPORATION	
FILE NO. EARC03145-01_FigureA.mxd				 TETRA TECH	
OFFICE Ti-VANC	DWN MRV	CKD SL	APVD TB	REV 4	A13
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan verburg



LEGEND

- Access Road Kilometre Marker
- ⬮ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬮ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- ⬮ Camp/Laydown
- ⬮ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- Nahanni National Park Reserve Boundary
- Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

STATUS

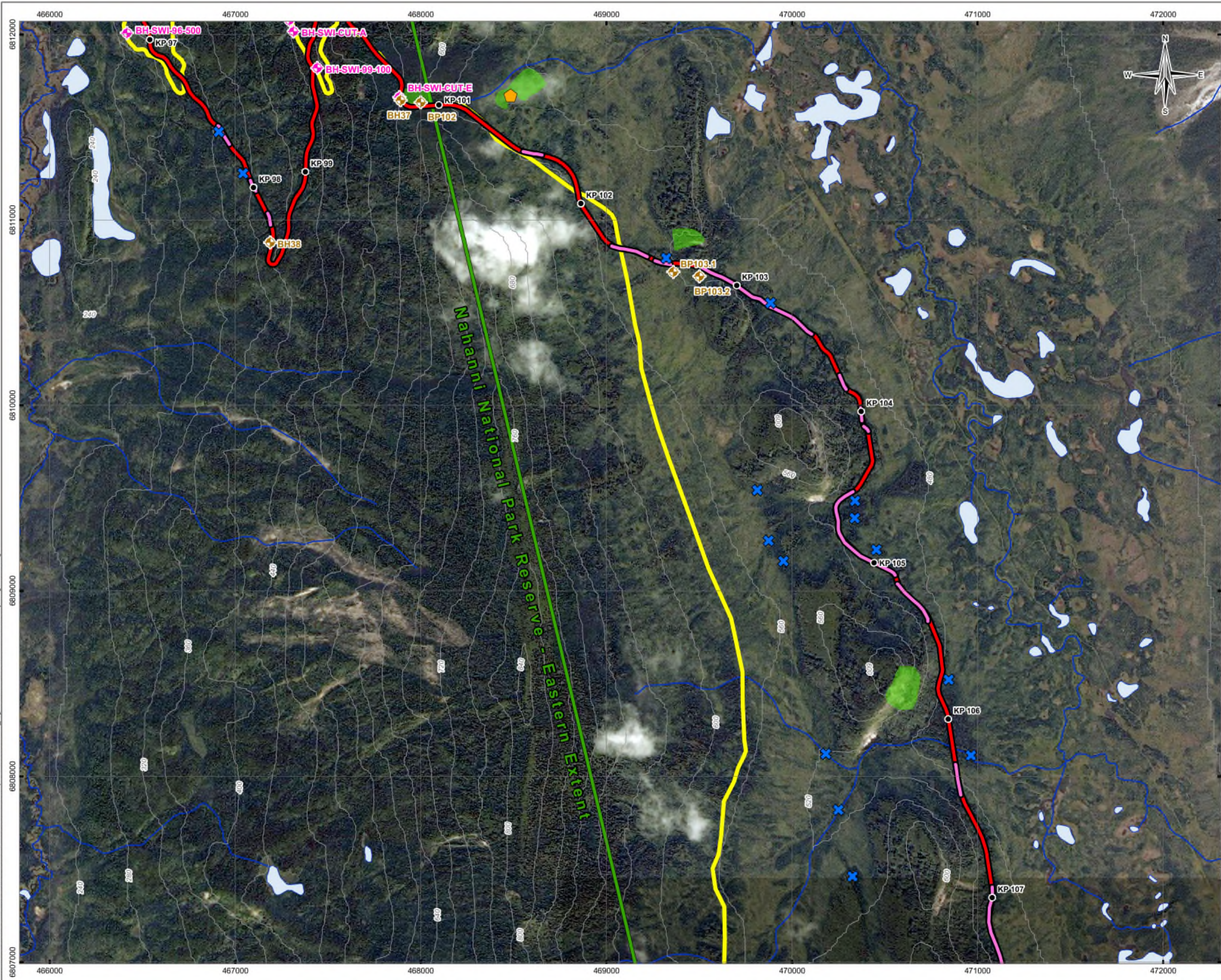
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION			
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH			
FILE NO. EARC03145-01_FigureA.mxd		A14			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan verburg



LEGEND

- Access Road Kilometre Marker
- ⬢ 2018 Borehole (Tetra Tech, 2018)
- ⬢ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬢ 2012 Borehole (SNC-Lavalin, 2012)
- ⬢ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬢ 2014 Testpit (Allnorth, 2014)
- ⬢ Camp/Laydown
- ⬢ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- Nahanni National Park Reserve Boundary
- Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

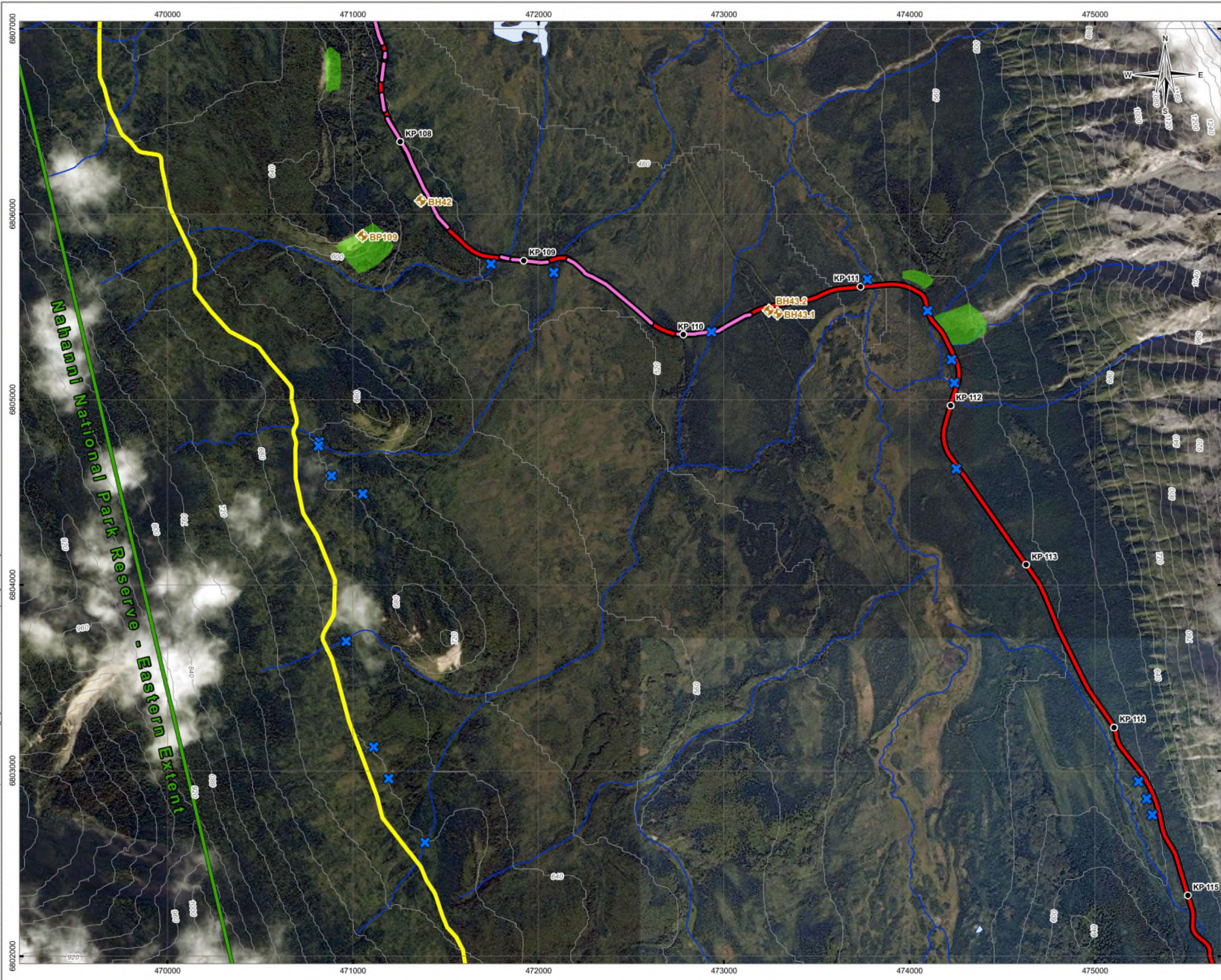
STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000 400 200 0 400 Metres				
FILE NO. EARC03145-01_FigureA.mxd		TETRA TECH		
OFFICE TI-VANC	DWN MRV			CKD SL
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01		A15	

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan verburg



LEGEND

- Access Road Kilometre Marker
- ◆ 2018 Borehole (Tetra Tech, 2018)
- ◆ 2014 Borehole (Tetra Tech EBA, 2014)
- ◆ 2012 Borehole (SNC-Lavalin, 2012)
- ◆ 2014 Testpit (Tetra Tech EBA, 2014)
- ◆ 2014 Testpit (Allnorth, 2014)
- ◆ Camp/Laydown
- ✕ Watercourse Crossing
- Prairie Creek Access Road (November 2018)
- Potential Permafrost Section
- Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000				TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE TI-VANC		DWN MRV	CKD SL	APVD TB	REV 4
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01		A16	



LEGEND

- Access Road Kilometre Marker
- ⬮ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬮ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- ⬮ Camp/Laydown
- ⬮ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

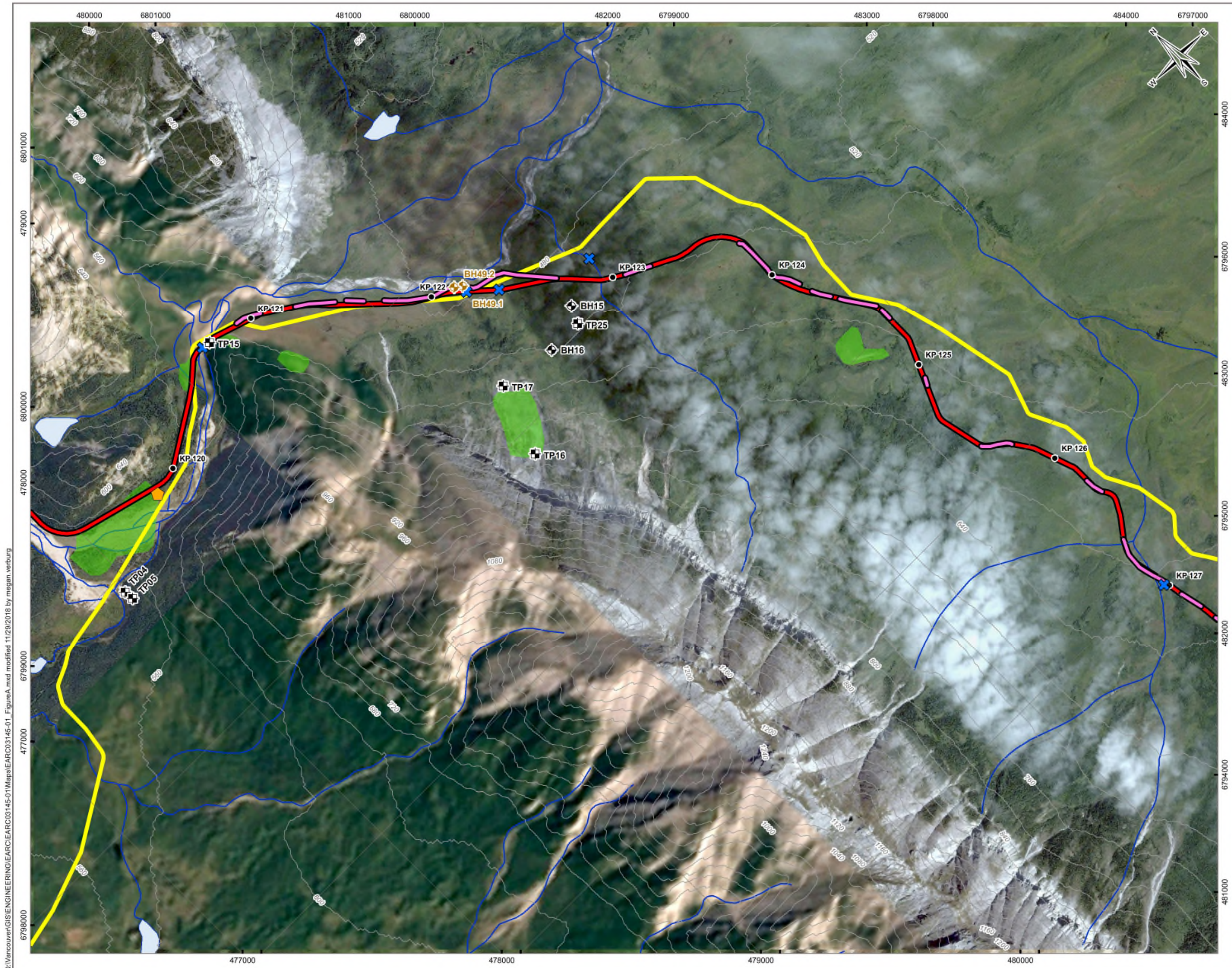
STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT	
Scale: 1:20,000		400 200 0 400		CANADIAN ZINC CORPORATION	
		Metres		TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd		DWN MRV		CKD SL	
OFFICE TI-VANC		APVD TB		REV 4	
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01		A17	

D:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan.vetburg



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- 🏠 Camp/Laydown
- ✕ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007

STATUS

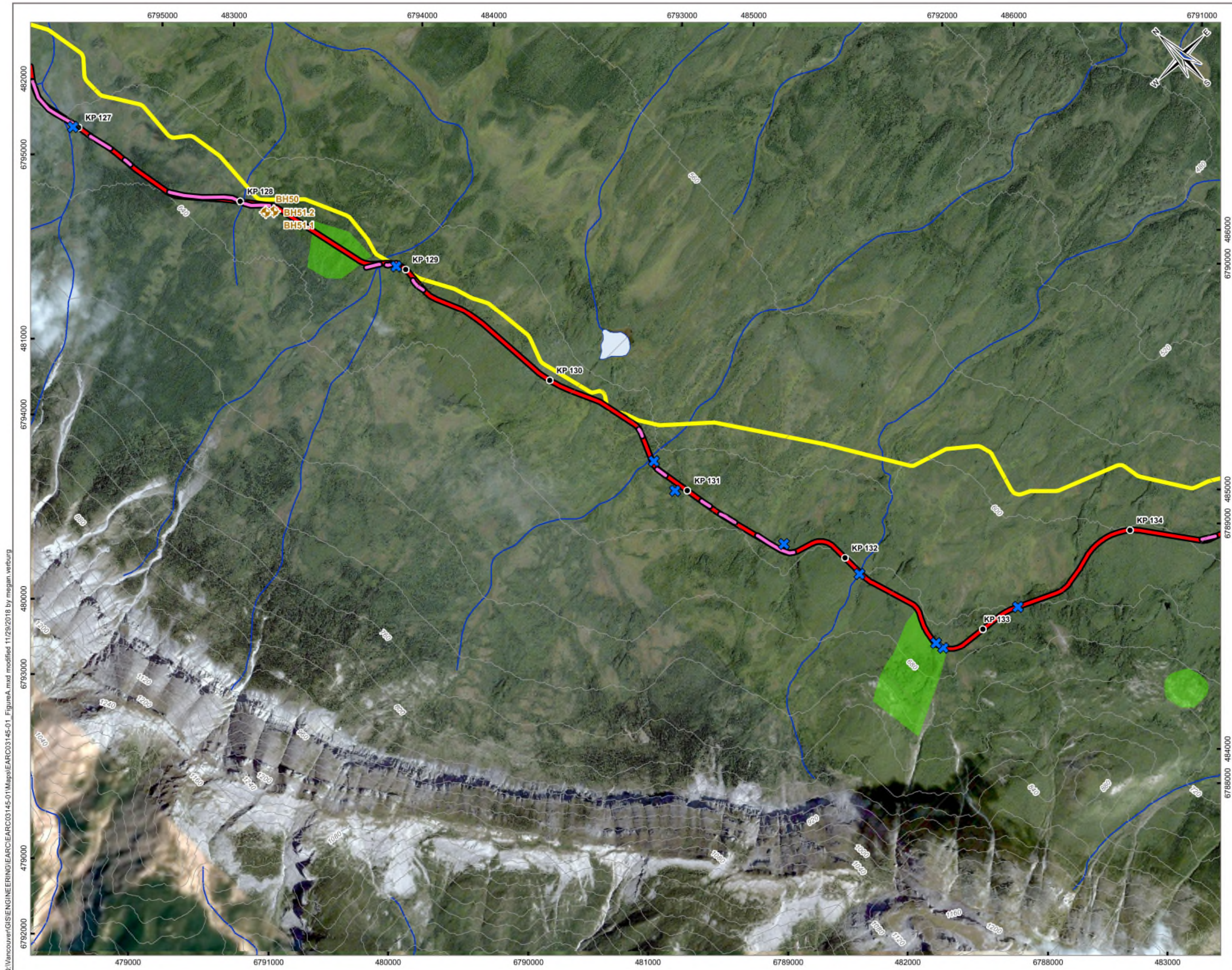
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION			
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH			
FILE NO. EARC03145-01_FigureA.mxd		A18			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				

O:\Vancouver\GIS\ENGINEERING\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬢ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬢ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬢ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- ⋯ Contour (40 m)
- 🌊 Watercourse
- 🌊 Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007

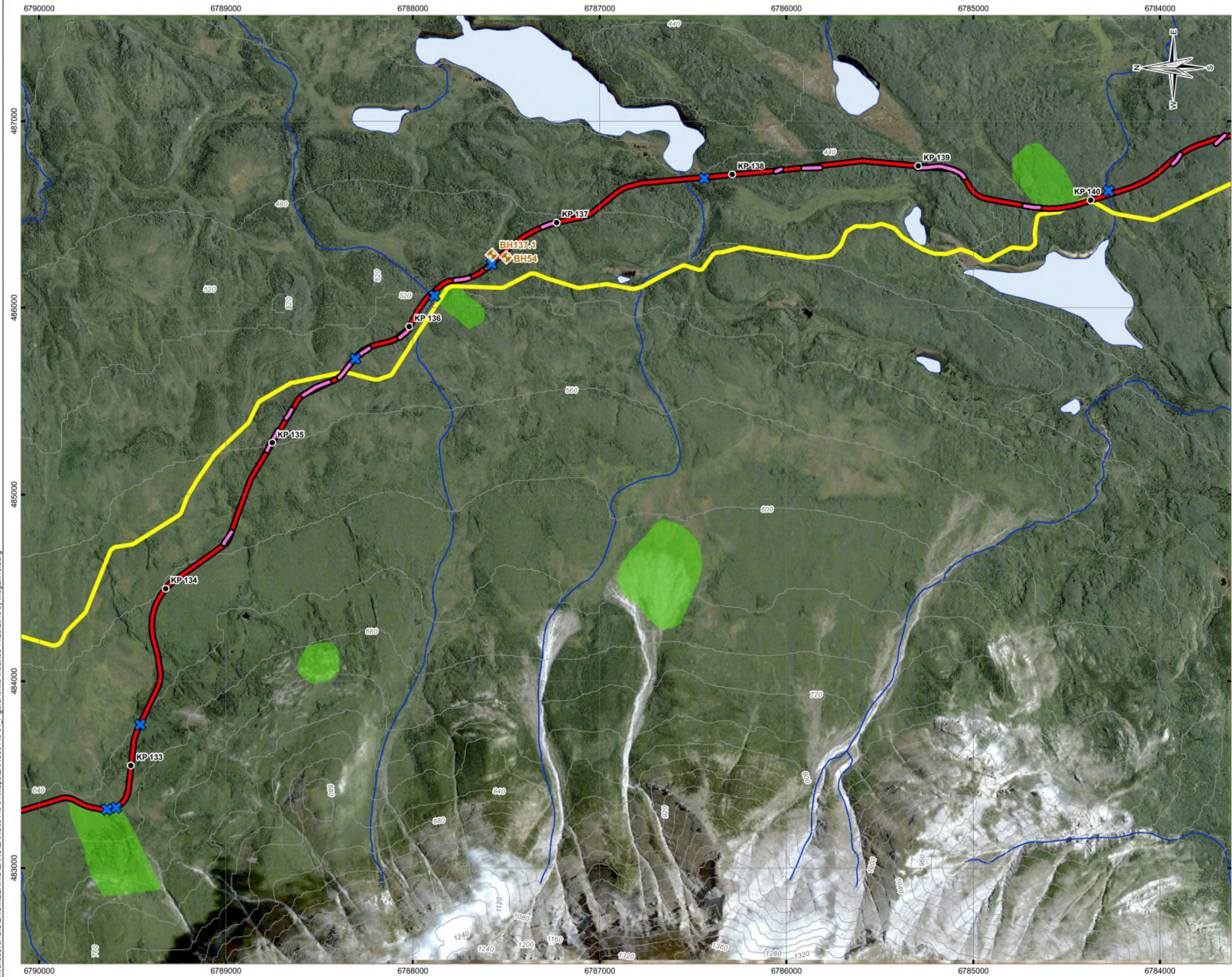
STATUS

ISSUED FOR REVIEW

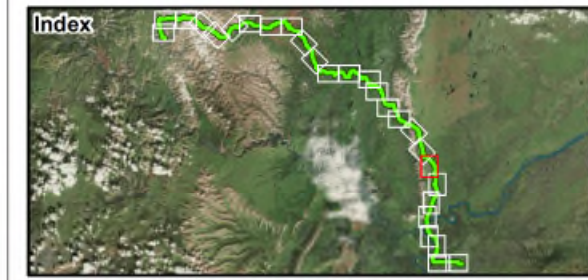
PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH
FILE NO. EARC03145-01_FigureA.mxd		
OFFICE TI-VANC	DWN MRV	CKD SL
DATE November 29, 2018	APVD TB	REV 4
PROJECT NO. ENG.EARC03145-01		A19



- LEGEND
- Access Road Kilometre Marker
 - 📍 2018 Borehole (Tetra Tech, 2018)
 - 📍 2014 Borehole (Tetra Tech EBA, 2014)
 - 📍 2012 Borehole (SNC-Lavalin, 2012)
 - 📍 2014 Testpit (Tetra Tech EBA, 2014)
 - 📍 2014 Testpit (Allnorth, 2014)
 - 🏠 Camp/Laydown
 - ✕ Watercourse Crossing
 - 🔴 Prairie Creek Access Road (November 2018)
 - 🟡 Potential Permafrost Section
 - 🟡 Proposed Winter Road Alignment
 - 🟢 Nahanni National Park Reserve Boundary
 - 🟢 Potential Borrow Source
 - 🏞 Contour (40 m)
 - 🌊 Watercourse
 - 💧 Waterbody



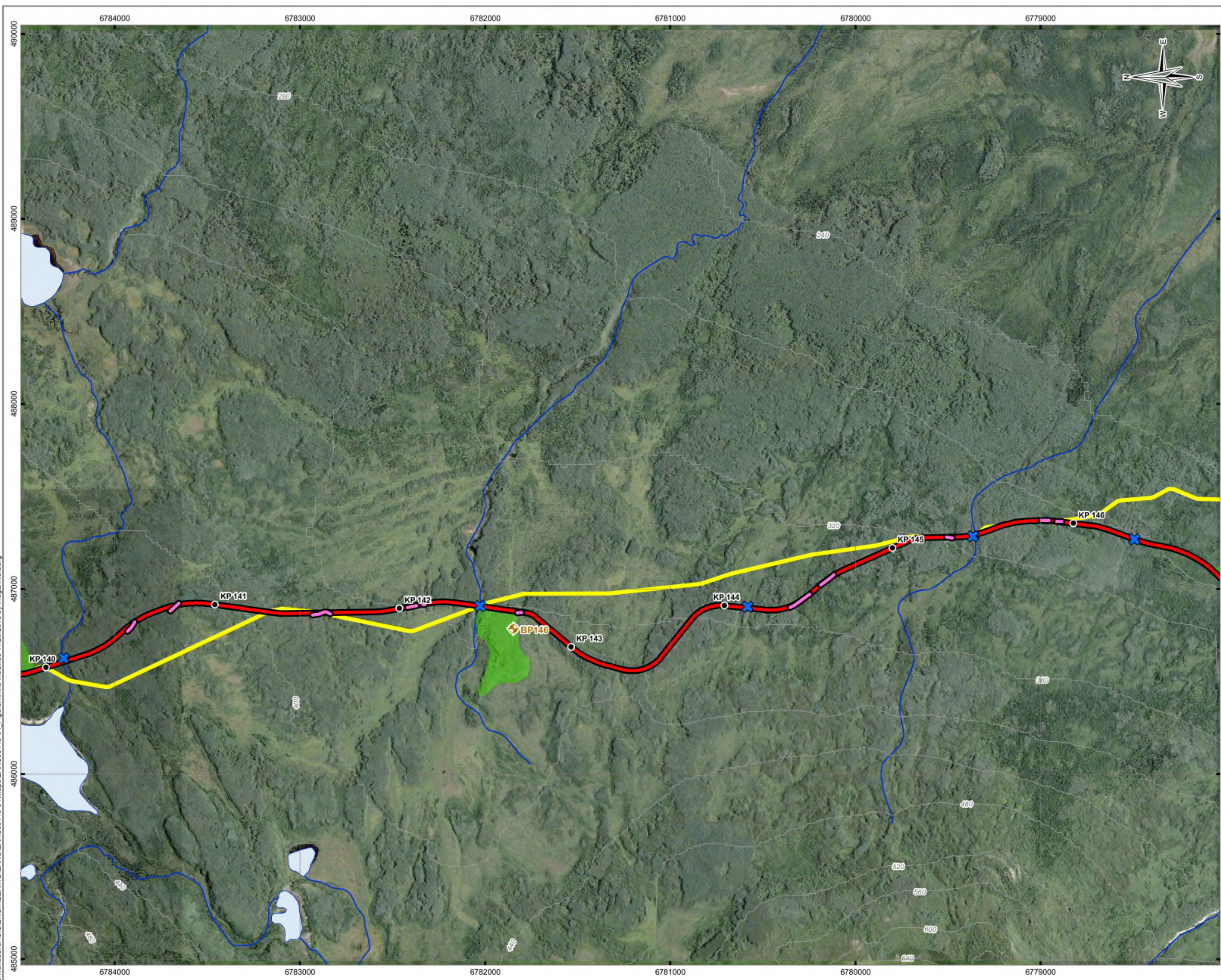
NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

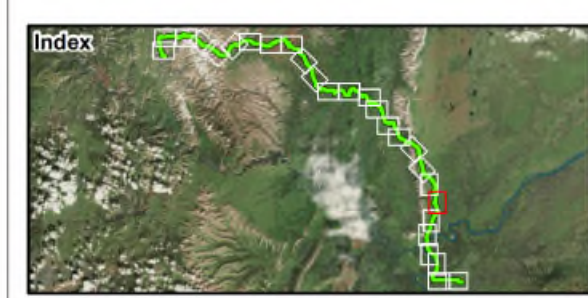
Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION		
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH		
FILE NO. EARC03145-01_FigureA.mxd				
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01		A20	



LEGEND

- Access Road Kilometre Marker
- 📍 2018 Borehole (Tetra Tech, 2018)
- 📍 2014 Borehole (Tetra Tech EBA, 2014)
- 📍 2012 Borehole (SNC-Lavalin, 2012)
- 📍 2014 Testpit (Tetra Tech EBA, 2014)
- 📍 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- 📏 Contour (40 m)
- 🌊 Watercourse
- 💧 Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007

STATUS
ISSUED FOR REVIEW

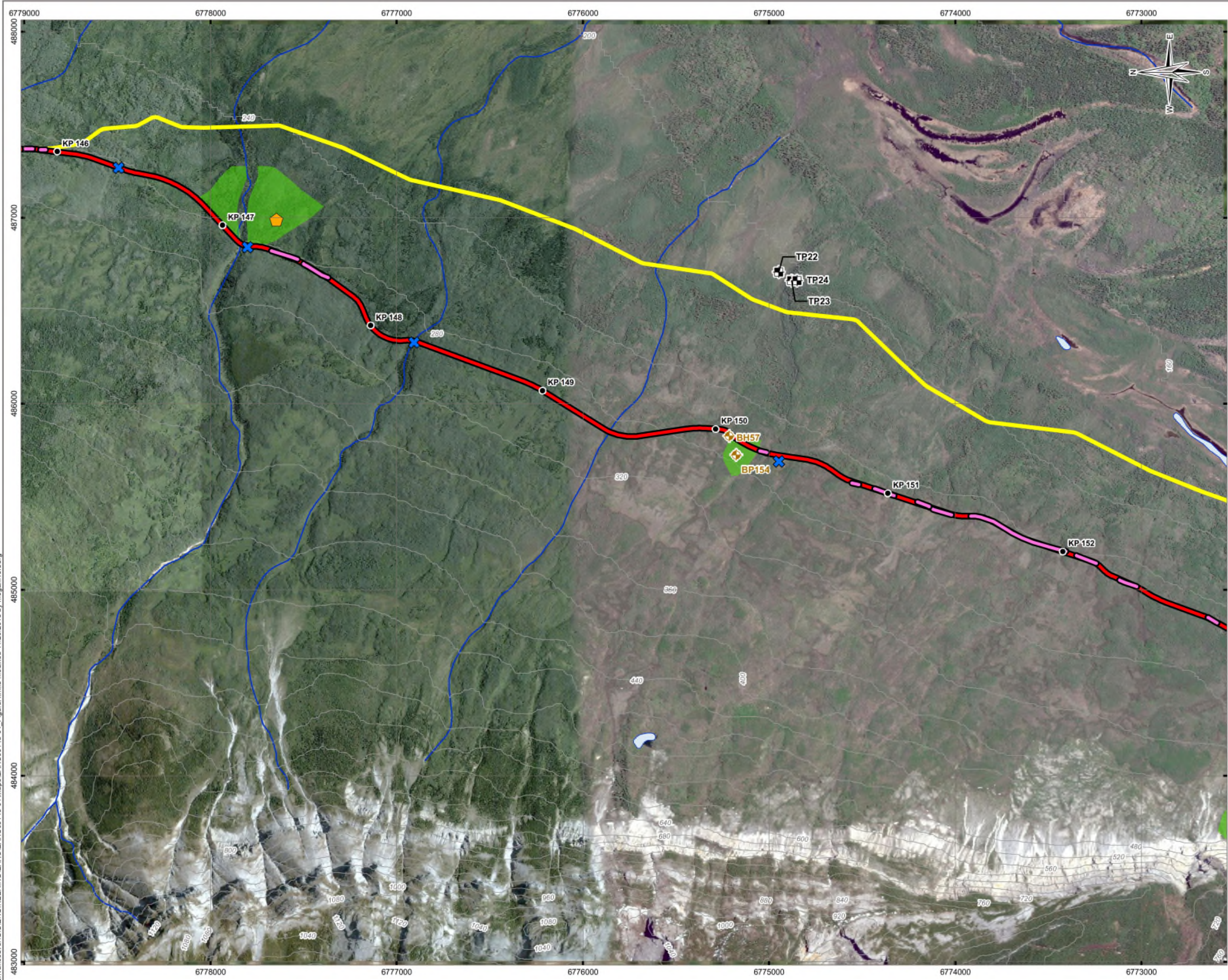
PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT CANADIAN ZINC CORPORATION	
Scale: 1:20,000 400 200 0 400 Metres				TETRA TECH	
FILE NO. EARC03145-01_FigureA.mxd					
OFFICE TI-VANC		DWN MRV	CKD SL	APVD TB	REV 4
DATE November 29, 2018		PROJECT NO. ENG.EARC03145-01			

A21

Q:\Vancouver\GIS\ENGINEERING\EARC\EARC03145-01\FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- 📍 2018 Borehole (Tetra Tech, 2018)
- 📍 2014 Borehole (Tetra Tech EBA, 2014)
- 📍 2012 Borehole (SNC-Lavalin, 2012)
- 📍 2014 Testpit (Tetra Tech EBA, 2014)
- 📍 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- ⤵ Contour (40 m)
- 🌊 Watercourse
- 💧 Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007-2015

STATUS

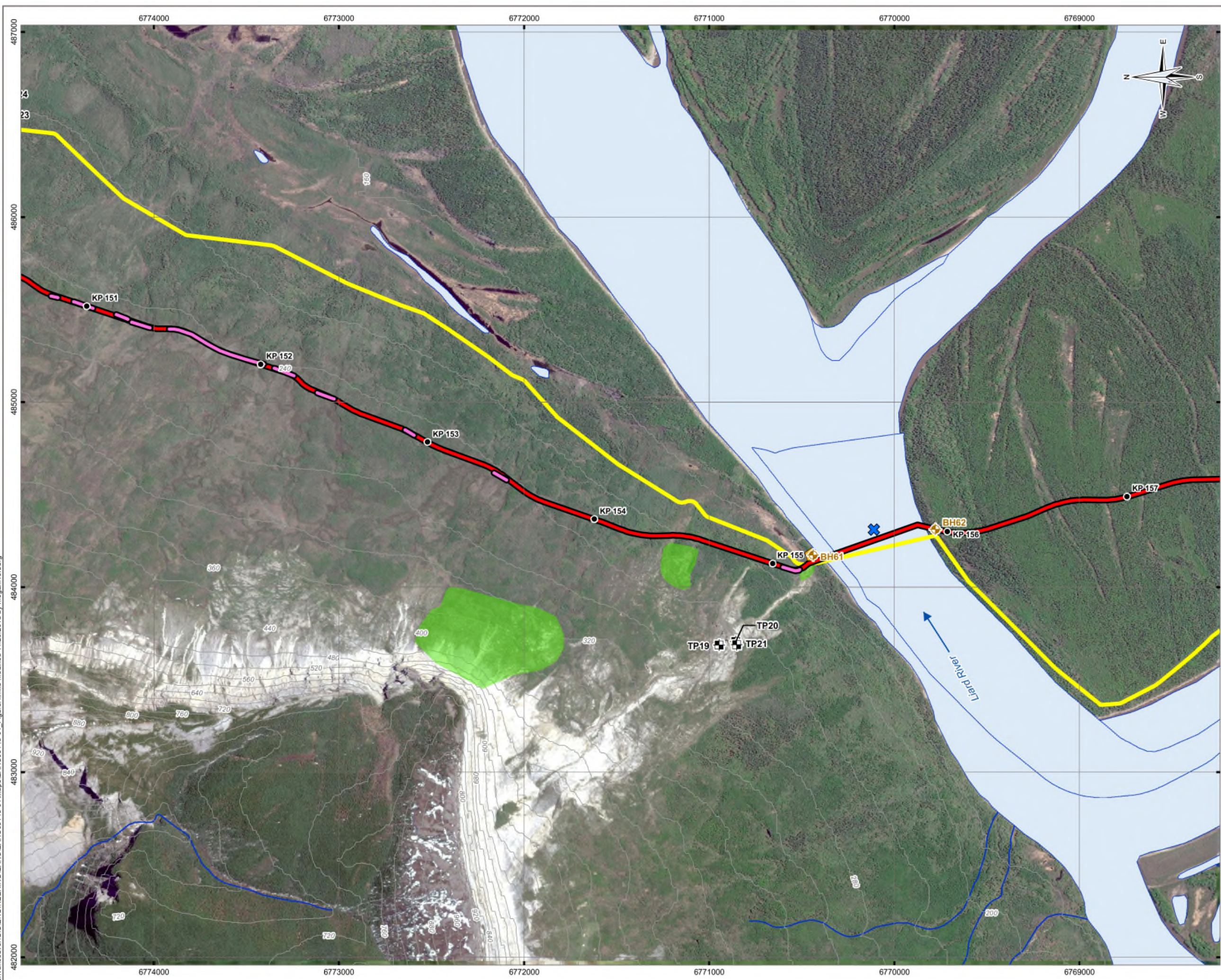
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

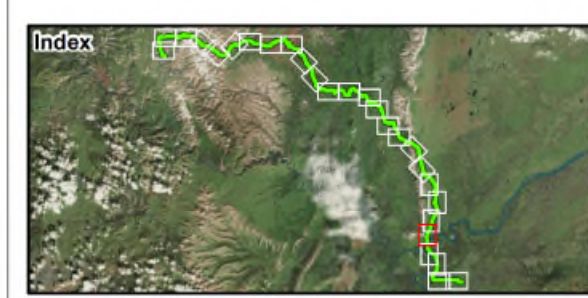
PROJECTION UTM Zone 10	DATUM NAD83	CLIENT 			
Scale: 1:20,000 400 200 0 400 Metres					
FILE NO. EARC03145-01_FigureA.mxd		A22			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				

Q:\Vancouver\GIS\ENGINEERING\EARC03145-01\Maps\EARC03145-01_FigureA.mxd modified 11/29/2018 by megan.verburg



LEGEND

- Access Road Kilometre Marker
- ⬮ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ⬮ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- ⬮ Camp/Laydown
- ⬮ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▬ Nahanni National Park Reserve Boundary
- ▬ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



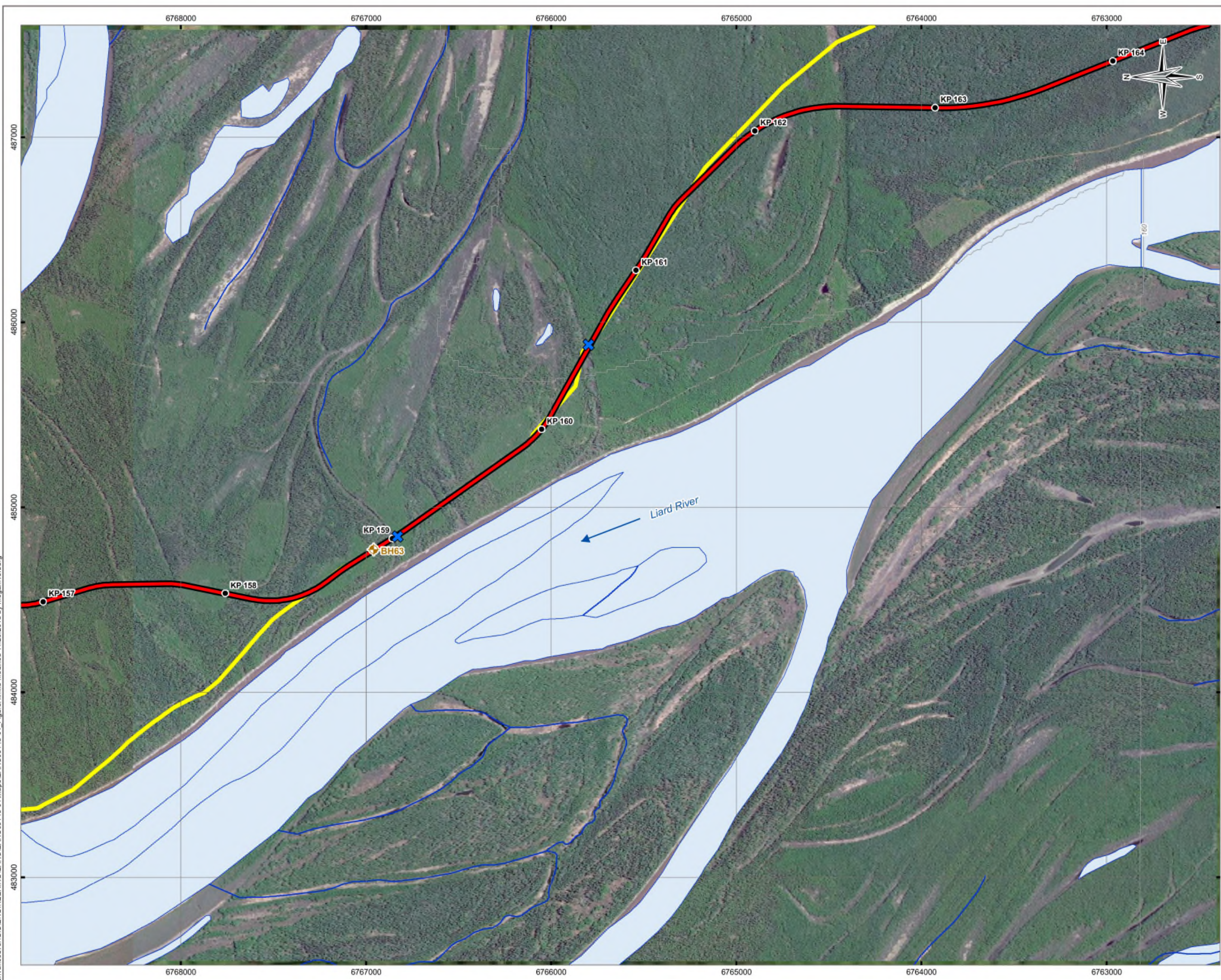
NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2015

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT 			
Scale: 1:20,000 400 200 0 400 Metres					
FILE NO. EARC03145-01_FigureA.mxd		A23			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				



LEGEND

- Access Road Kilometre Marker
- 📍 2018 Borehole (Tetra Tech, 2018)
- 📍 2014 Borehole (Tetra Tech EBA, 2014)
- 📍 2012 Borehole (SNC-Lavalin, 2012)
- 📍 2014 Testpit (Tetra Tech EBA, 2014)
- 📍 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✕ Watercourse Crossing
- 🔴 Prairie Creek Access Road (November 2018)
- 🟡 Potential Permafrost Section
- 🟡 Proposed Winter Road Alignment
- 🟢 Nahanni National Park Reserve Boundary
- 🟢 Potential Borrow Source
- ⤵ Contour (40 m)
- 🌊 Watercourse
- 🌊 Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2015

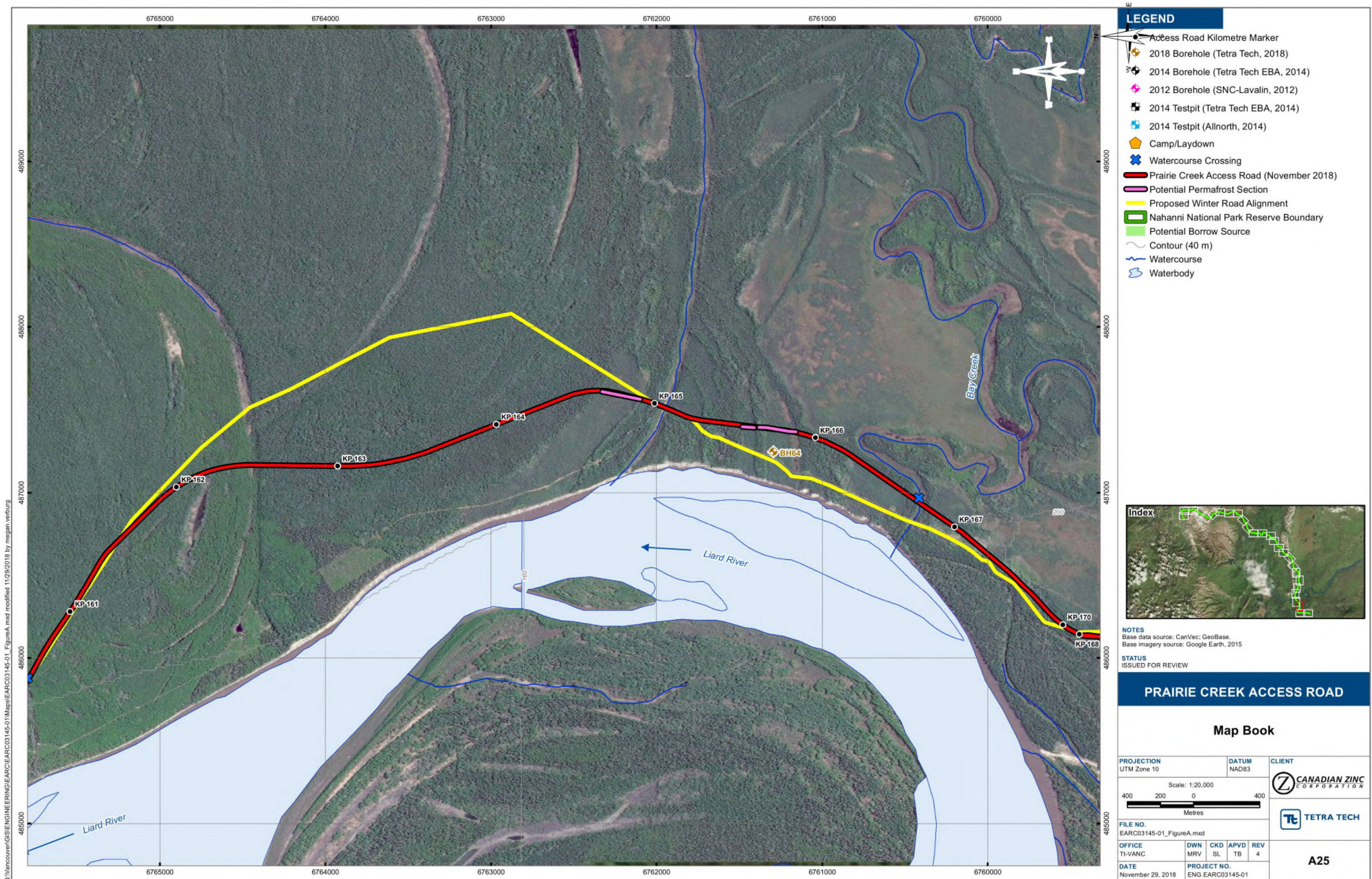
STATUS

ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT 			
Scale: 1:20,000 400 200 0 400 Metres					
FILE NO. EARC03145-01_FigureA.mxd		A24			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				





LEGEND

- Access Road Kilometre Marker
- ✦ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ✦ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✖ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- Contour (40 m)
- Watercourse
- Waterbody



NOTES
Base data source: CanVec; GeoBase.
Base imagery source: Google Earth, 2007-2015

STATUS
ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT CANADIAN ZINC CORPORATION		
Scale: 1:20,000 400 200 0 400 Metres		TETRA TECH		
FILE NO. EARC03145-01_FigureA.mxd				
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01		A26	



LEGEND

- Access Road Kilometre Marker
- ✚ 2018 Borehole (Tetra Tech, 2018)
- ⬮ 2014 Borehole (Tetra Tech EBA, 2014)
- ✚ 2012 Borehole (SNC-Lavalin, 2012)
- ⬮ 2014 Testpit (Tetra Tech EBA, 2014)
- ⬮ 2014 Testpit (Allnorth, 2014)
- 📍 Camp/Laydown
- ✚ Watercourse Crossing
- ▬ Prairie Creek Access Road (November 2018)
- ▬ Potential Permafrost Section
- ▬ Proposed Winter Road Alignment
- ▭ Nahanni National Park Reserve Boundary
- ▭ Potential Borrow Source
- ~ Contour (40 m)
- ~ Watercourse
- ~ Waterbody

Index

NOTES

Base data source: CanVec; GeoBase.
Base imagery source: Bing Maps Aerial

STATUS

ISSUED FOR REVIEW

PRAIRIE CREEK ACCESS ROAD

Map Book

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT 			
Scale: 1:20,000 400 200 0 400 Metres					
FILE NO. EARC03145-01_FigureA.mxd		A27			
OFFICE TI-VANC	DWN MRV		CKD SL	APVD TB	REV 4
DATE November 29, 2018	PROJECT NO. ENG.EARC03145-01				

APPENDIX B

NT-NU SPILL REPORT FORM



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
 TEL: (867) 920-8130
 FAX: (867) 873-6924
 EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR		REPORT TIME		<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____
	OCCURRENCE DATE: MONTH – DAY – YEAR		OCCURRENCE TIME			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION <input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE		LONGITUDE			
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
G	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION			
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE	
REPORT LINE USE ONLY						
N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER	
	STATION OPERATOR			YELLOWKNIFE, NT	(867) 920-8130	
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC				SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS		
LEAD AGENCY						
FIRST SUPPORT AGENCY						
SECOND SUPPORT AGENCY						
THIRD SUPPORT AGENCY						

APPENDIX C

IMMEDIATE REPORTABLE SPILL QUANTITIES

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.

APPENDIX D

LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner

consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

PRAIRIE CREEK ACCESS ROAD

