Advanced Exploration Technical Proposal
Roughrider Property
Rio Tinto Canada Uranium Corp.

Submitted by:

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Submitted to:

Saskatchewan Ministry of Environment

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Table of Contents

Application (Submitted electronically with the technical proposal to EA.applications@gov.sk.ca)

List of Tables

List of Figures

1 Reason for Submission

1.1 Introduction

Rio Tinto Canada Uranium Corporation is seeking Ministerial Approval pursuant to the Saskatchewan *Environmental Assessment Act* (Chapter E-10-1) to construct, operate and decommission the Roughrider Advanced Exploration Program in the Athabasca Basin, approximately 7 km north of Points North Landing, a service centre at the terminus of Provincial Highway No. 905, approximately 440 km north of La Ronge and approximately 700 km north of Saskatoon (Figure 1).

The Roughrider Advanced Exploration Program is an integral component of Rio Tinto Canada Uranium Corporation's investigation of the technical, environmental and commercial viability of developing the uranium deposits located within the boundaries of the Roughrider mineral claims.

1.2 Purpose of Submission

As a world leader in finding, mining and processing the Earth's mineral resources, Rio Tinto believes that excellence in environmental performance and stewardship is essential to our business success. To that end, we believe that our planning and development must be based on a thorough assessment of the effects of our activities in advance. In addition, certification of all applicable activities to International Standards Organization (ISO) 14001 Environmental Management standards is mandatory at all Rio Tinto operations.

In order to meet these principles, Rio Tinto believes that it must undertake a thorough environmental and social impact assessment of any proposed development in order to systematically evaluate the ecological, socio-economic and cultural aspects of the activity. We also believe that such an assessment must be conducted in an open and transparent manner and in a manner that includes an appropriate level of community, regulatory and public input and review.

This Roughrider Project Advanced Exploration Technical Proposal is being submitted to the MOE in order to initiate the processes necessary to meet the requirements of section 9 of the Saskatchewan *Environmental Assessment Act* in order to meet the principles noted above.

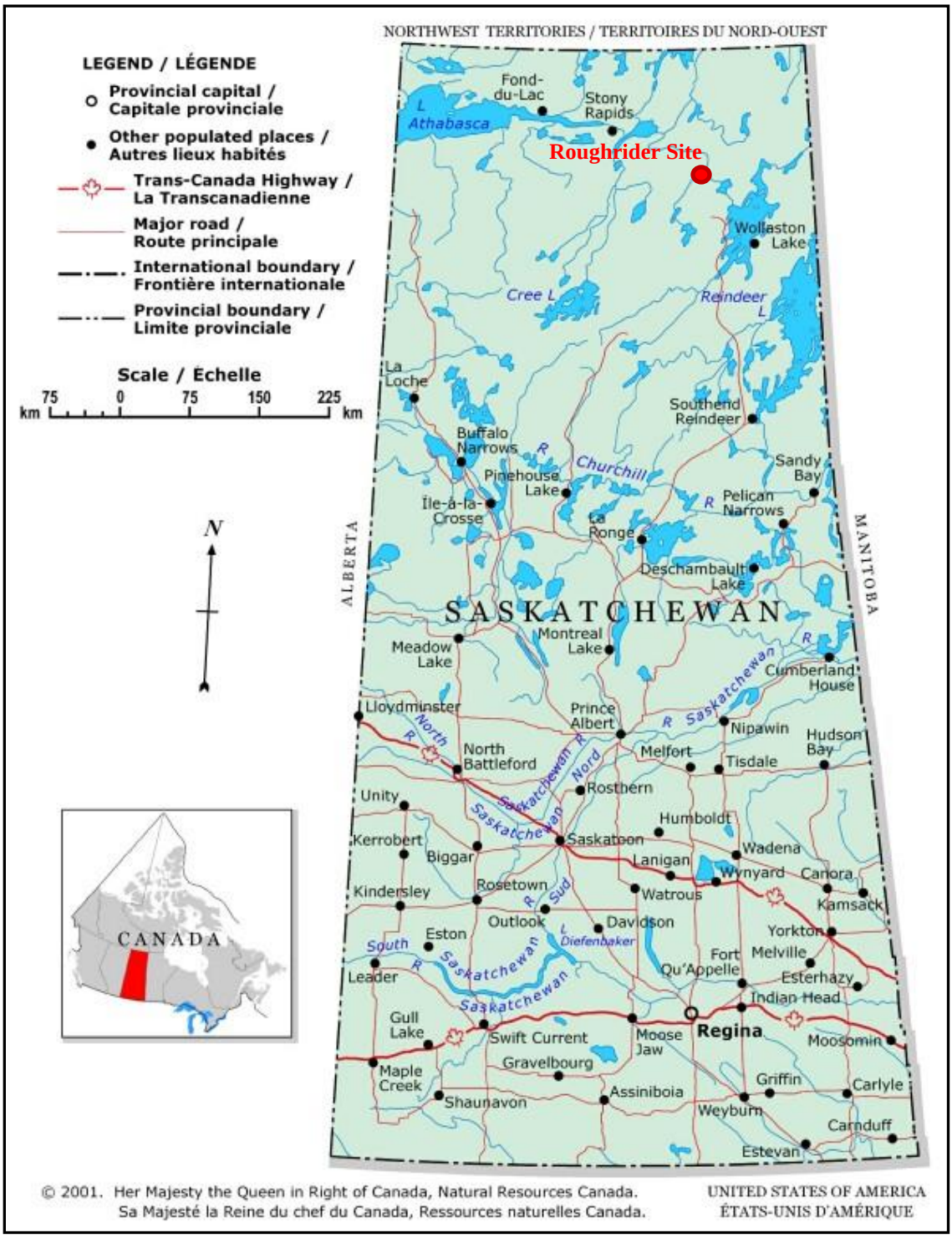

Figure 1: RTCU Roughrider Project Location

2 Proposed Advanced Exploration

2.1.1 Roughrider Property

The RTCU Roughrider property is located in the eastern Athabasca Basin of northern Saskatchewan, Canada. It is located approximately 7 km north of Points North Landing. (Figure 1)

The Roughrider Project comprises one mineral lease (ML-5547) which covers an area of approximately 598 ha. The project area has an irregular shape with a north-south dimension of a maximum of 2.5 km along its eastern boundary and east-west dimension of a maximum of 3 km. (Figure 2)

2.1.2 Project Location

The Roughrider project core camp facility is currently located within the mineral lease, on the shore of the northeast bay of South McMahon Lake and is located at 556,656 m East and 6,465,610 m North Universal Transverse Mercator (UTM), Zone 13, NAD83 datum or Latitude 58.3275º North and Longitude 104.0325º West (WGS84 datum).

Diamond drilling from surface has to date identified three separate ore bodies, referred to as the West, East, and Far East Zones at depths ranging from approximately 200 to 400 m. (Figure 3)

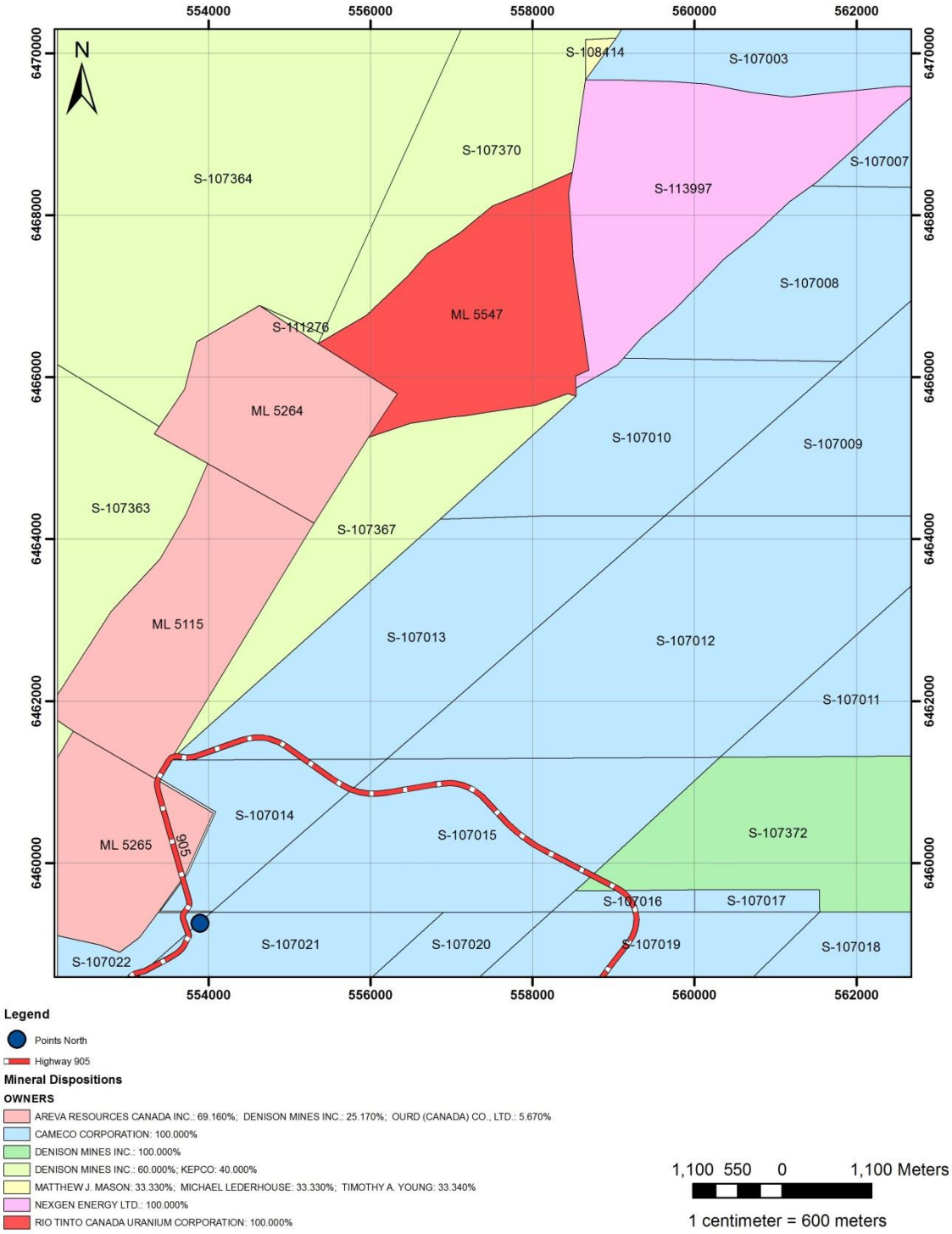

Figure 2: RTCU Roughrider District Land Tenure

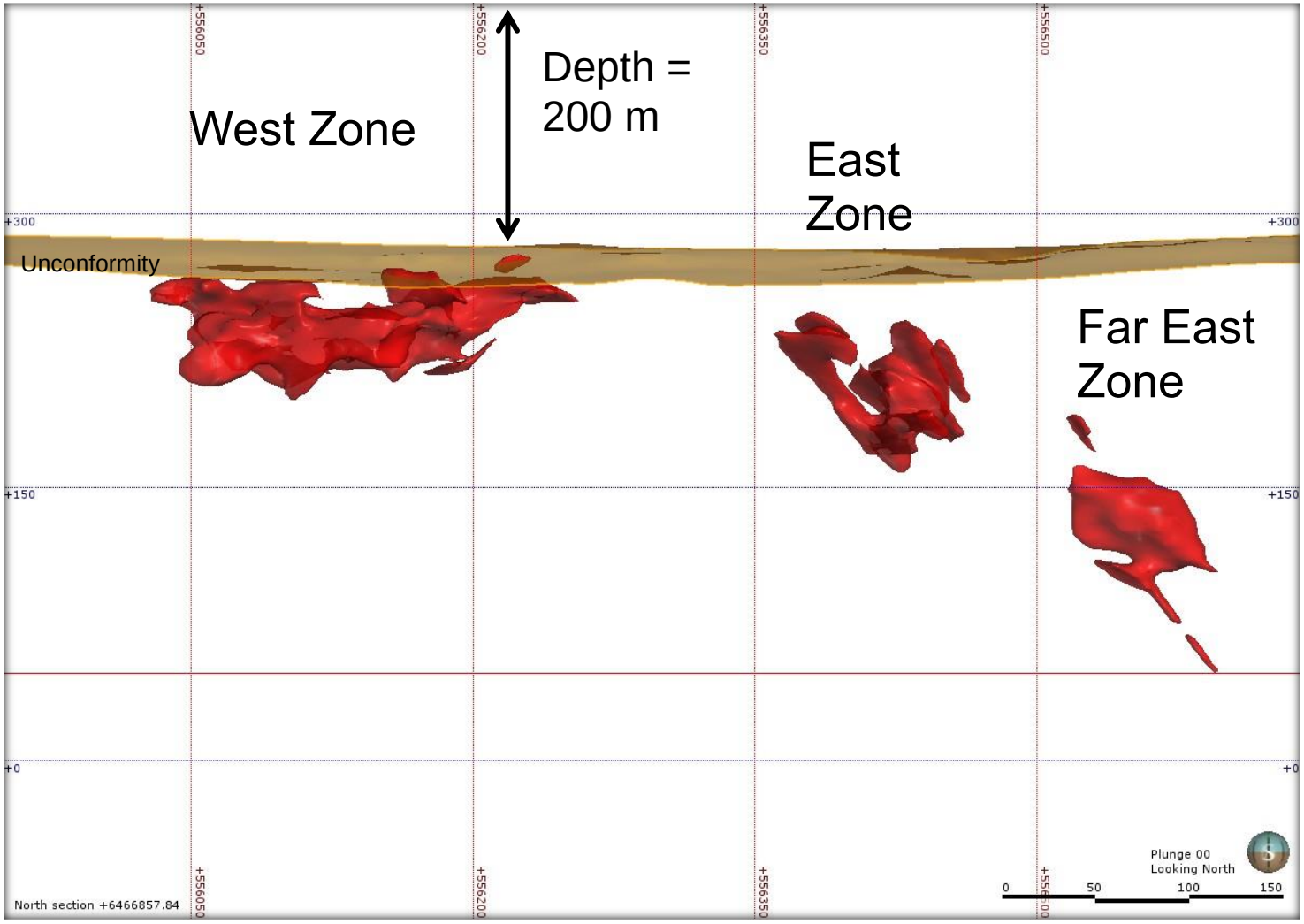

Figure 3: RTCU Roughrider Ore Zones

2.1.3 Scope of Project

In general terms, the Roughrider Advanced Exploration Program being proposed will consist of:

- The upgrade of approximately 7.5 km of an existing exploration trail (no new stream crossings required);
- The development and operation of an exploration shaft including hoisting and ventilation;
- The development of underground drifts to allow for exploration drilling. All drifts will be developed in competent rock at least 20 meters away from the ore bodies;
- The operation of appropriate underground and surface water management infrastructure;
- The operation of a water treatment facility including settling and monitoring ponds;
- The surface storage of a maximum of approximately 155,000 tonnes of development rock;
- The temporary surface storage of a maximum of 38,750 tonnes of "mineralized " (or "special") development rock;
- A treated effluent discharge pipeline;
- The construction and operation of various support facilities including:
    - Administration/office/mine dry facility;
    - Freeze plant;
    - Maintenance shop;
    - Freshwater intake;
    - Explosive storage magazine(s);
    - Electric generating capacity;
    - Fuel (diesel, gasoline and propane) storage facilities;
    - Concrete batch plant;
    - Cold storage building(s);
    - Borrow area(s);
    - Laydown areas;
    - Waste management area (conventional); and,
    - Camp with associated infrastructure (i.e. freshwater intake, sewage and domestic waste management facilities) to accommodate approximately 135 persons.
- Exploration drilling from the underground drifts ("remote drilling") to improve characterization of mineralization and understanding of ore bodies;
- The appropriate packaging and transport of all samples to accredited laboratories for analysis, testing and appropriate disposal.

2.1.4 Need for the Program

The information gained from the Advanced Exploration Program as proposed will provide significant "real life" data (as opposed to that provided by modelling) for the design of development and mitigation measures, equipment and infrastructure to ensure as low as reasonably achievable risk

to worker health and safety (both radiological and conventional) and the environment. It will also assist in the development of more robust action plans to address unanticipated events during the development and operation of a producing uranium mine should a decision to proceed with a production mine be made in the future.

Specifically, proceeding with the Advanced Exploration Program as proposed will allow RTCU to gain:

- More accurate knowledge of geotechnical conditions in development areas underground and within the ore bodies themselves. This information will allow for improved design, construction and safety during the development and operation of a producing uranium mine.
- More accurate knowledge of the hydrogeological regime at depth and of the potential impact of underground development on that regime (i.e. water inflow quantity and quality). This information will allow for improved design, construction and safety of mine-water management facilities underground and water treatment facilities on surface during the operation of a production mine.
- Enhanced characterization of the ore bodies through accurate, targeted drilling and sampling of the ore bodies. A more accurate characterization of the ore bodies will allow for:
    - Enhanced understanding of processing (milling) requirements for the ores; and,
    - A more accurate characterization of potential waste streams (tailings characterization and mill effluent quality) that could potentially result for a production mine and mill.

  This information will result in improved design and operation of the necessary waste management processes and infrastructure required to support a producing mine.
- Better understanding of the resource. The ore is contained in zones (and likely additional target areas that have not been defined) with highly variable concentrations of uranium over short distances. Drilling into the ore bodies and targeted zones from closer proximity than the surface will:
    - Avoid drill bit wandering allowing us to hit the region where we need additional information;
    - Limit the loss of core due to highly altered ground conditions; and
    - Better model the in situ resource.

  This information will result in a better understanding of the resource, be critical to Rio Tinto internal decision making on resource development and improve the planning and scheduling for production mining, mill capacity and tailings management.

2.1.5 Program Schedule

Figure 4 provides an illustration of the current program schedule.

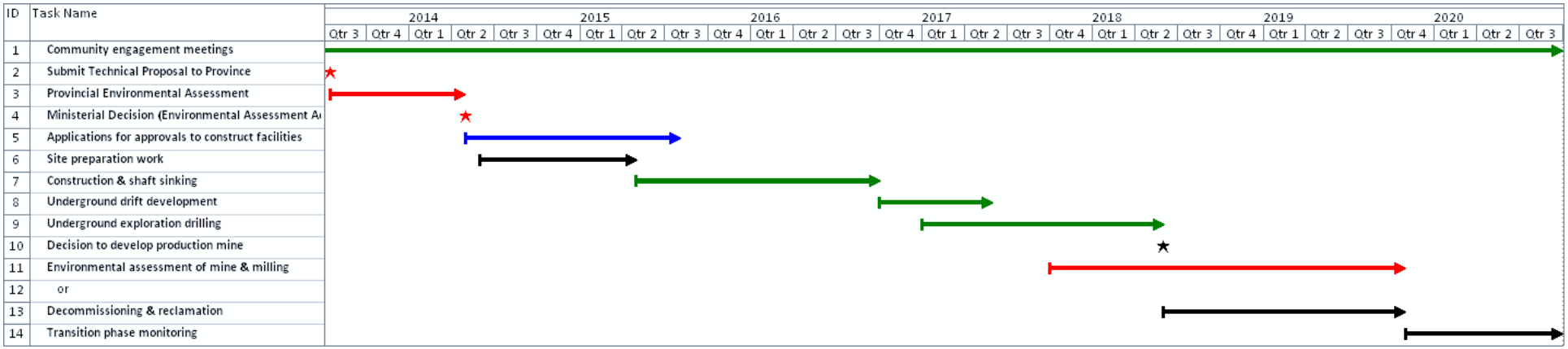

Figure 4: Roughrider Advanced Exploration Program Schedule

2.1.6 Program Operators

Rio Tinto Canada Uranium Corporation (RTCU) will be the project operator.

RTCU is a Saskatchewan based resource company whose major focus is the long-term, systematic uranium exploration and development of its mineral properties in Northern Saskatchewan.

The Rio Tinto Canada Uranium Corporation office for Saskatchewan is located at:

Rio Tinto Canada Uranium Corporation
233 Faithful Crescent
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Directors and Officers of the corporation are:

Dwight Gomes	Director, President
Jocelin Paradis	Director, Vice President Tax
Julie Parent	Director, Corporate Secretary
Stephen Scott	Director
Alexander (Sasha) Serebryakov	Director, Chief Financial Officer
Simon Charles Wensley	Director, Chief Executive Officer
Jay Fredericks	Vice President

2.1.7 Site Management

Management of all activities at the Roughrider Advanced Exploration site will be the direct responsibility of employees of Rio Tinto Canada Uranium Corp. although a number of specific activities may be contracted out. These are likely to include the establishment of the shaft and exploration drifts, drilling underground, the transport of the materials to the site and the maintenance and operation of the camp.

3 Regulatory Context

3.1 Provincial

3.1.1 Saskatchewan *Environmental Assessment Act*

Section 8 of the Saskatchewan Environmental Assessment Act specifies that no person shall proceed with a development until he/she has received ministerial approval. A "development" is defined within the Act as:

> *"…any project, operation or activity or any alteration or expansion of any project, operation or activity which is likely to:*
>
> *(i) have an effect on any unique, rare or endangered feature of the environment;*
> *(ii) substantially utilize any provincial resource and in so doing pre-empt the use, or potential use, of that resource for any other purpose;*
> *(iii) cause the emission of any pollutants or create by-products, residual or waste products which require handling and disposal in a manner that is not regulated by any other Act or regulation;*
> *(iv) cause widespread public concern because of potential environmental changes;*
> *(v) involve a new technology that is concerned with resource utilization and that may induce significant environmental change; or*
> *(vi) have a significant impact on the environment or necessitate a further development which is likely to have a significant impact on the environment."*

Based on the extensive baseline biophysical investigations conducted in 2011 and 2012, combined with an assessment of the potential impacts of the proposed activities (including the decommissioning and reclamation of the site) and consultations conducted to date:

- The Roughrider Advanced Exploration Program will not have a long term permanent effect on any unique, rare or endangered feature of the environment;
- The Roughrider Advanced Exploration Program will not reduce the total provincial resource (uranium) and therefore is not likely to pre-empt the use, or potential use, of any other resource for any other purpose
- The Roughrider Advanced Exploration Program will not cause the emission of any pollutants or create by-products, residual or waste products which require handling and disposal in a manner that is not regulated by any other Act or regulation of the Province of Saskatchewan;
- The Roughrider Advanced Exploration Program is not likely to cause widespread public concern because of potential environmental changes;
- The Roughrider Advanced Exploration Program does not involve a new technology that is concerned with resource utilization or which may induce significant environmental change; and,
- The Roughrider Advanced Exploration Program will not have a significant, lasting impact on the environment or necessitate a further development which is likely to have a significant impact on the environment.

Notwithstanding these conditions, as a world leader in finding, mining and processing the Earth's mineral resources, Rio Tinto believes that excellence in environmental performance and stewardship is essential to our business success. To that end, we believe that our planning and development must be based on a thorough assessment of the effects of our activities in advance. In addition, certification of all applicable activities to International Standards Organization (ISO) 14001 Environmental Management standards is mandatory at all Rio Tinto operations.

In order to meet these principles, Rio Tinto believes that it must undertake a thorough environmental and social impact assessment of any proposed development in order to systematically evaluate the ecological, socio-economic and cultural aspects of the activity. We also believe that such an assessment must be conducted in an open and transparent manner and in a manner that includes an appropriate level of community, regulatory and public input and review and therefore have initiated the process to complete an environmental assessment pursuant to the Saskatchewan *Environmental Assessment Act*.

3.1.2 Saskatchewan Acts, Regulations & Guidelines

During all construction, operation and decommissioning activities, the Roughrider Advanced Exploration project, ancillary facilities and actions will be subject (wholly or in part) to a number of provincial Acts and regulations. RTCU intends to adhere fully to them all. The relevant Provincial Acts, regulations and guidelines include, but are not necessarily limited to:

Acts

- *The Clean Air Act*
- *The Environmental Management and Protection Act*
- *The Fisheries Act (Saskatchewan)*
- *The Forest Resource Management Act*
- *The Litter Control Act*
- *The Forest Resources Management Amendment Act*
- *The Natural Resources Act*
- *The Prairie and Forest Fire Act*
- *The Provincial Lands Act*
- *The Wildlife Act*
- *The Wildlife Habitat Protection Act*
- *The Occupational Health and Safety Act*
- *The Radiation Health and Safety Act*
- *The Reclaimed Industrial Site Act*
- *The Passenger and Freight Elevator Act*
- *The Saskatchewan Watershed Authority Act*
- *The Mineral Resources Act*
- *The Crown Minerals Act*
- *The Public Health Act*
- *The Boiler and Pressure Vessel Act*
- *The Electrical Inspection Act,* 1993, S.S. 1993, c.
- *The Electrical Licensing Act*
- *The Gas Inspection Act*
- *The Gas Licensing Act*

Regulations

- The Mineral Industry Environmental Protection Regulations
- The Saskatchewan Fisheries Regulations
- The Fisheries Regulations
- The Used Oil Collection Regulations
- The Waste Paint Management Regulations
- The Water Regulations
- The Provincial Lands Regulations
- The Litter Control Regulations
- The Wildlife Regulations
- The Forest Resource Management Regulations
- The Clean Air Regulation
- The Environmental Spill Control Regulations
- The Hazardous Substances and Waste Dangerous Goods Regulations
- The Quarrying Regulations
- The Mines Regulations
- The Occupational Health and Safety Regulations
- The Use of Electricity in Mines Regulations
- The Reclaimed Industrial Sites Regulations
- The Groundwater Regulations
- The Mineral Disposition Regulations
- The Health Hazard Regulations
- The Plumbing and Drainage Regulations
- Regulations Respecting The Design, Construction, Installation and Use of Boilers and Pressure Vessels
- Regulations Respecting Compressed Gas Pressure Vessels
- Regulations Respecting Examinations and Certificates of Engineers and Firemen
- Regulations Respecting the Welding of Boilers, Pressure Vessels and Pressure Piping
- The Electrical Inspection Regulations
- The Use of Electricity in Mines Regulations
- The Canadian Electrical Code (Adoption) Regulations,
- The Canadian Electrical Code (Saskatchewan Amendments) Regulations
- The Gas Inspection Regulations
- The Gas Licensing Regulations,
- The Passenger and Freight Elevator Regulations
- The Radiation Health and Safety Regulations

Guidelines & Policies

- *Surface Water Quality Objectives*, Interim Edition, July, 2006, Saskatchewan Environment
- *Guidelines for Northern Mine Decommissioning and Reclamation*, EPB 381, November 30, 2008, Version 6, Saskatchewan Environment
- *Reclamation Guidelines for Sand and Gravel Operators*, May 22, 2003, Saskatchewan Environment

3.1.3 Provincial Permitting

A preliminary review of provincial permit and approvals requirements for the Roughrider Advanced Exploration Program to proceed has been completed. Based on that review, the project will be

required, but may not be limited, to securing the following major provincial permits and/or approvals:

Construction

- *Forest Product Permit* - Sask. Ministry of Environment, Landscape Stewardship Branch
- *Aquatic Habitat Protection Permit* - Sask. Ministry of Environment, Landscape Stewardship Branch
- *Miscellaneous Use Permits* - Sask. Ministry of Environment, Landscape Stewardship Branch
- *Sand & Gravel Surface Lease* - Sask. Ministry of Environment, Landscape Stewardship Branch
- *Approval to Construct Highways Approach* - Sask. Ministry of Highways and Infrastructure
- *Approval to Construct Pollutant Control Facilities* - Sask. Ministry of Environment, Industrial Branch
- *Approval to Construct Storage Facility* (Hazardous Substances and Waste Dangerous Goods) - Sask. Ministry of Environment, Industrial Branch
- *Approval to Construct Water Works* (Withdrawal from surface waters) - Saskatchewan Water Security Authority

Operations

- *Approval to Operate Pollutant Control Facilities* - Sask. Ministry of Environment, Industrial Branch
- *Approval to Operate Storage Facility* (Hazardous substances and waste dangerous goods) - Sask. Ministry of Environment, Industrial Branch
- *Approval to Operate Water Works* (Withdrawal from surface waters) - Saskatchewan Water Security Authority
- *Approval to Operate Sewage Works* - Sask. Ministry of Health, Regional Health Authority &/or Sask. Ministry of Environment, Stewardship Branch
- *Approval to Operate Potable Waterworks* - Sask. Ministry of Health, Regional Health Authority &/or Sask. Ministry of Environment, Stewardship Branch
- *Approval to Operate Industrial Incinerator* -Sask. Ministry of Environment, Industrial Branch

Decommissioning & Final Closure

- *Approval to Decommission Pollutant Control Facilities* - Sask. Ministry of Environment, Industrial Branch
- *Release from Decommissioning and Reclamation* - Sask. Ministry of Environment, Industrial Branch
- *Approval of Custodial Transfer to Institutional Control* - Sask. Ministry of Economy, Energy and Resources

3.2 Federal

3.2.1 Nuclear Safety & Control Act

Section 26 of the *Nuclear Safety and Control Act* states:

> ***26.*** *Subject to the regulations, no person shall, except in accordance with a licence,*
> *(a) possess, transfer, import, export, use or abandon a nuclear substance, prescribed equipment or prescribed information;*
> *(b) mine, produce, refine, convert, enrich, process, reprocess, package, transport, manage, store or dispose of a nuclear substance;*

(c) produce or service prescribed equipment;
(d) operate a dosimetry service for the purposes of this Act;
(e) prepare a site for, construct, operate, modify, decommission or abandon a nuclear facility; or
(f) construct, operate, decommission or abandon a nuclear-powered vehicle or bring a nuclear-powered vehicle into Canada.

Under Act, a "uranium mine" is a "nuclear facility".

Under the Uranium Mines and Mills Regulations, issued pursuant to the *Nuclear Safety and Control Act*, the following relevant definitions are provided:

"*excavation site*" means a place at which uranium is moved by means of underground activities for the purpose of evaluating a potential orebody.

"*licensed activity*" means an activity described in paragraph 26(*e*) of the Act that a licence authorizes the licensee to carry on in relation to a uranium mine or mill.

"*mill*" means a facility at which ore is processed and treated for the recovery of uranium concentrate, including any tailings-handling and water treatment system associated with the facility.

"*mine*" includes an excavation site and a removal site.

"*ore*" means a mineral or chemical aggregate containing uranium in a quantity and of a quality that makes mining and extracting the uranium economically viable.

"*removal site*" means a place at which uranium is removed from its place of natural deposit by means of surface activities for the purpose of evaluating a potential orebody.

"*waste management system*" means a system for collecting, transporting, receiving, treating, processing, storing or disposing of the wastes that are produced as a result of the licensed activity at a uranium mine or mill.

The Roughrider Advanced Exploration Program as proposed will not remove uranium mineralized material from the orebodies, other than that extracted during exploration drilling (i.e. core samples), nor will it mine, produce, refine, convert, enrich, process, reprocess, package, transport, manage, store or dispose of a nuclear substance other than that acquired from exploration drilling (i.e. core samples) and retained for the purposes of characterizing the ore and testing the material to investigate processing options and characterize the resulting waste streams (tailings, tailings pore water and effluent quality).

The Roughrider Advanced Exploration Program as proposed will not remove uranium mineralized material in a quantity that will make the extraction of the uranium economically viable, will not construct or operate a facility at which ore will be commercially processed and/or treated for the recovery of uranium concentrate, and the Roughrider Advanced Exploration Program as proposed will not construct or require a tailings-handling facility or a water treatment system associated with tailings handling.

Based on this analysis, the Roughrider Advanced Exploration Program as proposed is not a "uranium mine" or a "nuclear facility" as defined by the *Act* or the Uranium Mines and Mills Regulations, and therefore does not require a license as prescribed by section 26 of the *Nuclear Safety and Control Act*.

Throughout its exploration activities at the Roughrider property RTCU has been registered with Health Canada's National Dosimetry Services (NDS) and RTCU receives quarterly exposure reports from Health Canada. These services will continue during the Proposed Advanced Exploration Program.

3.2.2 Navigable Waters Protection Act

The *Navigable Waters Protection Act (NWP Act)* is a federal law designed to protect the public right of navigation. It ensures that works constructed in navigable waterways are reviewed and regulated so as to minimize the overall impact upon navigation. *The NWP Act* includes provisions for the removal of unauthorized works or obstructions that render navigation so difficult it proves to be considered dangerous. Within the Act **"**Navigable Waters**"** are defined as including any body of water capable of being navigated by any type of floating vessel for the purpose of transportation, recreation or commerce.

Only one aspect of the proposed Roughrider Advanced Exploration Program- the freshwater intake installation in South McMahon Lake - has the potential to impact navigable waters; however the placement of the intake will in no way impede navigation due to small size of the intake in relation to the overall size of South McMahon Lake.

3.2.3 *Migratory Birds Conservation Act*

Terrestrial and aquatic baseline investigations of the Roughrider Project study area, were conducted in 2011 and 2012 by Canada North Environmental Services (CanNorth). The terrestrial and aquatic studies were designed to allow regulatory agencies to make informed decisions regarding the proposed project.

Based on these investigations and the activities proposed during the development, operation, decommissioning and reclamation of the Roughrider Advanced Exploration Program, no impact on migratory birds is anticipated as a result of the construction, operation or decommissioning of the proposed project.

3.2.4 Species at Risk Act

Database searches conducted as part of the 2011 and 2012 baseline investigations identified four federally listed wildlife species at risk or species with special conservation measures as potentially occurring within the project area. These include four mammals including wolverine (*Gulo gulo*), little brown myotis (mouse eared bat) (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), and boreal woodland caribou (*Rangifer tarandus caribou*).

In response to this, as well to internal Rio Tinto requirements, RTCU intends to adhere to *Performance Standard 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources* issued by the International Financial Corporation (IFC, 2012). This will include the development of a Biodiversity Action Plan for the life of the Roughrider project. The action plan will focus on the boreal woodland caribou (*Rangifer tarandus caribou*).

3.2.5 Explosives Act

The Roughrider Advanced Exploration Program, as proposed will require facilities for the storage of explosive materials (magazine). The facility will be in a secure location and be locked at all times with only appropriately trained and authorized personnel allowed to access the facility. In addition, the access road leading to the magazine will be within the property boundary and therefore access will be controlled and public access restricted.

The site will contain an explosives magazine and a separate magazine for blasting accessories. The magazines will be constructed and operated in accordance with federal and provincial regulations and will meet or exceed the standards set out in the May 2001 edition (or subsequent iterations) of *Storage Standards for Industrial Explosives* published by the Explosives Regulatory Division of the Department of Natural Resources, Government of Canada and any terms and conditions imposed by the required permits and approvals. Neither an Explosives Factory License nor an ANFO Manufacturing Certificate will be required for the Roughrider Advanced Exploration Program.

3.2.6 Canadian Transportation Act

The Roughrider Advanced Exploration Program does not impact any rail line crossing and does not propose the relocation of a rail line, rail crossing or propose any other activity related to the *Canadian Transportation Act*.

3.2.7 Indian Act and *Natural Resource Act*

The Roughrider Advanced Exploration Program will not be located on, nor does it require access to, through or over any federal lands such as national parks, First Nation reserves or national defence bases.

3.2.8 Fisheries Act

Under the federal *Fisheries Act*, "fish habitats" are defined as those parts of the environment "on which fish depend, directly or indirectly, in order to carry out their life processes". The Act also defines "fish" to include all the life stages of "fish, shellfish, crustaceans, marine animals and marine plants". Accordingly, pursuant to the Act, the *Department of Fisheries and Oceans Policy for the Management of Fish Habitat* (DFO, 1991) is applied to all projects and activities, large and small, in or near the water, that could alter, disrupt or destroy fish habitats, by chemical, physical or biological means, thereby potentially undermining the economic, employment and other benefits that flow from Canada's fisheries resources.

No aspects of the Roughrider Advanced Exploration Program (other than the installation of the fresh water intake and treated effluent discharge), including any upgrade of the existing access trail to a road, will alter, disrupt or destroy fish habitat. The installation of the temporary floating intake will be completed in accordance with the DFO's 'Timing Window' Saskatchewan Operational Statement which specifies when no in-water work is to occur. The construction of the effluent discharge will result in a temporary disturbance to fish habitat during the actual installation activity. This will be successfully mitigated at the time of installation as recently demonstrated by the installation of the treated effluent discharge at the Cigar Lake uranium mine.

It is important to note that initial consultation with the primary stakeholder communities for the Roughrider project during a January 2013 Communities Environmental Workshop, identified the protection of lakes and streams during development and operations as one of the most important criteria from the stakeholder communities' perceptive. This criterion was reinforced during subsequent consultations with community leadership and members and by a June 2013 workshop held with the North Saskatchewan Environmental Quality Committee. In response to this significant criterion, from the onset of planning, RTCU has established a 100 meter buffer zone along the shoreline of all water bodies in the project area and ensures that none of the major facilities (other than access roads) associated with the Advanced Exploration Program are allowed to encroach within that 100 m buffer zone.

3.2.9 Federal Policy on Wetland Conservation

RTCU is also cognizant that the "Federal Policy on Wetland Conservation" (1991), promotes the wise use of wetlands and protection through adequate consideration of wetland concerns in environmental assessments of development projects. The objective of the Policy is to promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and into the future.

In its planning and implementation, RTCU will take all reasonable measures to avoid wetlands, where feasible, irrespective of whether they are wet or dry, and, when feasible establish buffers or setbacks based on the 1-in-100 year high water mark. In addition, at the end of operations, RTCU will reclaim wetland areas within the project area in a manner that restores, to the extent possible, the function, type and area of wetlands lost directly as a result of this project. The overall goal will be to promote the maintenance of the functions and values derived from wetlands throughout the project area.

4 Summary of Historical Property Activities

4.1 Exploration History

The Roughrider Project property comprises one mineral leases (ML-5547) which covers an area of approximately 598 ha. The project area has an irregular shape with a north-south dimension of a maximum of 2.5 km along its eastern boundary and east-west dimension of a maximum of 3 km.

Between 1976 and January 2004, the property now referred to as "Roughrider" was held by a variety of companies including Gulf Minerals, Numac Oil and Gas, Esso Minerals, Bow Valley Industries, Asmera Oil Company, Saskatchewan Mining development Corporation, Cameco Corporation, and the Dawn Lake Joint Venture consisted of Cameco, Cogema Resources Inc., PNC Exploration Canada Ltd., and Kepco Canada Ltd.

The mineral claim associated with the current Roughrider property was acquired by Bullion Fund on January 30, 2004. Bullion Fund sold a 90% interest in the property to Roughrider on September 10, 2004 and retained a 10% carried interest. On August 10, 2006, Roughrider became a wholly owned subsidiary of Hathor Exploration Ltd. On April 12, 2007, Terra purchased an 8% carried working interest from Bullion Fund for seven claims comprising 56,360 acres over two separate projects (Midwest Northeast and South Russell) in the Athabasca Basin. The claims included mineral claim S-107243. On March 24, 2008, Terra announced that it had purchased Bullion Fund's remaining 2% carried working interest in mineral claim S- 107243.

The Roughrider West Zone was discovered by Hathor during the winter drilling program in February 2008. The Roughrider East Zone was discovered during the summer drilling program in September 2009 and was further delineated by drilling during the winter and summer of 2010. A third zone, the Roughrider Far East Zone, was discovered during the winter drilling program in February 2011.

By September 2011, the Roughrider West Zone had been defined by approximately 149 diamond drill holes which defined a northeast-southwest strike length of approximately 200 m with an across-strike extent of 100 m. Uranium mineralization occurs at depths of 190 m to 290 m below surface. Mineralization in the West Zone is confined to an east west trending corridor of deformation that dips to the north.

By September 2011, the Roughrider East Zone had been defined by approximately 88 diamond drill holes, and has a surface projection of approximately 120 m long in a north-easterly direction, which corresponds to a down dip length of approximately 125 m, and an across-strike extent of up to 70 m. Uranium mineralization has a vertical extent of up to eighty to 100 m, starting at depth approximately 250 m from surface, and some 30 m to 50 m below the unconformity. This is slightly deeper than the Roughrider West Zone.

On January 12, 2012 Rio Tinto announced that it had, through an indirect wholly-owned subsidiary, acquired Hathor Exploration Ltd. and subsequently Rio Tinto Canada Uranium Corporation (RTCU) was formed.

RTCU conducted exploration in the winter of 2012. A total of 4 diamond drill holes were completed and one restart for a total of 2,070 m. The program comprised 2 diamond drill rigs which were dedicated to exploration targets.

In the summer of 2012, a total of 32 diamond drill holes were completed (including piezometers for hydrogeology and water quality testing) and 3 restarts for a total of 35 drill holes for a total of 16,041 m. The program comprised 4 diamond drill rigs, of which three were dedicated to exploration targets and one dedicated to drilling hydrogeological test work. Other exploration activities on the property during this season were a soil sampling program and ground gravity survey.

Exploration conducted in the winter of 2013 consisted of five diamond drill rigs, four of which were dedicated to exploration drill holes, including two holes for geotechnical analysis, and one rig dedicated to hydrogeological test work. The exploration drill rigs completed 29 drill holes; the hydrogeology drill completed 15 drill holes, for a total of 16,465 m in 44 drill holes. Exploration is currently being conducted in the summer of 2013.

4.2 Tenure

4.2.1 Surface Tenure

Access Road

RTCU anticipates that the access road from Highway No. 905 to the Roughrider property will follow that of the current temporary access trail route. RTCU will make an application to Saskatchewan Ministry of Environment to secure an "easement" corridor for the road, replacing the existing temporary permits and approval allowing for the construction and use of the temporary access trail in existence.

Roughrider Property

RTCU plans to request a Surface Lease Agreement for the Roughrider property site. A Surface Lease Agreement is a contractual agreement between the provincial government and the land user.

Borrow Sources

RTCU will prepare and to submit an *Application for a Sand and Gravel or Quarrying Surface Lease on Provincial Lands* (Saskatchewan Ministry of Environment, July, 2009) for all "borrow" materials required for the construction and operations of the Roughrider Advanced Exploration Program (including the proposed access road).

4.2.2 Mineral Tenure

The Roughrider Project originally consisted of three contiguous mineral claims, S-107243 staked on January 30, 2004, and S-110759 and S-110760 staked on March 18, 2008, covering a total area of 543 hectares. Hathor Exploration Ltd. (previous owner) carried out a legal survey of the property in 2010. On March 16, 2011, the three mineral claims were converted to mineral leases and these were subsequently converted to a single mineral lease (ML 5547). Due to minor modification to the eastern property boundary as a result of the legal survey and land tenure changes, the official size of the mineral lease is 598 ha.

The Roughrider Project currently comprises one mineral lease as shown in Figure 2. Mineral resources for the Roughrider East, Far East and West Zones are contained completely within the mineral lease which is currently in good standing.

4.3 Current Site Condition

An access trail currently exists between the Roughrider property and Highway #905. The trail travels approximately 7.5 km southwest from the site, ending at Highway No. 905, approximately 2.5 km north east of Points North (Figure 5). Currently, the trail can be travelled by 4x4 truck but upgrades will be required once approval to proceed with the project is received.

The Roughrider deposit area has been the focus of varying levels of exploration since the late 1970s. In addition to significant line cutting and other geological surveys, significant surface drilling has been completed by RTCU, and by the properties' previous owner, Hathor Exploration Ltd. since 2007.

As a result of this exploration activity, the Roughrider property has been previously disturbed with the removal of vegetation to allow for various surveys, access trails, exploration drilling from surface and the operation of a core storage camp.

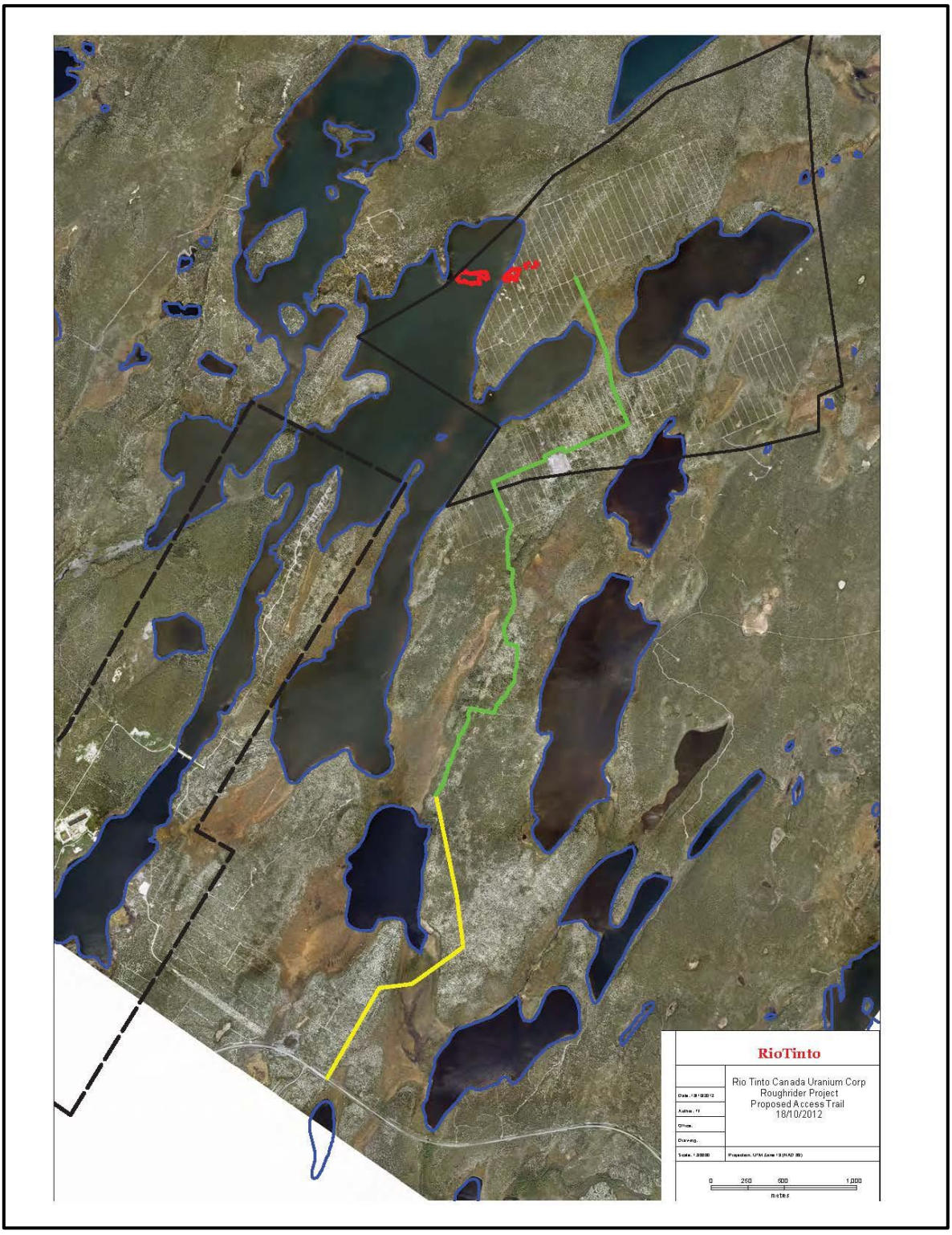

Figure 5: Roughrider Property Current Access Trail

5 Proposed Advanced Exploration Program

5.1 Project Alternatives Considered

5.1.1 Surface Exploration Drilling vs. Underground Exploration Drilling

RTCU could potentially continue exploration drilling of the identified ore bodies from surface; however the information potentially gained from surface drilling is limited.

The information gained from the Advanced Exploration Program as proposed (i.e. the development of a shaft and drilling from exploration drifts) allows RTCU to gain:

- More accurate knowledge of geotechnical conditions in development areas underground and within the ore bodies themselves. This information will allow for improved design, construction and safety during the development and operation of a producing uranium mine.
- More accurate knowledge of the hydrogeological regime at depth and of the potential impact of underground development on that regime (i.e. water inflow quantity and quality). This information will allow for improved design, construction and safety of mine-water management facilities underground and water treatment facilities on surface during the operation of a production mine
- Enhanced characterization of the ore bodies through accurate, targeted drilling and sampling of the ore bodies. A more accurate characterization of the ore bodies will allow for:
    - Enhanced understanding of processing (milling) requirements for the ores; and,
    - A more accurate characterization of potential waste streams (tailings characterization and mill effluent quality) that could potentially result for a production mine and mill.

  This information will result in improved design and operation of the necessary waste management processes and infrastructure required to support a producing mine.
- Better understanding of the resource. The ore is contained in zones with highly variable concentrations of uranium over short distances. Drilling into the ore bodies from closer proximity than the surface will:
    - Avoid drill bit wandering allowing RTCU to hit the region from which additional, more detailed information is required;
    - Limit the loss of core due to highly altered ground conditions; and
    - Better model the resource in situ.

  This information will result in a better understanding of the resource, be critical to Rio Tinto internal decision making on resource development and improve the planning and scheduling for production mining, mill capacity and tailings management.

The information gained from the Advanced Exploration Program will provide significant "real life" data (as opposed to that provided by modelling alone) for the design of mitigation measures, equipment and infrastructure to ensure as low as reasonably achievable (ALARA) risk to worker health and safety (both radiological and conventional) and to the environment. It will also assist in

the development of more robust action plans to address unanticipated events during the development and operation of a producing uranium mine should a decision to proceed with a production mine be made in the future.

5.1.2 Shaft vs. Decline

RTCU has examined two options for underground access – the construction of either a decline or shaft.

A decline is a gently sloping tunnel that can be used to drive mobile equipment into and out of the underground development and generally are a spiral tunnel which circles either the flank of the deposit or circles around the deposit. The decline begins with a box cut, which is the portal to the surface. Depending on the amount of overburden and quality of bedrock, a galvanized steel culvert may be required for safety purposes at the portal.

Shafts are vertical excavations adjacent to an ore body equipped with a hoist and are generally used when ground conditions, ground water, ventilation or other worker safety conditions warrant or when haulage to surface via truck is not economical.

Based a detailed assessment of the two options to access underground on a technical, safety, environmental and economic perspective, RTCU is proposing the development of a shaft as the preferred method to access the underground in order to conduct the proposed Advanced Exploration Program.

5.1.3 Treated Effluent Discharge Location

Treated effluent from the Roughrider Advanced Exploration Program must be discharged in a responsible manner. In choosing the most appropriate location for such a discharge, considerations must be given to the capacity of the receiving environment to assimilate the treated discharge without adverse impacts on people and animals depending on that environment. In addition, the preferred discharge option must also be technologically and economically viable.

The Roughrider property straddles two distinct watersheds, either of which potentially could reasonably be used to receive the effluent discharged from the water treatment facility:

- The Smith Creek watershed; or
- The Collins Creek watershed.

The Smith Creek watershed essentially flows north from the Roughrider property, entering Hatchet Lake from the south into Smith Bay. There are no other industrial users discharging to the watershed and the nearest commercial user of the watershed is an outfitting camp located near the north end of Hatchet Lake and potentially a winter commercial fishery within the lake.

The Collins Creek watershed essentially flows east from the area of the Roughrider property to Collins Bay, Wollaston Lake. Collins Creek currently receives the treated effluent from the AREVA Resources (Canada) Inc. McClean Lake uranium mill which is located approximately 11 km east of

the Roughrider property. The creek then enters Collins Bay (opposite the currently operating Cameco Corporation Rabbit Lake uranium mine and mill). A freshwater intake for the Rabbit Lake mine and mill is located within Collins Bay and treated effluent from the Rabbit Lake operation is discharged into Wollaston Lake.

Treated Effluent Discharge Location Alternatives Assessment

In order to assess which of the two options for discharging treated effluent, an alternatives assessment has been completed using a variance of the multiple accounts analysis methodology framework. This proven methodology allows for an unbiased quantitative assessment of the alternatives (or options) taking into account technical, environmental, economic and social considerations.

The six primary actions within the framework can be summarized as follows:

1. Defining discharge location sites, taking into account conceivable, practical and appropriate management approaches.
2. Conducting a pre-screening assessment (also called a "fatal flaw analysis"). This is the first step in eliminating alternatives that are not appropriate for the Project. The elimination of alternatives at this point is based on a primary set of criteria, selected by the proponent from the master categories developed in Step 2, and is intended to point out alternatives that are fatally flawed, and therefore not worthy of further evaluation. An option that would be technically or economically unviable for the proposed project is an example of such a fatal flaw.
3. Defining site specific criteria against which the alternatives can be evaluated to ensure that the unique complexity of each alternative is adequately assessed. At this point in the assessment the intent is to characterize each alternative to the extent that Step 3 and Step 4 can be completed using appropriate relevant information. The criterion applied to the alternative is specifically selected to fall within one of four categories:
    a. Environmental;
    b. Technical/operational;
    c. Economic; and,
    d. Local & traditional land use.
4. Defining an assessment rating matrix and ranking criteria. During this step, the criteria in each master category is reviewed and grouped together in such a way as to ensure that there would be no double accounting when alternatives were evaluated.
5. Completing the alternatives assessment. This step entails actual ranking of each alternative and carrying out a quantitative comparison.
6. Completing a sensitivity analysis in order to evaluate any possible user imposed biases in the alternatives assessment.

For each option considered, a ranking or a 'weighted score' from 0 to 5 is applied to each aspect criteria/factor. Application of ranking scores is based on technical assessments of each option and how it affects the various risk factors. To a large extent, assigning ranking scores is subjective; however, the system is transparent and allows reviewers to follow the decision making process utilized during the assessment.

The "score" for each factor is generated by applying professional judgment regarding the "Rank" of each factor against the "Balance of Probabilities" for each potential response of the option under consideration. Consequently, the simple quantifiable assessment provides not only a generic comparison of each of the options by way of their total scores, but also allows a comparison of individual risk factor scores. This is helpful when comparing sensitivity of the various options to their particular risk factor and circumstances.

Ranking is a simple ordered list based on the individual scores each option received and indicates the relative desirability of the assessed option.

Assessment of Options

As the first step in assessing the two viable treated effluent discharge locations, RTCU commissioned a preliminary assessment of the assimilative capacity of the two watersheds as one of the considerations in the determination of an appropriate discharge location for treated effluent. The screening-level assessment focuses on water quality of five key Contaminants of Potential Concern (COPC) namely copper, molybdenum, selenium, uranium and radium-226. The assessment derived maximum effluent loads in the Smith Creek watershed under two scenarios: discharge to Smith Creek about 3.5 km north of the site or to the North McMahon Lake about 2 km west of the site. In the Collins Creek watershed, only one scenario was analyzed, that being discharge to Collins Creek upstream of station CC1 about 7 km southeast of the site. The locations of the discharge points are preliminary; however, for the purposes of the screening level assessment, this accuracy is sufficient.

Applicable environmental quality objectives used in the initial assessment included the Canadian Environmental Quality Guidelines and Saskatchewan Surface Water Quality Objectives.

Table 1 provides a preliminary estimate of the maximum limits for the three scenarios. As expected, the assimilative capacity of Smith Creek is slightly lower than that of Collins Creek due to a smaller drainage area. The assimilative capacity of discharging to McMahon Lake versus Smith Creek downstream of the lake is seen to be slightly higher.

Table 1 – Estimated Assimilative Capacity for Different Discharge Locations

COPC	Unit	Smith Creek	North McMahon Lake	Collins Creek
Copper	Kg/yr	4.6	7	6.0
Molybdenum	Kg/yr	179	266	230
Selenium	Kg/yr	2.3	7	3.0
Uranium	Kg/yr	36	55	47
Radium-226	KBq/yr	2.6×10^5	3.9×10^5	3.3×10^5

Example calculation for molybdenum in Smith Creek:

Low flow at the discharge point = 0.14 m^3/s
Dilution factor = 1:10
Background concentration= 0.05 µg/L
Objective = 73 µg/L or mg/m^3

Effluent load = 73 [mg/m^3] * (0.5*0.14 [m^3/s]/ (1-0.1)) - 0.05 [mg/m^3] * 0.5*0.14 [m^3/s] = 5.67 [mg/s] or 179 [Kg/yr]

Example calculation for radium-226 in North McMahon Lake for 20 years of continuous discharge:

Low flow at the discharge point = 0.116 m^3/s
Volume of North McMahon Lake = 6.96 x 10^6 m^3
Dilution effect value = 1 – exp(-0.116 [m^3/s] / 6.96 x 10^6 [m^3] * 20 [yr] * 3.15 x 10^7 [s/yr]) = 1
Background concentration= 0.0025 Bq/L or KBq/m^3
Objective = 0.11 Bq/L or KBq/m^3
Effluent load = (0.11- 0.0025) [KBq/m^3] * 0.116 [m^3/s] /1 * 3.15 x 10^7 [s/yr] = 3.9 x 10^5 [KBq/yr]

Ranking Matrix

A preliminary ranking matrix was developed for the two options using available information including the extensive aquatic baseline investigations conducted by Canada North Environmental Services Limited (CanNorth) on both the Smith Creek and Collins Creek watersheds. The ranking matrix was then scored excluding any economic (i.e. cost) considerations. The results of this initial scoring are presented in Table 2 and identify the discharge of treated effluent into the Smith Creek watershed as the preferred alternative or option.

Table 2 – Discharge Location Ranking Matrix

Environmental Aspects	Collins Creek Discharge	Rank	Smith Creek Discharge	Rank
Drainage area (size of watershed) - Total (sq.km)	≈ 685	**3**	≈ 300	**2**
Drainage area - Above discharge location (sq.km)	≈ 140	**3**	≈ 108	**2**
Estimated "low flow volumes" at discharge location (cu. m/sec)	≈ 0.18	**3**	≈ 0.14	**2**
Receiving water quality	Baseline	**3**	Baseline	**3**
Disturbance footprint	7 km X 15 m new corridor (≈ 105,000 sq. m.)	**2**	3 km x 15 m new corridor (≈ 45,000 sq. m)	**4**
Impacts to terrestrial plants & animals species	Lost ecosystems during operation & decommissioning	**2**	Lost ecosystems during operation & decommissioning	**4**
Impacts to Traditional Use Terrestrial Plants		**3**		**4**
Impacts to Species at Risk & related habitat	Corridor length & remoteness	**3**	Corridor length & remoteness	**4**
Erosion potential at discharge location	Design discharge	**3**	Design discharge	**3**
Ecological sensitivities (Aquatic)	Walleye, lake whitefish, northern pike	**3**	Artic grayling, lake whitefish, northern pike	**3**
Impacts to fish & fish habitat	McClean Lake (east basin) has elevated nickel levels in sediments & whitefish bone samples	**2**		**4**
Impacts to fish spawning habitat	Highly suitable habitat for walleye, pike, perch, grayling & sucker	**3**	Highly suitable habitat for grayling, pike & sucker	**4**
Impacts to aquatic plants & habitat [normal operations & breach (spill)}		**3**		**3**
Impacts to Heritage Resources	Corridor to discharge not assessed	**2**	Likely corridor to discharge (Lake A and Lake B areas) assessed and no heritage resource identified	**4**
Ability to decommission	≈ 7 km	**2**	≈ 3 km	**4**
Post closure impacts & recovery	≈ 10,000 sq. m. to remediate & reclaim	**2**	≈ 3,000 sq. m to remediate & reclaim	**4**
Existing "industrial" impacts	Receives treated effluent from McClean operation	**1**	None	**5**
Subtotal		**43**		**59**
Local & Traditional Land Use Aspects				
Local User (trapping)	≈ 105,000 sq. m. of lost area	**3**	≈ 45,000 sq. m of lost area	**4**
Downstream users	Rabbit Lake operation potable water intake - 21 km downstream - Wollaston Lake	**3**	Hatchet Lake - Outfitter north end of Hatchet Lake - 43 km downstream	**3**
Preservation of cultural sites		**3**		**2**
Access for Traditional Harvest (wildlife & plant harvest)		**3**		**2**
Local community preference	Wollaston Lake already receives treated mine effluent	**3**		**4**
Subtotal		**15**		**15**
Technical Aspects				
Pipeline length	≈ 7 km	**2**	≈ 3 km	**3**
Operations (maintenance & inspections)		**2**		**3**
Potential for breach (unanticipated discharge or spill)		**2**		**4**
OH&S (Construction, operation & closure)		**4**		**4**
Expandability		**4**		**3**
Subtotal		**14**		**17**
TOTAL		**72**		**91**

Scoring

1 = Least Desirable …. 2 …. 3 …. 4 ….5 = Most Desirable

Local User

On June 24, 2013, a discussion of the two potential discharge option locations was held with the local trapper, a member of the Hatchet Lake Denesuline first Nation, active in the vicinity of the Roughrider property was held. The discussion was focused on the same aspects as those identified in Table 2. At the end of the discussion, the local trapper expressed a clear preference for the discharge of treated effluent into the Smith Creek watershed.

NSEQC Ranking of Options

The ranking matrix was also the subject of a workshop held with the North Saskatchewan Environmental Quality Committee on June 25, 2013. During the workshop, the same aspects table (i.e. Table 2) was used and a detailed discussion of each of the aspects was held. Each EQC member was then asked to enter a score in each of the categories present on the table. This was done anonymously and the separate completed tables were handed to the facilitator. In total, 13 of the 18 EQC members present at the workshop completed at least a major portion of the matrix. Eleven of the twelve members who completed the matrix scored the Smith Creek watershed as the preferred option.

Preferred Option

The Smith Creek watershed is the preferred location for the discharge of treated effluent from the Roughrider Advanced Exploration Program. This location is preferred by the local trapper in the Roughrider area, the majority of the members of the North Saskatchewan Environmental Quality Committee and by RTCU.

5.2 Proposed Project

In general terms, the Roughrider Advanced Exploration Program will consist of:

- The upgrade of approximately 7.5 km of an existing exploration trail (no new stream crossings required);
- The development and operation of an exploration shaft including hoisting and ventilation;
- The development of underground drifts to allow for exploration drilling. All drifts will be developed in competent rock at least 20 meters away from the ore bodies;
- The operation of appropriate underground and surface water management infrastructure;
- The operation of a water treatment facility including settling and monitoring ponds;
- The surface storage of a maximum of approximately 155,000 tonnes of development rock;
- The temporary surface storage of a maximum of 38,750 tonnes of “mineralized” (or “special”) development rock;
- A treated effluent discharge pipeline;
- The construction and operation of various support facilities including:

  - An administration/office/mine dry (change) facility;
  - Freeze plant;
  - Maintenance shop;
  - Freshwater intake;
  - Explosive storage magazine(s);
  - Electric generating capacity;
  - Fuel (diesel, gasoline and propane) storage facilities;
  - Concrete batch plant;
  - Cold storage building(s);
  - Borrow area(s);
  - Laydown area(s);
  - Waste management area (conventional); and,
  - Camp with associated infrastructure (i.e. freshwater intake, sewage and domestic waste management facilities) to accommodate approximately 135 persons.
- Exploration drilling [maximum BQ] from the underground drifts ("remote drilling") to improve characterization of mineralization and understanding of ore bodies;
- The appropriate packaging and transport of all samples to accredited laboratories for analysis, testing and appropriate disposal.

5.3 Site Plan

Figure 6 provides the proposed surface site plan for the advance exploration shaft, waste management and associated infrastructure required to operate the facilities.

It is important to note that initial consultation with the primary stakeholder communities for the Roughrider project during a January 2013 Communities Environmental Workshop, identified the protection of lakes and streams during development and operations as one of the most important criteria from their perceptive. This criterion was reinforced during subsequent consultations with community leadership and members and by a June 2013 workshop held with the North Saskatchewan Environmental Quality Committee. In response to this significant criterion, from the onset of planning, RTCU has established a 100 meter buffer zone along the shoreline of all water bodies in the project area and ensured that none of the major facilities (other than access roads) associated with the Advanced Exploration Program were allowed to encroach within that 100 m buffer zone.

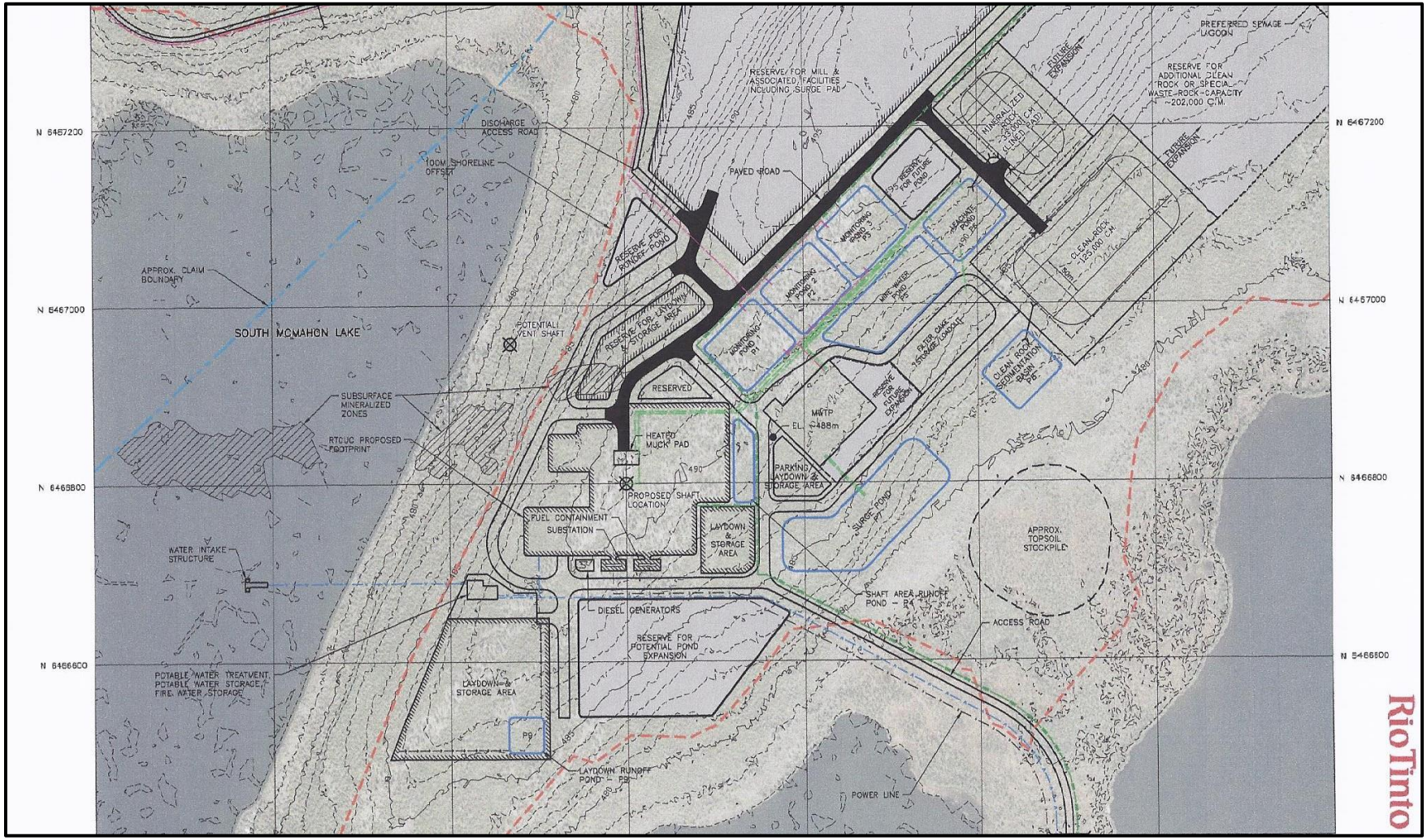

Figure 6: Roughrider Site Plan

5.4 Shaft & Drift

5.4.1 Shaft

A 7m finished inside diameter, concrete lined shaft is proposed to be sunk to a depth of 550m. RTCU is currently undertaking the appropriate trade off studies to assess whether ground freezing or grouting is the most appropriate method to stabilize the ground for shaft construction.

A hoist house will be constructed to accommodate the skip, cage and auxiliary hoists. The building will contain a dedicated hoist control booth accommodating the hoist controls, an electrical room at the back accommodating switchgear for the power distribution of the Advanced Exploration Program and a 10 tonnes capacity overhead crane to allow maintenance access of the drives.

5.4.2 Drifting

In order to service the advanced exploration effort adequate infrastructure must be provided, such as ventilation, de-watering, process water, compressed air, electrical power distribution, development rock handling and transport to surface, mobile equipment and maintenance facility, communications and refuge station.

Based on the layout of the West, East and Far-East ore zones, three exploration drifts have been identified to provide the necessary drill horizons for the three known ore bearing zones and targets. Figure 7 provides a preliminary schematic of the proposed underground development looking north.

The 270L exploration drift will be located 30m below the unconformity (at 240L) in order to avoid a potential breach of the unconformity and unexpected water ingress into the underground workings. This exploration drift is intended to service exploration drilling of the West and East zones.

The 340L exploration drift is intended to service exploration drilling of the Far-east zone. This ore zone is well below the unconformity.

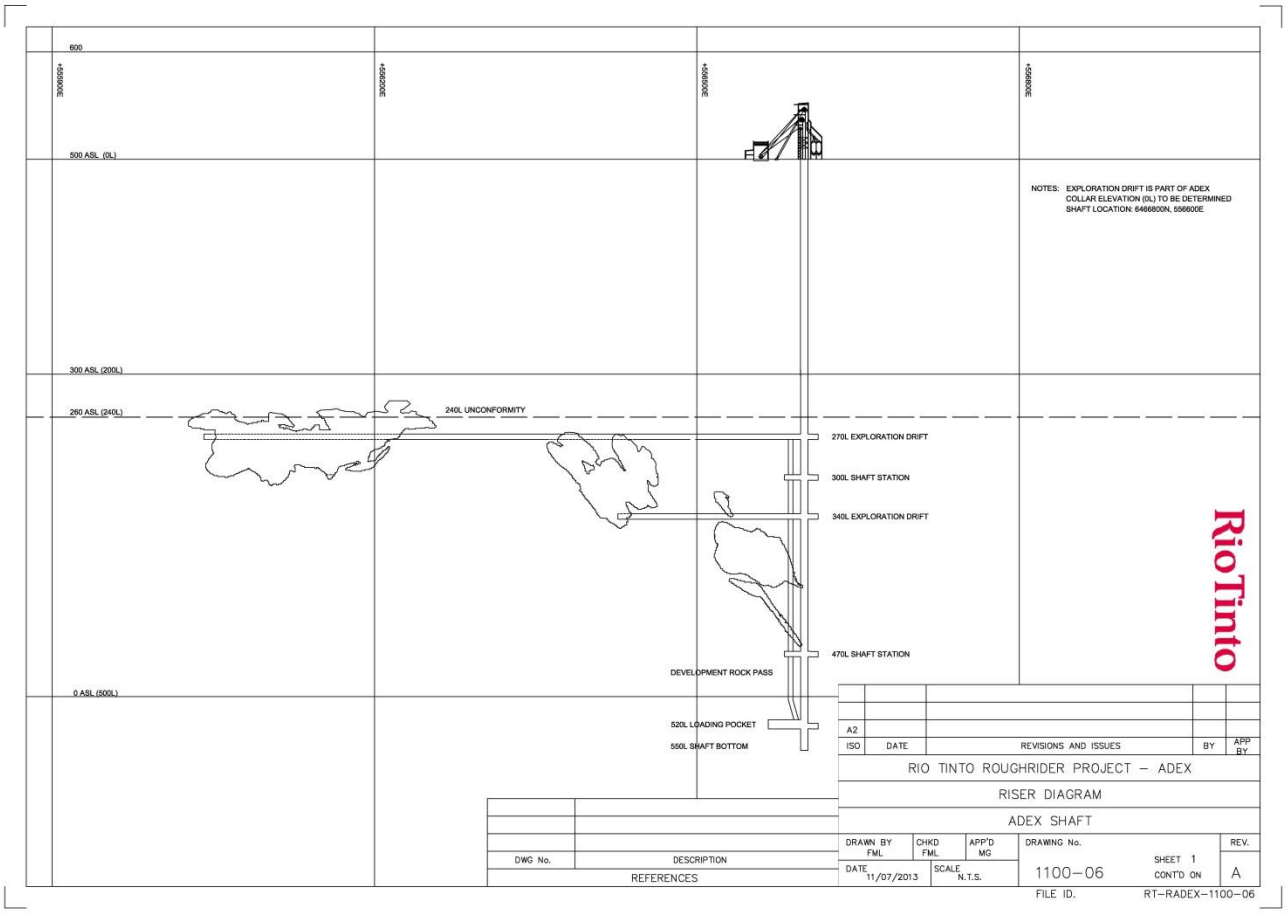

Figure 7: Preliminary Schematic of Underground Development

5.4.3 Underground Water Management

A series of sumps will be established in the underground to collect and pump water from the underground workings. It is presently anticipated that a sump will be developed at the 520L. Water from the shaft bottom will be collected in this sump and will be pumped to the 340L sump. The 340L sump will collect runoff from that level plus the water reporting from the 520L sump and will be pumped to the 270L sump. The 270L sump will collect runoff from that level plus the water reporting from the 340L sump and will be pumped to the surface collection pond for treatment.

Each of the level sumps will have a settling section and a holding section. The settling section will over flow into the holding section. The re-use of water directed to the sumps is planned with the balance being pumped to surface to the lined minewater ponds

5.4.4 Ventilation

During shaft sinking one 1,200 mm rigid vent pipe will be installed to provide fresh air. The shaft will be upcast exhausting the air during shaft sinking. After change over (i.e. in the advanced

exploration phase) this vent duct will be used to provide fresh air for the 340L exploration horizon and the 520L loading pocket and shaft bottom.

During the changeover phase, a second rigid vent duct will be installed to supply fresh air to the 270L exploration drift.

The solid vent pipes will be turned into the exploration horizons at 270L and 340L and will be carried as flexible ducts as the development progresses. Once a sufficient length of drift is developed and the blast impact is low enough for the solid piping, it shall be extended following the development. Return air shall be through the drift and up the shaft.

Propane fired mine air heaters will be provided on surface to pre heat the air to ensure that services and equipment sensitive to sub-zero temperatures are not affected.

5.4.5 Underground Equipment

Conventional equipment used in underground mining operations will be used during the Advanced Exploration Program, although as previously noted, no mining will be taking place. Underground equipment is expected to include Load Haul Dump units (scoops), development drills (either 2 or 1 boom), explosives loader, longhole drills, scissor lift/bolting utility truck, personnel carriers and diesel pickup trucks.

5.5 Development Rock Management

5.5.1 Introduction

Development rock materials generated from the underground development of the Advanced Exploration Program will typically be classified as either clean rock or mineralized development rock. Clean rock consists of rock that does not contain sufficient quantities of any minerals that could be mobilized and potentially cause an adverse impact if released into the environment. (Clean waste rock may still be a source of fine sediments). “Mineralized ” development rock in contrast may be potentially acid generating and/or contain minerals such as uranium, arsenic, nickel, selenium, molybdenum, or others in amounts that when mobilized from the parent material could cause an adverse impact to the receiving environment.

“Mineral development rock” (“Special” rock) at uranium facilities in northern Saskatchewan are generally characterized as having elevated, although not economic, levels of uranium or contain other elements at levels that, if not managed appropriately and released to the environment, may be harmful. The concentration of uranium considered uneconomical is not specified in regulatory documents or guidelines and is generally established by the proponent during the licencing (permitting) process.

Although the Roughrider Advanced Exploration Program as proposed will not be mining any ore, it will be sinking a shaft to a depth of approximately 550 m (below the ore bodies) and will be constructing drifts approximately 20 m from the ore bodies. As such, it is assumed that a small

volume of "mineralized" rock will be encountered (i.e. generated from the interception of stringers of ore, etc.) and this will be appropriately managed, transported to surface and temporarily stored on a specially engineered and constructed "mineralized rock storage pad" which has been conservatively designed to contain 25% of the rock brought to surface.

5.5.2 Development Rock Characterization

The development of the shaft and exploration drifts is anticipated to produce approximately 155,000 tonnes of development rock. As a result, a portion of the rock will be permanently stored on surface in a pile close to the shaft itself.

Depending on the mineralization of the material, mine rock has the potential to pose a risk to the environment in the immediate area of the pile, particularly if the rock is enriched with low levels of uranium, heavy metals or sulfur-bearing minerals such as pyrite, chalcopyrite, sphalerite etc.

When stored on surface in piles, the weathering of the mine rock can produce a weak acid which combines with water creating acidic water which itself dissolves minerals present in the rock. Water flowing through the rock pile can eventually discharge into the local environment as acid rock drainage (ARD). In order to assess the potential environmental impact of the surface storage of development rock at the Roughrider site, RTCU has undertaken a review of the quantities of rock that will be developed at each stage of the program (shaft sinking, drift development, refuge stations, etc.) to characterize the rock lithology.

In order to characterize the type of rock likely to be encountered during the Advanced Exploration Program, recommendations contained within *The Mine Rock Guidelines – Drainage and Control of Drainage Water Quality* (Saskatchewan Environment and Public Safety, 1992) were first used to determine a reasonable number of core samples required to gain an accurate understanding of the rock character, the potential for that rock to result in ARD and to assess the potential environmental risks associated with permanent surface storage of the rock, prior to the operation of the Advanced Exploration Program.

Using the conceptual design for the underground workings and the comprehensive database of drill logs which show the lithology, a series of representative samples were collected. Fifteen samples were collected which included the following rock types: sandstone, granodioritic gneiss, granodiorite pegmatite, granite, pegmatite and politic gneiss. The samples were sent for acid/base accounting testing and ICP-MS elemental analyses. The number of samples collected is considered adequate for this stage in the process, considering that additional samples will be collected during the exploration program as per *The Mine Rock Guidelines*.

The results of the analysis will be included in the Environmental Impact Statement.

5.5.3 Volume Estimates

The sinking of the shaft and the development of the two exploration drifts as proposed is anticipated to result in the production of approximately 155,000 tonnes of development rock which will brought to surface.

5.5.4 Clean Rock Management

Notwithstanding the results of the acid base accounting and metals analysis results from the initial set of samples, RTCU will develop and implement a development rock monitoring program based on the recommendations provided in the *Mine Rock Guidelines – Design and Control of Drainage Water Quality* (Saskatchewan Environment and Public Safety, April 1992) and industry best management practices during the program. The objective of the plan will be to establish procedures and testing to identify, segregate and properly manage any "mineralized" rock encountered during the development of the shaft and exploration drifts.

The clean rock storage pile itself will be designed, built, and reclaimed so as to minimize short-, medium- and long-term impacts on the environment. In the event that "mineralized" rock is encountered during the development of the advanced exploration shaft and drifts, it will be segregated from the non-acid generating mine rock and either be used as backfilled in the underground or appropriately decommissioned in place.

The surface clean rock storage area is designed for a storage capacity of approximately 125,000 m^3 which includes capacity for the storage of 155,000 tonnes of development rock and any additional material excavated during construction of the site. This is anticipated to result in an area approximately 200 m by 110 m with a maximum height of 10 m. The development rock storage area is proposed to be located generally east of the proposed shaft (Figure 6). The area is underlain by bedrock interspersed with glacial till and rock ranging size from pebbles to boulder size.

Prior to the deposition of any clean rock in the area, all trees and other vegetation will be removed and be stockpiled for use. All other organics will be removed and stockpiled in an area south of the site for reuse during site reclamation. A vegetation survey has confirmed that no rare or endangered species are present in the proposed areas of disturbance.

Diversion and collection ditches will surround the clean rock pile and it will be constructed in such a way so as to direct runoff to a central collection point which itself will discharge to the water treatment plant.

A portion of the clean development rock will also be used for the construction of surface facilities such as roads, laydown areas and structure foundations. In all such activities, only non-acid generating rock or rock considered to be of low uranium content will be used.

5.5.5 Mineralized Rock Management

The CNSC Regulatory Document - *RD/GD-370, Management of Uranium Mine Waste Rock and Mill Tailings, March 2012*,provides the following definition of mineralize rock:

> *Rock which has the potential to release hazardous and/or nuclear substances that could have a significant adverse effect on human health or be deleterious to the environment. Mineralized waste rock may be further segregated based on radiological content, contaminants of concern (e.g., nickel, arsenic), and acid generating potential. Mineralized waste rock is often referred as to special waste rock.*

RTCU will use this definition to develop appropriate criteria for the segregation of mineralized rock based on the rock chemistry. Mineralized rock will be placed on a lined storage pad which will be lined with a low permeability liner. A lined perimeter ditch and holding will be constructed to contain any runoff from the pad. All water captured from the pad will be directed to the water treatment plant.

5.6 Underground Exploration Program

A series of drill bays will be developed at strategic locations along the two drifts in order to conduct underground drilling into and around the three ore zones. The drifts and drill bays will remain 20 m from the defined ore zones. Diamond drilling (maximum HQ size drill bit) will be completed on a 24 hour basis with the number of drills in use being dependant on the drift development progress and results received. Water used by the drills will be recycled whenever practical to reduce water usage.

As with RTCU's surface drill programs, there will be strict Quality Assurance and Quality Controls (QA/QC) in place during the drilling and sampling program. Project Geologists will oversee the drilling contractor and will manage the segregation of mineral and non-minerals core samples. Samples collected from the exploration program will be stored at the existing core storage area. All core is scanned with a hand held scintillometer to determine radioactivity. Mineralized core is clearly marked and placed in enclosed core boxes. The QA/QC process includes quality control samples such as blanks, standards, field duplicates, course reject duplicates, and pulp rejects in addition to the assay lab QA/QC programs.

5.7 Support Infrastructure

5.7.1 Explosives Magazine

An onsite storage facility will be required to ensure an uninterrupted supply of explosives for underground development at the site. As such, RTCU will meet or exceed all requirements specified in *The Mines Regulations 2003*.

In addition, the explosives facility will be constructed and operated in accordance with federal and provincial regulations. The site will contain an explosives magazine and a separate magazine for

blasting accessories. Access to the magazine will be controlled and restricted to appropriately trained and authorized personnel.

5.7.2 Dry & Administration

A mine dry will be constructed in the vicinity of the headframe to provide change and shower facilities for workers on site. It is anticipated that the capacity of the dry will be for up to 80 people with separate showers for men and women with up to 48 showers, a series of lockers, washrooms and baskets for hanging safety equipment/clothing to ensure proper hygiene. Laundry facilities will also be located in the dry and all water from the dry will be directed to the water treatment for treatment prior to discharge to the environment.

5.7.3 Electricity

Site preparation, site facilities construction, shaft sinking as well as the Advanced Exploration Program will be performed using installed, on-site diesel generator power.

Power requirements are estimated at 540kVA and will be provided by four 1.5MVA 600V diesel generators with "yn" winding and 5A NGR. The units will be provided with a day tank for fuel within secondary containment and contain a 24h reserve with insulation and heat tracing if necessary to prevent malfunction of the unit due to jellying of the diesel fuel at extreme low temperatures.

The generators will also be equipped with a change over valve in the coolant inlet and outlet of the radiator in order to allow flow of the jacket coolant through a heat exchanger in order to maximize engine efficiency recover the engine heat to provide heat for the hoist house, winch building and possibly other facilities.

5.7.4 Concrete Batch Plant

A batch plant will be required on site in order to produce the concrete necessary for underground development and the construction of some surface facilities. The batch plant will be located adjacent (north west) to the shaft headframe.

5.7.5 Freeze Plant

Control of water inflow during shaft sinking will be implemented by either grouting or freezing the ground surrounding the shaft. Should freezing be selected a series of refrigeration pipes which will re-circulate brine will be installed around the shaft perimeter to create a freeze wall around the proposed shaft. The freeze wall monitoring systems will consist of the following elements: monitoring the ground temperatures; monitoring the closure of the freeze wall in the centre hole (pressure relief hole); supervision of temperatures, brine flow, pressure, etc.; monitoring and alarms for ammonia and/or brine leakage; and external off-site monitoring of the system. The time required to develop the freeze wall is expected to vary between till and the underlying sandstone/conglomerate, and is expected to range between 3 to 4 months.

A series of refrigeration containers will be required within the freeze plant building. Each refrigeration container will be equipped with the following: an exhausted ventilation system; an ammonia warning system; an optical and acoustics alarm; gas masks; and a fire extinguisher.

5.7.6 Hazardous Substance Storage & Use

RTCU and its contractors will manage and store all hazardous substances and waste dangerous goods in accordance with the requirements specified in *The Hazardous Substances and Waste Dangerous Goods Regulations.*

Detailed design of storage facilities for materials such as fuels and chemicals have not been completed; however, each of the storage facilities will be designed, constructed and operated in accordance with all relevant codes and regulations. Each facility will have appropriate secondary containment in order to protect the environment, site personnel and the public. Once the final design is complete an application will be submitted to Ministry of Environment, for approval, prior to construction of these facilities.

All fuels for equipment on site will be stored in double walled tanks which will include self-contained secondary containment, appropriate high level alarms and pump dispensers. A Spill Kit will be located in the immediate vicinity of the fuelling station and the actions identified in Roughrider Project Spill Contingency Plan will be implemented immediately in the unlikely event that an unanticipated discharge takes place. The fuel storage area will be equipped with suitable crash barriers and will be certified and/or registered as required by the appropriate regulatory authority.

Fuel will be trucked to the site by a commercial hauler as required and will immediately be transferred to the tanks. The commercial hauler will be required to have a Spill Contingency Plan and be capable of responding to an unanticipated discharge while transporting fuel to the site.

No fuels, oils or other hazardous substances will be stored within 100 m of any water body and no equipment maintenance or re-fuelling will be conducted within 100 m of a water body.

5.7.7 Site Propane Fuel

Propane will be stored at the Roughrider site in tanks provided by the material supplier. The tank area will be constructed with suitable crash barriers and will be operated in accordance with all applicable regulations. Propane will be delivered by a commercial supplier on an as-needed basis and immediately placed within the appropriate tank. The commercial hauler will be certified and capable of responding to an unanticipated discharge in the unlikely event that such a situation occurs.

All provincial regulations relating to the handling and storage of propane will be adhered to.

5.7.8 Site Lubricants and Coolants

Various lubricants and coolants required for regular maintenance of equipment will be stored on site. Each one of these materials will be stored, handled, recycled or disposed of in an appropriate manner. The site manager will maintain an up to date record of the various lubricants and coolants on site and will maintain MSDSs and appropriate procedures for spill management, handling and clean up in an accessible location.

Used oil and lubricants on site will be stored in appropriate containers and transported off site for appropriate recycling or disposal.

5.8 Site Water Management

5.8.1 Freshwater Use & Source

It is proposed that South McMahon Lake be used as the freshwater source during the Roughrider Advanced Exploration Program.

South McMahon Lake is one of the largest lakes in the Roughrider primary aquatic study area with a surface area of 3.25 km^2 and a volume of 4.58 x 10^6 m^3. It has a highly irregular shoreline, with a length of 21.5 km and a shoreline development value of 3.37. South McMahon is a relatively shallow lake with roughly 63% of the volume found in the upper meter of the lake and mean and maximums depths of 1.41 m and 3.78 m, respectively.

The predicted water use by the Roughrider site (with no recycling) is anticipated to be well below the long term sustainable yield of the South McMahon Lake basin and, as such, withdrawal of water to facility operations will have no discernible or measurable effect on the lake or the aquatic habitats within the bay of the lake. A conceptual site water balance will be included in the EIS to verify this expectation.

The fresh water intake in South McMahon will consist of an electrically driven pump which will be suspended from a floating intake structure. The intake structure will be accessed using a floating walkway and will be screened in accordance with the specifications defined in the Department of Fisheries and Oceans (DFO) *Canada Freshwater Intake End-of-Pipe fish Screen Guideline* and installed in accordance with DFO's Timing Window Operational Statement for Saskatchewan. The proposed location of the freshwater intake is shown on Figure 6.

An appropriate potable water treatment facility will be employed to treat water at both the Roughrider site and camp in accordance with MOE requirements.

5.8.2 Site Runoff

During construction, operations and decommissioning, all site runoff from disturbed areas will be collected and directed to lined ponds for surge storage until it can be sampled, and if required, passed through the water treatment facility before being discharged to the environment.

Diversion and collection ditches will be constructed as required to ensure that surface runoff either avoids active areas or reports directly to a containment area.

5.8.3 Site Water Recycling

During all underground development and exploration activities, RTCU intends to maximize the recycling of water inflows to underground in order to reduce the amount of South McMahon Lake fresh water consumed and the amount of water that must be pumped to surface and discharged to the environment.

Water recycling has proved very successful during the underground exploration and mine development at other sites in the region where groundwater inflows into the underground workings are recycled and have significantly reduced the need to use surface water in underground activities such as drilling.

5.8.4 Site Water Treatment

The goal of the water treatment plant is to allow release of treated effluent directly to North McMahon Lake and based on the present design, predicted concentrations for all COPCs are below the water quality targets.

Based on these targets and the anticipated water quality constituents, the recommended treatment system will include high-density sludge (HDS) Metals Precipitation (iron precipitation), Lime-Soda Ash Softening, Gravity Settling, Media Filtration, Reverse Osmosis (RO) with Effluent Stabilization.

This treatment system was selected because of the following:

1. Greater operational flexibility. This system offers the opportunity to add metal scavenger between the HDS and lime softening processes, thus allowing a problem metal to be removed without interference from other metals.

2. Less sensitive to changes in water quality. For example, if the water should contain ligands that coordinate with the target metals, the effectiveness of ion exchange technologies could be limited. However, the HDS or lime softening processes could be operated differently (i.e., different pH, additional reagents), as could the recovery of the RO membranes, to cope with the change in chemistry.

3. Lower generation of residuals. The primary residual from this system would be sludge cake, which is more easily managed onsite than regeneration brine generated in other treatment schemes. While this system may also generate a periodic liquid residuals stream as a result

of the build-up of soluble constituents in the RO concentrate, the volume of this liquid residuals stream is likely to be less than for other treatment schemes.

The EIS will provide details on the treated effluent volume, anticipated quality and provide a site wide water balance.

5.9 Site Air Emissions

Development and operation of the underground facilities at the site may result in some minimal effect on the air quality (primarily airborne particulates [dust], radon and exhaust emissions from mobile equipment and electrical generation units) in the immediate vicinity of the site. Such emissions will result from activities such as underground ventilation releases, development rock hauling, service and general vehicle traffic, and potentially wind generated dust from the surfaced stored rock stockpiles. Appropriate dust suppression measures will be taken to maintain air quality within the standards specified in *The Clean Air Regulations.* In addition, all requirements specified in *The Occupational Health and Safety Regulations, 1996* and *The Mines Regulations, 2003*, related to emissions monitoring and abatement will be complied with.

5.10 Associated Infrastructure

5.10.1 Access Road

RTCU anticipates that the access road from Highway No. 905 to the Roughrider site will follow the same alignment of the existing temporary access trail to the site. RTCU will make an application to Saskatchewan Ministry of Environment to secure an "easement" corridor for the road.

5.10.2 Accommodations (Camp)

The personnel and contractors working at the site during both the construction of the facilities and during the Advanced Exploration Program will require accommodations. In order to accommodate the workforce a camp is planned adjacent to the site. The camp will be positioned so that it is as far away from the construction site as possible, in order to limit the noise from the construction work and maintain safe working distances, but be close enough to allow staff walk to the work site office and dry.

The camp will be sized so that sufficient accommodation is provided during surface construction phase, shaft sinking phase for the project staff and laborers working on the project and for operating staff during production. It shall be scalable, to provide flexibility to adjust accommodation levels in a cost effective way. Expected staff levels during site construction, shaft sinking and ADEX is a project staff of 35, including all management and project services. Construction workers of 85 (with rotation overlaps) during surface construction, 50 miners during shaft sinking, and a staff of 50 during advanced exploration drilling. Therefore the initial size of the camp is anticipated to be approximately 135 persons to allow for visitors and personnel fluctuations.

The camp shall be declared "dry" with no alcohol or drugs allowed past the security point. Alcohol and drug detection shall be a priority to ensure that chemical factors don't jeopardize the ultimate goal of zero harm to employees and staff.

RTCU is also examining the option of utilizing existing facilities, such as those at Points North as an alternate to constructing a camp.

5.11 Waste Management

5.11.1 Camp Sewage

Wash water will be supplied to the camp by a fresh water line which will connect to the proposed water intake for the exploration site. Sewage will be directly discharged into a holding tank. Based on the current anticipated capacity of the tank, it is anticipated that the potable water and sewage treatment facility (lagoon) will be regulated by Saskatchewan Ministry of Environment. The facilities will be constructed in accordance with the requirements specified in the *A Guide to Waterworks Design* (SWA & MOE, 2012) and *Guidelines for Sewage Works Design* (MOE, 2008) will be

5.11.2 Domestic Solid Waste

Domestic waste will be handled in an appropriate manner. For example, "household waste" generate at the camp facility will be collected and temporarily stored in wildlife proof containers. Uncontrolled burning of garbage, plastics and other waste (excluding clean wood) will be strictly prohibited at the Roughrider site. Any waste that cannot be reused or recycled will be disposed of by hauling the material off site for disposal in an approved waste disposal site.

5.11.3 Industrial Waste

Conventional

Initial plans do not include the creation of a solid waste disposal area at the Roughrider site. Any waste that cannot be reused or recycled will be disposed of by hauling the material off site for disposal in an approved waste disposal site

Radiological Wastes

It is anticipated that the Roughrider Advanced Exploration Program will generate a relatively small amount of potentially radiological contaminated waste. This material will be scanned and if required, will be securely stored on the lined "mineralized" rock storage pad for the duration of the Advanced Exploration Program after which it will be disposed in the underground drifts, should a decision be made to not initiate mining at the site. Records will be kept of the type and volume of material, the results of the radiation scan and the ultimate fate of all potentially radioactive waste generated on the site.

Water Treatment Process By-Products

Settling ponds sediments (generated during the cleaning and inspection of these ponds), the brine solution from the reverse osmosis treatment will require special management as they may contain contaminants of potential concern. The collected sludge will be temporarily managed on surface and then placed underground at the completion of the program should a decision be made to not initiate mining and milling at the site. Should mining and milling proceed, radiological wastes will be placed within the tailings management facility.

5.12 Health, Safety & Environment Quality Management

5.12.1 Introduction

RTCU is in the process of developing detailed programs to support the environment, conventional worker health and safety, radiation and emergency management of the Roughrider Advanced Exploration Project. Collectively, these programs will form the major components of the Rio Tinto Health, Safety and Environment Quality Management System. This system will, at a minimum, include the following:

- A Conventional Worker Health & Safety Program
- An Environmental Management Program;
- A Radiation Protection Program; and
- An Emergency Preparedness and Response Program.

5.12.2 Conventional Health & Safety

The emphasis at the Roughrider site has and will continue to be on the prevention of safety and/or health problems through the development and strict adherence to a companywide safety culture, safety conscious employees and maintaining a safe work environment. This is accomplished through a combination of training and diligence in monitoring the workplace to identify and minimize factors that may have the potential to pose an unnecessary risk to the health and safety of a worker.

Some of the more significant activities related to conventional health and safety that will be implemented at the Roughrider site are as follows: new employee's orientation, adherence to mandatory safety manuals, the provision and appropriate use of appropriate personal protective equipment (including hearing protection where appropriate) at all times, strict adherence to documented lock out procedures, suitable fire protection equipment and training, training (where appropriate), strict adherence to a site wide WHMIS program, and the establishment of an Occupational Health and Safety Committee.

5.12.3 Environmental Management Program

A detailed Environmental Management Program (EMP) will be developed and strictly adhered to in order to limit, to the extent possible, impacts from site construction, operation and decommissioning to the environment on and surrounding the proposed Roughrider Advanced Exploration Program.

The EMP will include, but not necessarily be limited to: an extensive Environmental Code of Practise, effective ground water management and monitoring; environmental information gathering; effective waste segregation and management; effective spill prevention and spill response programs; effective and timely decommissioning and reclamation (should a decision be made not to proceed with a production mine); effective and accurate monitoring data management and interpretation of environmental data with effective Quality Assurance/Quality Control (QA/QC) throughout.

5.12.4 Radiation Protection Program

An enhanced Radiation Protection Program (i.e. more comprehensive than that currently employed during the surface drilling activities) will be developed and established to manage personal radiation exposures and doses to levels that are consistent with the ALARA principle, and to comply with radiation protection regulatory requirements. Major components of the program will include, but not necessarily be limited to, regular, scheduled radiation measurements and monitoring, dosimetry management activities, the development and strict adherence to a Radiation Code of Practice, development and strict adherence to an ALARA protocol, and appropriate record keeping and reporting of radiological testing results.

RTCU is registered with Health Canada's National Dosimetry Services (NDS) and RTCU receives quarterly exposure reports from Health Canada. These services will continue during the proposed Advanced Exploration Program.

5.12.5 Emergency Preparedness and Response Plan

A detailed, effective Emergency Preparedness and Response Program (EP&RP) will also be developed for the Roughrider Advanced Exploration Program in order to provide timely and appropriate response plans for such things as injury, fire, unanticipated underground water inflows, spills, etc. The EP&RP will ensure that sufficient and appropriate resources are in place and that on-site personnel are suitably trained in the execution of the plan as well as the appropriate use of the non-human resources.

5.13 Upset Conditions

In the case of any unanticipated or upset condition on any of the Roughrider Project site or transportation routes, the policy will be as follows:

1. Protect the health and safety of persons in the area.
2. Protect the environment.
3. Protect the facility.

Appropriate personnel at each site will be trained and equipped for firefighting and mine rescue activities as required by applicable regulations.

An Emergency Preparedness & Response Plan and a Spill Contingency Plan will be prepared to cover all aspects of the Roughrider Project and cover all chemicals, fuel and other hazardous and

waste dangerous goods present on the site and those being transported to and between sites. The plan will be updated regularly, all supervisory personnel will be familiar with the updated Plan and it will be made available at strategic locations at the site for easy access.

In the event of a medical emergency, a vehicle will be available at all times on site to evacuate injured or sick personnel to Points North for evacuation to Prince Albert or Saskatoon medical facility.

5.14 Malfunctions or Accidents

Malfunctions or accidents will be a consideration in the planning and operation of a project such as the Roughrider Advanced Exploration Program and this section considers the potential malfunctions and accidents related to significant aspects of the proposed project. These include: the underground development, including the management of water inflow, the management and discharge of treated effluent and the transportation of hazardous substances to and from the sites.

Various reasonable malfunctions will be considered in terms of their probability of occurrence, response in the event that they do occur and the potential effects of occurrence.

RTCU will establish a detailed Emergency Preparedness & Response Plan and a Spill Contingency Plan for the Roughrider Advanced Exploration Program to cover all facilities and activities at the Roughrider site. The plan will consist of a number of Environmental Protection Plans (EPP) focusing on specific activities and/or situations. These EPPs document proactive as well as reactive procedures to be implemented to prevent and/or mitigate accidental releases or spills of potentially harmful substances. The updated plan will include general contingency planning including, but not necessarily limited to;

- Actions to be taken in the event of a spillage of contaminated waters outside of contained areas;
- Action to be taken in the event that treated effluent approaches or exceeds quality limits specified in *The Mineral Industry Environmental Protection Regulations, 1996*, or the *Metal Mining Effluent Regulations* and/or specified in the Approval to Operate Pollutant Control Facilities;
- An action plan to deal with spills of specific hazardous materials used on site; and
- A general action plan to deal with spills of unspecified hazardous materials.

6 Inspections & Monitoring

6.1 Geotechnical Monitoring Program

RTCU will develop and implement a geotechnical monitoring plan for all phases of shaft development and drift development. The inspections, testing (if required) and reporting will be conducted by appropriately qualified individuals.

6.2 Inspection & Monitoring

6.2.1 Visual Inspections

Prior to the commencement of any construction activities, RTCU will establish a detailed inspection program for all environmental aspects of the Roughrider Advanced Exploration Program and facilities.

Environmental inspection activities at the site will include, but not necessarily be limited to, daily inspections of all equipment (equipment, pumps, etc.) for leaks and/or fuel, lubricants and/or coolants spills. Secondary containment and emergency spill equipment will be at all locations (near operating equipment, pump locations, etc.) where the potential for a hazardous material spill may exist.

6.2.2 Water Quality Monitoring

Once Ministerial Approval is received for the Roughrider Project, RTCU will prepare and submit to the Ministry of Environment an application to construct various facilities at the site. That application will, at minimum, provide detailed design and operational aspects.

That submission will also propose the location and extent of proposed environmental monitoring at the Roughrider site and will include, but not necessarily limited to:

- Proposed surface water quality sampling station locations;
- Proposed ground water sampling station locations:
- Proposed frequency of sample collection at each station;
- Proposed suite of analytes for analysis at each station; and
- Any additional monitoring deemed appropriate or specified by the appropriate regulatory agencies.

6.2.3 Metal Mining Effluent Regulations

Section 2 of the *Metal Mining Effluent Regulations* (*MMER*) issued pursuant to subsections 34(2), 36(5) and 38(9) of the *Fisheries Act* states:

> ***2.*** *(1) These Regulations apply in respect of mines and recognized closed mines that*
>
> *(a) at any time after these Regulations are registered, exceed an effluent flow rate of 50 m^3 per day, based on effluent deposited from all the final discharge points of the mine; and*
>
> *(b) deposit a deleterious substance in any water or place referred to in subsection 36(3) of the Act.*

Based on baseline investigations and an assessment of the volume and quality of water discharged from the Roughrider Advanced Exploration Program, the total flow of "effluent" discharged from the site will likely exceed 50 m^3 per day but will be of a quality well below those specified in Schedule 4 of the *MMER*. RTCU will consult with Environment Canada to determine whether MMER applies to this proposed exploration program. In the event that MMER does apply, RTCU will adhere to the requirement related to the conduct of an appropriately designed and implement Environmental Effects Monitoring Program.

6.2.4 Air Quality Monitoring

Radon

Environmental monitoring for radon gas (Rn-222) concentrations using Radtrak track-etch radon detectors has been initiated and will continue during the exploration program.

Suspended Particulate Matter

A high volume sampling unit will be used to collect the suspended particular matter in the air during the construction, operation and decommissioning of the Roughrider Advanced Exploration Program. The sampler will likely be located approximately 150m downwind of the centre of activities (i.e. the headframe area) in the prevailing wind direction at the Roughrider site

6.2.5 Reporting

RTCU will prepare and submit environmental reports to the Ministry of Environment on a frequency defined within the Approval to Operate for the Roughrider site. The reports will provide a summary of the previous period sampling programs and prior to submitting each report, representatives of RTCU will review the data with respect to accuracy and completeness, effluent quality limits and the Saskatchewan Surface Water Quality Objectives.

6.3 Radiological Management Program

The Roughrider Radiation Protection Program will be developed and established to monitor personal radiation exposures and doses to levels that are consistent with the ALARA principle, and to comply with radiation protection regulatory requirements. Major components of the program will include, but not necessarily be limited to:

- Radon monitoring underground and at six separate sites around the project

- Regular, scheduled radiation measurements of specific areas both underground and on surface;
- Measurement and monitoring of gamma fields around the site (i.e. Special rock storage area);
- Personal dosimeter monitoring; and,
- Appropriate record keeping and reporting of radiological testing results.

7 Decommissioning & Reclamation

7.1 Introduction

In the event that a decision is made not to proceed with the development of a production mine at the end of the Advanced Exploration Program, RTCU has both a legal and a moral responsibility to decommission, cleanup and reclaim all sites related to the Roughrider Project including all roads and borrow areas at the cessation of activities. RTCU fully intends to do so in the manner prescribed by the appropriate regulatory authorities.

Once approval for the Roughrider Advanced Exploration Program to proceed is received and prior to the initiation of the Advanced Exploration Program, RTCU will develop a detailed Conceptual Decommissioning and Reclamation Plan and an estimate of the cost to undertake all activities identified within the plan. The Conceptual Decommissioning and Reclamation Plan and cost estimates will then be submitted to the Ministry of Environment for review and approval.

Once approval of the Conceptual Operational Decommissioning and Reclamation Plan and associated cost estimates is received from the Ministry of Environment, RTCU will immediately establish a financial assurance fund to cover the cost of decommissioning and reclamation in an amount and form approved by the Minister and the requirements of *The Mineral Industry Environmental Protection Regulations, 1996,*

7.2 Conceptual Decommissioning Plan

In all decommissioning and reclamation activities, RTCU intends to adhere to:

1. The design criteria and objectives specified by MOE's *Guidelines for Northern Mine Decommissioning and Reclamation* (November 30, 2008 – Version 6)

2. Environment Canada's *Environmental Code of Practice for Metal Mines (2009)*; and,

3. Industry Best Management Practices (BMP).

7.3 Reclamation

Once all surface infrastructure has been removed and disposed of appropriately, all depressions (excluding the shaft) will be backfilled with the material that was removed and stockpiled during initial development in order to restore each area to as near to pre-development condition as possible. All remaining equipment, machinery, tanks etc. will be demobilized from the site.

The remainder of the site will then be graded to match pre-disturbance topography as much as feasible and scarified to promote re-vegetation. The duff, logs and organic debris, which was stockpiled during initial site development, will be spread across the cleared areas in order to stimulate natural re-vegetative processes.

7.4 Summary

It is anticipated that after decommissioning, reclamation and transition phase monitoring are completed, the Roughrider advanced exploration site will be in a state that will allow for unrestricted access and for land use similar to that which existed before the development of the Advanced Exploration Program. The ability to successfully decommission the sites and minimize the residual effects can be judged against the operational impacts/effects of previous mining operations in the region, their success in implementing mitigation activities and effectively decommissioning the sites.

7.5 Transition Phase Monitoring

Once all required decommissioning and reclamation activities are completed to the satisfaction of the appropriate regulatory agencies, "transition phase monitoring" or "post-closure monitoring" will be initiated at the Roughrider site for an appropriate period of time to demonstrate that all areas are performing as predicted and to demonstrate that the site is physically and chemically stable.

7.1 Decommissioning Financial Surety

7.1.1 Decommissioning Cost Estimate

Once approval is granted for the Roughrider Advanced Exploration Program to proceed and prior to the initiation of the Advanced Exploration Program, RTCU will develop a detailed Conceptual Decommissioning and Reclamation Plan and estimate of associated costs for all aspects of the entire Project. The conceptual Decommissioning and Reclamation Plan and cost estimates will then be submitted to the Ministry of Environment for review and approval. Once approval of the Conceptual Operational Decommissioning and Reclamation Plan and associated cost estimates is received from the Ministry of Environment, RTCU will immediately establish a financial assurance fund to cover the cost of decommissioning and reclamation in an amount and form approved by the Minister and the requirements of The Mineral Industry Environmental Protection Regulations, 1996.

8 Existing Environment

8.1 Introduction

Canada North Environmental Services (CanNorth) was retained to conduct comprehensive environmental baseline studies for Rio Tinto's Roughrider Project. The studies were designed to provide a state of the art baseline program in order to thoroughly assess the environmental impact of the proposed project and to prepare the project for potential future licensing and regulatory requirements. Preliminary studies were conducted in 2011, the majority of the program was completed in 2012, and certain components like the water quality, air quality, hydrology and hydrogeology monitoring programs are ongoing.

The aquatic investigations focused on three areas: the Primary Aquatic Study Area (ASA), the Collins Creek ASA, and the Smith Creek ASA (Figures 8 and 9). The Primary ASA includes: North McMahon Lake; South McMahon Lake; Mink Arm; lakes A, B, D, E, F, and G; lakes C1 to C3 and lakes C5 to C7; Boulder Creek; Midwest Creek; and streams 1 to 7. These lakes and streams were chosen as they are located in close vicinity to the Roughrider ore bodies. Two waterbodies that can potentially act as reference areas once the Project is operational were also included in the baseline assessments. These include Henday Lake East Basin and an unnamed lake herein referred to as Reference Lake. These two references were chosen as Henday Lake's East Basin is similar in size to the larger lakes in the study area while Reference Lake is similar in size to the smaller lakes in the study area.

The Collins Creek ASA and Smith Creek ASA were included in the aquatic studies as both are being considered as possible treated effluent receiving areas. Waterbodies included within the Collins Creek ASA include: McClean Lake West and East basins; Kewen Lake; and Collins Creek between Indigo Lake and Kewen Lake, while waterbodies investigated in the Smith Creek ASA include: Unnamed Lake; Stomach Lake; Smith Creek; and Smith Bay of Hatchet Lake.

Terrestrial investigations focused on the Roughrider deposit mineral lease area (lease area), a Local Study Area (LSA) centred on the lease area, and a Regional Study Area (RSA) (Figure 10). The LSA included a 1 km zone surrounding the lease area, covering an area of approximately 20 km^2. The RSA encompassed a 15 km radius centered around the lease area totalling 706.9 km^2. This larger area was chosen as it provides the required information for any future developments associated with the mine, it provides a landscape-scale context for potential developments, and is consistent with Saskatchewan Ministry of the Environment (MOE) and Environment Canada (EC) requirements for assessment of potential impacts to terrestrial resources, including species at risk. Heritage resource investigations were focused in the LSA since they are required where ground disturbance occurs. In addition, select surveys were conducted along proposed access routes to the Project from Highway No. 905.

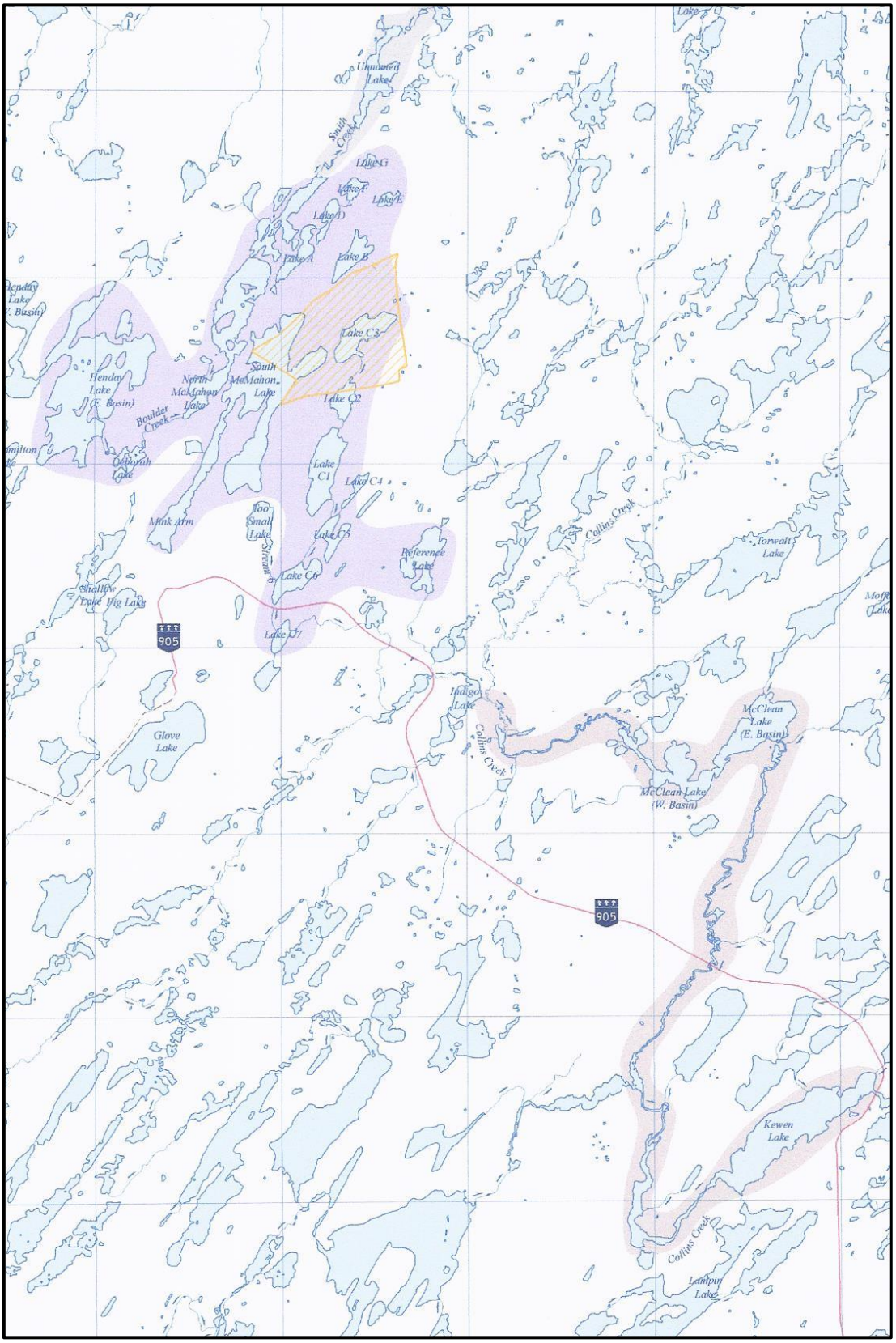

Figure 8: Aquatic Study Area – Primary & Collins Creek

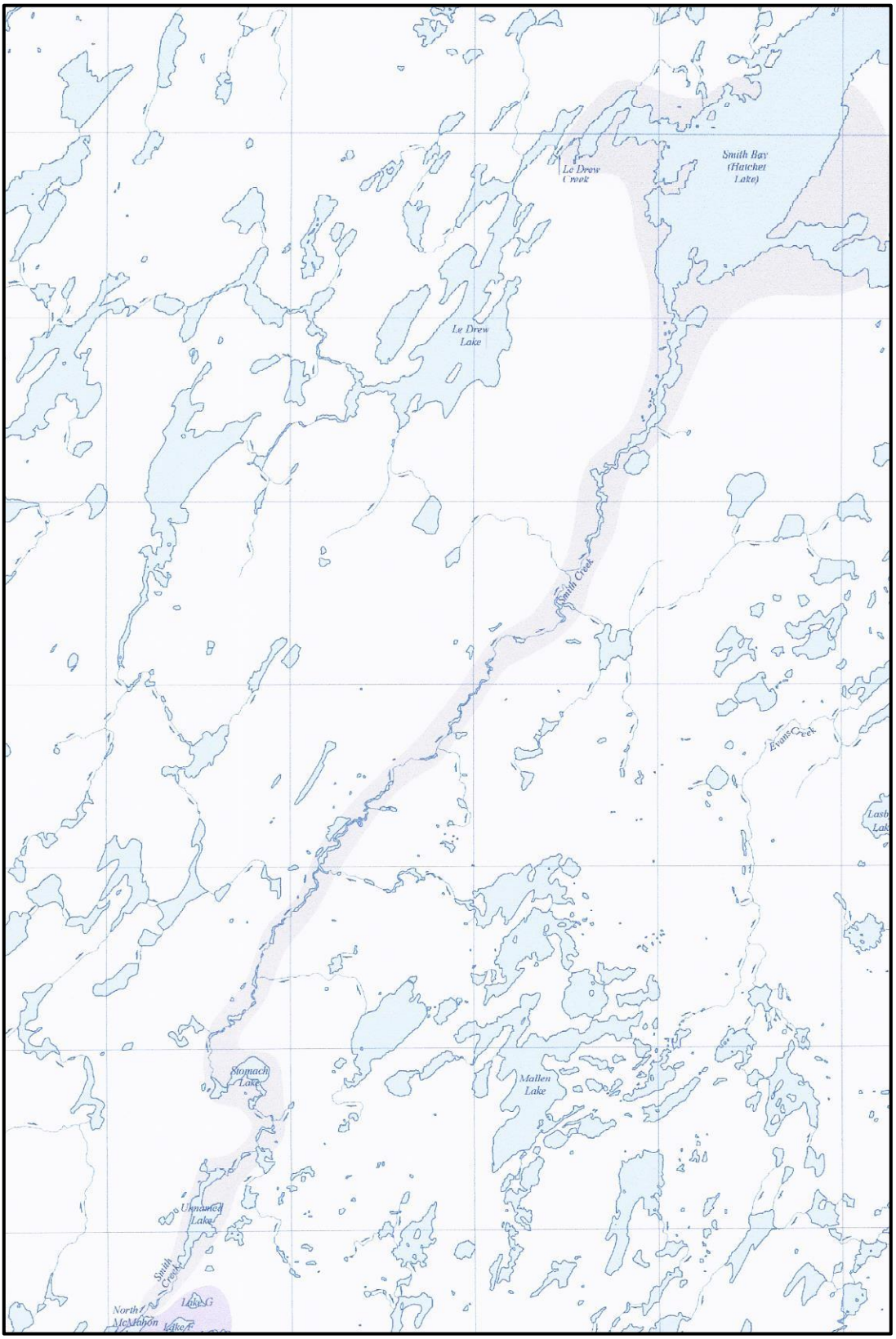

Figure 9: Aquatic Study Area – Smith Creek

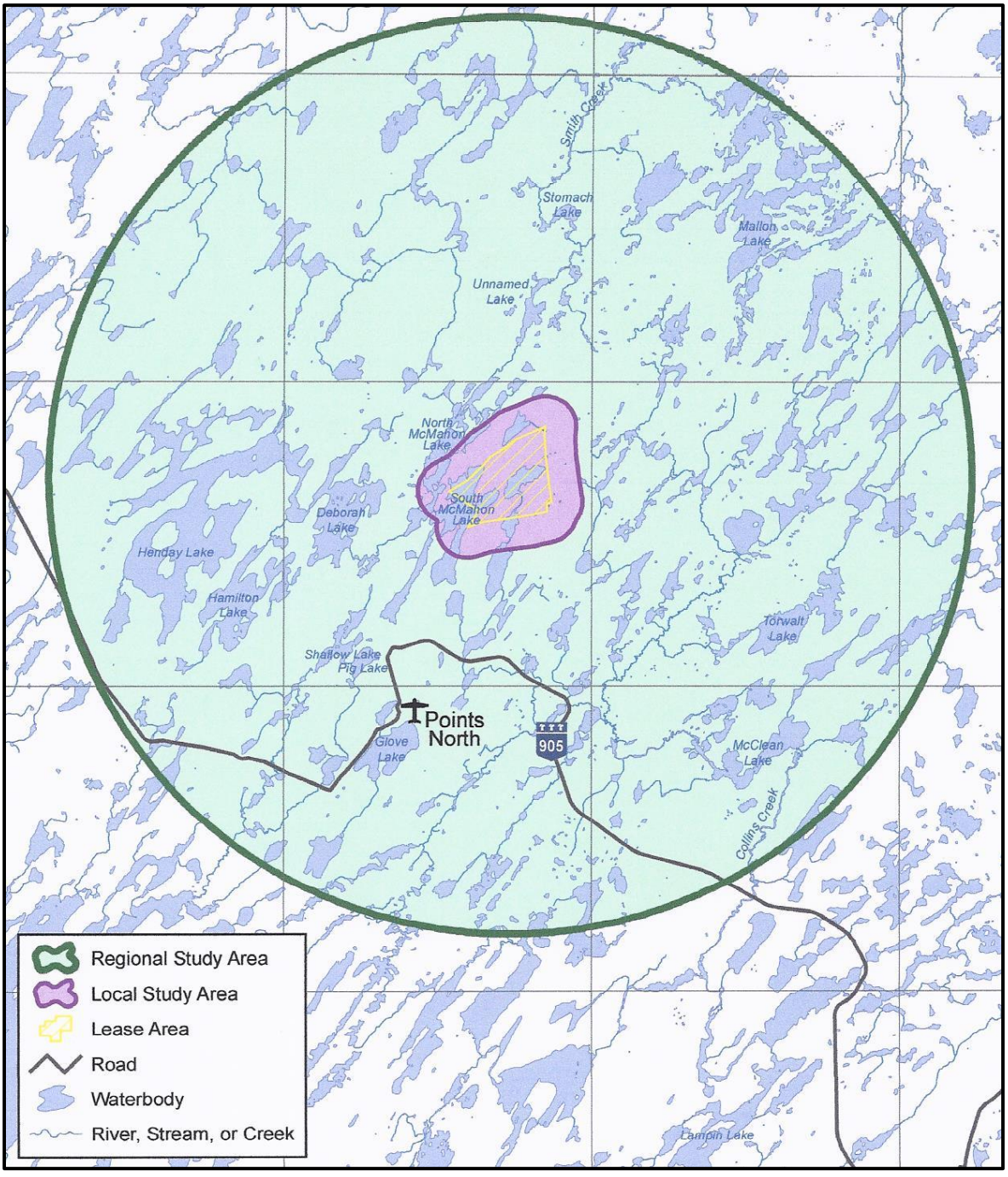

Figure 10: Regional and Local Study Areas

8.2 Ecoregion Description

The study area lies within the Athabasca Plain ecoregion in the Wheeler Upland Landscape within the Boreal Shield ecozone. This ecoregion is characterized by flatlying sandstone bedrock and a relatively thick and continuous cover of glacial deposits (Fung 1999). Drumlins, eskers, and meltwater channels provide local relief across the landscape. The climate is characterized by long, cold winters and short, cool summers.

As a result of the harsh environment, wildlife species diversity and population sizes are low in the Athabasca Plains ecoregion relative to other ecogions in the Boreal Shield ecozone (Acton et al. 1998). Drainage in this area is poorly developed and is often facilitated by small creeks connecting to larger waterbodies. Fires naturally occur on a regular basis and many forest stands are currently in a state of regeneration. The Wheeler Upland extends from the east side of Cree Lake to Hatchet and Wollaston lakes. Fewer glaciofluvial deposits are found north of Waterbury Lake, meaning more favourable soil moisture conditions are found here.

Flora found in the Athabasca Plain typically falls into one of six vegetation groups: jack pine forests, black spruce forests, black spruce/jack pine forests, mixed wood forests, boreal wetlands, or peatlands (bogs and fens). Jack pine forests tend to be found on well drained and sandy soils, whereas black spruce forests are generally in areas with a higher moisture regime. Black spruce/jack pine forests represent a transitional area between moisture gradients. Due to the prevalence of dry sandy soils, a harsh climate, and an intense fire regime, the vegetation in the Athabasca Plain ecoregion is dominated by jack pine stands (Acton et al. 1998; SKCDC 2012).

The fauna of the ecoregion tend to be concentrated near the diverse vegetation found in riparian areas. There are an estimated 42 mammal species, 193 known avian species (including 6 year round resident species), and 4 amphibian and reptile species that occur in the ecoregion (Acton et al. 1998; SKCDC 2012). In addition to terrestrial species, 22 fish species are known to occur in the ecoregion (Acton et al. 1998).

8.3 Climate

Historical climate data (1971-2000) for the Environment Canada meteorological station at Collins Bay (approximately 25 km east of the Roughrider Project area) was used to describe the climate normals for the region surrounding the Roughrider Project area. Annual average temperature was -4.0°C with monthly average temperatures ranging from –24.4°C (January) to 15.0°C (July). Total mean annual precipitation over the 30 year period was 551.6 mm, while mean annual snowfall was 278.9 cm, approximately 38% of the total annual precipitation.

In the summer of 2012, a permanent meteorological station was installed in the Roughrider Project area. This station continuously monitors temperature, precipitation, relative humidity, wind speed and wind direction, solar radiation, and barometric pressure. Over the five month period of record, mean monthly temperatures in the Roughrider Project area ranged from -23.6°C in December to

15.6°C in August, while precipitation in August and September was 78.5 mm and 90.9 mm, respectively.

8.4 Air Quality

Air quality was examined by measuring parameter concentrations in soil, blueberry, and lichen samples collected from six Permanent Sampling Plots (PSPs) established in the Roughrider LSA and six PSPs located near the northeast edge of the Roughrider RSA (Figure 11). The study design was set-up so that these PSPs can function as exposure and reference areas once the project is operational. Mean concentrations/activities of nutrients, metals, trace elements, and radionuclides illustrated little variability between sampling stations and reflected baseline conditions. Radon sampling stations were also established at each of the PSPs; however, the first radon detector collection was scheduled for the spring of 2013 and analysis of the detectors is currently underway.

8.5 Regional Noise

A baseline noise monitoring program was established in May 2012. As no sensitive receptors were found within the RSA, two monitoring stations were established within the Roughrider Project lease area. Noise monitoring occurred three times throughout the year and for a 24-hour period at each site. The average sound level recorded throughout the monitoring period ranged from 46.9 dBA in the fall to 55.8 dBA in the summer.

These levels are typical of baseline environmental levels recorded in other areas.

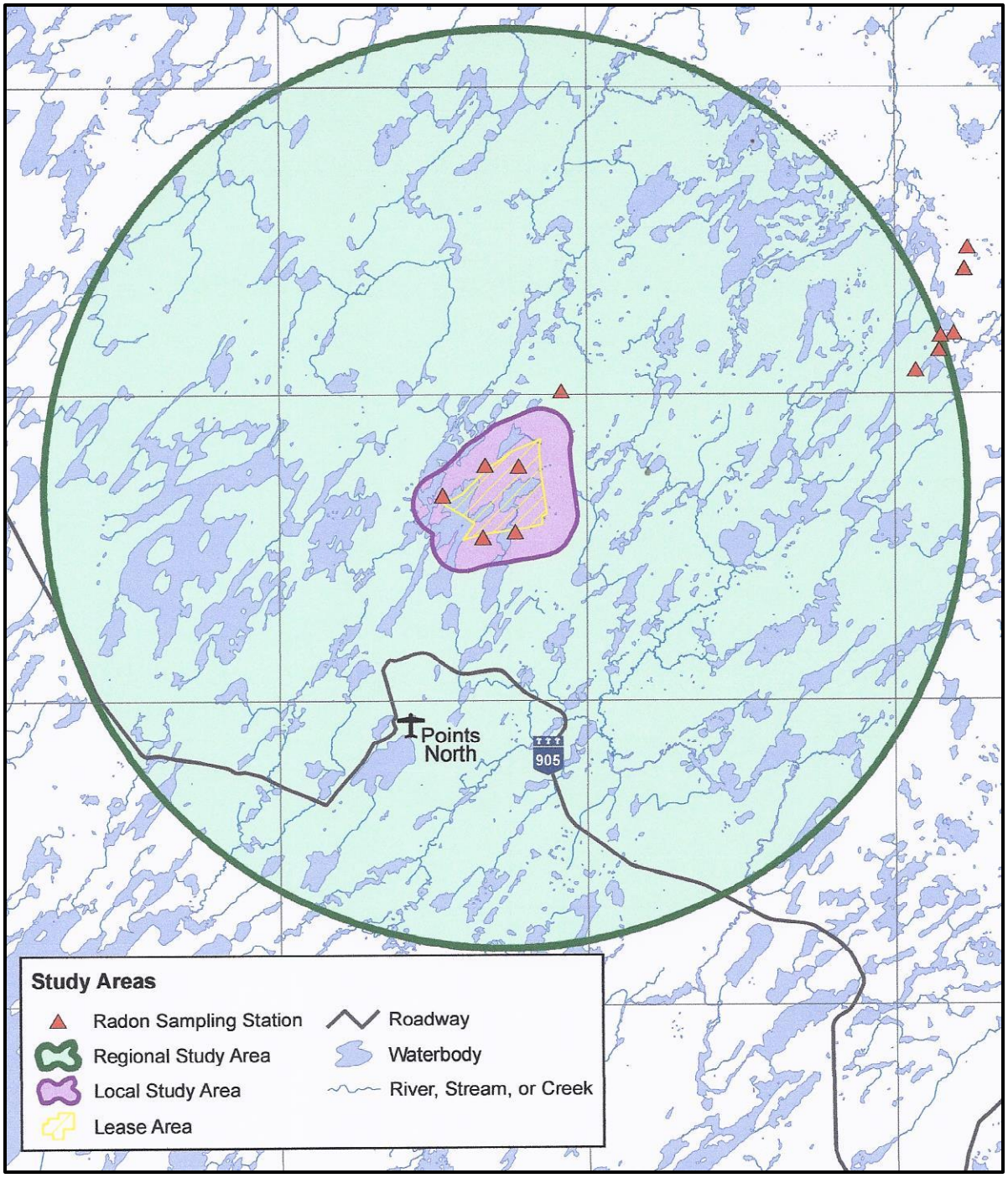

Figure 11: Air Quality Study Area

8.6 Regional Geology

The most significant uranium district in Canada is the Athabasca Basin which covers over 85,000 km^2 in northern Saskatchewan and north-eastern Alberta. The basin contains a relatively undeformed and unmetamorphosed sequence of Mesoproterozoic clastic rocks, the Athabasca Group. These rocks lie unconformably on the deformed and metamorphosed rocks of the Western Churchill Province of the Archean Canadian Shield. The basement rocks consist of Archean orthogneisses, which are overlain by, and structurally intercalated with, the highly deformed supracrustal Palaeoproterozoic Wollaston Group.

The Athabasca Basin is elongated along an east-west axis and straddles the boundary between two subdivisions of the Western Churchill Province; the Rae Subprovince to the west and the Hearne Subprovince to the east. The subprovinces are separated by the northeast trending Snowbird Tectonic Zone, which is called the Virgin River-Black Lake shear zone in the area of the Athabasca Basin. In the vicinity of the Roughrider Project area within the eastern Athabasca Basin, the basement rocks of the Hearne Subprovince are subdivided into a number of domains. The Hearne Craton, beneath the eastern Athabasca Basin, comprises variably reworked Archean basement, which is dominated by granitic domes and foliated to gneissic granitoid rocks with infolded outliers of Paleoproterozoic metasedimentary rocks. The structural and tectonic regime of the area has been influenced strongly by collisional tectonics between the Hearne and Superior Cratons during the early Proterozoic Trans-Hudson Orogen, which occurred approximately 1.9 to 1.77 billion years ("Ga") ago.

Unconformably overlying the basement rocks is the late Paleoproterozoic to Mesoproterozoic Athabasca Group consisting mainly of fluvial clastic sedimentary rocks. The Athabasca Group comprises eight formations in which four broadly fining-upward, unconformity-bound cycles can be distinguished. Overall, sedimentary provenance was from the east, south, and northwest. Lithologies are dominated by fine- to coarsegrained, partly pebbly or clay-intraclast-bearing quartz arenites and minor conglomerates.

Four important lithostructural domains have been identified in the Hearne Subprovince: the Eastern Wollaston Domain ("EWD"), Western Wollaston Domain ("WWD"); Wollaston-Mudjatik Transition Zone ("WMTZ"), and Mudjatik Domain ("MD"). The basement rocks within the property are part of the WMTZ. The majority of the uranium occurrences and all currently producing uranium mines in the area are hosted in rocks of the WWD and WMTZ.

The Roughrider Uranium Deposit overlies the WMTZ of the Wollaston Domain. The basement is structurally complex, comprising steeply dipping Wollaston Group rocks interfingering Archean granitic to granodioritic orthogneisses. Interpretations of aeromagnetic data suggest that several Archean granitic domes dominate the basement geology. Several basement packages are recognised in the Roughrider Uranium Deposit:

- Wollaston Group;
- Hanging Wall Wedge ("HWW");
- Foot Wall Wedge ("FWW"); and

- Midwest Dome ("MWD").

The property geology indicates that the Roughrider Project is situated in the basal part of the Wollaston Group, which is dominated by garnet- and cordierite-bearing politic gneisses with subordinate amounts of graphitic pelitic gneisses and psammopelitic to psammitic gneisses, and rare garnetites. Both the FWW and HWW are complex packages and comprise variable amounts of granitic to tonalitic orthogneiss that was subjected to local anatexis. The gneiss was intruded by younger pegmatites, leucogranites and microgranites. From drilling data, the FWW is only locally present and has been interpreted to plunge to the southwest and does not extend from the Roughrider West Zone eastward across the Roughrider East Zone. It is possible that several FWWs are present, and these represent slivers of either the MWD or the FWW that had been carved off during deformation.

The MWD comprises strongly foliated orthogneisses that range in composition from granitic to dioritic. They additionally contain volumetrically minor amounts of partially melted material, and younger 'Hudsonian' pegmatites, leucogranites and microgranites.

The sandstone and basement rocks have been subjected to several episodes of brittle deformation, including the brittle reactivation of older ductile shear zones.

Macro-scale geophysical, geological and structural modelling suggests that Roughrider Project is cross cut by a large number of structures. The two main structures to note are: (1) the east-west trending Roughrider Corridor and (2) the northern extension of the north northwest-south southwest-trending Midwest Trend, that hosts the Midwest and Midwest A Deposits on the adjacent mineral leases to the south of the project.

8.7 Local Hydrogeology

Hydrogeologic investigations at the Roughrider site began in July 2012 and by June 2013 eighteen monitoring wells and six multi-level vibrating wire piezometers had been installed. The hydrogeology was characterized through drilling and packer testing at six locations in and around the East and Far East zones, followed by installation of multilevel vibrating wire piezometers (strings of five to six vibrating wire pressure transducers installed in a single borehole) and nests of three monitoring wells at each of the six locations. To date, the hydrogeologic characteristics of the shallow unconsolidated deposits have not been investigated, but data has been collected for the Midwest Site, and the Roughrider area is expected to be similar.

Each monitoring well nest includes a well in the Athabasca sandstone at a depth of approximately 100 m below ground surface, a well at the unconformity at approximately 200 m below ground surface, and a well in the crystalline bedrock (highly altered in East and Far East zones) with total depths ranging from 275 and 385 m below ground surface.

Vibrating wire piezometers include five to six pressure transducers attached to 1-inch PVC casing with the deepest transducer installed at depths ranging from 290 to 444 m below ground surface. For each vibrating wire piezometer string there are transducers installed in the Athabasca sandstone within 10 m of the contact with the overlying unconsolidated deposits (at approximately 30 m below ground surface), in the Athabasca sandstone approximately 10 m above the unconformity between the sandstone and underlying crystalline basement rock, at the unconformity, in the crystalline bedrock approximately 10 m below the unconformity, in the crystalline bedrock within the orebody (East and Far East zones) or adjacent to the orebody at similar depths, and below the orebody (East and Far East zones).

The monitoring program includes water level measurements and water quality sampling (samples analysed for general chemistry, major cations and anions, trace metals, and radionuclides) from the monitoring wells on a quarterly basis and continuous water level monitoring from the vibrating wire piezometers (water levels measured twice daily). The results from these investigations will be included in the EIS.

8.8 Regional Surface Hydrology

Baseline hydrologic information was obtained from both desktop studies and field surveys conducted throughout the Roughrider Project ASA. A hydrology monitoring program was established in May 2012 to characterise the spatial and temporal variability in the hydrologic regime of the area. In total, 33 stations were established throughout the Primary ASA, Collins Creek ASA, and Smith Creek ASA. Six stations monitor stage elevation and stream discharge on a continuous basis, twenty-four stations monitor lake levels only, and three stations monitor velocity only. These stations will be monitored on an ongoing basis to capture both wet and dry years and to develop a streamflow record that represents the long-term variability in the hydrologic regime.

Bathymetric mapping of all of the waterbodies in the Primary, Collins Creek, and Smith Creek ASAs was completed in August and September of 2012. North McMahon and South McMahon lakes are the largest lakes in the Primary ASA with surface areas of 2.41 km^2 and 3.25 km^2, respectively, and volumes of 5.19 x 106 m^3 and 4.58 x 106 m^3, respectively. The remainder of the lakes in the ASA are fairly small, ranging in surface area from 0.08 km^2 (Lake G) to 0.65 km^2 (Lake C3) and in volume from 0.14 x 106 m^3 (Lake E) to 1.09 x 106 m^3 (Lake B).

Waterbodies in the Collins Creek ASA range in size from 0.77 km^2 (McClean Lake West Basin) to 2.66 km^2 (Kewen Lake). Kewen Lake is the most complex lake in the Collins Creek ASA, with five inflows, one outflow, and an irregular shoreline. In the Smith Creek ASA, waterbodies range in size from 0.35 km^2 (Stomach Lake) to 12.19 km^2 (Smith Bay). Unnamed and Stomach lakes are both small, shallow lakes that are located along Smith Creek, while Smith Bay of Hatchet Lake is large and complex.

8.9 Aquatic Environment

8.9.1 Introduction

In 2012, twenty-two long-term water quality monitoring stations were established in the Roughrider Project ASA, which includes the Primary, Collins Creek and Smith Creek ASAs, from which field-measured and laboratory-analyzed water quality data were collected seasonally. The study areas were generally well oxygenated (except in the winter), contained low specific conductance levels (mostly <20 µS/cm), and had pH levels in the range of 6.5 to 7.

8.9.2 Water Quality

Water chemistry data illustrated that parameter concentrations were mostly low and comparable among waterbodies, with the majority of values being near or below laboratory detection limits. In all three study areas, during all three seasons, aluminum, cadmium, and iron concentrations exceeded Saskatchewan Surface Water Quality Objectives and Canadian Water Quality Guidelines for the protection of freshwater aquatic life on various occasions. The concentrations of some parameters, particularly ions, were higher in waterbodies located downstream of treated effluent release from AREVA's McClean Lake uranium mining and milling operation.

8.9.3 Sediment Quality

Sediment chemistry (0 to 2 cm horizon) and particle size (0 to 5 cm horizon) samples were collected from 22 sampling locations in the Roughrider Project ASA in September 2012. In each study area, five replicate stations were sampled using a Tech-ops corer in the lakes and an Ekman dredge in the creeks. Particle size composition was primarily silt/clay in the Primary and Smith Creek ASAs and fine/coarse sand in the Collins Creek ASA. Parameter concentrations in the sediment chemistry samples were generally low, comparable between study areas, and reflected baseline conditions. There were some instances where concentrations of arsenic, cadmium, lead-210, molybdenum, nickel, polonium-210, selenium, vanadium, and zinc exceeded Canadian Sediment Quality Guidelines or Lowest Effect Levels at one or more stations. In particular, arsenic levels appear to be naturally elevated in the Roughrider Project ASA.

8.9.4 Phytoplankton & Zooplankton

Phytoplankton and zooplankton samples were collected at each of the water quality stations located in lakes in July/August 2012. One composite sample was collected per study area. The phytoplankton communities in the majority of lakes were dominated by cyanophytes (blue-green algae), with chlorophytes (green algae), chrysophytes (golden algae), and diatoms also making notable contributions. The dominant zooplankton taxon in the Primary and Smith Creek ASAs was rotifers, with the exceptions of Lake B and Stomach Lake. Zooplankton composition differed among the three locations in the Collins Creek ASA with rotifers, copepods, and cladocerans containing different densities. Simpson's diversity and evenness indices indicated that plankton communities in the Roughrider Project ASA were diverse but numerically dominated by few taxa.

8.9.5 Benthic Invertebrates

Benthic invertebrate sampling was conducted in depositional habitat at each of the 18 lake areas (co-located with sediment samples) and in erosional habitat at each of the 4 creek areas in September 2012. In the lakes, benthic invertebrate assemblages were predominantly composed of midges from the family Chironomidae. In the erosional habitat sampled in Collins and Smith creeks, hydrazoans, sphaeriid clams, and mayflies were abundant. Benthic invertebrate densities and biomass varied widely between sampling stations and study areas which is likely related to habitat differences.

Taxonomic richness was higher in the erosional habitats than the depositional habitats with richness at the family level ranging from 4 taxa (Reference Lake) to 21 taxa (Collins Creek 1). Simpson's diversity indices were relatively high (>0.62) in 5 of the 12 study locations in the Primary ASA, all 5 study locations in the Collins Creek ASA, and 4 of the 5 study locations in the Smith Creek ASA. The majority of the study areas contained low Simpson's evenness indices.

8.9.6 Aquatic Macrophytes

Aquatic macrophyte samples were collected from littoral areas of Unnamed Lake, North McMahon Lake, South McMahon Lake, and McClean Lake East and West basins in July/August 2012 for potential future chemical analysis. Five stations were established in each waterbody from which sedge shoot, root, and associated sediments were collected. The samples are currently archived.

8.9.7 Fish Spawning Survey

Fish spawning surveys were conducted in the spring and fall in waterbodies where the species under study are known to reside with the objective of documenting key spawning areas. Northern pike (*Esox lucius*) eggs were abundant throughout the Roughrider ASA. Sucker (*Catostomus spp*.) eggs were prevalent in areas of North and South McMahon lakes, Lake C2, Collins Creek, Smith Creek, and Smith Bay. Walleye (*Sander vitreus*) eggs were most abundant in the Collins Creek ASA and Arctic grayling (*Thymallus arcticus*) eggs were found only in Smith Creek. The lake trout (*Salvelinus namaycush*) spawning survey conducted in Smith Bay located low densities of eggs in the bay and the lake whitefish (*Coregonus clupeaformis*) spawning survey located eggs in the Smith Creek ASA.

8.9.8 Fish Community Surveys

Fish community surveys were conducted in 28 lakes and creeks in the Roughrider Project ASA in July/August 2012. A total of 2183 fish representing 12 species were captured in 15 waterbodies in the Primary ASA. The three most prevalent large-bodied fish species in the Primary ASA included northern pike, white sucker (*Catostomus commersoni*), and lake whitefish. In addition, yellow perch (*Perca flavescens*) were abundant in the C Lake drainage. A total of 470 fish representing 11 species were captured from four waterbodies in the Collins Creek ASA with yellow perch and northern pike dominating the large-bodied fish catch. A total of 698 fish representing 11 species were captured from four waterbodies in the Smith Creek ASA. In addition, Arctic grayling were captured in Smith Creek during the spring spawning survey.

8.9.9 Fish Tissue Chemistry

Northern pike samples were submitted for chemical analyses as a predatory species and lake whitefish were submitted from the majority of lakes as a bottom feeding species (white sucker were a surrogate in the C lakes where lake whitefish do not occur). The concentrations/activity levels of metals, trace elements, and radionuclides in fish flesh and bone samples from all study areas reflected baseline conditions and were generally similar between lakes. The exception was northern pike and lake whitefish bone samples from McClean Lake East Basin where cobalt concentrations were approximately ten-fold higher than in the other study lakes.

8.9.10 Aquatic Habitat Mapping

Aquatic habitat mapping was completed in each water body where a fish community survey was conducted, as well as in streams adjoining study lakes, in July/August 2012. The objective of the mapping was to document locations that provide critical fish habitat in the littoral zones of lakes and in stream channels by recording habitat features such as substrate type, water depth, macrophyte type and abundance, fish cover, etc. The habitat assessments illustrated a diversity of habitat types in the Roughrider Project ASA with fish spawning, rearing, feeding, and overwintering habitat provided.

8.10 Terrestrial Environment

8.10.1 Introduction

The terrestrial program included database searches for rare, at-risk, or sensitive plant and wildlife species, along with an intensive field program to assess the vegetation, wildlife, and wildlife habitat present within the lease area. Field investigations were completed June and August 2011 and March through October 2012. The terrestrial sampling program included rare plant surveys, ecosite classification, wetland classification, aural and visual amphibian surveys, waterfowl/raptor (nest) aerial survey, breeding bird census, ungulate aerial survey, winter wildlife tracking survey, pellet/browse survey, semi-aquatic mammal survey, small mammal trapping, and incidental wildlife observations.

8.10.2 Database Searches

Database searches resulted in 37 plant species with provincial conservation rankings of S1 to S3 (rare to rare-uncommon) previously observed in the area; none are federally or provincially listed species at risk. Eleven federally listed wildlife species at risk or species with special conservation measures were identified as potentially occurring within the search area. These include seven bird species and four mammals including boreal woodland caribou (*Rangifer tarandus caribou).* An additional 11 bird species that potentially occur in the area are ranked as rare provincially, and/or are considered sensitive species that have provincially recommended setback distances.

8.10.3 Habitat & Ecosite Classification

A supervised satellite image classification resulted in a total of 8 general habitat types being classified in the RSA and LSA.

Closed canopy conifer forest dominates the Project area, encompassing 324.7 km^2 (45.9%) of the RSA, and 8.73 km^2 (45.9%) of the LSA. Open canopy conifer forest (79.5 km^2 (11.2%) of the RSA; 1.3 km^2 (6.3%) of the LSA), and treed wetlands (80.1 km^2 (11.3%) of the RSA; 3.0 km^2 (15.1%) of the LSA) were also dominant habitats in the Project area. Approximately 30.3 km^2 (4.3%) of the RSA, and 1.5 km^2 (7.5%) of the LSA was recently burned.

Ecosite classifications of the dominant landforms in the Project area identified 10 distinct classes from 66 surveys. The jack pine/blueberry/lichen (BS3) (n = 27) ecosite was the most dominant habitat surveyed followed by the black spruce/blueberry/lichen (BS7) (n = 8) and jack pine/feathermoss ecosite types (BS4) (n = 8). Habitats in the Roughrider Project area are at various stages of succession after natural disturbance including recent (<10 years) fires, and regenerating forest. A total of 37 wetland classifications were also completed resulting in 7 wetland types, further divided into 14 ecosite types based on vegetation, identified in the Project area. Graminoid fens (BS24) (n = 7), black spruce treed bogs (BS17) (n = 5), leatherleaf shrubby poor fens (BS22) (n = 5), and black spruce – jack pine/feathermoss (BS9) (n = 4) were the most common ecosite types encountered in wetlands.

8.10.4 Plant Surveys

A total of 44 vascular plant species were identified during the spring 2012 surveys and 66 species were found during fall 2011 and 2012 rare plant surveys. Five of these species are rare provincially: leathery grape-fern (*Botrychium multifidum*; S3), few-flowered sedge (*Carex pauciflora*; S3), three-fruited sedge (*Carex trisperma*; S2), hairy butterwort (*Pinguicula villosa*; S2S3), and American scheuchzeria (*Scheuchzeria palustris*, S3).

Treed wetlands and jack pine-dominated forests had the highest estimated species richness. Twenty-nine of the observed plant species have documented traditional uses by the Cree and/or Dene people of northern Saskatchewan. Many of these plants are common and widely distributed in the Athabasca Plain ecoregion.

8.10.5 Amphibian Surveys

Two frog species were observed during amphibian surveys including boreal chorus frog (*Pseudacris maculata*) and wood frog (*Lithobates sylvaticus*). Boreal chorus frogs were detected at 9 of 17 (52.9%) acoustic survey sites and wood frogs were detected at 1 acoustic survey site. A total of 20 adult frogs were observed at 6 of 17 wetlands (35.3%) surveyed during visual amphibian surveys. Sixteen boreal chorus frogs were observed at three waterbodies and three wood frogs were observed at three different waterbodies. Neither of these species are species at risk.

8.10.6 Bird Survey

Eight quadrats were surveyed for waterfowl and raptor nests in May 2012: one quadrat in the LSA and seven quadrats in the RSA. A total of 336 individual birds were observed during the surveys representing 20 species. The most abundant species observed were mallard (*Anas platyrhynchos*) (n = 70), scaup spp. (*Aythya spp*.) (n = 50), and whitewinged scoter (*Melanitta fusca*) (n = 49). One species ranked as rare and one with recommended activity guidelines (SE 2003), were observed during the survey in the RSA but outside of survey quadrats: red-throated loon (*Gavia stellata*) (S1B; n = 1), and bald eagle (S5B, S4M, S4N).

During the breeding bird surveys in June 2011 and 2012, a total of 67 avian species were detected on 108 point counts. Two species detected in the study area are listed federally as threatened: olive-sided flycatcher (*Contopus cooperi*) (n = 8), and common nighthawk (*Chordeiles minor*) (n = 9). Four species detected within the lease area and/or RSA have provincial activity setbacks: bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), northern hawk owl (*Surnia ulula*), Bonaparte's gull (*Chroicocephalus philadelphia*), and common tern (*Sterna hirundo*). Setback distances for common terns apply only to breeding colonies, and no colonies were observed.

A total of 17 surveys were completed within or in close proximity to the LSA for staging and migrating waterfowl. Twenty-three migratory bird species were seen from a total of 2,174 observations during all three fall migration surveys. Snow geese (*Chen caerulescens*) (n = 1,450), sandhill cranes (*Grus canadensis*) (n = 151), and Ross's geese (*Chen rossi*) (n = 128) had the highest abundance of migrating birds. Waterfowl, including geese, ducks, and loons accounted for 2,145 (98.7%) of the observations. Five observations of osprey, and one bald eagle were also observed. Most birds seen during this survey were observed flying over.

8.10.7 Winter Tracking Survey

Winter tracking surveys were conducted in the RSA to: 1) determine the presence/absence and relative abundance of animals active in the winter, 2) provide a better understanding of species/habitat relationships, and 3) provide a scientifically valid baseline for potential follow-up/monitoring requirements. Triangle transects (3 km in length, 1 km each side) were placed in the LSA and throughout the RSA in homogeneous habitat types where possible. Winter tracking surveys were conducted March 6th to March 22nd, 2012.

Thirteen triangular transects were surveyed in the RSA in four general habitat types. Winter tracking effort was split between the RSA and the LSA with 69% of sampling effort in the RSA (33 km). Evidence of mammals was observed 1,000 times during winter tracking surveys (828 tracks, 150 trails, 22 networks). Twelve species, or species groups, were detected during winter tracking surveys including red squirrel (*Tamisciurus hudsonicus*), snowshoe hare (*Lepus americanus*), fisher (*Martes pennanti*), American marten (*Martes americana*), red fox (*Vulpes vulpes*), moose, caribou (either woodland or barren-ground), grey wolf, Canada lynx, as well as grouse/ptarmigan (ruffed grouse *Bonasa umbellus*, spruce grouse *Falcipennis canadensis*, or sharp-tailed grouse *Tympanuchus phasianellus*, *Lagopus* spp.), weasel (*Mustela* spp.), and microtine species (e.g., shrews, mice).

Snowshoe hare tracks were the most abundant tracks observed (410 tracks, 141 trails, 10 networks), followed by grouse/ptarmigan (114 tracks, 1 trail, 2 networks), and red squirrel (104 tracks, 4 trails, 1 network). Nine caribou tracks were observed on three transects, and only one set of moose tracks was observed. Two Canada lynx tracks were observed along with seven red fox tracks and nine microtine tracks. Tracks of microtines are not a good estimator of their abundance because their tracks are easily destroyed, and most of their activity in the winter occurs below the surface of the snow (Jones et al. 2011). Additionally, several microtine species have cyclical population changes due to various factors including predation, and food supply (Krebs 2011), and single-year studies reflect population levels at a specific point in that cycle.

Caribou (boreal or barren-ground) tracks were observed in black spruce dominated forest (0.27 tracks/km/DSS), and jack pine-dominated forest (0.16 tracks/km/DSS). Red fox tracks were observed in jack pine-dominated (0.18 tracks/km/DSS) forest, and treed wetland habitat types (0.72 tracks/km/DSS). Jack pine dominated forest contained the highest abundance of American marten tracks (1.90 tracks/km/DSS) followed by black spruce-dominated forest (1.64 tracks/km/DSS), and treed wetlands (1.26 tracks/km/DSS). Track abundance was lower in open/shrubby wetland (0.34 tracks/km/DSS). Fisher tracks were observed only in jack pine-dominated forest (0.50 tracks/km/DSS), and black spruce-dominated forest (0.51 tracks/km/DSS).

Weasel track abundance was highest in treed wetland habitat types (1.88 tracks/km/DSS), and jack pine-dominated forest (1.42 tracks/km/DSS) but were also observed in black spruce-dominated forest (0.98 tracks/km/DSS).

8.10.8 Ungulate Aerial Survey

A systematic ungulate aerial survey was conducted to determine presence and density of moose and boreal caribou in the Project area. Twenty-nine transects were flown by helicopter covering a total area of 284.2 km2 (39.8% of the Project area). A total of 13 individual moose (including a cow/calf pair) were observed on the survey resulting in a density of 0.042 moose/km^2. No caribou were observed during aerial surveys; however, caribou tracks and craters were observed at three locations indicating their presence within the RSA.

8.10.9 Pellet & Browse Survey

Pellet and browse surveys were conducted in the Project area to determine presence and abundance of wildlife species, along with an estimate of their habitat use. Signs of five species/groups were identified: woodland caribou, moose (*Alces alces*), mink (*Neovison vison*), snowshoe hare (*Lepus americanus*), and grouse/ptarmigan (spruce grouse, sharptailed grouse, ruffed grouse, and *Lagopus lagopus*). Moose pellets were observed in all habitat types but were highest in mixedwood forest. Caribou pellets were observed once in jack pine-dominated forest. Mink scat was observed at one location in shrubby wetland habitat. Grouse/ptarmigan pellets were distributed throughout the study area, with pellets observed in five out of six habitat types sampled. Snowshoe hare pellets were observed in jack pine and black spruce forests as well as recently burned forest. Common browse species in the study area were alder (*Alnus spp*.), dwarf birch (*Betula nana*), and willow (*Salix spp*.).

Browse data indicate that shrubby wetlands, burned forest, and treed wetlands are important moose foraging habitats.

8.10.10 Small Mammal Survey

A total of 748 snap traps were set for small mammals in seven ecosite types to determine species composition, relative abundance and chemical parameters. Two-hundred and sixty seven small mammals were caught of three species of small mammals: red-backed vole (*Myodes gapperi*), meadow vole (*Microtus pennsylvanicus*), and *Sorex spp*. Whole body specimens were collected from all transects and a portion of collected specimens (18 to 24 individuals) were composited into 5 samples and submitted for chemical analysis. Eight of the parameters had concentrations below the detection limit for all stations. Mean concentrations of other parameters were variable between all stations.

Semi-aquatic furbearer surveys resulted in 75 observations of muskrat (*Ondatra zibethicus*), beaver (*Castor candensis*), and mink at a density of 1.38 observations/km of shoreline surveyed over 30 transects. Muskrat activity was observed on 11 of 30 transects, beaver activity was observed on 15 of 30 transects, and mink scat was observed on 4 of 30 transects.

8.11 Rare & Endangered Species

8.11.1 Plant Species

A total of 63 sites were surveyed for rare plants in the Roughrider project area in 2011and 2012. Spring and fall surveys were distributed throughout 10 ecosite types with a range of 1 to 25 sites per ecosite (mean 6.2 sites/ecosite).

Of the 119 rare plant species potentially occurring in the Athabasca Plain ecoregion, 5 were observed in the study area: leathery grape fern (*Botrychium multifidum*) (S3), few-flowered sedge (S2), three-seeded sedge (*Carex trisperma*), hairy butterwort (*Pinguicula villosa*) (S2S3), and American scheuchzeria (S3) (Figures 12). None of the species observed are listed on the federal Species at Risk Act or protected under the provincial Wildlife Act. No exotic and/or prohibited, noxious, or nuisance weeds as listed by the *Saskatchewan Weed Control Act* were observed during vegetation studies.

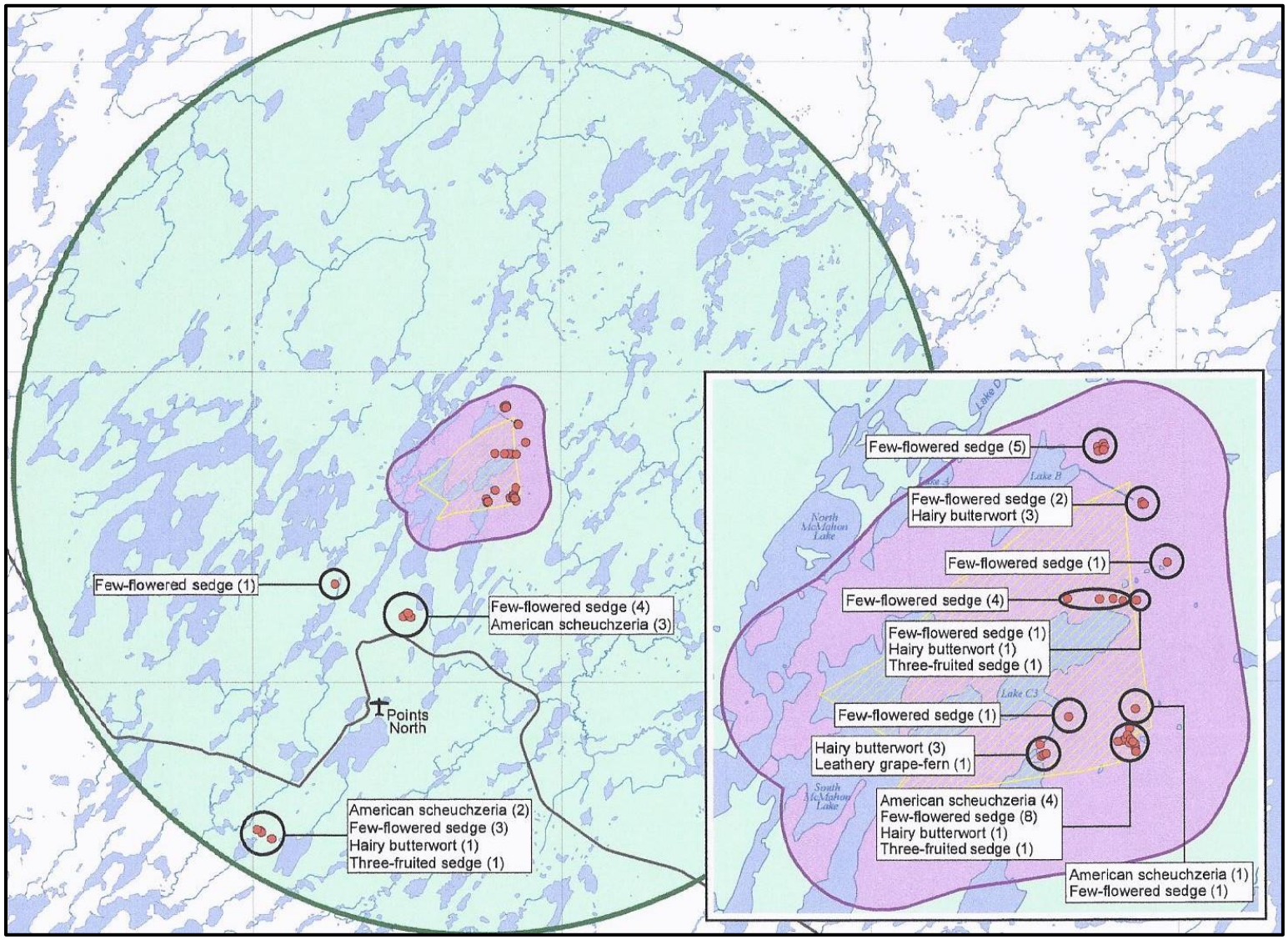

Figure 12: Rare Plant Occurrence – Site Area

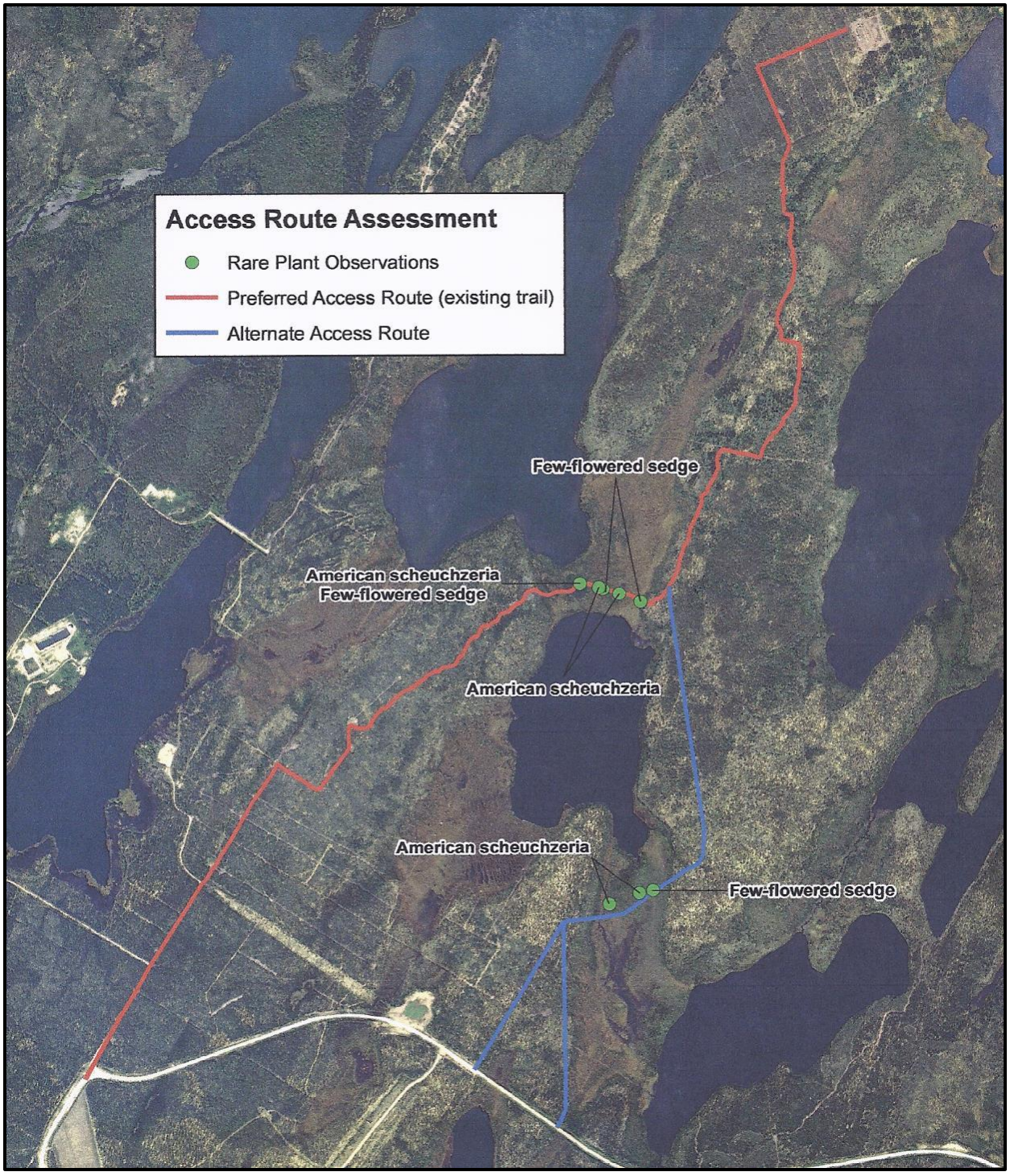

Figure 13: Rare Plant Occurrence – Access Route

CanNorth conducted a rare plant survey and an ecosite classification survey along the Roughrider project proposed access route, including two alternative route options, from September 20th to September 21st, 2012. The primary objective of these surveys was to gather data on vegetation occurring along the proposed access routes.

Twenty sites were surveyed for rare plants along the preferred and alternative access route options (Figure 13). All vascular plant species were identified within each 25 m radius rare plant plot. A total of 35 vascular plant species were identified during the survey. Two rare plants were observed: American scheuchzeria (*Scheuchzeria palustris*), ranked as S3 (rareuncommon), and few-flowered sedge (*Carex pauciflora*), ranked as S2 (rare) (SKCDC 2012). Neither one of these species are federally listed or protected under the provincial wildlife act.

Ecosites were classified at each of the 20 rare plant plots along the proposed access routes. Ground cover within a 10 m by 10 m quadrat, plant community composition, and general site characteristics were evaluated at each location. Six different ecosites occurred along the proposed access routes.

8.11.2 Wildlife Species

Database searches resulted in the identification of eleven federally listed wildlife species at risk or species with special conservation measures were identified as potentially occurring within the study area. These include seven bird species and four mammals.

During the breeding bird surveys in June 2011 and 2012, a total of 67 avian species were detected on 108 point counts. Two species detected in the study area are listed federally as threatened: olive-sided flycatcher (*Contopus cooperi*) (n = 8), and common nighthawk (*Chordeiles minor*) (n = 9).

Four bird species detected within the lease area and/or RSA have provincial activity setbacks: bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), northern hawk owl (*Surnia ulula*), Bonaparte's gull (*Chroicocephalus philadelphia*), and common tern (*Sterna hirundo*). Setback distances for common terns apply only to breeding colonies, and no colonies were observed.

Database searches conducted as part of the 2011 and 2012 baseline investigations identified 4 federally listed wildlife species at risk or species with special conservation measures as potentially occurring within the project area. These include four mammals including wolverine (*Gulo gulo*), little brown myotis (mouse eared bat) (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), and boreal woodland caribou (*Rangifer tarandus caribou*).

8.12 Valued Ecosystem Components

8.12.1 Introduction

Valued ecosystem components (VECs) are environmental attributes or components identified as having a legal, scientific, cultural, economic or aesthetic value (*e.g.*, fish, beaver, caribou, moose and raptors). They provide a common basis that underlies the environmental baseline studies conducted

in support of an assessment and are generally a significant consideration in the development of an effective monitoring program.

8.12.2 Valued Ecosystem Components

The concept and identification of VECs has more than 16 years of history in northern Saskatchewan and continues to be an important consideration for RTCU during consultation on the potential impacts of a proposed activity or operation.

Identified VECs for the Roughrider Advanced Exploration Program include:

- Benthic Invertebrates;
- Phytoplankton;
- Zooplankton;
- Predatory fish (Northern Pike and Lake Trout);
- Bottom feeding fish (White Sucker and Lake Whitefish);
- Fish habitat;
- Raptors;
- Migratory waterfowl;
- Snow shoe hare;
- Woodland Caribou, Moose; and,
- Muskrat, Beaver, Mink.

8.12.3 Traditional Valued Ecosystem Components

Plant Species

Twenty-nine plant species that have documented traditional uses by Cree and/or Dene people in northern Saskatchewan (Marles 1984; Marles et al. 2008; Moerman 2010) were observed during rare plant surveys in the Roughrider Project area in 2011 and 2012. Defined categories of use include: food, medicinal, spiritual/ceremonial, and household/miscellaneous. To respect the privacy of practitioners who may access and use these plant resources in the present day, additional details about plant locations are not presented; however, it is noted that many of these plants are common and widely distributed throughout the Athabasca Plain ecoregion.

Traditional Foods

A dietary survey of members of the Hatchet Lake Denesuline First Nation was commissioned by the Atomic Energy Control Board (AECB) in 1999.

The results of the survey indicated that traditional food consumption was a very important dietary source for members of the Hatchet Lake Denesuline First Nation. Total energy contribution from traditional food intake for children and adults in summer was 14% and 18% respectively. In winter, total energy contributed from traditional foods increased for children and adults to 20% and 29% respectively. The increase was largely due to higher consumption of caribou during the winter.

The study found that traditional meat is predominantly from caribou, although moose, snowshoe hare, beaver, muskrat and porcupine were also consumed. These animals are obtained locally,

although in winter, hunters often travel north near the Northwest Territories border and northeast into Manitoba to hunt caribou. The average consumption of traditional meat (excluding fish, poultry and fat) is 256.1 grams per day in summer and 382.4 grams per day in winter

Fish are also an important dietary component of Band members of Hatchet Lake Denesuline First Nation. Consumption of fish is highest in the summer with an average intake of 82.2 grams per day. In winter this decreases to 27.7 grams per day. The most commonly used fish species are lake whitefish and lake trout, although walleye, northern pike, artic grayling and sucker species are also fished and consumed. Fish are primarily obtained from Wollaston Lake, although other nearby lakes are also a source of fish. Grouse, ptarmigan, ducks, geese, swans and sandhill crane are also consumed on an opportunistic basis.

Traditional fruits consumed include bog cranberries, pinch berries, raspberries, blueberries and cloudberries. These are usually eaten fresh, frozen or canned, and are prepared by boiling or baking. Plants used for medicinal purposes include bearberry, birchbark, spruce gum, muskrat root and blackberry.

January 2013 Communities Environmental Workshop

On January 15th and 16th, 2013, RTCU hosted a workshop in La Ronge which was attended by representatives of Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet) Southend/Kinoosao (Peter Ballantyne Cree Nation), the Northern Settlement of Stony Rapids and the Prince Albert Tribal Council.

One of the objectives of that workshop was to have the workshop participants identify “traditional valued ecosystem components”. The workshop discussions identified some of the important traditional valued ecosystem components, including caribou, medicinal plants such as rat root, and mushrooms. It was also noted that beaver remains an important food source in the north. Concerns were raised regarding the potential for fish and moose contamination as they are a food source for many of the communities.

8.13 Heritage Resources

A heritage resources impact assessment was conducted during 2012 in areas that could potentially be impacted by the Roughrider Project including the temporary access trail (also proposed permanent access road) route. During previous studies, one known heritage resource (IcNa-6) was located in the LSA while a second known heritage resource (IbNa-6) was located immediately outside of the LSA. These sites were previously assessed and determined to have low interpretive value and no further archaeological work was required. No further heritage resources were identified throughout the Roughrider Project area in 2012.

8.14 Human Environment

The RTCU Roughrider Project is located within the Northern Administration District (NAD) of Saskatchewan . The NAD is defined in the Province's *Northern Municipalities Act*, but its creation dates back to *The Northern Administration Act, 1948*, which provided for the administration and development of the northern part of Saskatchewan.

The NAD or the "North", as it is often referred to, covers 46% of the Province of Saskatchewan (land mass of 268,499 square kilometres) yet consists of less than 4% of the provincial population. One of every five Aboriginal people in Saskatchewan lives in the northern region (21%). Almost 9 of every 10 people in the northern region are of Aboriginal heritage – 86% compared to 15% provincially and 4% nationally.

The North's population of approximately 36,000 lives in approximately 70 communities which include municipalities, First Nations Reserves, settlements, and, in some instances, a combination of both. In 2010, 32% of the population was under 15 years of age. Only 4.5% was over age 65. In total approximately two-thirds of the population is under the age of 35, and almost 9 out of 10 people are of Aboriginal heritage: Cree, Dene or Métis.

RTUCU will include a detailed socioeconomic baseline and assessment of the potential social and economic impacts likely to arise as a result of the Roughrider Advanced Exploration Program in the EIS.

9 Athabasca Denesuline Northern Land Use Vision

Provincial government sponsored land use planning in the Athabasca Basin was originally undertaken in 2000 by the creation of an Athabasca Basin Land Use Interim Advisory Panel. The deliberations of this body were subsequently discontinued by the Ministry of Environment. Notwithstanding the withdrawal of the government and representatives of industry, three First Nations and four municipal communities continued independently to prepare an "independent" Athabasca land use vision and plan.

The Athabasca Denesuline Northern Land Use Vision is "to manage the use of the land and resources of the Athabasca in an integrated and environmentally sound manner to ensure ecological, economic, social, cultural and spiritual benefits for present and future generations".

The Vision is the result of extensive review and consultation in the communities to ensure public input and direction. Three First Nations and four municipal communities, including Camsell Portage, Uranium City, Fond-du Lac, Stony Rapids, Black Lake, Wollaston and Hatchet Lake, united to form the Athabasca Land Use Panel and to prepare the Athabasca land use vision and plan covering First Nation reserves and provincial Crown lands within the Athabasca.

The planning area covers 132,300 sq. km and includes four land use zones (Figure 14):

- Nih bÿk'ÿsórÿdåí (Conservation Zone) – 30% (shown in pink on Figure 14)
- Special Management Zone – 40% (shown in green in Figure 14)
- Multiple Use Zone – 27% (shown in blue in Figure 14)
- Infrastructure Zone – 3% (shown in gold in Figure 14)

70% of the planning area is potentially open for new development subject to the Athabasca land use planning guidelines. 30% of the planning area is set aside to protect Athabasca Denesuline land use and occupancy, including cultural places, barren ground caribou habitat, other important terrestrial and aquatic species' habitats, and important ecological landscapes. The conservation of cultural places, drainage systems and wildlife habitat are paramount throughout the planning area.

A set of overarching land use policies were developed to guide land use including requirements to:

- Consult with Aboriginal communities, including arrangements of socio-economic benefits;
- Report and avoid cultural places, archaeological sites, and caribou encountered during development is mandatory
- Complete licences, permits or other government authorizations and their environmental protection terms, as well as ensure conformity with the Athabasca land use vision and plan.

The RTCU Roughrider property is located in a "Special Management" Zone according to the Athabasca Denesuline Northern Land Use Vision. Mineral exploration and mineral extraction/mining will "potentially be permitted " or "allowed" in "special management" zones under the following "conditions":

"Special Management" Zone

"In this zone, protection of cultural places and wildlife habitat are paramount. New development may be permitted providing that the impacts on cultural and wildlife resources are minimal.

New developments are subject to more rigorous up-front scoping and consultation to identify and protect significant natural and cultural values. The required consultations and investigations may be best accomplished through a social and environmental impact assessment of any proposed development."

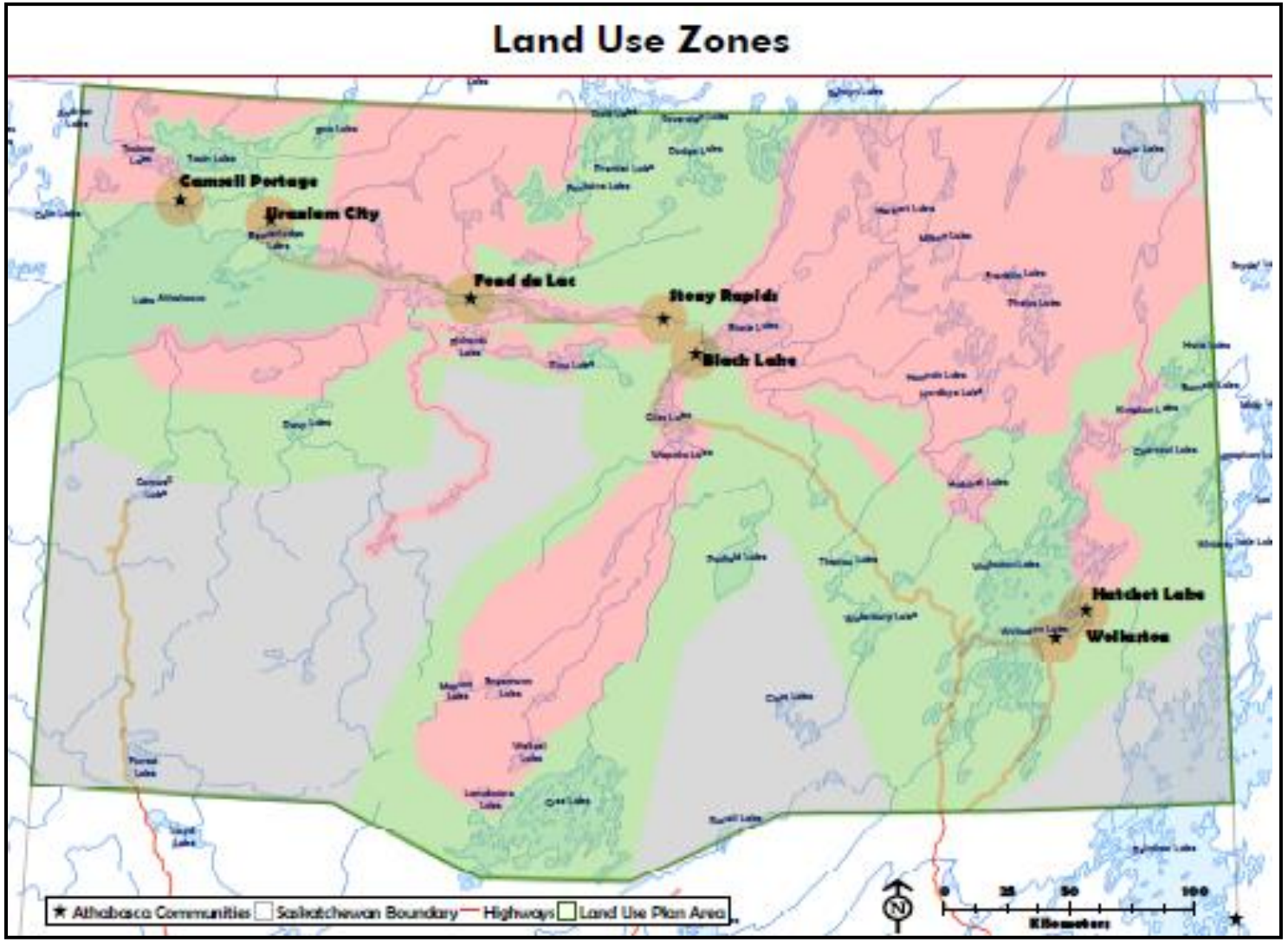

Figure 14: Athabasca Denesuline Northern Land Use Vision

10 Potential Impacts and Mitigation Measures

10.1 Assessment Scope and Methodology

This section presents a general overview of the assessment methodology adopted to conduct an assessment of the impacts resulting from the Roughrider Advanced Exploration Program as proposed. The assessment methodology reflects the requirements of the *Environmental Assessment Act* (Saskatchewan) and the *Canadian Environmental Assessment Act* (CEAA). The results of this assessment will be included in the Environmental Impact Statement and will include the following:

- Consideration of Alternative Means of Carrying Out the Project;
- A clear identification of assessment boundaries (both temporal and spatial) including the Valued Ecosystem Components (VECs) which must be considered;
- General Assessment Methodology (the systematic consideration of how the program facilities and operations interact with the environment);
- An identification of over the entire life of the project , including;
    - Project specific impacts;
    - Regional Impacts;
    - Cumulative Impacts;
    - Impacts of the Environment on the Project;
- Ranking of potential impacts identified;
- An identification of methods to mitigate potential impacts;
- An identification of residual impacts after mitigation;
- The proposed method of monitoring of predicted impacts; and
- An identification of any uncertainties in the process and results.

10.2 Valued Ecosystem Components

The EIS will focus on valued ecosystem components.

Valued ecosystem components (VECs) are environmental attributes or components identified as having a legal, scientific, cultural, economic or aesthetic value (*e.g.*, fish, beaver, caribou, moose and

rapturs). They provide a common basis that underlies the environmental baseline studies conducted in support of this assessment and have been a significant consideration in the development of an effective monitoring program.

The concept and identification of VECs has more than 16 years of history in northern Saskatchewan and continues to be an important consideration during consultation on the potential impacts of a proposed activity or operation.

Identified VECs for the Roughrider Project include:

- Benthic Invertebrates;
- Phytoplankton;
- Zooplankton;
- Predatory fish (Northern Pike and Lake Trout);
- Bottom feeding fish (White Sucker and Lake Whitefish);
- Fish habitat;
- Raptors;
- Migratory waterfowl;
- Snow shoe hare;
- Woodland Caribou, Moose; and,
- Muskrat, Beaver, Mink.

10.3 Ecological & Human Health Risk Assessment

RTCU has commissioned SENES Consultants to conduct a screening level ecological and human health risk assessment of the proposed Roughrider Advanced Exploration Program.

10.3.1 Screening Level Ecological Risk Assessment

Ecological risk assessment (ERA) is the evaluation of the probability of adverse health consequences to ecological receptors such as fish, terrestrial vegetation, soil-dwelling organisms, mammals and birds caused by the presence of contaminants at a site.

The Canadian Council of Ministers of the Environment (CCME 1996) has provided general guidance concerning its views on what constitutes an ecological risk assessment (ERA). The recommended framework is similar to that proposed by Environment Canada (Env. Can. 1997) and is supported by the Ontario Ministry of the Environment (MOEE 1996). The CCME recommends three levels of investigation.

The first level, a Screening Level Assessment (SLA or Tier 1) is essentially a qualitative assessment of potential risks to important ecological receptors. The second level, the Preliminary Quantitative Risk Assessment (PQRA or Tier 2) focuses on filling gaps identified at the screening level and the third, a Detailed Quantitative Risk Assessment (DQRA or Tier 3) includes more detailed data and modelling.

The rigour of the risk assessment adopted for a particular situation should be commensurate with the degree and extent of potential harm and may progress to a more stringent level (i.e., from Tier 1 to

Tier 2 or from Tier 2 to Tier 3) depending on the findings at each level. Each level in this tiered approach has the same structure and builds upon the data, information, knowledge and decisions generated from the preceding level. Thus, each level is progressively more rigorous and complex.

Each level of the assessment includes the following elements:

- Receptor Characterization: At this phase of the assessment, the potential receptors are identified and the pathways of exposure are defined.
- Exposure Assessment: The purpose of this stage is to quantify the contact between the receptor and the contaminant of concern.
- Hazard Assessment: This phase of the ERA examines the potential effects of a contaminant to a receptor.
- Risk Characterization: The risk characterization stage combines the information collected in the exposure assessment and the hazard assessment, and the potential for adverse ecological effects is estimated.

Adverse ecological effects are characterized by the value of a simple screening index (generally considered to be 1). This index is calculated by dividing the expected exposure concentration or dose by the selected toxicity reference value for each ecological receptor. An ERA is concerned with estimating effects on populations, communities and ecosystems (multi species). Estimation of population level impacts is a complex issue and involves some level of scientific judgement.

10.3.2 Human Health Risk Assessment

A human health risk assessment (HHRA) evaluates the probability of adverse health consequences caused by the presence of contaminants in the environment. In a HHRA, receptor characteristics (e.g., portion of time spent in the study area, source of drinking water, composition of diet) and exposure pathways (e.g., ingestion of berries) are taken into consideration to quantify the risk of adverse health effects. Unlike an ecological risk assessment (ERA), which is concerned with population effects, the HHRA focuses on effects on individuals.

Additionally, a HHRA does not follow the tiered framework of the ERA; rather, it relies mainly on measured data where possible and concentrations of contaminants of potential concern (COPC) in the flesh of animals calculated from the ERA. The HHRA uses scenarios that are considered to be realistically conservative for the program in order to ensure that potential exposures and risk are over estimated.

The results of the screening level ecological and human health risk assessment will be reported in the EIS and the results used to inform the identification of potential impacts resulting from the Roughrider Advanced Exploration Program.

11 Impacts of the Environment on the Project

11.1 Introduction

An environmental impact assessment must also take into account how the environment could adversely affect the project; for example, severe weather.

11.2 Forest Fire

All facilities associated with Roughrider Advanced Exploration Program will be self-reliant for fire prevention and suppression. As such, programs, procedures and practices will be developed and implemented at the site in order to ensure that fire prevention and protection are of paramount importance.

Once approval to proceed with the project is received and the project implemented a *Fire Control Plan* for the Roughrider site will be prepared and provided to Saskatchewan Ministry of Environment, Fire Co-ordinator in La Ronge and Southend. The plan will include, but not necessarily be limited, to the following information:

- An identification of any staff with firefighting training and their training levels;
- Radio frequencies, contact phone list, and other communication information for contacting program staff;
- An inventory of additional equipment on site (e.g. dozers, power units, chain saws, etc.) capable of assisting in firefighting; and
- An emergency response plan in case of a forest fire including, but not necessarily limited to, program staff assignments and contacts; steps to be taken for initial suppression; steps to be taken to contact Saskatchewan Ministry of Environment: identification of any known nearby industries, residences, etc.

11.3 Drought Conditions

The impacts of a short or long term drought in the project area will have a minimal impact on the project operations as proposed. The two most significant implications with regard to droughts would likely be the increased potential of forest fires in the area and a potential decrease in surface flows throughout the project area. As the predicted discharges of all liquid effluents will have relatively low concentrations of contaminants of concern and therefore not rely solely on dilution to reduce impacts to the receiving aquatic environment, reduced natural flows in muskegs and natural streams due to short-term drought are not expected to have a significant effect on the project or its environmental impacts.

South McMahon Lake is a relatively large water body and the freshwater withdrawal for use at the Roughrider site is not likely to be impacted by drought conditions.

11.4 Major Precipitation Event

Secondary containment facilities, water settling and treated effluent ponds and contaminant retention structures will be constructed to accommodate extreme precipitation events and prevent the inadvertent release of deleterious substances to the receiving waters. Although not all facilities will be designed to individually contain a probable maximum precipitation event, they will be designed in a manner that ensures that if such an event were to occur, potential contaminants will not enter the downstream receiving environment at a concentration likely to have a significant or long-term negative impact on the environment. This is particularly true if the dilution factor resulting from such an event is considered.

11.5 GHG Emissions

Once approval of the Roughrider Advanced Exploration Program is received, RTCU will implement a program to quantify the greenhouse gas (GHG) and air pollution emission rates for all activities and at all sites and continually pursue opportunities to reduce both greenhouse gas and air pollution emissions.

11.6 Seismic Event

Extensive research on the tectonic stability of the Canadian Shield has been carried out by numerous investigators and concluded that the Shield is one of the most tectonically stable areas in the world. As a result, seismic activity is not a concern.

11.7 Climate Change

Assessing the potential changes in climate resulting from global warming in a particular region of Canada has been and continues to be a challenge. Although a number of complicated and reputed general circulation models have been developed and used to simulate the effect of various concentrations of greenhouse gasses on the global climate, they differ to some extent in terms of how the operate and the input parameters used. Consequently, although the models produce similar results on a global scale, significant variations occur on a regional scale.

Generally it can be stated that higher air temperatures are predicted for most of Canada with noticeably warmer fall and winter periods. The models also suggest that increased winter precipitation may lead to more intense runoff events and that evaporation and evapotranspiration rates are generally expected to increase in many areas of Canada.

Potential impacted features of the Roughrider Project will be designed to handle significant precipitation events and therefore potential increases in runoff do not pose a significant risk.

12 Cumulative Impacts

Cumulative impacts are residual impacts on the environment (i.e. impacts that occur after mitigation measures have been implemented) combined with the environmental impacts of other past, present or reasonably foreseeable future projects or activities in the area. Cumulative impacts can also result from the combination of different project-specific impacts acting on the same environmental component. The Canadian Environmental Assessment Agency guidance documents, *Operational Policy Statement - Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act* (2007), *Cumulative Effects Assessment Practitioners Guide* (1999) and *Reference Guide: Addressing Cumulative Environmental Effects* (1994) may be useful when considering the scope of cumulative impacts to be evaluated.

RTCU will assess the cumulative impacts associated with the proposed project, including:

- the combined impacts from all stages of the project lifecycle;
- the effect of the proposed project when added to other past, present or reasonably foreseeable future projects or activities in the area;
- the combination of impacts from the existing project combined with the impacts of an expansion or alteration of the project;
- the total impact or risk of impact from operating the project over a long period of time (taking into account the likelihood of extensions or expansions to the project's operating life);
- the effect of ancillary facilities that may not be part of the proponent's project, but which are essential to the project proceeding (e.g., roads, transmission lines); and
- any additional activities or developments that may be enabled or encouraged as a result of the project proceeding.

13 Stakeholder, First Nations and Métis Consultations

13.1 Introduction

The purpose of this section is to provide a summary of actions to date and the planned future activities of the Rio Tinto Canada Uranium Corporation's (RTCU) Community Engagement & Consultation Plan (CEC Plan) related to the Roughrider Advanced Exploration Program.

In every jurisdiction in which it is present, it is Rio Tinto's objective is to build enduring relationships with its neighbours that demonstrate mutual respect, active partnership, and long term commitment (Rio Tinto's "The Way we Work", 2009). At all stages of a project life, positive community relations work is integrated into project and operational planning and efforts are made to accommodate the different cultures, lifestyles, preferences, heritage and perceptions of our neighbours.

Rio Tinto respects the diversity of indigenous peoples, acknowledging the unique and important interests that they have in the land, waters and environment as well as their history, culture and traditional ways.

RTCU recognizes the importance of full and open discussion of the issues and options associated with the development of the project and the related concerns that individual or communities may have in relation to the activities. In light of this, RTCU has maintained open and honest communications with local communities and individual stakeholders throughout all stages of the project. As the proponent desires to ensure that their operational practices, both now and into the future, reflect the values, expectations and needs of the region in which it is operating, continued mutually respectful consultation with all stakeholders is important to Rio Tinto.

Stakeholders are defined as those groups, sub-groups and/or individual people whom the project might affect. They all have a stake in the progress of the project, whether they are regulators, supporters or critics.

13.2 Roughrider CEC Plan Objectives

The objectives of the Roughrider Community Engagement and Consultation Plan are:

- To ensure that communities are consulted, in a format and language they understand, before we open new operations.
- To promote collaborative engagement at regional and local levels.
- To understand the cultural, traditional and unique interests that our Aboriginal neighbours have in the land, waters and environment.

- To engage in a process that hears and considers these interests in all aspects of Roughrider project planning and delivery.
- To gather information from First Nation and Métis communities on how the proposed Roughrider project may affect their ability to pursue hunting, fishing, trapping and other traditional activities.
- To explore ways for local communities to actively participate in the economic activity resulting from operations and to explore ways to support regional and community based projects that contribute to sustainable development, without creating dependency.
- Assist, where appropriate, the Saskatchewan Ministry of Environment in meeting its Duty to Consult, while respecting that the Duty to Consult ultimately resides with the Crown.

13.3 CEC Plan Guiding Principles

The following principles have and will continue to be used by RTCU and its representatives in conducting consultations with stakeholders:

- Communicate clearly and at the right time;
- Provide full information promptly to encourage fair and informed discussion;
- Support consultation to the maximum by responding to information requests fully and quickly;
- Establish clear and realistic timetables for accepting requests, suggestions and submissions, and be sensitive to the limited resources available to people and groups;
- Provide information, particularly technical information, in plain language;
- Give practical help to people and groups to take part, with attention to equal opportunity;
- Include people from non-English speaking backgrounds;
- Provide frequent feedback, including the results of meetings, incoming suggestions and requests, key recommendations, and information about emerging technologies;
- Ensure that people who join the consultation process at different stages will, as much as possible, be able to influence the direction of the developing project;
- Stimulate conciliatory and constructive exchanges of views and genuinely try to address, without prejudice, the major issues;
- Frequently monitor and evaluate the effectiveness of the consultation program during and at the end of each phase of the project; and
- Share with the community the responsibility for effective consultations

The consultations to date have been undertaken to ensure open and informed discussion of the various options that must be considered in developing a project such as the Roughrider Advanced Exploration Program. In the end, all parties must be satisfied, to the extent possible that the site and associated activities pose no danger to worker health and safety, public health and safety, and are not a source of unnecessary negative impact on the environment during operations and that after decommissioning and reclamation are complete the site will, to the extent possible, allow for a productive use of the land similar to its original use prior to mining or to an acceptable alternative.

13.4 Local Land User

Rio Tinto Canada Uranium Corporation has consulted on a regular basis with the local trapper, a member of the Hatchet Lake Denesuline First Nation, active in the Roughrider Project area since acquiring the property in January 2012 and commencing surface exploration drilling. This has included regular consultation prior to each season's drilling program as well as seeking the individual's (and some of his immediate family's) input on the routing of the temporary site access trail constructed.

The local trapper has also recently been consulted in order to identify any issues or concerns he may have related to the potential development associated with the Advanced Exploration Program at the site and how the project could potentially impact his traditional pursuits of hunting, fishing and trapping. In addition he was also asked to provide his individual preference regarding the potential location of the discharge of the treated effluent from the Roughrider site if the Advanced Exploration Program is granted approval to proceed.

RTCU plans to continue consultation with the local trapper and his family during planning, construction and operation of the exploration program.

13.5 Identification of Primary Stakeholders

Early in the project planning stages, RTCU also identified the need to engage people and organizations potentially impacted by the Roughrider Advanced Exploration Program. In order to determine the appropriate communities to consult, RTCU considered their proximity to the project, historical connections to the lands in the project area, watershed flow directions and prevailing winds in and around the site as well as engagement expectations. Based on this, as well as that fact that the Roughrider property straddles two watersheds (therefore has the potential to discharge treated effluent into either), the following communities/groups/organizations were identified as the primary stakeholders related to the Roughrider project:

- Hatchet Lake Denesuline First Nation
- Black Lake Denesuline First Nation
- Fond du Lac Denesuline First Nation
- Barren Lands First Nation (Brochet)
- Northlands Denesuline First Nation (Lac Brochet)
- Southend/Kinoosao – Peter Ballantyne Cree Nation (PBCN)
- Northern Region 1, Métis Nation of Saskatchewan
- Northern Settlement of Wollaston Lake
- Northern Settlement of Stony Rapids

Figure 15 provides the location of the identified settlements.

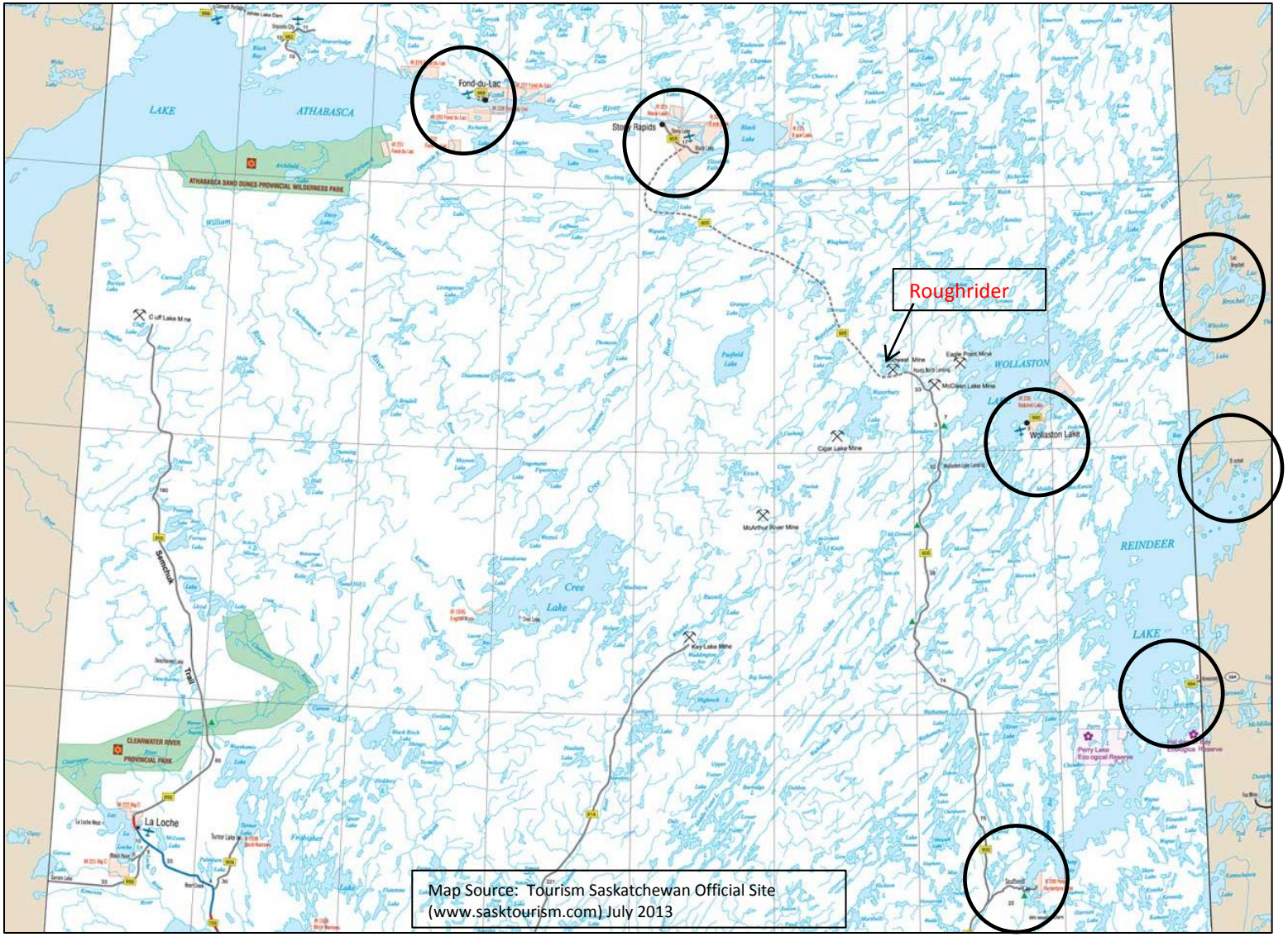

Figure 15: Roughrider Project Stakeholder Communities

13.6 North Saskatchewan Environmental Quality Committee

The Northern Saskatchewan Environmental Quality Committee (EQC) was also identified as a primary stakeholder. The EQC was originally established in 1995 and is currently composed of representatives from some 32 northern municipal and First Nation communities in northern Saskatchewan. Each member is nominated by the communities identified as "primary impact communities" for uranium mining operation in the region. Since its inception, the EQC has met consistently to receive information on uranium mining activities and to review the environmental protection measures being employed, provide input on regulatory approvals and on the socio-economic benefits being gained from the industry.

Since acquiring the Roughrider property, RTCU has regularly attended EQC meetings held in La Ronge and provided presentations on completed Roughrider surface exploration activities and on planned future activities at the site.

More recently, RTCU conducted a workshop with the EQC (June 25, 2013). During the workshop, the EQC members received a presentation on the proposed Roughrider Advanced Exploration Program, provided written feedback on a number of questions posed related to the proposed project and participated in an options analysis exercise in order to rank their individual preferences regarding the potential location of the discharge of treated effluent from the Roughrider site in the event that Advanced Exploration Program is granted approval to proceed.

RTCU plans to continue consultation with the EQC.

13.7 Community Engagement & Consultation Activities

Table 3 provides a summary of the community engagement activities conducted by representatives of RTCU to date.

Each concern raised during the public consultation in each community is recorded and will be reported on.

13.8 Future Engagement Consultations Plans

Future consultations are being planned to continue the positive relationship already established in the identified Aboriginal and non-aboriginal communities. Table 4 provides a summary of these planned activities.

Table 3 - Community Engagement & Consultation Activities to Date

ACTIVITY	DESCRIPTION OF ACTIVITY	COMMUNITY/ORGANIZATION	DATE
Presentation All NSEQC meeting	Presentation to introduce Rio Tinto, summarize Roughrider surface exploration activities, and answer questions	NSEQC members & NMMS Manager	March 6-7, 2012
Establish Toll Free Number	Establish and communicate a toll free number for Roughrider community inquiries	Available in all communities	March 30, 2012
Public Open House	Introduce Rio Tinto, discuss most appropriate method of future communications summarize Roughrider surface exploration activities and answer questions	Northern Settlement of Stony Rapids	April 23, 2012
Meet with Chief and Council	Introduce Rio Tinto, summarize Roughrider surface exploration activities, discuss most appropriate method of future communications and answer questions	Hatchet Lake Denesuline First Nation Black Lake Denesuline First Nation Fond du Lac Denesuline First Nation	April 25, 2012 April 23, 2012 April 24, 2012
Phone contact with Chief	Introduce Rio Tinto, discuss most appropriate method of future communications answer questions and request community meeting	Northlands Denesuline First Nation (Lac Brochet)	April 24, 2012
Public Open House	Introduce Rio Tinto, summarize Roughrider surface exploration activities and answer questions	Hatchet Lake Denesuline First Nation Black Lake Denesuline First Nation Fond du Lac Denesuline First Nation Northern Settlement of Stony Rapids	April 25, 2012 April 23, 2012 April 24, 2012 April 23, 2012
Phone contact with Chief	Introduce Rio Tinto, discuss most appropriate method of future communications answer questions and request community meeting	Barren Lands First Nation (Brochet)	May 7, 2012
Presentation All NSEQC meeting	Presentation to summarize Roughrider surface exploration activities and answer questions	NSEQC members & NMMS Manager	June 20-21, 2012
Attend Hatchet Lake Denesuline First Nation Band Council Meeting	Presentation on Roughrider surface exploration activities, temporary access trail, and answer questions from community members	Hatchet Lake Denesuline First Nation	September 20, 2012
Presentation All NSEQC meeting	Presentation to summarize Roughrider surface exploration activities and answer questions	NSEQC members & NMMS Manager	October 30-31, 2012
Consultation on Temporary Access Trail	Receive input on temporary trail route selection and construction	Local (to Roughrider property) trapper Hatchet Lake Denesuline First Nation Councilor	November 09, 2012
Meet with Southend Councilors	Meet with Southend Councilors and Southend Working Group	Southend/Kinoosao – Peter Ballantyne Cree Nation	November 23, 2012
Public Open House	Introduce Rio Tinto, discuss most appropriate method of future communications summarize Roughrider surface exploration activities and answer questions	Southend/Kinoosao	November 23, 2012
Conduct Communities Environmental Workshop (La Ronge)	2 Day Workshop to: • Continue on-going communication with area communities. • Facilitate early engagement with community representatives and local land users on issues related to the potential development of a mine and mill facility at the Roughrider Project site. • Describe the major aspects of a theoretical mine and mill at the Roughrider project to community representatives. • Discuss issues of concern identified by community representatives and local land users. • Identify and discuss realistic alternatives (options) for major aspects of a theoretical mine and mill. • Identify criteria that community members and land users would use to assess the identified alternatives. • Identify appropriate Valued Ecosystem Components (VECs) - both from a scientific and from a traditional land use knowledge base. • Identify appropriate human and ecological receptors for modeling purposes (including appropriate location of receptors to be modeled).	Representatives from: Hatchet Lake Denesuline First Nation Black Lake Denesuline First Nation Fond du Lac Denesuline First Nation Barren Lands First Nation (Brochet) Northlands Denesuline First Nation (Lac Brochet) Southend/Kinoosao Northern Settlement of Stony Rapids Vice Chief, Prince Albert Tribal Council SENES Consultants CanNorth Environmental Services RTCU	January 15 & 16, 2013

ACTIVITY	DESCRIPTION OF ACTIVITY	COMMUNITY/ORGANIZATION	DATE
Presentation All NSEQC meeting	Presentation to summarize Roughrider surface exploration activities and answer questions	NSEQC members & NMMS Manager	April 15-16, 2013
Women's focus group	Introduce Rio Tinto, summarize Roughrider surface exploration activities, discussion of phases (or stages) of mineral development; temporary access trail; proposed advanced exploration activities, and to identify & discuss issues related to Rio activities & advanced exploration proposal.	Women from Hatchet Lake Denesuline First Nation	June 19, 2013

Meet with Chief and Council	Presentation on:
	• Roughrider activities to date;
	  ○ Phases (or stages) of mineral development;
	  ○ Temporary access trail;
	  ○ Proposed advanced exploration activities;
	• Identify & discuss issues related to activities & advanced exploration proposal;
	• Solicit input on treated effluent discharge location
	• Discuss the development of a Memorandum of Understanding (MOU) on principles of future consultation, engagement and future relationships
		Hatchet Lake Denesuline First Nation
		Black Lake Denesuline First Nation
		Fond du Lac Denesuline First Nation
		Southend/Kinoosao – Peter Ballantyne Cree Nation
			June 20, 2013
			July 04, 2013
			June 21, 2013
			June 24, 2013

Public Open House	Presentation on:
	• Roughrider activities to date;
	  ○ Phases of mineral development;
	  ○ Temporary access trail;
	  ○ Proposed advanced exploration activities;
	• Identify & discuss issues related to activities & advanced exploration proposal;
	• Receive input on treated effluent discharge location
		Hatchet Lake Denesuline First Nation
		Black Lake Denesuline First Nation
		Fond du Lac Denesuline First Nation
		Southend/Kinoosao – Peter Ballantyne Cree Nation
		Northern Settlement of Stony Rapids
			June 20, 2013
			July 04, 2013
			June 21, 2013
			June 24, 2013
			June 26, 2013

All NSEQC workshop	Presentation on:
	• Roughrider activities to date;
	  ○ Phases of mineral development;
	  ○ Temporary access trail;
	  ○ Proposed advanced exploration activities;
	• Identify & discuss issues related to activities & advanced exploration proposal;
	• Solicit input on treated effluent discharge location
		NSEQC members & NMMS Manager	June 25, 2013

Attend Athabasca Dene Gathering	Presentation on: • Introduction to Rio Tinto • Roughrider activities to date; • Phases of mineral development;	Representatives from:	June 27, 2013

Table 4 - Planned Community Engagement & Consultation Activities

ACTIVITY	DESCRIPTION OF ACTIVITY	COMMUNITY/ORGANIZATION	TTIMELINE
Meet with Chief & Councils	• Provide Advanced Exploration Program specific information in plain language. • Identify project aspect that may have the potential to affect ability to pursue hunting, fishing, trapping and other traditional activities in the vicinity of the Roughrider project. • Identify mitigation actions to address identified affects	Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet), Southend/Kinoosao (PBCN)	Fall, 2013
Public meetings	• Provide Advanced Exploration Program specific information in plain language. • Identify potential environmental and socio-economic impacts of project and identify mitigation actions to address identified affects • Identify & discuss issues related to activities & advanced exploration proposal;	Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet), Southend/Kinoosao (PBCN Northern Settlement of Stony Rapids Town of La Ronge and Air Ronge	Fall, 2013
Meet with Métis representatives	• Provide Advanced Exploration Program specific information in plain language. • Identify project aspect that may have the potential to affect ability to pursue hunting, fishing, trapping and other traditional activities in the vicinity of the Roughrider project. • Identify mitigation actions to address identified affects	Métis Nation of Saskatchewan - Northern Region 1	Fall, 2013
Meet with Chief & Councils	Provide regular project updates	Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet), Southend/Kinoosao (PBCN), Southend/Kinoosao (PBCN)	On an on-going basis and when requested
Public meetings	Provide regular project updates	Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet), Southend/Kinoosao (PBCN Northern Settlement of Stony Rapids Town of La Ronge and Air Ronge	On an on-going basis
Negotiation of MOU	Finalize Memorandum of Understanding (MOU) on principles of future consultation, engagement and future relationships	Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation (Brochet), Northlands Denesuline First Nation (Lac Brochet), Southend/Kinoosao (PBCN Northern Settlement of Stony Rapids	On-going

13.9 Identification of Community Issues and/or Concerns

The consultation program has been and will continue to be structured to stimulate a broad understanding of all project aspects, the potential impacts of the project and the monitoring programs and results.

Efforts to date have been successful in involving the First Nations, Métis, the northern public and the NSEQC on contribution of the identification of traditional knowledge and the determination of Traditional Valued Ecosystem Components, issue/concerns identification and options analysis related to the potential development of the Roughrider Advanced Exploration Program. Elements of the plans for public information/consultation have also provided a basis for discussion of the identification of potential new business development and the enhancement of regional business and employment opportunities. This will continue during the preparation of the EIS.

RTCU will continue to explain the results of consultation in a clear and direct manner in order to make the issues comprehensible to as wide an audience as possible.

Specifically, RTCU will:

- Describe the past and ongoing consultation activities, tools employed during consultations and any plans for further public consultation about the Project;
- Summarize the comments made to and responses provided by RTCU during past and future consultation with respect to the Project; and,
- Identify the key issues of concern raised by the public (including First Nations and Métis) and how RTCU has, or intends to, address them.

13.10 Response to Issues Raised in Consultations

Each issue/concern raised during the public consultation in each community is recorded, as are the responses provided at the time of the meeting by representatives of RTCU.

13.11 Continuing Consultation

RTCU is committed to continue an appropriate level of engaging the people of the Athabasca Basin, including people of Métis' ancestry and leadership and members of the Hatchet Lake Denesuline First Nation, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Barren Lands First Nation, Northlands Denesuline First Nation, Peter Ballantyne Cree Nation communities of Southend/Kinoosao related to activities at its Roughrider project and any other activities undertaken (i.e. further exploration in the region) by scheduled public meetings in relevant communities. This consultation has and will continue to be undertaken in a manner that ensures that the leadership and community members in the area are informed about activities of the company in a manner that maximizes the opportunity for feedback on those activities.

As interest in the Roughrider Advanced Exploration Program may extend beyond the project area, RTCU is prepared to provide project information to, and address issues identified by, persons and/or organizations residing outside of the project area.

14 Commitments Register & Conclusion

14.1 Commitment Register

A commitments register which provides a summary of both the implicit and specified commitments made by RTCU in completing and submitting the Technical Proposal and EIS for the Roughrider Advanced Exploration Project will be completed and included in the EIS.

14.2 Conclusion

Rio Tinto Canada Uranium Corporation is proposing conducting the Roughrider Advanced Exploration Program which will be consist of:

- The upgrade of approximately 7.5 km of an existing exploration trail (no new stream crossings required);
- The development and operation of an exploration shaft including hoisting and ventilation;
- The development of underground drifts to allow for exploration drilling. All drifts will be developed in competent rock at least 20 meters away from the ore bodies;
- The operation of appropriate underground and surface water management infrastructure;
- The operation of a water treatment facility including settling and monitoring ponds;
- The surface storage of a maximum of approximately 155,000 tonnes of development rock;
- The temporary surface storage of a maximum of 38,750 tonnes of "mineralized " (or "special") development rock;
- A treated effluent discharge pipeline;
- The construction and operation of various support facilities including:
    - Administration/office/mine dry facility;
    - Freeze plant;
    - Maintenance shop;
    - Freshwater intake;
    - Explosive storage magazine(s);
    - Electric generating capacity;
    - Fuel (diesel, gasoline and propane) storage facilities;
    - Concrete batch plant;
    - Cold storage building(s);
    - Borrow area(s);
    - Laydown areas;
    - Waste management area (conventional); and,

  - Camp with associated infrastructure (i.e. freshwater intake, sewage and domestic waste management facilities) to accommodate approximately 135 persons.
- Exploration drilling from the underground drifts ("remote drilling") to improve characterization of mineralization and understanding of ore bodies;
- The appropriate packaging and transport of all samples to accredited laboratories for analysis, testing and appropriate disposal.

The information gained from the Advanced Exploration Program as proposed will allow RTCU to gain:

- More accurate knowledge of geotechnical conditions and hydrogeological regime at depth and of the potential impact of underground development on that regime (i.e. water inflow quantity and quality). This information will allow for improved design, construction and safety of mine-water management facilities underground and water treatment facilities on surface during the operation of a production mine;

- Enhanced characterization of the ore bodies through accurate, targeted drilling and sampling of the ore bodies; and

- Better understanding of the resource which will be critical to Rio Tinto internal decision making on resource development and improve the planning/scheduling for production mining, mill capacity and tailings management (should a decision be made to advance the project beyond the exploration stage).

Rio Tinto believes that it must undertake a thorough environmental and social impact assessment of any proposed development in order to systematically evaluate the ecological, socio-economic and cultural aspects of the activity. We also believe that such an assessment must be conducted in an open and transparent manner and in a manner that includes an appropriate level of community, regulatory and public input and review.

This Roughrider Project Advanced Exploration Technical Proposal is being submitted to the MOE in order to initiate the processes necessary to meet the requirements of section 9 of the Saskatchewan *Environmental Assessment Act* in order to meet the principles noted above.

This Technical Proposal provides a summary of relevant information gathered to date and has provided an outline of information which will be included in an Environmental Impact Statement. Based on the current scope of the exploration program no federal licenses and/or permits, which could trigger a federal environmental assessment, will be required.

15 References

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