ROOK I PROJECT

Project Description

Submitted to:

Saskatchewan Ministry of Environment

Environmental Assessment and Stewardship Branch

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April 2019

Executive Summary

The Rook I Project (Project) is a proposed new uranium mining and milling operation that is 100% owned by NexGen Energy Ltd. (NexGen). It is located adjacent to Patterson Lake in the southern Athabasca Basin in northern Saskatchewan approximately 155 km north of the town of La Loche, 80 km south of the former Cluff Lake Mine site (currently in decommissioning) and 640 km by air north west of Saskatoon. The mineral resource basis for the proposed Project is the Arrow deposit, a land-based, 100% basement hosted high grade uranium deposit.

The current indicated Mineral Resource estimate for the Project totals 2.89 million tonnes at an average grade of 4.03% triuranium octoxide (U_3O_8), for a total of 116.4 million kg (256.6 million pounds) U_3O_8. (NexGen 2018). The Inferred Mineral Resource estimate is 91.7 Mlbs U_3O_8 in 4.84 million tonnes at an average grading of 0.86% U_3O_8. The Probable Mineral Reserve estimate is 234.1 Mlbs U_3O_8 contained in 3.43 million tonnes at an average grading of 3.09% U_3O_8. The proposed processing plant will be capable of producing up to 14 million kg (31 million lbs) of U_3O_8 per year with a projected mine life of 24 years based on current global resource estimates.

The Project will help meet the needs of the increasing global demand for low emissions power generation by supplying uranium for fueling nuclear reactors around the globe. Market demand for uranium is driven primarily by current or planned nuclear reactors operating globally, while market supply is driven by the global supply of uranium. Given the projected expansion in global demand for nuclear power as part of the overall energy supply, demand for uranium for fuel fabrication is projected to increase in the foreseeable future with increasing electricity demand and a growing need for low carbon dioxide emitting sources in electricity generation.

The Project includes underground and surface facilities to support the mining and processing of uranium ore from the Arrow deposit. The main components included in the scope of the Project for environmental assessment purposes, include:

- underground mine development;
- an on-site mill to process an average of 1,400 tonnes of ore per day;
- surface facilities to support the short and long-term storage of waste rock and ore;
- an underground tailings management facility (UGTMF);
- water handling infrastructure and an effluent treatment circuit with associated treated effluent discharge; and
- additional infrastructure that will include a camp for personnel, an airstrip and supporting waste and water management facilities, a maintenance shop, warehouse, and offices.

Vehicular access to the site will be via an existing access road that connects the site with Provincial Highway 955 which extends from La Loche to Cluff Lake. The access road will be used to transport equipment and supplies to and from the Project, as well as the ground transport of U_3O_8 product to market. Personnel will be flown to and from site. Electricity for both surface and underground operations will be provided by on-site diesel generators, although liquid natural gas (LNG), and renewable options are also being considered.

Access to the mine will be through two shafts. The first shaft will be used as a production shaft to transport personnel and materials, to deliver ore and waste rock from the workings, and to deliver fresh air from surface and into the mine. The second shaft will be used as an exhaust ventilation shaft and will provide secondary emergency egress. The Project will be primarily mined using a combination of longhole stope mining methods. Waste generated from the milling process as well as waste generated from the underground mining activities and radiologically contaminated waste generated on site will be

progressively decommissioned through permanent storage underground, either as cemented paste backfill in mined out stopes or within a purpose-built underground facility, referred to as the UGTMF.

Clean waste rock will be permanently stored on surface and where possible, will be used as a source of aggregate material for construction activities. Mineralized and any yet to be identified potentially acid generating waste rock (special waste rock) will be segregated, temporarily stored on surface on a lined pad and used as blend material in the milling process with any remaining balance to be returned underground during operations and decommissioning.

Freshwater for operations, domestic purposes and emergency firewater will be drawn from Patterson Lake. To the extent practical, mine water collected underground will be used as process water and recycled to minimize the amount of surface water required and reduce the volume of treated water discharged to the environment.

Domestic and industrial water treatment facilities will be constructed with sufficient capacity to meet operational requirements and manage non-routine inflows from underground and surface runoff from a 24-hour 1:100 year storm event. Treated effluent will be batch released to Patterson Lake.

Upon completion of mining and milling, the Project will be decommissioned and reclaimed in accordance with a Detailed Decommissioning Plan approved by both the Saskatchewan Ministry of Environment and the Canadian Nuclear Safety Commission. It is envisioned that following decommissioning, the site will be free from access restrictions and suitable for recreational and traditional land use.

EXISTING ENVIRONMENT

The Project is situated along the southwestern rim of the Athabasca Basin, which covers much of northern Saskatchewan and part of northern Alberta. The climate is typical of a sub-Arctic climate for mid-latitude continental areas.

The topography of the Project area is variable with drumlins, lakes and wetlands dominating the northwest and southeast parts of the Project area, respectively, and lowland lakes, rivers, and muskegs dominating the central part of the Project area. The northwest part of the Project area is adjacent to Patterson Lake and Forrest Lake, which are two of the largest waterbodies within 100 km of the Project. Both lakes are part of the Clearwater River watershed. The Clearwater River extends east-southeast from Beet Lake and eventually drains south off the Property. The Project area is covered by boreal forest common to the Canadian Shield.

The most common trees are jack pine and black spruce, with few poplar and birch clusters. Tamarack, stunted black spruce, willow, and alder are also common in the lower wetland areas. Wildlife species known to occur in the region include moose, woodland caribou, deer, black bear, wolf, and all other mammal species commonly found in boreal forest ecosystems. Fish species include walleye, lake trout, northern pike, whitefish, and perch.

Environmental baseline studies have been undertaken to gather detailed information on the current conditions for the biophysical, cultural and socioeconomic environment in the area of and relation to the Project. Baseline studies provide information on the current condition of the area, providing a basis for future Environmental Assessment and long-term monitoring programs.

ENVIROMENTAL INTERACTIONS AND ASSESSMENT APPROACH

Based upon a preliminary screening level review of the Project and expected interactions between the Project and the environment, possible areas of concern related to potential environmental effects have been identified. A comprehensive assessment of the Project impacts that includes the implementation of mitigative measures will be completed during the Environmental Assessment.

Potential environmental effects that have been identified at this preliminary screening phase based on a review of interactions include:

- potential for air quality changes related to emissions generated by Project activities and/or components;
- potential for groundwater resources changes related to the underground storage of process waste as engineered paste backfill;
- potential for surface water and aquatic environment changes related to water management;
- potential for terrestrial environment changes related to the Project footprint and Project activities;
- potential for human and ecological health changes associated with the Project activities;
- potential for local land and resource use changes; and
- potential for socio-economic changes in local communities.

NexGen is committed to managing the Project in such a way that we avoid or minimize effects to the environment to the extent possible. For instance, the construction, operation, and closure of the Project can potentially result in changes to air quality from air emissions generated from Project activities, equipment and infrastructure. Changes in air quality and associated deposition may have direct and/or indirect effects on surface water quality, fish, and fish habitat, soils, vegetation, wildlife and wildlife habitat. Environmental design features will be identified and considered during the design of the Project to limit or eliminate potential effects associated with air emissions, as well as other effects identified in the Environmental Assessment.

All potential environmental effects will undergo a detailed assessment during the Environmental Assessment to understand the potential short and long-term impacts and to identify mitigation measures as may be necessary to minimize or eliminate impacts identified. In addition, the Environmental Assessment will identify monitoring programs to verify the Environmental Assessment predictions and to evaluate the environmental response in relation to the Project activities.

The Project is located in a remote, largely undeveloped region of Saskatchewan and there is currently no other industrial activities occurring in the immediate vicinity of the Project. There are two commercial outfitters operating in the area and the area is the focus of active uranium exploration by a number of companies. These and any other potential industrial projects and recreational activities in the area will be considered in the cumulative effects assessment of the Environmental Assessment.

ENGAGEMENT

NexGen recognizes the importance engaging with local and indigenous communities, residents, businesses, organizations, land users and the various regulatory authorities, collectively referred to as ‘stakeholders’, as an important aspect of responsibly developing the Rook I Project. Since exploration commenced in 2013, NexGen has:

- undertaken to meet regularly with identified stakeholders to discuss and provide updates on activities at the site;
- become involved in initiatives and activities in the local communities (i.e., breakfast program); and
- has sought to provide opportunities directly to local residents and businesses.

NexGen was recently recognized for their involvement in community outreach initiatives by the Prospectors and Developers Association of Canada (PDAC) with the 2019 Environment and Social Responsibility Award. These outreach initiatives have focused on youth and relate to education, health and wellness, and fostering economic capacity.

As NexGen proceeds through the regulatory process and advances development of the site, engagement activities will evolve as necessary to ensure the inclusion of applicable stakeholders in a manner that provides the opportunity for effective information exchange and dialogue specific to each stage of the Project.

For the purposes of developing effective plans for engagement, NexGen has identified three broad stakeholder categories in relation to the Project. These categories include:

- regulatory authorities;
- Indigenous communities; and
- the general public.

NexGen is committed to ongoing engagement throughout the entire life-cycle of the Project and recognizes that engagement is a dynamic process subject to change based on the needs of the parties or as new or emerging information becomes available. NexGen will take an adaptive approach to engagement to allow for adequate opportunity to respond to the needs of various stakeholders, while also respecting specific government policy and/or legislation.

Preliminary engagement for the Project has been underway in the communities closest to the Project since early 2013. Activities to date have been well received and serve to keep the communities up to date with the exploration activities. NexGen has developed a comprehensive outreach program that exceeds regulatory requirements and shows commitment to local communities. NexGen has initiated early engagement with identified Indigenous communities. NexGen's Engagement Plan has established and will continue positive relationships with public and Indigenous stakeholders of the Project, while obtaining information required for a successful EA and licensing submission.

CONCLUSION

The Project hosts a uranium deposit which merits advancement towards development work. The proposed Project includes underground and surface facilities to support the mining and processing of uranium ore. The Project will include a mill and additional infrastructure including a camp for personnel, an airstrip, a wastewater treatment plant, and supporting waste and water management facilities. Project construction, operation and closure is anticipated to proceed over approximately a 42 year time span which includes a 24 year operating period.

It is anticipated that the Project will be subject to both a provincial and federal Environmental Assessment and that the assessment would be a cooperatively managed process between the Canadian Nuclear Safety Commission (CNSC) and the Saskatchewan Ministry of Environment (SMOE).

List of Acronyms

Acronym	Term
ABA	acid-base accounting
the Act	*The Environmental Assessment Act* (Saskatchewan)
AER	*Alberta Energy Regulator*
ALARA	as low as reasonably achievable
AQMG	air quality modelling guideline
ARU	automated recording units
BC	British Columbia
CCD	counter-current decantation
CEAA	*Canadian Environmental Assessment Act, 2012*
CIE	Commission Internationale de l'Eclairage
CNSC	Canadian Nuclear Safety Commission
CO_2	carbon dioxide
COPC	contaminants of potential concern
DC	direct current
EA	environmental assessment
EM	electromagnetic
HSA	heritage study area
HRIA	Heritage Resources Impact Assessment
Hwy	Highway
IAEA	International Atomic Energy Association
IEA	International Energy Agency
IEMP	Independent Environmental Monitoring Program
IESNA	Illuminating Engineering Society of North America
IK	Indigenous Knowledge
LNG	liquid natural gas
Mega	Mega Uranium Ltd.
MIEPR	*Mineral Industry Environmental Protection Regulations* (Saskatchewan)
MST	mudstone
NexGen	NexGen Energy Ltd.
NO_2	nitrogen dioxide
NPAG	non-potential acid generating
NSEQC	Northern Saskatchewan Environmental Quality Committee
NSCA	Nuclear Safety Control Act
PAG	potentially acid generating
PEA	Preliminary Economic Assessment

Acronym	Term
PDAC	Prospectors and Developers Association of Canada
PFS	Pre-feasibility Study
$PM_{2.5}$	Particulate Matter 2.5 microns
PMP	probable maximum precipitation
Project	Rook I Project
RPA	Roscoe Postle Associates Inc.
SEQG	Saskatchewan Environmental Quality Guidelines
SFE	shake flask extraction
SK	Saskatchewan
SKCDC	Saskatchewan Conservation Data Centre
SMDC	Saskatchewan Mining Development Corp.
SMOE	Saskatchewan Ministry of Environment
SO_2	sulphur dioxide
SO_3	sulphur trioxide
SST	sandstone
SWRP	storm water runoff pond
SX	solvent extraction
TMZ	talston magmatic zone
TSP	total suspended particulate
TSS	total suspended solids
UGTMF	underground tailings management facility
VCs	valued components
U_3O_8	triuranium octoxide
WWTP	wastewater treatment plant

List of Units

Unit	Term
%	percent
°C	degrees Celsius
cm	centimetres
dBA	A-weighted decibels
dBZ	unweighted decibels
ha	hectares
kg	kilogram
km	kilometres
km^2	square kilometres
kV	Kilovolt
KW	Kilowatt
L	litre
lbs	pounds
$L_{eq,day}$	daytime noise levels
$L_{eq,night}$	nighttime noise levels
m	metre
m^3	cubic metre
m/s	metres per second
masl	metres above sea level
Mlbs	million pounds
MPa	megapascal
MW	Megawatt
µS/cm	microsiemens per centimetre
tpd	tonnes per day
tpy	tonnes per year

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1.0 GENERAL INFORMATION AND CONTACTS

1.1 Purpose of Project Description

This document constitutes a Project Description for the Rook I Project (the Project), a proposed uranium mine and mill development to be located in northwestern Saskatchewan. This Project Description contains all the information prescribed in with the *Prescribed Information for the Description of a Designated Project Regulations (SOR/2012-148)*, pursuant to section 84(b) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Under the jurisdiction of the Province of Saskatchewan, the Project may meet the criteria of a *development* as defined under *The Environmental Assessment Act* (the Act) and this document is provided to the Saskatchewan Ministry of Environment (SMOE) as the *Technical Proposal* for an Environmental Assessment determination as required under the Act. This Project Description contains the information requirements outlined under the *Technical Proposal Guidelines: A Guide to Assessing Projects and Preparing Proposals under The Environmental Assessment Act.*

This document is also provided for the purposes of describing the Project to allow for the Canadian Nuclear Safety Commission (CNSC), as the designated federal regulatory authority, to make a determination with respect to the requirement for an Environmental Assessment under the respective legislation applicable to each jurisdiction.

Appendix A provides a concordance table identifying where information required under the *Prescribed Information for the Description of a Designated Project Regulations* is located within this document.

Appendix B provides a concordance table identifying where information required under the *Technical Proposal Guidelines: A Guide to Assessing Projects and Preparing Proposals under The Environmental Assessment Act* can be found.

The objective of this Project Description is to introduce the Project to the public and regulatory authorities with responsibility for assessment of the Project and to initiate the formal provincial and federal project review process. It includes a high-level overview of the plans to prepare the site and construct, operate, and decommission the Project. The information provided is based on information that is available from the pre-feasibility study titled *Technical Report on Pre-feasibility Study, Arrow Deposit, Rook I Property, Saskatchewan* (Wood Canada Limited 2018), completed in December 2018. It describes the current environment in the Project area, provides a high-level description of the potential interactions of the Project with the environment, and summarizes the engagement activities with Indigenous communities and the public that have been completed to date and plans for further and ongoing engagement.

1.2 Project Overview

The proposed Project is a new uranium mining and milling operation located on the Patterson Lake peninsula in the southwestern Athabasca Basin in northern Saskatchewan, at latitude 57.668291 N and longitude 109.250704 W. The anticipated maximum footprint for the Project is approximately 178 ha. The Project is solely owned and managed by NexGen Energy Ltd. (NexGen), a Canadian company listed on the Toronto and New York stock exchanges. NexGen will construct and be the operator of the Project.

The Rook I property (the Property) is located in Saskatchewan, approximately 155 km north of the town of La Loche, 80 km south of the former Cluff Lake Mine site (currently in decommissioning) and 640 km north of Saskatoon by air (768 km by road) (Figure 1.2-1). The Project resides within Treaty 8 territory. The Mineral Resource basis for the proposed Project is the Arrow deposit, a land-based, basement hosted, high grade uranium deposit that is 100% owned by NexGen. The most recently updated Indicated Mineral Resource estimate for the Project totals 2.89 million tonnes at an average grade of 4.03% triuranium octoxide (U_3O_8), for a total of 116.4 million kg (256.6 million pounds) U_3O_8. The Inferred Mineral Resource estimate is 41.6 million kg (91.7 million pounds) U_3O_8 in 4.84 million tonnes at an average grade of 0.86% U_3O_8. The Probable Mineral Reserve estimate is 234.1 Mlbs U_3O_8 contained in 3.43 million tonnes at an average grading of 3.09% U_3O_8.

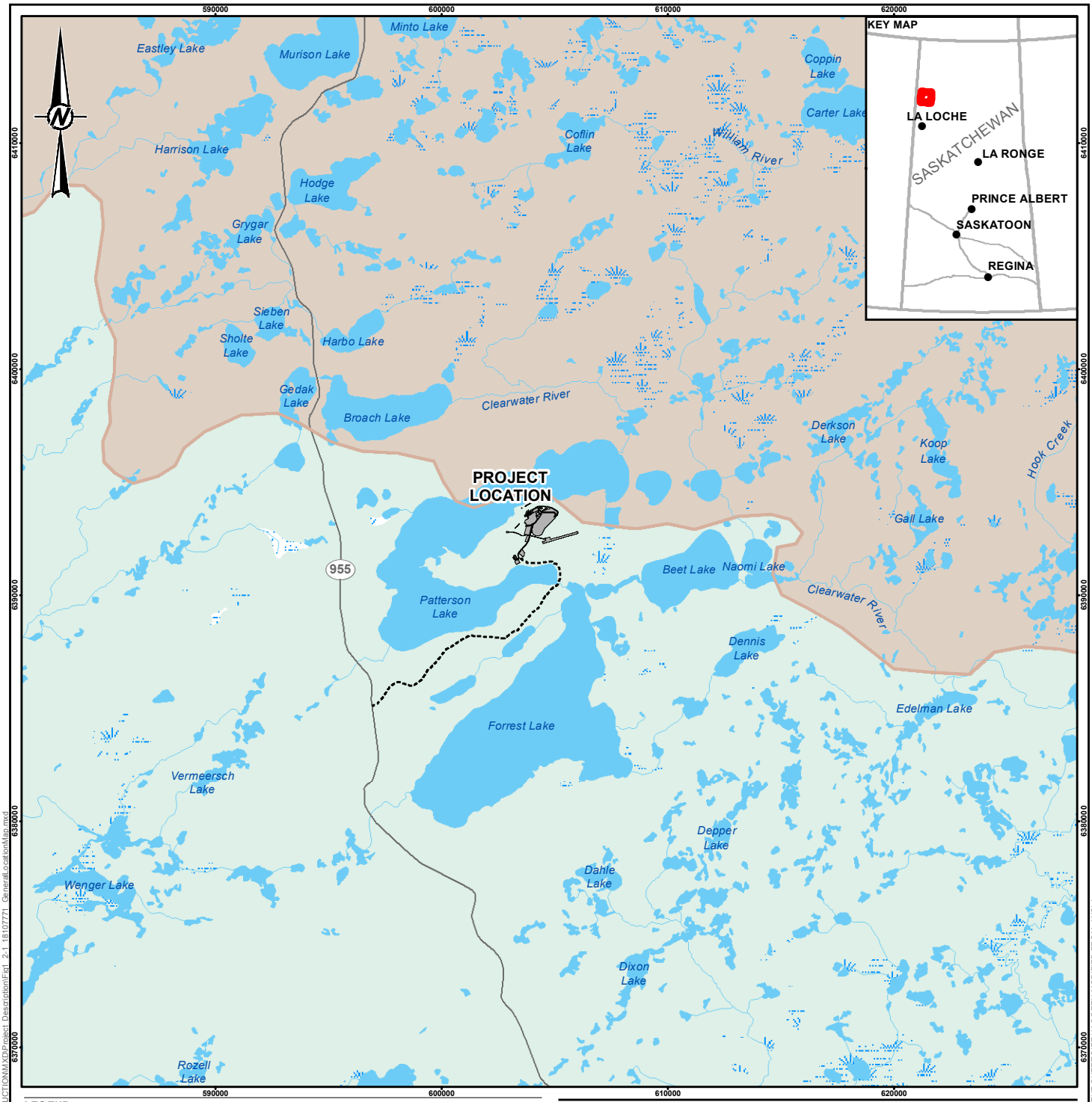
The Project includes underground and surface facilities to support the extraction and processing of uranium ore from the Arrow deposit. The conceptual mine development will utilize underground longhole stope mining as the primary mining method, which is a proven technique that has been successfully applied at other mining operations worldwide and within the Athabasca Basin. The Project may also apply variations of longhole stope mining, other bulk tonnage mining methods, or raiseboring. The mill will be located on surface directly above the mine and is planned to process an average of 1,400 tonnes of ore per day with an annual production capacity of up to 14 million kg per year (31 million pounds per year) of U_3O_8 over a projected 24-year operating period. The milling process will utilize acid leaching, solvent extraction, uranium precipitation, and calcining to extract a marketable U_3O_8 product.

Additional infrastructure required to support the development and operation of the Project will include, yet are not limited to:

- ore storage pad;
- special waste rock storage pad;
- clean waste rock stockpile;
- a paste backfill circuit for processing of mill waste (tailings) into engineered paste and paste transfer system;
- an underground tailings management facility (UGTMF);
- water handling infrastructure and an effluent treatment circuit;
- a maintenance shop, warehouse, and offices;
- staff accommodations;
- an airstrip, site roads; and
- fuel storage and transfer facilities.

Vehicular access to the site will be via an existing road that currently leads to the current exploration camp which is accessed from Provincial Highway 955 which extends from La Loche to Cluff Lake. The access road will be used to transport equipment and supplies to and from the Project, as well as the trucking of the U_3O_8 product, personnel will be flown to and from site. Electricity for both surface and underground operations will be provided by on-site diesel generators, although liquid natural gas (LNG), and renewable options are also being considered.

The Project will be designed, developed, constructed, commissioned, operated, decommissioned and reclaimed in accordance with applicable regulatory requirements and industry best management practices that provides for the safety of the public and workers and the long-term protection of the environment. The Project will not require any financial support from federal authorities nor will it require the use of any federal land.



LEGEND

- SECONDARY HIGHWAY
- WATERCOURSE
- ATHABASCA BASIN
- WATERBODY
- WETLAND
- WOODED AREA

PROJECT FEATURES

- EXISTING ACCESS ROAD
- PROPOSED FOOTPRINT

0 5,000 10,000

1:250,000 METRES

REFERENCE(S)

1. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED, GEOLOGICAL ATLAS OF SASKATCHEWAN VIEWER © 2018, GOVERNMENT OF SASKATCHEWAN, OR IHS MARKIT CANADA LIMITED. PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

LOCATION OF THE PROJECT

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
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1.3 Proponent Information

NexGen is a uranium development company with a number of mineral tenures located throughout the southwestern portion of the Athabasca Basin in Saskatchewan. NexGen is a Canadian company, listed and publicly traded on both the TSX and NYSE.

The Project is 100% owned, operated, and managed by NexGen. The business address and principal contacts for the Project are shown in Table 1.3-1.

Table 1.3-1: NexGen Project Contacts

Official Title	Name	Address	Phone/Email
President and Chief Executive Officer (Principal contact)	Leigh Curyer	3150-1021 W Hastings St Vancouver, BC V6E 0C3	(604) 428-4112 lcuryer@nxe-energy.ca
Chief Financial Officer	Bruce Sprague	3150-1021 W Hastings St Vancouver, BC V6E 0C3	(604) 428-4112 bsprague@nxe-energy.ca
Senior Manager, Permitting, Environment, and Regulatory Affairs	Shawn Harriman	Suite 200, 475 2nd Ave S Saskatoon, SK S7K 1P4	(306) 978-6870 sharriman@nxe-energy.ca

1.4 Need for and Benefits of the Project

Uranium is used principally as the primary input in the production of nuclear fuel which is required globally in the nuclear power generation industry, an important component of the global electricity mix. The International Energy Agency (IEA) forecasts that global demand for electricity could rise up to 90% between 2018 and 2040 (World Energy Outlook 2018). Market demand for uranium is driven primarily by the level of current or planned nuclear reactors operating globally, while market supply is driven by the global supply of uranium. Given the projected expansion in global demand for nuclear power as part of the overall energy supply, demand for uranium is projected to increase in the foreseeable future with increasing electricity demand and a growing need for low carbon dioxide emitting sources in electricity generation (IAEA 2017). The estimated share of nuclear power in the total electricity supply is expected to increase from the current 11% up to 13.7% in the high demand case by 2050. In order to meet high case demand, timely investments will be necessary to enable these resources to be brought into production and be ready for use in nuclear fuel production. In light of the growing global demand for electricity and need for expansion of low greenhouse gas emitting energy options, the Rook I Project represents a significant potential source and secure supply option from which to meet this demand.

1.5 Environmental Assessment and Regulatory Requirements

Based on the nature of the Project and the stated legislative EA criteria NexGen anticipates that the Project will be subject to both a federal and provincial EA before the Project can proceed. The Project will also require federal and provincial licenses, approvals, and permits for various aspects and phases of the Project. The regulatory framework and associated approvals processes for the Project are outlined in the following sections.

It is anticipated that the CNSC and the Environmental Assessment & Stewardship Branch (EA Branch) of the SMOE will conduct a cooperative provincial-federal EA in accordance with the *Canada-Saskatchewan Agreement on Environmental Assessment Cooperation (2005*) or similar instrument. Although the EA is anticipated to be conducted through this cooperative process, separate requirements still apply and must be satisfied with respect to the acts, regulations and guidelines in place for each jurisdiction. While the EA and regulatory requirements are described here specifically, NexGen

plans to follow an integrated EA and CNSC licensing process and documentation associated with the specific licensing requirements will be prepared and filed separately.

1.5.1 Federal Environmental Assessment

It is anticipated that the Project will require the completion of a federal EA pursuant to the CEAA 2012. Under the CEAA 2012, an EA is required for new uranium mines and mills which are considered *designated projects* as defined in section 31 of the Schedule provided under the *Regulations Designating Physical Activities*. As stated in section 4(2) of the *Regulations Designating Physical Activities*, the CNSC is the federal authority mandated with ensuring that the CEAA 2012 requirements are met for new uranium mines and mills in Canada.

As the sole federal responsible authority for uranium and nuclear projects, the CNSC will act as the lead agency overseeing the federal EA process and is responsible for coordinating activities in cooperation with the provincial government and other federal agencies.

1.5.2 Provincial Environmental Assessment

In Saskatchewan, EAs are governed under the Act which requires that a proponent receives the approval from the SMOE before proceeding with a development as defined under the Act. A project may be defined as a *development*, and will require a review under the Act, if any of the following are likely to occur:

- The project is likely to have an effect on any unique, rare or endangered feature of the environment.
- The project is likely to substantially utilize any provincial resource, and in doing so, pre-empt the use, or potential use of that resource for any other purpose.
- The project is likely to 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.
- The project is likely to cause widespread public concern because of potential environmental changes.
- The project is likely to involve a new technology that is concerned with resource utilization and that may induce significant environmental change.
- The project is likely to have a significant effect on the environment or necessitate a further development, which is likely to have a significant impact on the environment.

Based on the criteria noted above the Project is expected to be considered a ‘development’ and require the completion of a provincial EA. The Saskatchewan Ministry of Environment will work cooperatively with the CNSC to execute the required regulatory processes.

1.5.3 Nuclear Safety and Control Act

Under the *Nuclear Safety and Control Act* (NSCA) and applicable regulations, proponents wishing to carry out activities related to the site preparation, construction, operation, decommissioning and abandonment of nuclear facilities and uranium mines and mills in Canada must first obtain a license authorizing the activity from the CNSC. The CNSC regulates these activities under the NSCA, which establishes the CNSC’s authority to set regulatory requirements for all nuclear-related activities in Canada. As part of the mandate of the CNSC, the environmental effects of all licensed activities are required to be evaluated and considered when licensing decisions are made. The CNSC uses the EA process as a planning tool to support the Commission’s determination on whether the licensee will make adequate provisions for the protection

of the environment and the health and safety of persons while carrying out a licensed activity. The EA conducted will be considered by the Commission during licensing and will form part of the licensing basis for the licensed activity.

The regulations made under the NSCA list the information applicants must submit to the CNSC as part of their license applications. The CNSC's licensing process for uranium mines and mills includes the four general licensing phases:

- license to prepare site and construct;
- license to operate;
- license to decommission; and
- license to abandon.

NexGen has initiated the process to obtain a license to prepare site and construct with the submission of an initial license application (NexGen 2019a) which accompanies this submission to the CNSC. Details specific to the licensing requirements to prepare site and construct, and how the CNSC requirements will be considered and achieved, are outlined within that application.

1.5.4 Provincial Approval Processes

The SMOE is responsible for protecting and managing Saskatchewan's environment and natural resources. For uranium mines and mills, approvals are issued in accordance with the *Environmental Management and Protection Act 2010*, and the associated regulations so that mineral industrial operations are operated and managed in manner that protects the environment, meets regulatory requirements, and achieves the policy objectives. Applications for the required provincial regulatory approvals are made following the EA approval with relevant approvals required prior to the commencement of Project related activities.

For uranium mines and mills in Saskatchewan, *The Mineral Industry Environmental Protection Regulations* (MIEPR) dictate the primary permitting requirements. Under MIEPR, the Project will require an *Approval to Construct, Install, Alter or Extend a Pollutant Control Facility* prior to commencement of construction. In addition, an *Approval to Operate a Pollutant Control Facility* will be required prior to operations and will be subject to review and renewal throughout the operating phase of the Project. Both approvals will stipulate conditions and compliance criteria specific to the Project covering a range of applicable provincial regulatory requirements.

An important component of the CNSC licensing process is the requirement to develop and periodically revise a preliminary decommissioning plan and a preliminary decommissioning cost estimate which provides the basis for a financial assurance posted to cover the costs associated with executing the preliminary decommissioning plan in the event that the company becomes insolvent. Both documents will require approval by both the CNSC and the SMOE.

1.5.5 Other Regulatory Approvals

In addition to the EA and licensing approvals, development of the Rook I project will be subject to a number of other acts and regulations and additional permits and approvals will be required at various stages from applicable federal and provincial ministries and agencies. A summary of potentially applicable federal and provincial legislation is provided in Table 1.5-1 and Table 1.5-2, respectively. NexGen recognizes that other legislation and requirements may apply and it will be the responsibility of NexGen to comply with all applicable legislation and obtain all required permits and approvals throughout the full life-cycle of the Project.

Table 1.5-1: Potentially Applicable Federal Legislation

Act	Regulations
Canadian Environmental Assessment Act, 2012	Regulations Designating Physical Activities
	Prescribed Information for the Description of a Designated Project Regulations
	Cost Recovery Regulations
Nuclear Safety and Control Act	General Nuclear Safety and Control Regulations
	Uranium Mines and Mills Regulations
	Radiation Protection Regulations
	Nuclear Substance and Radiation Devices Regulations
	Packaging and Transport of Nuclear Substances Regulations
	Nuclear Security Regulations
	Nuclear Non-Proliferation Import and Export Control Regulations
Fisheries Act	Metal and Diamond Mining Effluent Regulations
	Deposit Out of The Normal Course of Events Notification Regulations
	Wastewater Systems Effluent Regulations
Canadian Environmental Protection Act	Environmental Emergencies Regulations
	Federal Halocarbon Regulations
Pan Canadian Framework on Clean Growth and Climate Change	Greenhouse Gas Reporting Program
Transportation of Dangerous Goods Act	Transportation of Dangerous Goods Regulations
Aeronautics Act	Canadian Aviation Regulations
Navigation Protection Act	No specific regulations related to this act.
Species at Risk Act	No specific regulations related to this act.
Canadian Wildlife Act	Wildlife Area Regulations
Migratory Birds Conservation Act	Migratory Birds Regulations
	Migratory Birds Sanctuary Regulations
Explosives Act	Explosives Regulations

Table 1.5-2: Potentially Applicable Provincial Legislation

Act	Regulations
The Environmental Assessment Act	No specific regulations related to this act.
The Environmental Management and Protection Act, 2010	The Environmental Management and Protection (General) Regulations
	The Mineral Industry Environmental Protection Regulations, 1996
	The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations
	Discharge and Discovery Reporting Chapter
	Site Assessment Chapter
	Corrective Action Plan Chapter
	Halocarbon Control Chapter
	Environmental Code of Practice on Halons
	Industrial Source (Air Quality) Chapter
	The Hazardous Substances and Waste Dangerous Goods Regulations
	The Municipal Refuse Management Regulations
	The Waterworks and Sewage Works Regulations
The Water Security Agency Act	The Water Security Agency Regulations
	The Withdrawal from Allocation Regulations
The Fisheries Act (Saskatchewan), 1994	The Fisheries Regulations
The Groundwater Conservation Act	The Groundwater Protection Regulations
The Wildlife Act, 1998	The Wildlife Regulations
	The Wild Species at Risk Regulations
The Forest Resources Management Act	The Forest Resources Management Regulations
The Wildfire Act	The Wildfire Regulations
The Provincial Lands Act, 2016	Saskatchewan Wetland Conservation Corporation Land Regulations
	Crown Resource Land Regulations
	Provincial Lands Regulations
The Heritage Property Act	The Heritage Property Regulations
The Crown Resources Act	The Crown Resource Land Regulations, 2017
The Mineral Resources Act	The Quarrying Regulations
The Natural Resources Act	The Resource Protection and Development Service Regulations
The Pest Control Act	The Pests Declaration Regulations
	The Pest Control Products Amendment Regulations, 2012
The Weed Control Act	The Weed Control Regulations
The Management and Reduction of Greenhouse Gases Amendment Act	The Management and Reduction of Greenhouse Gases (General and Reporting) Regulations
The Northern Municipalities Act, 2010	The Northern Municipalities Regulations
The Saskatchewan Employment Act	The Occupational Health and Safety Regulations, 1996
	The Mines Regulations, 2018
The Radiation Health and Safety Act, 1985	The Radiation Health and Safety Regulations, 2005
The Boiler and Pressure Vessel Act	The Boiler and Pressure Vessel Regulations

Table 1.5-2: Potentially Applicable Provincial Legislation

Act	Regulations
The Technical Safety Authority of Saskatchewan Act	No specific regulations related to this act.
The Electrical Inspection Act	The Electrical Inspection Regulations
The Gas Inspection Act	The Gas Inspection Regulations
The Public Health Act	The Food Safety Regulations
	The Plumbing and Drainage Regulations
	The Public Sewage Works Regulations
	The Public Accommodations Regulations
The Passenger and Freight Elevator Act	The Passenger and Freight Elevator Regulations, 2017
The Reclaimed Industrial Sites Act	The Reclaimed Industrial Sites Regulations
Treaty Land Entitlement Act	No specific regulations related to this act.

1.6 Overview of Engagement to Date

Since the commencement of exploration, NexGen has undertaken regular engagement with interested groups (See Section 5.0). This includes updates on exploration activities, as well as involvement in community initiatives and opportunities for local residents and businesses. Additionally, as the Project progresses into the next stage of development, engagement activities will be expanded to include additional interested groups and additional forms of communication.

With respect to regulatory engagement, NexGen has routinely engaged with the applicable provincial ministries and agencies associated with exploration permitting and has maintained good regulatory standing with these agencies. More recently, NexGen has met with the CNSC and the SMOE EA Branch to introduce the Project and provide an update on activities and timelines associated with the pending EA for the Project. NexGen will continue to engage regularly with these authorities, and other recognized parties, through various forms of communication. Engagement will expand and be maintained throughout the entire Project lifecycle (See Section 5.0).

Since exploration commenced in 2013, NexGen has actively engaged with Indigenous communities in nearest proximity to the Project as well as identified land users providing regular updates, participating in community initiatives, and hosting tours of the site. These communities include:

- the Clearwater River Dene Nation;
- Métis Local 39 (La Loche);
- Métis Local 62 (Buffalo Narrows);
- Métis Local 130 (Descharme Lake);
- Métis Nation Saskatchewan – Region 2;
- Birch Narrows Dene Nation;
- Buffalo River Dene Nation;
- Meadow Lake Tribal Council; and

- Northern Saskatchewan Environmental Quality Committee.

The feedback received has been positive. Feedback has included questions about economic and employment opportunities; future land use opportunities; environmental and human health impacts; engagement plans; and transportation. With the advancement of the Project, NexGen has reviewed and expanded its Indigenous engagement plan to include those communities that may be affected by the Project activities or those communities that have an expressed interest in the Project. Section 5.0 provides a summary of this list and the approach to engagement considered.

In addition, NexGen has been and will continue to engage with the public. Communication to date has been through multiple forms, including:

- notification letters;
- email;
- local media;
- meetings;
- site tours; and
- participation in local events.

The feedback has been positive with questions about public involvement in the design of the Project; environmental impacts; impacts to land users; employment opportunities; and opportunities to tour the site. NexGen will continue to engage in meaningful dialogue with members of the public that have a direct interest in the Project as well as providing accessible, relevant and timely information. Section 5.0 provides an overview of the public engagement activities and future engagement plans.

2.0 PROJECT INFORMATION

The Rook I Project is a proposed uranium mining and milling operation that will be located adjacent to Patterson Lake in the southwestern Athabasca Basin region of northern Saskatchewan. The Project includes an underground mine and surface facilities to support the extraction and processing of uranium ore through development and mining of the Arrow deposit, currently the largest undeveloped uranium deposit in Saskatchewan. The deposit is a high-grade uranium deposit hosted below land and contained entirely within competent basement rock. The Project is 100% owned by NexGen Energy Ltd., a Canadian company traded publicly on both the Toronto and New York stock exchanges.

The main objectives in developing and subsequently operating and closing the Project are to:

- develop a workplace environment and culture which emphasizes and protects the safety of all employees, contractors, visitors and the public through all phases of the Project;
- establish a robust design and system of controls that minimizes radiation exposure of workers to levels As Low As Reasonably Achievable (ALARA) through all phases of the Project;
- reduce or eliminate environmental effects from the Project through the development and implementation of industry leading environmental design features, incorporation of best practices, and application of appropriate mitigation measures;

- develop, design, and operate the Project in a manner which fully complies with or exceeds the expectations of the public, regulatory requirements, and takes into account provincial, federal and international guidance and industry best practices; and
- maximize the value of the Project for all shareholders by reducing operating and capital costs necessary to achieve safe production without compromising any of the objectives outlined above.

Due to the remote location of the Project, there is no access to the provincial power grid. Power to service the surface infrastructure will be supplied by an on-site power generating station with associated fuel storage and distribution infrastructure. Mine production and other underground infrastructure power will be derived from on-site diesel generators. For the long-term operation of the Project alternative power sources are being considered. Personnel will be transported to and from site primarily via aircraft. A short (~15 km) access road will allow access for supplies and shipment of U_3O_8 from Provincial Highway 955 that was originally constructed to provide access for uranium mining at the Cluff Lake Operation. The Project will be designed, constructed, operated, and decommissioned in accordance with all regulatory requirements and will incorporate industry best management practices to provide for the safety of the public and workers and the long-term protection of the environment.

The conceptual Project design information provided in this document is based upon PFS level engineering design completed in the NI 43-101 technical Report on Pre-feasibility Study (Wood 2018). Additional studies and analysis will be completed during the feasibility design and concurrent EA processes and the design will be subject to refinement within the scope of what is described herein.

2.1 Exploration

Exploration has been recorded in and around the dispositions of the Property since 1968 from multiple companies. Airborne magnetic and radiometric surveys, prospecting, geological mapping and geochemical sampling have been completed for the area.

From 1980 to 1982, Saskatchewan Mining Development Corp. (SMDC) drilled 13 holes, and abandoned one hole on what is on intersected weak uranium mineralization in highly altered basement rocks just below the unconformity at 97 m. The mineralization and alteration were reported to be similar to that seen at unconformity associated uranium deposits in the Athabasca Basin.

In 1982, exploration waned in the western part of the Athabasca Basin and companies allowed their claims to lapse. There is little work recorded in the Saskatchewan mineral assessment files between 1982 and 2006. In 2006, Titan Uranium Inc. carried out airborne surveys of the mineral claim, which detected and/or confirmed numerous electromagnetic (EM) anomalies. A ground survey was then completed in 2008 and confirmed the presence of many of the airborne anomalies. In 2012, Mega Uranium Ltd. (Mega) completed a ground gravity survey and further delineated anomalies within this claim. A soil geochemical survey and prospecting program were also completed in the same year. No soil geochemical anomalies or radioactive boulders were identified.

In 2012, NexGen was incorporated as a uranium exploration and development company and acquired the 32 mineral claims from Mega, covering an area of 35,065 ha in Saskatchewan, and began drilling within the SW2 land package. NexGen's drilling displayed favourable host rocks, alteration and coincident structures that are typically associated with unconformity style uranium. In 2013, NexGen completed a detailed gravity survey that defined regional trends and more local smaller features that could be caused by alteration, topography, or changes in till thickness. In total, 12,867 gravity measurements were acquired within the survey areas, including a number of duplicate measurements acquired in areas surveyed by Mega before the Property was acquired by NexGen.

In 2013, NexGen completed a Direct Current (DC) resistivity survey over a small area on the western-most portion of the Property. The survey successfully identified several prospective basement hosted EM anomalies. It also identified a near surface, flat lying conductive horizon interpreted to be carbonaceous Manville Group rocks overlying the basement. Further drilling conducted in 2014, intersected several zones of uranium mineralization and high radioactivity which ultimately represented the discovery of the Arrow deposit.

In 2016, NexGen completed a high-resolution survey over the Arrow Deposit and immediate surrounding area. The survey showed a resistivity anomaly highly coincident with and immediately flanking the Arrow Deposit. The survey also identified an un-drilled additional anomaly coincident with an arrow parallel deformation zone.

Following discovery of the Arrow deposit, diamond drilling has been the principal method employed for exploration and delineation of the deposit. Due to favourable ground conditions and established access, drilling can generally be conducted year-round on the Property. From 2013 to November 2018, NexGen completed 555 holes totalling 296,681 m. Additional drilling was conducted throughout 2018 to further delineate the Arrow deposit and to provide geotechnical and other information to support mine design and assessment activities with results currently pending.

Exploration activities, delineation drilling, and geotechnical and other investigations will continue at the site in 2019. The primary objectives are to provide an updated resource model for use in the feasibility study, and to provide geotechnical, geochemical, hydrogeological and other technical information to support project design and to provide necessary technical details to support the EA process.

Current mineral resources, as described in NI 43-101 Technical Report on Pre-feasibility Study (PFS) (Wood 2018) and considering drill results associated with the Project include Indicated Mineral Resources totaling 2.89 million tonnes, at an average grade of 4.03% U_3O_8 for a total of 116.4 million kilograms (256.6 million pounds) U_3O_8. The lowest cutoff grade for reporting the mineral resources in an underground scenario considered is 0.05% U_3O_8, which is considered appropriate for construction of mineralized wireframe outlines. Based on the Mineral Resource and cut-off grade calculation, stope shapes of greater than 0.25% U_3O_8 will be considered in the mine plan. Inferred Mineral Resources total 4.84 million tonnes, at an average grade of 0.86% U_3O_8 for a total of 41.6 million kilograms (91.7 million pounds) U_3O_8 (NexGen 2018). The Probable Mineral Reserve estimate is 234.1 Mlbs U_3O_8 contained in 3.43 million tonnes at an average grading of 3.09% U_3O_8. Given that exploration programs are ongoing, for the purposes of conducting an environmental assessment of the Project, the global resource estimate (Indicated + Inferred resources) has been included which provides total mineral resources to support operation for 24 years.

2.2 Project Phases and Schedule

Project construction, operation and closure is anticipated to span approximately 42 years (Table 2.2-1). At this time, the schedule is an estimate based on PFS design detail and the current global resource estimate and will be refined as the design process progresses.

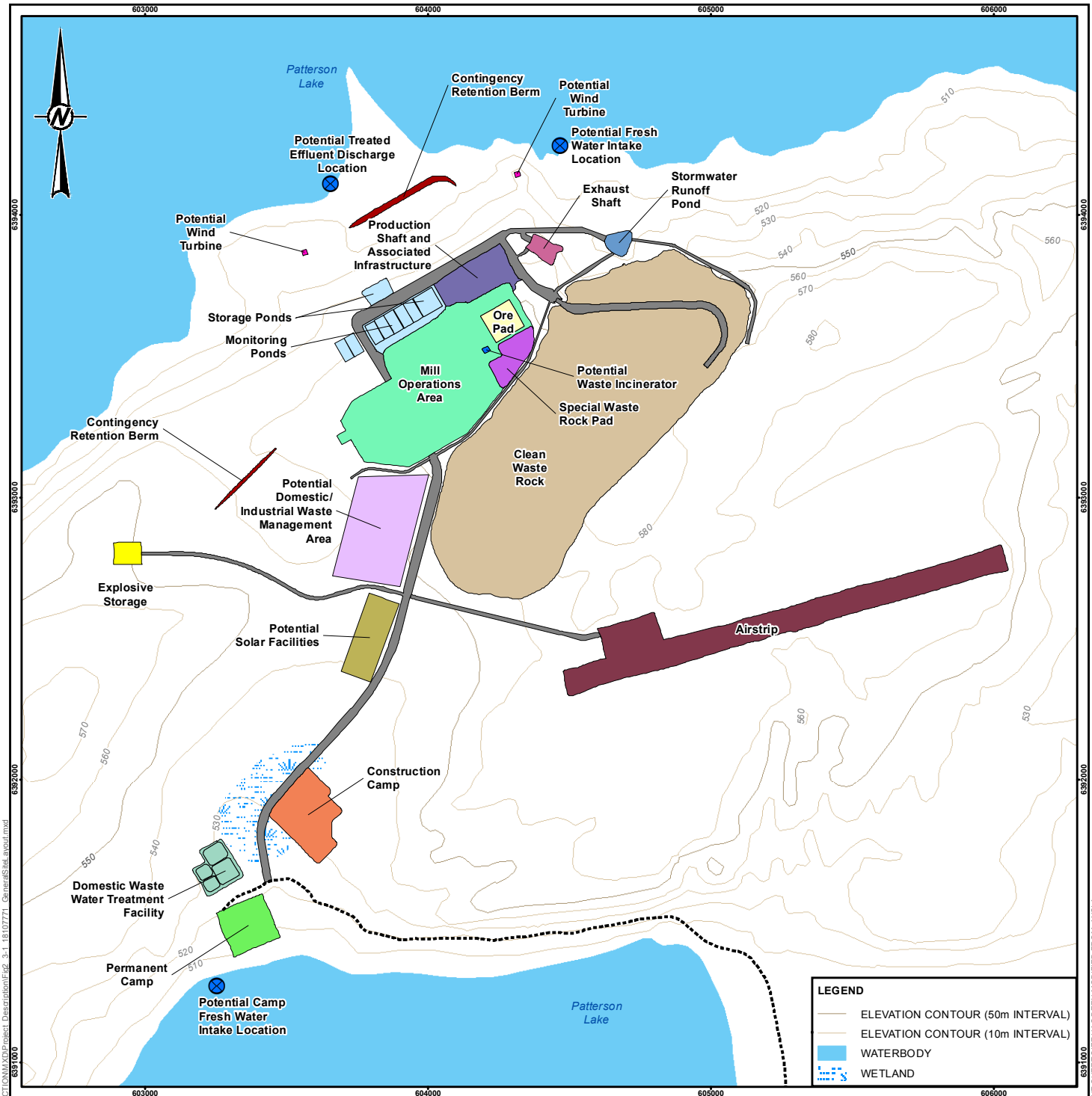
Table 2.2-1: Conceptual Project Schedule

Phase	Description	Duration (years)
Construction	Site preparation, mine, mill and site infrastructure development, commissioning all structures, systems and components.	3
Operation	Mining and milling of ore, production of uranium concentrate and supporting activities.	24
Decommissioning	Backfilling mine workings, removal of physical infrastructure, recontouring and revegetating disturbed areas and any other activities required to achieve decommissioning objectives and to return the site to a safe and stable condition.	5
Closure (i.e., Institutional Control)	The transition to Institutional Control involves monitoring of environmental media to verify that decommissioning criteria have been met; and the transfer of the property back to the province once performance to criteria has been fully demonstrated.	10

2.3 Project Activities and Components

The main project components, as currently understood, are illustrated in Figure 2.3-1, and include:

- mine workings, supporting infrastructure and mining process;
- mill facilities, supporting infrastructure and milling process;
- a paste backfill circuit for processing mill waste (tailings) into paste backfill;
- an UGTMF;
- water handling infrastructure and an effluent treatment circuit;
- waste rock and ore storage areas;
- surface water management features;
- supporting surface infrastructure;
- airstrip; and
- site access and road infrastructure.



LEGEND

- POTENTIAL INTAKE/DISCHARGE LOCATION
- EXISTING ACCESS ROAD

PROPOSED LAYOUT

- AIRSTRIP
- CLEAN WASTE ROCK
- CONSTRUCTION CAMP
- CONTINGENCY RETENTION BERM
- EXHAUST SHAFT
- EXPLOSIVE STORAGE
- DOMESTIC WASTE WATER TREATMENT FACILITY
- MILL OPERATIONS AREA
- ORE PAD
- PERMANENT CAMP
- POTENTIAL DOMESTIC/INDUSTRIAL WASTE MANAGEMENT AREA
- POTENTIAL SOLAR FACILITIES
- POTENTIAL WASTE INCINERATOR
- POTENTIAL WIND TURBINE
- PRODUCTION SHAFT AND ASSOCIATED INFRASTRUCTURE
- ROAD
- SPECIAL WASTE ROCK PAD
- STORAGE/MONITORING POND
- STORMWATER RUNOFF POND

0 400 800

1:20,000 METRES

REFERENCE(S)

1. PROJECT FEATURES OBTAINED FROM NEXGEN, NOVEMBER 2018.
2. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED OR IHS MARKIT CANADA LIMITED.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

GENERAL SITE LAYOUT

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**2.3-1**

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PATH: G:\Clients\NexGen\Rook1\Project SASK\09 PROJECTS\18107771 Rook1 EA\Rook1 EA\02 PRODUCTION\MXD\Project Description\Fig2 3-1 18107771 GeneralSiteLayout.mxd

NexGen plans to develop and operate all Project infrastructure, components, and systems in accordance with design standards developed for the Project which are to be based on applicable requirements (e.g., National Building Code of Canada, National Fire Code of Canada) and best available practices as developed by applicable industry and trade associations, standards organizations and regulatory guidance. By ensuring predictable and reliable operation of equipment and processes, these design standards will help promote the protection of the public, workers, and the environment. The design standards will be routinely reviewed and revised as updates are issued by the guiding bodies, based on site-specific operating experience, updates to legislation, regulatory guidance, with the introduction of new technologies, or in consideration of advances in research.

In addition to the standards, guiding design and development principles for environmental protection include, but are not limited to:

- containment structures will be compatible with the material being contained and will be adequately sized and appropriately situated to prevent releases of contaminants to the environment;
- maximizing diversion of clean surface runoff away from facilities and infrastructure;
- collection and treatment of contaminated or potentially contaminated water and surface runoff;
- avoidance of sensitive habitat where practical or required, or implementation of appropriate mitigation measures where avoidance is not possible;
- minimization of cleared areas, soil disturbance and potential wildlife interactions; and
- erosion protection to reduce the potential transport of deleterious substances to surrounding waterbodies.

The Project information provided in this document is based upon pre-feasibility stage engineering design and studies. NexGen plans to gather more information, perform additional analysis to complete a Feasibility Study and validate and enhance the resolution of the Project design in alignment with the EA process. As such, the descriptions of Project components are subject to revision, based on further detailed design information, which will be incorporated and assessed (as applicable) in the EIS.

2.3.1 Site Preparation

The initial development of the Project includes, but is not limited to:

- removal and stockpiling of vegetation;
- stripping topsoil (where present), oversized rock, and any other organic and unsuitable materials;
- excavation and fill placement; and
- stockpiling of the excavated materials that are not suitable or required for backfilling.

Topsoil will be stripped, stockpiled and separated to be available for future use. Ditches, swales and other water diversion and control features will be constructed to keep the site well-drained and to maximize the diversion of runoff water away from surface infrastructure and disturbed areas. Sediment traps/settling basins will be used as required for erosion and sediment control. Roads required during the construction phase will be located such that they are also appropriate for permanent use, where practical, to minimize the Project footprint. Embankment slopes will be designed and constructed in a manner to reduce or eliminate erosion. Vegetation, crushed stone or other forms of armouring may be installed for slope stabilization as required.

2.3.2 Mine

The scope of the mining activities, as outlined in this document, are for the purposes of consideration in the context of the environmental assessment process and include underground mine development and mine operations. Transport of the ore to the mill is described in Section 2.3.4.

2.3.2.1 Underground Mine Development

The conceptual underground mine development is illustrated in Figure 2.3-2. The rock mass quality of the deposit is such that it allows for mining through the creation of large, open excavations (i.e., longhole stoping) and the high value of ore per tonne of the Arrow Deposit justifies a "maximum extraction" approach with no pillars between stopes. Following the extraction of ore, the excavations will be backfilled with engineered, cemented paste backfill comprised of processed mill waste (tailings) and binders. This paste will be designed to meet established strength criteria. The backfilling of cemented paste into large open voids supports the longhole stoping method of mining the deposit, by ensuring the enhanced stability of backfilled stopes.

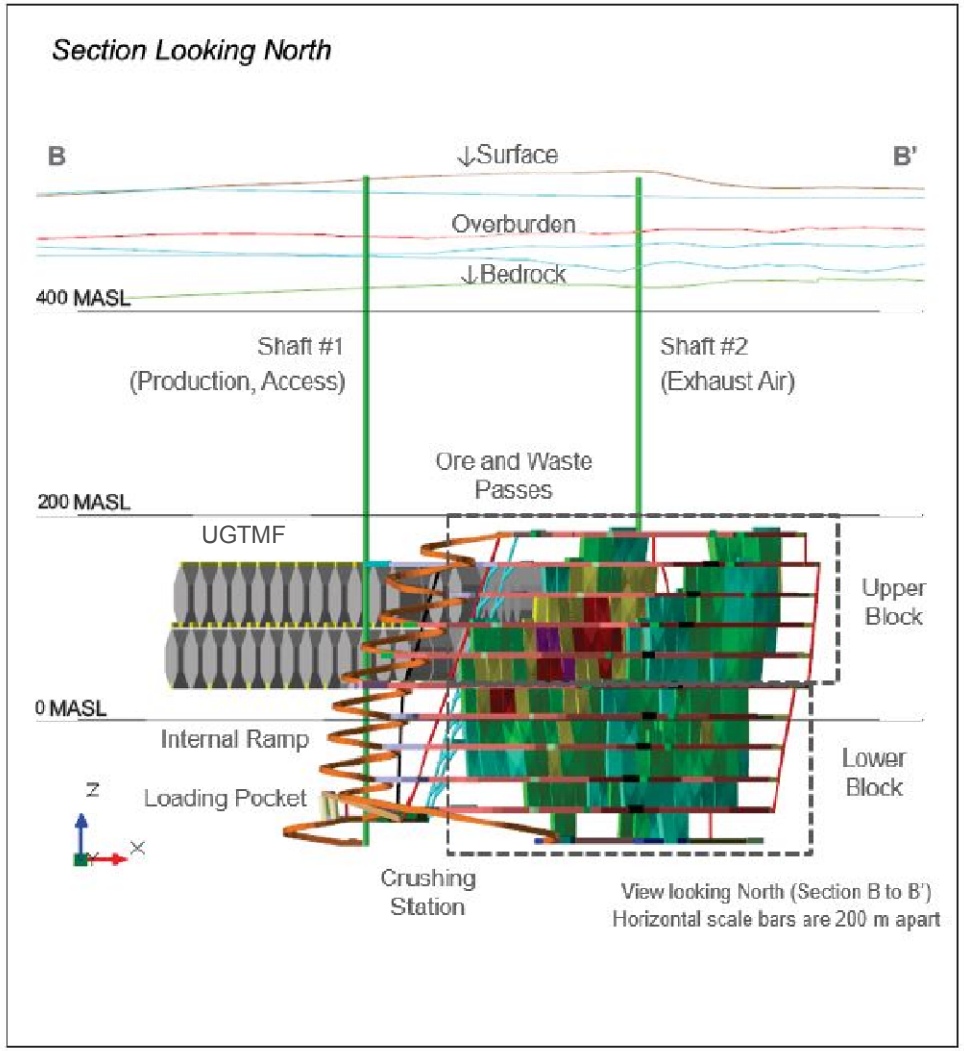
The Project will have capacity to use two longhole mining methods to extract the ore: transverse stope mining, and longitudinal retreat stope mining. Transverse stope mining will be used in areas of higher grade (generally greater than 4% U_3O_8) and wider stopes (generally greater than 10 m), while longitudinal retreat stope mining will be used in areas of lower grade and thinner stope widths. Both longhole mining methods will incorporate the use of cemented paste backfill to provide ground stability through the backfill of stopes following removal of ore. This combination of longhole stoping and paste backfill provides good productivity, high extraction rates, and stable ground support. The Project has also considered a number of variations of longhole stope mining for lower grade areas such as cut and fill mining, Sub-Level Shrinkage, other bulk tonnage mining methods such as Alimak Raise Slashing for narrow view widths, and the raisebore mining method that may be used as secondary methods where required.

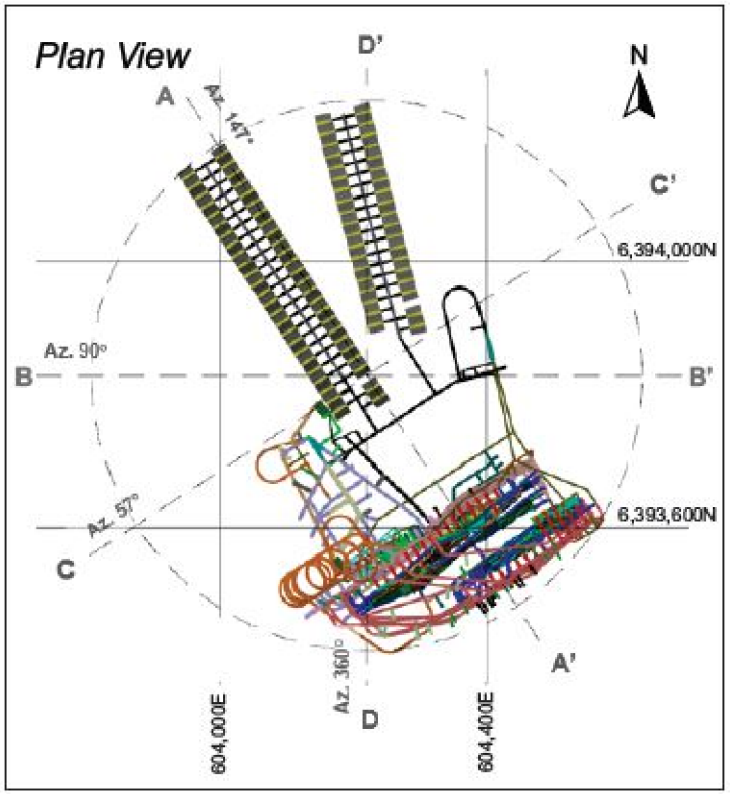
The underground mine development will include a number of key activities, including shaft sinking; lateral development; and non-shaft vertical development. These activities are described in the subsequent sections.

2.3.2.1.1 Shaft Sinking

Access to the mine will be facilitated through the installation of two shafts. The first shaft will be used as a production shaft (production shaft) to transport personnel and materials, remove ore and waste rock from the workings, and deliver fresh air from surface and into the mine with a separate compartment and ventilation circuit for hoisting ore. The second shaft will be used as an exhaust ventilation shaft (exhaust shaft) and will include secondary emergency egress. The production shaft will be sunk to a depth of approximately 650 m below surface and the exhaust shaft will be sunk to a depth of approximately 530 m below surface. Both shafts will be developed either sequentially or concurrently, using conventional blasting and proven shaft sinking technologies such as raiseboring and blindboring.

Each shaft will be hydrostatically lined through the overburden and keyed into bedrock to a depth of approximately 150 m followed by a conventional, non-hydrostatic concrete lining installed to shaft bottom. During construction and prior to installation of the shaft liner, a temporary freeze plant will be required to freeze the surrounding overburden to prevent groundwater in the overburden from entering the shafts during shaft excavation in the upper 150 m. Additional shafts for ventilation may be added to the design at later stages in the operating life of the Project, should they be required.





REFERENCE(S)

1. MAP IMAGE OBTAINED FROM RPA, 2018.

CLIENT

NexGen Energy Ltd.

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT

ROOK I PROJECT

TITLE

CONCEPTUAL UNDERGROUND MINE DEVELOPMENT

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	2.3-2

2.3.2.1.2 Lateral Development

2.3.2.1.2.1 Lateral Waste Development

Lateral development is required to support mining of the deposit. The lateral development will occur from both shafts following completion of shaft sinking. There will be a total of 11 main levels in the mine. Each level will be approximately 30 m apart and will range in depth from 380 to 620 m below surface. Within the mine, ramps will be developed to access various production levels to allow for mining on multiple levels and locations within the mine to occur at the same time. The initial phase of lateral development will include the internal ramp, material handling systems, the UGTMF, and a number of access drifts.

Load Haul Dumps (LHDs) will transport material from the drifts to waste and ore passes located at each level. Underground haul trucks are not required for material haulage; however, they could be required in the future if mining activities extend further away from the shafts and planned material handling systems. Consequently, headings will be sized appropriately to accommodate haul trucks in the future.

All lateral developments will have arched back profiles. This design will provide optimal stability of openings. The location of waste development has been chosen to avoid intersection with major known fault structures or areas of potentially adverse ground conditions.

2.3.2.1.3 Ore Development

There are two primary types of ore development planned: longitudinal stope development and transverse stope development. The type of development to be used will be based primarily on the estimated U_3O_8 grade of the development in order to minimize potential radiological exposure to workers. Transverse stopes will have a larger profile (6.0 m by 6.0 m) than the longitudinal stopes (5.0 m by 5.0 m). This will allow for effective mining processes and lower radiation exposure for mine personnel.

2.3.2.1.4 Non-Shaft Vertical Development

In addition to the two shafts, there are several vertical developments that will extend between levels in the mine. These developments will serve multiple purposes, including movement of waste and ore, servicing the UGTMF, facilitation of ventilation between levels, and limiting the amount of dust entering working areas.

2.3.2.2 Mining Operations

It is currently anticipated that the Project will have a 24-year operational mine schedule based on global resource estimates. The total ore production schedule for the 24-year operating phase is expected to have an average grade of 3.28%. Mining will be carried out using mechanized equipment, with personnel working two twelve-hour shifts per day to produce an average of 1,400 tonnes per day (tpd) of ore.

Prior to construction, detailed assessment of the geology and hydrogeology will be completed and considered in the mine design. On-going hydrogeological analysis will validate the baseline groundwater flow patterns and appropriate mitigation will be put in place to limit water seepage into the mine workings. In addition, appropriate controls to limit radiation exposure of underground workers, such as shielding, ventilation, sequencing plans and other protective measures (e.g., limiting time spent underground in ore headings, use of autonomous or remote equipment, dust suppression, routine cleaning of equipment, and a robust monitoring and surveillance program) will be put in place.

The transverse stopes will be supported with cable bolt support in stopes 15 m wide and up to 15 m long. The transverse ore development is planned at 6 m wide by 6 m high, with standard bolt support and shotcrete. The ground support

requirements are typical of the Canadian Shield with patterned bolts and screen in the back and walls, with a nominal amount of shotcrete required outside of the orebody.

Mined stopes will be backfilled primarily with cemented paste backfill comprised of processed waste (i.e., tailings) and binders. The cemented paste will be designed to meet established criteria for strength and stability required for stope backfilling. Processed waste not used for stope backfill will be stored in the purpose-built UGTMF.

2.3.2.3 Mining Infrastructure

2.3.3 Surface Facilities and Supporting Infrastructure

The Project is located in a region of northwest Saskatchewan with established road access via Provincial Highway 955 and an access road; however there is currently no permanent infrastructure on the Property. Supporting infrastructure and utilities are limited. There is a 14.4 kilovolt (kV) single phase power line approximately 95 km from the site, but it is of insufficient capacity for the Project's needs while the nearest sub-station of adequate capacity is approximately 200 km away. An on-site power plant, with a 14 megawatt (MW) capacity is planned.

Both industrial and non-industrial structures and infrastructure will be constructed to support the Project (Table 2.3-1). Industrial buildings are considered structures constructed for processing, transporting and storing materials used in the production process or resulting from the production process. Non-industrial structures will be those constructed for non-processing activities. Supporting infrastructure includes facilities of main occupancy and other site services needed to support the Project.

Table 2.3-1: Surface Infrastructure at the Rook 1 Project

Industrial Buildings	Non-industrial Buildings	Supporting Infrastructure
▪ Mineral processing facilities (mill) ▪ Hoist building and shaft collar-house ▪ Ventilation exhaust and emergency egress ▪ Product and storage structures ▪ Conveyor and pipe galleries ▪ Potable water treatment plant ▪ Wastewater treatment plant ▪ Acid plant ▪ Freshwater pumphouse ▪ Power generation plant ▪ Freeze plant (temporary, removed after shaft sinking)	▪ Electrical buildings (housing dry type transformers, load centers, and MCC cabinets) ▪ Administrative buildings & workers dry ▪ Maintenance shops, wash bays & storage warehouses ▪ Sewage treatment facilities ▪ Construction camp & permanent camp ▪ Fuel storage & power generation plant	▪ Administrative offices ▪ Electrical rooms ▪ Site security/ Guard houses ▪ Airstrip ▪ Emergency Response Centre

During the construction phase, a construction camp will be located in proximity to the future permanent camp site to limit disturbance footprint and infrastructure requirements such as piping. The construction camp will be sized to accommodate up to a maximum of 1,000 people and will include a kitchen and recreation room.

The permanent camp will be sized to accommodate up to 500 people and will include a catering facility and dining hall, entertainment room, and sports and recreation complex. The camp kitchen and dining area will be located close to the lake and provide a view of Patterson Lake.

The design service life of the permanent structures of the Project will accommodate a minimum of all Project phases including construction, operation, and decommissioning. All facilities will be designed in accordance with relevant industry standards and the applicable provincial, and federal legislation, industry best practice and relevant guidance where

available and applicable. In advance of the construction of permanent surface facilities on the Property a surface lease agreement will be required from the provincial government.

2.3.4 Mill Design

The mill design is based on conventional uranium milling methodologies, the most recent relevant literature, and the results of the PFS metallurgical test program (NexGen 2018). The design was overseen and directed by subject matters experts with experience designing and operating other uranium mills and includes the functionality necessary to protect workers, the public and the environment over all phases of the Project.

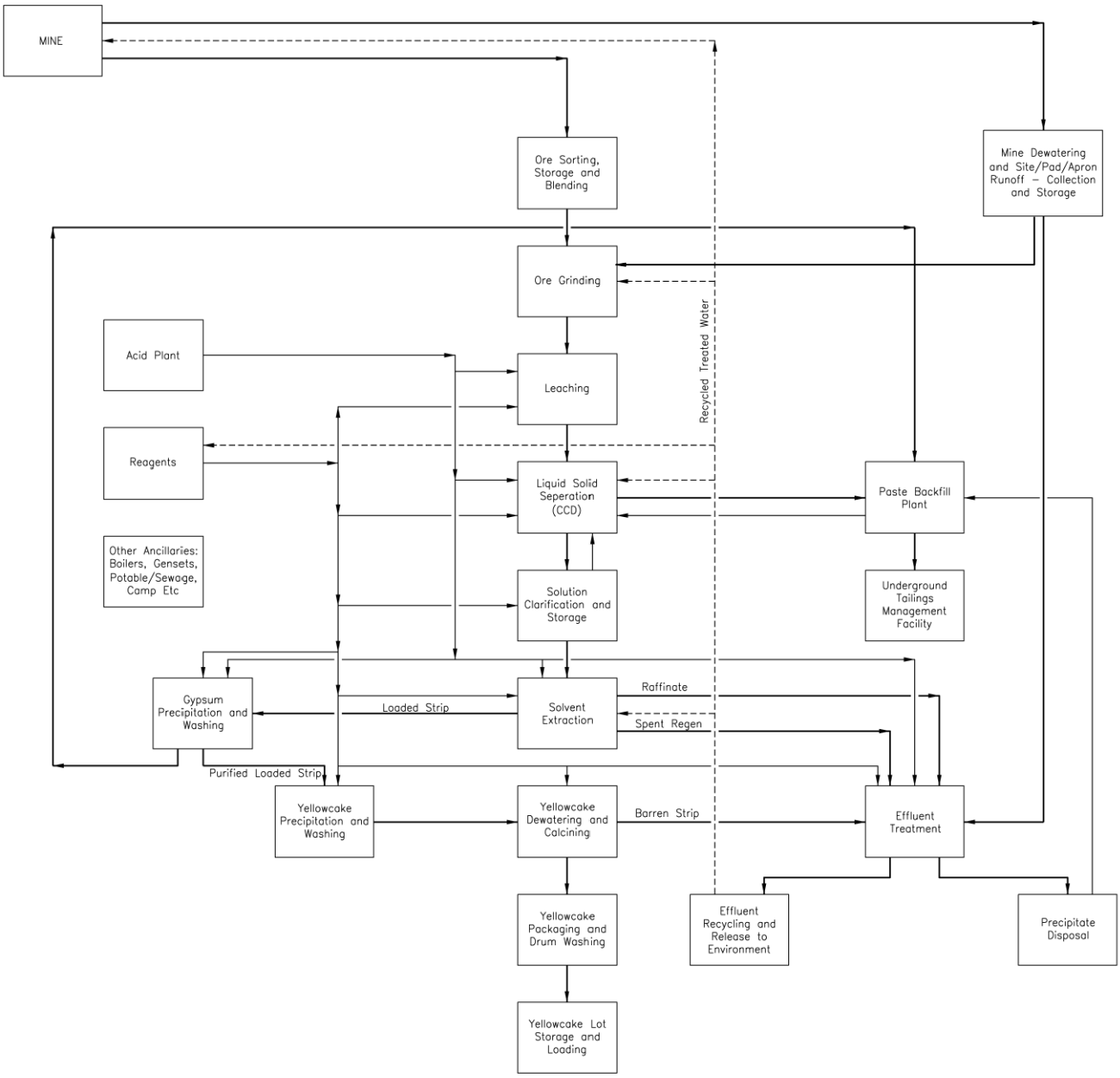
The mill has a proposed design capacity to produce up to 14 Mkg (31 Mlbs) of U3O8 per year, with a nominal daily throughput of 1,400 tpd. Total net uranium recovery from the milling process is estimated to be 97.6% based on the results of the PFS metallurgical test program. The preliminary testing of the recovery of other metals and by products was conducted during the PFS and will be further evaluated and considered where feasible.

The mill and process design, as presented in the PFS, includes the following processing circuits (Figure 2.3-3):

- Ore Sorting and Storage;
- Grinding;
- Leaching;
- Counter Current Decantation;
- Pregnant Solution Clarification;
- Solvent Extraction;
- Gypsum precipitation and washing;
- Yellowcake precipitation and washing;
- Yellowcake calcining and packaging;
- Wastewater treatment plant;
- Tailing neutralization and Paste Circuit; and
- Acid plant.

The following provides a brief summary of each aspect of the mill process.

Ore will be crushed underground to achieve suitable sizing of material prior to bringing to surface. Ore received on surface will be scanned to determine grade of material and transported to an ore storage area for storage and blending prior to feeding into the mill grinding circuit. The ore storage area will be adequately sized to allow for the storage, sorting and blending of ore delivered from the mine to feed the mill. Blending the ore allows for a more consistent feed grade generating more efficient mill operation. The ore storage area will be a dual lined facility with leak detection and designed with adequate containment volume.



LEGEND

– – ▶ RECYCLED TREATED WATER

REFERENCE(S)
FLOWCHART OBTAINED FROM WOOD, 2018.

CLIENT
NexGen Energy Ltd.

PROJECT
ROOK I PROJECT

TITLE
MILL PROCESS FLOWCHART

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**2.3-3**

The grinding circuit will be comprised of a series of grinding mills that will crush the ore received into smaller size fractions which will allow for optimized extraction of uranium from the ore in the leaching circuit. Water will be injected to obtain the target composition of a solids and slurry mix. The ground ore from the grinding circuit will be fed into an agitated leach feed tank that provides further blending prior to leaching.

Leaching oxidizes and dissolves the uranium that is present in the ore solids and separates the uranium from other elements contained in the ground ore slurry. The leaching circuit will be comprised of mechanically agitated tanks that are connected in series. Leach solution will be transferred in sequence through the circuit by gravity feed. Sulphuric acid and hydrogen peroxide will be added to the tanks to maximize extraction of the uranium from the ore. The resultant slurry is transferred to the Counter-Current Decantation (CCD) circuit. The proposed acid plant has the capacity for up to 300 tpd (90,000 to 100,000 tpy) of 94% sulphuric acid production.

The CCD circuit separates the uranium bearing solution from the barren leach residue. Uranium is concentrated in solution as it flows through the series of tanks in the opposite direction of the solids residue. The “pregnant aqueous” solution is then transferred to the solvent extraction (SX) circuit for further recovery and the leach residue from CCD is routed to the paste backfill plant for neutralization and processing.

Prior to entering the SX circuit, the pregnant aqueous solution is routed through a clarifier and treated with a small quantity of flocculant to promote the settling of suspended solids. The resultant overflow from the clarifier (clarified pregnant aqueous solution) flows by gravity to the solvent extraction feed tank. Settled solids are pumped back to the CCD circuit for further processing.

The clarified pregnant aqueous solution is delivered to the SX circuit and is fed through a series of extractions cells where it is mixed with organics to strip the uranium from the solution. The uranium-loaded organic solution is washed with acidic water to remove impurities and is then fed into a series of stripping cells where uranium is recovered from the organic using a strong acid solution. The resulting loaded strip solution is pumped to the gypsum precipitation circuit.

Lime is added in stages within the gypsum precipitation circuit to gradually increase the pH of the loaded strip solution to remove the acid prior to uranium precipitation. As lime is added, it reacts with sulphuric acid and results in the formation and precipitation of gypsum. The precipitated gypsum undergoes a series of steps including washing, centrifuging and settling. The final step produces a concentrated uranium solution (purified loaded strip solution). A gypsum cake is also produced as a by-product and is transferred to the paste backfill circuit for processing.

Purified loaded strip solution is transferred to the uranium precipitation circuit. In the uranium precipitation and washing process, hydrogen peroxide is added to the purified loaded strip solution to precipitate uranyl sulphate as uranyl peroxide. In addition, the uranium solids are washed to limit contamination during the drying process. During the washing process, the uranium precipitate and barren strip solution slurry are separated. The washed uranium precipitate reports to a conveyor that feeds into a calciner. The barren strip solution reports to the barren strip tank and is transferred to the waste water treatment circuit for treatment.

In the uranium precipitate drying/calcining and packaging process, the moist uranium precipitate (studtite - uranyl peroxide) is dried and calcined to produce the final mill uranium product (U_3O_8) which is transferred to a storage bin from where it is packaged and sent off site as a final ‘yellowcake’ product. The combustion gas flow that heats the dryer drum is kept uranium free and discharges through a stack. A small ventilating air stream passes through the calciner so that no gasses are concentrated in the calciner. Upon exiting, the gas passes through a scrubber to remove any particulates. The liquid discharge of the scrubber reports to the uranium precipitate wash tank.

The calciner cools the calcined product before discharging it to a storage bin. The bin and product transfer points are kept under a slight vacuum to prevent any uncontrolled dust emissions. The fan that draws the vacuum is routed through a small baghouse to remove and recover any entrained yellowcake particles prior to discharge to the atmosphere.

The calcined storage bin feeds a packaging system that loads the calcine into standard 205 L (45 G) steel drums for shipping. The packaging system is sealed to prevent any dust from contaminating the area. Product samples are collected from the drums before lids are fit and seal rings applied. The drums are then washed to remove any dust or product and dried. It is projected that there will be about 100 drums packaged per mill operating day.

There are three waste slurry streams generated through the milling process: neutralized leach residue (tailings), gypsum (from gypsum precipitation) and waste water treatment precipitates. All three waste streams will be processed through the paste circuit prior to transfer underground for placement within mined stopes or within the UGTMF. This process will allow for progressive decommissioning of mill waste material during the operating phase of the Project.

Within the paste circuit, residue from the leaching process will undergoes neutralization prior to paste backfill processing. The slurry from the CCD circuit will be pumped to the paste plant and into a centrifuge feed tank. Calcium hydroxide (slaked lime) will be mixed into the slurry product to render it chemically basic. The resulting neutralized tailings will be blended with a binder and used primarily for making cemented paste backfill for placement in mined stopes. Cemented paste backfill will be generated from neutralized tailings and binder (Portland cement and binding agent (slag, fly ash or other suitable material) mixed with water to a set criteria established to achieve required pumpability characteristics and backfill strength following placement and curing. This cemented paste backfill product will be transferred underground via a dedicated piping network and placed into mined stopes. This process will allow for progressive decommissioning throughout the operating phase of the Project.

Processed waste placed into the UGTMF will be comprised of a combination of neutralized tailings, gypsum and effluent precipitates. These residues will be pumped to and mixed in the paste backfill plant and processed to meet established criteria for pumping and placement. The combined paste product will then be transferred underground through a piping system and placed into the UGTMF.

If opportunities to process metals other than uranium (e.g., precious metals) or generate products other than U_3O_8 (e.g., gypsum) are identified through future study, then the mill process, if required, will be evaluated so that the health, safety, and environmental performance is maintained.

Molten sulphur is fed to acid plant where it is burned in the presence of dry air to produce a sulphur dioxide gas stream. The sulphur dioxide gas stream is cooled and then fed to a converter system where it is converted into sulphur trioxide (SO_3)gas. The SO_3 gas is then absorbed into sulphuric acid producing 98% sulphuric acid. The 98% sulphuric acid is diluted with water to 94% strength and stored for use in the process.

The acid plant is in a stand-alone building separate from the process plant. The plant is designed to produce 300 tonnes per day of sulphuric acid and requires 90 tonnes of sulphur feed.

2.4 Water Management

The Project water management system is designed to:

- maximize the diversion of fresh water away from facilities and infrastructure including, but not limited to mine infrastructure, processing areas, waste management areas, waste rock piles and ore stockpiles;
- minimize fresh water intake through water reuse and recycling wherever possible;

- collect and treat wastewater generated by mining, milling, industrial, and domestic activities;
- collect and treat surface run-off from mine and mill related infrastructure as a cautionary measure; and
- consistently meet both regulated and established discharge criteria for treated water.

Overall, the Project's water management and handling system is designed with sufficient storage, conveyance, and treatment capacity to prevent the uncontrolled release of untreated water to the environment under both routine and non-routine situations, including precipitation events, and upset operating scenarios.

To prevent runoff with potentially high suspended solids content from running off the site, a storm water runoff pond (SWRP) and associated runoff diversion features are incorporated to capture runoff from the mill and mine surface footprint for transfer and treatment in the wastewater treatment plant (WWTP). These features are designed for a maximum 24-hour 1:100 year storm event. For contingency, a constructed dike between the mine and mill facilities and Patterson Lake to the North has been incorporated to prevent the additional stormwater runoff that would be generated under 24-hour PMP scenario from discharging directly into Patterson Lake.

Primary containment structures, including process and monitoring ponds, the ore pad and special waste stockpile pad have been designed with capacity and will be operated with adequate freeboard to accommodate additional water contained generated as a result of a 24-hour PMP event.

2.4.1 Water Supply

2.4.1.1 Potable Water Supply

Freshwater pumped from Patterson Lake will be treated in a potable water treatment plant designed to supply water safe for human consumptive use in facilities throughout the site (e.g., camp, dry, office, lab). A groundwater well installed within the overburden and beyond the influence of mining and milling activities is also being considered as a potential source of potable water.

2.4.1.2 Process Water Supply

Process water will be supplied to the mill whenever possible from recycled sources including mine dewatering and surface water management ponds. Freshwater will be pumped from Patterson Lake for process water when required.

2.4.1.3 Fire Protection

On-site fire suppression will be designed to meet the National Fire Code. The fire water pump will use the same freshwater intake that will feed the project site where required, which will feed an oversized storage tank that will be used solely for the fire protection system. A standard deep buried interconnected firewater loop will be installed. The firewater loop will encircle the process plant, production plant and the production shaft. Appropriate fire protection will also be installed for all other on-site infrastructure as required.

2.4.2 Surface Water Management Ponds

Storage ponds will be required to collect surface runoff that is or may be exposed to contamination from areas including, but not limited to, mining areas, processing areas, waste management areas, waste rock piles and ore stockpiles. Ponds will be constructed on the property for surface runoff collection, mine water settling, collection of precipitation associated runoff and storage and monitoring of treated water from the WWTP prior to batch release discharge. These ponds will be constructed in a manner to limit or reduce erosion and designed and operated with adequate freeboard such that capacity is available to store precipitation during a 24-hour PMP event.

The surface water process ponds that are expected to be required during operations are listed in Table 2.4-1. Additional process ponds may be added in the future, if required.

Table 2.4-1: Surface Water Process Ponds

Pond Name	Capacity (m^3)	Quantity
Settling Pond	16,000	1
Contingency Pond	5,000	1
Monitoring Ponds	5,000	4

All ponds will be double lined with a leak detection system. Piping between the process ponds, the WWTP, and the production shaft will be dual contained with appropriate monitoring.

2.4.3 Mine Water

The mine dewatering system will be capable of collecting and removing all seepage from the shafts, workings, and UGTMF as well as process water from equipment and routine operational activities (e.g., washing equipment). Water from these sources will be sent to underground sumps located at the lower levels of the mine. Water from these collection sumps will be available for reuse in underground equipment and processes or will be pumped directly to the surface settling pond.

2.4.4 Surface Drainage Structures

Site drainage will be designed to divert as much surface run-off water as possible away from any areas where water may become contaminated, including but not limited to any mining areas, processing areas, waste management areas, waste rock piles and ore stockpiles. In areas where volumes of clean water routed through diversion could be substantive, retention berms have been incorporated to prevent runoff with potentially elevated TSS content from reporting directly to Patterson Lake, allowing for dissipation within these retention areas.

Areas such as the ore pad, special waste pad and outdoor containment will be designed and constructed to capture and retain all runoff from within these facilities. Ditches, culverts and pipelines will be constructed to transfer runoff from potentially contaminated areas to the appropriate collection ponds for further treatment. General water conveyance features will also be incorporated to collect surface water drainage from other areas around site including the clean waste rock management area

In general, runoff from these areas will be captured through swales and open ditches and flow to the directed storm water pond. Runoff water from roads within the Project footprint will be designed to drain away and not pond near the road. Ditching will be used to transport the runoff to natural grades that flow away from the road and into the natural drainage system. The invert of ditching adjacent to roadways and graveled pads will be lower than the subgrade below the shoulder in order to function properly.

Contingency containment structures have been incorporated into the design to provide downstream capture of site runoff to prevent runoff with potentially elevated suspended solids from directly entering Patterson Lake. These structures are designed to passively collect and retain runoff from extreme rainfalls such as that from a 24-hour PMP event from entering the lake.

2.4.5 Wastewater Treatment Plant

A WWTP will provide for removal of elements of concern to produce water that is suitable for release to the environment as established through applicable regulation and project specific discharge criteria. As well as mill effluent, the effluent treatment circuit will receive and treat mine water and site runoff from potentially contaminated areas (e.g., ore stock piles

and mineralized waste piles) and storm water generated by runoff from the mine and mill areas. All waste water derived from areas such as the dry/laundering, laboratory and maintenance shop will similarly report to the water treatment circuit. The settling and runoff ponds as well as mill tankage provide surge capacity for feed effluents, that allows the WWTP to be fed at a relatively constant flow rate.

2.5 Roads

The Project is located 8 km east of Provincial Highway 955, an all-weather gravel highway, which extends north from the town of La Loche, located 155 km to the south of the Project, to the Cluff Lake Operation, a former uranium mine and mill operation that is currently undergoing decommissioning located 80 km to the north of the Project. The highway, which is maintained year-round by the Provincial government, was developed to provide all-season road access to Cluff Lake, and represented the main transportation route for inbound supplies and outgoing uranium product for more than 20 years.

A 13.5 km all-season access road connects the Project site to Hwy 955. The road was permitted in 2016 under Provincial Aquatic Habitat Protection Permit 15ML117 and Forest Product Permit 0544I. The current road is approximately 5 m wide and provides access for passenger vehicles, transport units and heavy equipment. There is one bridge crossing of a stream. No material changes to the road and access to the Project are envisioned during construction. Any potential upgrades or new crossings will be reviewed as NexGen completes the next phase of the Project studies. At this time no new stream crossings are anticipated nor contemplated for the Project. Currently there is an access trail from the existing exploration camp to the proposed mine/mill site that is being used for exploration activities. On-site roads will be upgraded to meet the needs of the Project.

2.6 Airstrip

An airstrip will be constructed at the Project site and will function as the primary mechanism for transporting personnel to and from the work site from designated pick-up points. The airstrip will be sized to match the landing and take-off requirements of regional commuter aircraft and is proposed to include a small airport terminal, fuelling area and associated storage and transfer infrastructure, a lighting system, and navigation equipment. Similar to the runways at other northern Saskatchewan mining operations and communities, it is currently envisioned that the runway will be constructed with a sand and gravel surface with the option to apply an asphalt surface.

2.7 Waste Management

An overview of the strategies currently envisioned for managing tailings, waste rock, and domestic, industrial and radiologically contaminated waste are outlined below.

2.7.1 Tailings Management

During operation there will be three solid mill process waste streams generated as a biproduct of the milling process:

- leach residues (tailings);
- precipitated gypsum; and
- wastewater treatment precipitates.

The conceptual project design accounts for these waste streams to be diverted to paste backfill circuit where they would be processed prior to transfer and disposal underground. Two types of processed waste streams would be generated by the paste backfill circuit: cemented paste backfill comprised of leach residue and binder which would be used as a product for backfilling mined stopes; and uncemented paste backfill comprised of a mix of all three waste streams and binder that would be placed directly in the UGTMF. Cemented paste backfill will be engineered to meet strength criteria required for cemented paste backfill product in the mined stopes whereas the processed waste placed in the UGTMF will not be subject to the same level of strength criteria.

2.7.1.1 Underground Tailings Management Facility

The UGTMF will be a purpose-built, underground facility with chambers dedicated to the storage and progressive decommissioning of a number of waste streams generated through mining and milling (Figure 2.3-2). This includes primarily the waste generated from the milling process, conventionally identified as tailings, as well as waste generated from underground mining activities and radiologically contaminated waste generated as part of mining and milling activities.

The primary waste stream, on a volumetric basis, managed in the UGTMF will be the generated through the milling process. This primarily includes gypsum precipitates, effluent treatment precipitates, and neutralized leaching residue, conventionally referred to as tailings. These waste streams will be directed to and processed within a paste backfill circuit prior to transfer and placement underground. Underground waste streams include sediment from underground sumps and material radiologically contaminated as part of the mining process.

The creation of cemented paste backfill generated from the mill waste stream is directly proportional to the amount of available space underground for the storage of this waste. To achieve the established strength criteria, process waste will be mixed with a binder comprised of a combination of Portland cement and ground-based slag or other adequate binder material. The amount of binder applied will depend on the application of the pastes, with primary transverse stopes and longitudinal stopes with adjacent stopes on strike requiring the highest strength (>2.5 MPa) and thus having the highest proportion of binder. The combined precipitates that will be returned to the UGTMF will not receive any binder but will have a managed water content to facilitate transfer.

Priority for backfilling with the cemented paste backfill underground is to first fill the stopes (i.e., open excavations) created by mining. Due to the swell factor of broken rock compared to in-situ rock, not all processed mill waste will be returned to these stopes. The balance of processed waste will be stored in the purpose-built UGTMF excavation chambers. In both circumstances, waste will be decommissioned progressively during the operating phase of the Project.

Future studies will confirm the proportion and type of process waste used in the paste backfill to optimize the mix design, paste density, and the use of underground storage space. In addition, segregating clean gypsum precipitates from the other process waste streams to allow for the surface storage of this material in a purpose-built facility is being investigated. Test work to-date has indicated that the gypsum precipitates will have low levels of Constituents of Potential Concern (COPC) which make them a low-risk potential candidate for surface storage. Removing this material from UGTMF would reduce the amount of underground development required and the amount of clean waste rock stored on surface.

Three UGTMF cavities are planned for initial development during the construction phase to provide adequate storage capacity to support the start of mining and milling operations.

2.7.2 Waste Rock Management

As part of the mining process, the Project will extract ore, clean waste rock, and potentially special waste rock from the mine which will all be brought to surface. Ore is classified as all material extracted from mining which has a uranium

content above established grade cut-off criteria. Special waste is considered any waste rock that has a uranium content below grade cut-off but above 0.03% U_3O_8, has a net acid generating potential, or that has concentrations of other important parameters above established criteria. Clean waste rock is considered benign with uranium concentrations below 0.03% U_3O_8, little or no acid generating potential and has concentrations of key parameters below established criteria. The Project will have sufficient capacity to characterize, separate and store clean and special waste rock on dedicated and specifically designed surface facilities, as outlined on Figure 2.3-1.

Waste rock will be separated from ore beginning with a scanner located underground that will provide information on uranium content (grade), allowing for separation of ore and waste rock prior to transfer to surface. Further testing of waste rock will be conducted on surface and material classified as either clean waste rock or special waste rock. A rigorous, scientifically defensible rock sampling and characterization program will be developed for the Project for appropriate segregation of material classes is established and maintained.

It is currently anticipated that up to 11,600,000 m^3 of clean waste rock will be generated over the course of the life-cycle of the Project. To the extent possible, clean waste rock will be used as a source of aggregate material for construction activities and the remainder will be stored on surface in the designated clean waste rock management area. As this material is considered non-mineralized and non-acid generating it will be placed on a surface storage pad as shown in Figure 2.3-1. The storage pad will be compacted and designed so that runoff that contacts the waste rock is intercepted by a diversion ditch where it flows to either the east waste rock runoff pond or the west collection basin.

Geochemical analysis of the rock surrounding the Arrow deposit indicates limited presence of problematic elements and low acid generating potential. As a result it is estimated that approximately 1% of the waste rock brought to surface will be classified as special waste rock. This material will be stored on a dual lined special waste rock storage pad equipped with a leak detection system installed between the liners. The runoff collection measures for the Project will be designed to self-contain runoff from the special waste rock storage pad during a 24 hour PMP event.

2.7.3 Domestic and Hazardous Waste

The Project will incorporate a number of processes and associated infrastructure for the safe and responsible handling, storage, processing, reuse, recycling and disposal of domestic, industrial, radiologically contaminated, and hazardous wastes generated during all Project phases. Proper management and control on these various waste streams will be imposed so that wastes will be segregated, tracked, and managed according to their classification and characterization in a manner that complies with applicable regulatory requirements and protects workers, the public and the environment and which conforms to the waste management program to be developed for the Project.

The Project as currently designed includes both on-site and off-site disposal of the identified waste streams expected to be generated as part of the Project. Current predictions of the types and total quantities of waste generated through Project construction, operation, and decommissioning are presented in Table 2.7-1 along with current planned methods for managing them. The approximate location and extent of on-site waste storage and processing facilities is shown in Figure 2.3-1.

Table 2.7-1: Waste Predictions for Life of Mine

Type	Volume (m^3)	Types of Waste	Handling Method
Domestic/Industrial	25,000	Non-radiologically or chemically contaminated waste generated from the camp, offices, and operational activities	Off-site recycle
	250,000		On-site landfill
	80,000		On-site incineration
Radiologically Contaminated	180,000	Radiologically contaminated waste generated from operational activities	On-site underground disposal
	165,000		On-site incineration
Hazardous	5,000	Chemically contaminated waste generated from operational activities	Off-site recycle
	5,000	Hydrocarbon impacted soils	On-site landfarming Domestic landfill

Hazardous substances will be handled by trained personnel and sent to approved facilities for disposal. If a major spill occurs, the cleanup, treatment, and disposal of the contaminated waste and soil will be handled and disposed of by appropriately trained personnel in correspondence with regulatory authorities and approved criteria and corrective action plans. Hydrocarbon impacted soil may either be disposed of off-site, within an on-site domestic landfill or through on-site landfarming.

Waste bins, designed to limit wildlife attraction, will be located around site in appropriate areas. It is currently envisioned that the non-radiologically contaminated, non-hazardous domestic and industrial waste will be disposed of at an on-site landfill and/or collected and transported to the landfill in Meadow Lake. However, during the feasibility study, options will be considered for on-site landfilling, incineration, composting and capacity and access to any third party waste management facilities explored. Recycling bins and receptacles, designed to limit wildlife attraction, will be located around site in the most appropriate areas During the construction phase recycling bins will also located in the construction laydown. The recyclables will be removed and shipped to the appropriate facility.

2.7.4 Sanitary Sewer Collection

A combination mechanical/facultative lagoon sewage treatment system will be constructed near the camp for the treatment of sanitary sewage. The domestic sewage from the camp will be directly pumped to the sewage treatment facility while sewage from the mine, mill and ancillary facilities will be collected in a sanitary septic system and hauled to the sewage treatment facility for treatment.

2.8 Human Resources

NexGen recognizes that skilled, knowledgeable, and qualified employees, are an integral component of an efficient, safe, and environmentally responsible operation during all Project phases. NexGen will focus on maximizing employment of a local workforce, derived from northern Saskatchewan. The Human Resources and Development Program will implement a systematic approach for identifying and providing the training required by site employees.

In addition, a program will be developed that will:

- provide a means of measuring, monitoring, and improving the capability of employees to meet organizational objectives;
- provide efficient and effective training;

- look for opportunities to provide continuous improvement in staff skills and the facility operation; and
- confirm if regulatory changes or facility changes may necessitate changes in corporate policy or training requirements.

Underground production and maintenance employees, including front-line supervisors, will work twelve-hour shifts, on a "two weeks in, two weeks out" rotation and stay at the camp for the duration of their shift.

2.9 Project Decommissioning and Closure

Where possible, the Project has been designed with closure in mind and opportunities for progressive reclamation and decommissioning will be explored and implemented throughout the operating life of the Project.

Throughout the life of the Project from construction to decommissioning and closure NexGen commits to the following:

1) Long term protection of human health and the environment.

2) End of state conditions reflective of pre-disturbance conditions and that meets designated land use objectives.

3) Site free of access restrictions and suitable for recreational and traditional land uses.

Upon completion of mining and milling, the Project will be decommissioned and reclaimed in accordance with a Detailed Decommissioning Plan approved by both the SMOE and CNSC that will include a thorough assessment of various decommissioning strategies and criteria. Final closure of the site will commence following completion of decommissioning activities supported by performance monitoring to confirm that end-state objectives have been achieved. An application for approval to decommission will be submitted to the SMOE and the CNSC in accordance with the requirements of *The Mineral Industry Environmental Protection Regulations* and the *Uranium Mines and Mills Regulations*, respectively. Once approved, the site will be transferred back to the province through the Institutional Control Program in accordance with *The Reclaimed Industrial Sites Act* and *The Reclaimed Industrial Sites Regulations*.

2.9.1 Removal of Surface Infrastructure

Surface infrastructure, equipment and materials identified for on-site decommissioning, including the mill, mine surface and supporting infrastructure, will undergo sequential demolition starting with those not required to support decommissioning. Surface infrastructure, equipment and materials will be demolished, staged and transferred underground, where they will be incorporated as backfill during mine decommissioning.

Any remnant ore or special waste stockpiled on surface will be returned to the mine and backfilled along with associated liners, berms and fill material. Surface water management ponds will be dewatered and sediment, liners and fill material similarly transferred underground and backfilled within the mine. These areas will then be subject to testing and radiological surveys to confirm conditions meet established criteria.

Roadways, storage pads, building foundations, ditches, berms and other earthworks components will undergo a radiological survey prior to decommissioning. Material not meeting decommissioning criteria will be removed and backfilled as part of mine decommissioning, with areas re-surveyed until criteria are achieved. These areas will then undergo contouring, scarification and revegetation with appropriate plant species.

The WWTP and associated infrastructure will be retained until the final stage of decommissioning, when the mine is backfilled and decommissioning of the first shaft is complete, to provide for the collection and treatment of water from the mine and surface facilities. All hazardous substances and waste dangerous goods will be consumed during the decommissioning activities with the remainder shipped off-site to an approved facility for safe disposal. Non-hazardous and

non-radiologically contaminated domestic and industrial waste will be shipped off-site to an approved disposal facility for recycling or disposal.

2.9.2 Closure of Underground Workings

Mine decommissioning will occur in parallel with surface infrastructure, with designated surface materials transferred underground and backfilled into the lateral portions of the mine along with mine infrastructure, equipment and material. Throughout the operating life of the Project cemented paste backfill (tailings) will be permanently placed for long term storage underground. Backfilled material will be placed using available space until all designated waste has been removed from surface.

Shafts will be decommissioned sequentially following completion of backfilling in the lateral portions of the mine. The lower portion of the shaft, from the bottom of the shaft to bottom of the shaft liner, will be backfilled with remnant waste material and clean waste rock. A concrete plug will then be placed to seal the shaft below the bottom of the liner. The remainder of the shaft, from the concrete plug to shaft collar, will be filled with clean fill material removed from berms, roadways or other surface earthworks and remaining stockpiled overburden retained from shaft-sinking. Each shaft will then be sealed with a shallow reinforced concrete plug at surface. Mine dewatering and treatment will be maintained up to decommissioning of the first shaft, at which time the water treatment system will be decommissioned and placed within the bottom portion of the second shaft during backfilling. All other openings to surface will be filled with a low conductivity, impermeable material and sealed at surface during decommissioning.

The UGTMF will be progressively decommissioned during operation and active decommissioning will not be required during the decommissioning phase. Facility performance and environmental monitoring criteria established during operation will be utilized to confirm UGTMF end-state objectives are achieved and that processed waste is safe and stable prior to decommissioning access drifts and associated infrastructure.

2.10 Environmental, Health and Safety Management Systems

NexGen is committed to providing to the health and safety of its employees and the public and the protection of the environment through the implementation of the Project's health, safety, security and environmental management systems and programs. As such NexGen will strive to be a leading performer through a strong safety culture, environmental performance, environmental leadership and continual improvement.

The overall health, safety, security and environmental management system will meet requirements as defined under provincial and federal acts and regulations as they relate and apply to the Project.

The programs that are anticipated to form the Project health, safety, security and environmental management system are expected to include, but are not limited to:

- Radiation Protection Program;
- Environmental Protection Program;
- Waste Management Program;
- Occupational Health and Safety Program;
- Emergency Preparedness and Response Program;
- Security Program; and

- Fire Protection Program.

2.11 Alternative Methods Evaluation

In considering options for the Project, several alternative methods for key components were identified, including:

- mill process;
- tailings management;
- underground mining equipment fleet;
- power supply; and
- gypsum diversion/disposal.

As applicable, these options may be further evaluated during the EA process. Continued evaluation will consider the inclusion of feedback provided through engagement activities.

2.11.1 Mill Process

As part of the Preliminary Economic Assessment (NexGen 2017), NexGen considered an ammonia stripping circuit as the primary method for recovery of uranium in the milling process. During the pre-feasibility study (NexGen 2019), NexGen revaluated this base-case assumption to evaluate the potential for acid stripping as an alternative to ammonia stripping (see Table 2.11-1).

Ammonia stripping will require a crystallization circuit which will generate ammonium sulphate which can potentially be sold as fertilizer by-product and shipped off-site. Ammonia stripping results in ammonia being concentrated in the process water which presents a challenge to effectively manage in the effluent treatment process. Un-ionized ammonia is listed as a deleterious substance under the *Metal and Diamond Mining Effluent Regulations* and achieving the discharge limits for un-ionized ammonia in effluent was perceived to be potentially problematic. Anhydrous ammonia is also used as the source of ammonia and is a potentially toxic gas requiring special handling during transport and in the mill process. The use of ammonia in the stripping process was also identified as potentially problematic from a product purity perspective with increases in the presence of undesirable constituents such as molybdenum in the finished uranium product, requiring the addition of a specialized removal circuit.

The use of sulphuric acid in the stripping process requires neutralization using lime, generating a gypsum (calcium sulphate) by-product stream. The gypsum has the potential to be treated and managed as a by-product or diverted as a waste stream for appropriate disposal. From an effluent quality and performance perspective, stripping with sulphuric acid is not expected to effect effluent quality or to introduce potentially deleterious substances to effluent, providing a benefit in environmental performance. Additionally, lime is transported and handled in a solid form and is considered to present less of a risk to the health and safety of workers and the public. For these reasons, NexGen determined that sulphuric acid stripping would provide better environmental performance for the mill and reduced health and safety concerns for the operation.

Table 2.11-1: Mill Process Options Analysis

Option	Benefits	Drawbacks
Ammonia stripping	■ No bulk neutralization circuit which means there are no gypsum precipitates to handle ■ Less process waste requiring management ■ Less consumption of acid and lime ■ Less conceptual uranium recovery loss	■ Introduction of process-derived ammonia in the final treated effluent ■ Potential increase in impurities in finished uranium product, requiring a specialized removal circuit ■ Requirement for ammonia crystallization removal process and by-product marketing or disposal considerations ■ Ammonia has a high toxicity requiring added precautions for transport and handling.
Sulphuric acid stripping	■ No crystallization circuit which means there is no ammonium sulphate by-product generated. ■ Gypsum by-product is relatively inert and has potential to be cleaned of uranium and other impurities allowing for disposal as a clean waste material or potentially marketable as a by-product ■ Elimination of process derived ammonia in the WWTP. ■ On-site sulphuric acid production generates waste heat which can be used to generate steam for use in the milling process ■ Lime is transported and handled in a solid form and has a relatively low toxicity representing a benefit in reduced risk to workers and the public	■ Neutralization of acid using lime which generates a gypsum precipitates (calcium sulphate) ■ Slight potential decrease in uranium recovery ■ Additional quantities of sulphuric acid require appropriate handling and prevention measures for potential releases.

2.11.2 Tailings Management

Four tailings management options were considered for the Project (Clifton 2017) including disposal in

- the UGTMF;
- a purpose-built pit (in-pit);
- cellular surface pits; and
- a conventional above ground tailings management facility.

Specific locations were not considered, but general concepts were developed and evaluated using a qualitative ranking methodology, with the intent of narrowing down the alternatives to a smaller number for further consideration.

The in-pit tailings disposal option was considered, as this is practice is recognized as the established standard for uranium mill tailings. All the other options were evaluated in respect to being *Better*, *the Same* or *Worse* than the base case. All tailings management facility options were evaluated against criteria within the following categories:

- safety;
- environment;
- communities of interest;
- policy/regulations;
- closure technology;
- design; and
- cost.

In comparison to the base case, the UGTMF scored the highest in regards to closure technology, environmental performance, community interest, and overall safety of the facility's performance.

This section describes the other three options that were considered at the conceptual level. The second ranked option was the cellular facility, with the purpose-built pit ranked third. However, these rankings varied depending upon the weighting of the criteria. All three of these options were very similar in their overall rankings. The Conventional Above Ground Facility was eliminated from consideration based on scoring worse than the Base Case for each criteria.

All concepts assumed that backfilling of the mined-out stope would be completed using a cemented Paste Backfill, and that approximately 50% of the overall tailings produced would have to be disposed of in a separate tailings facility. In addition, all scenarios assumed that tailings would be deposited in the selected facility as a paste or thickened tailings, to achieve best performance of the tailings in operations and closure, for safety, security and environmental control. Based upon the available information at the time of the options assessment, storage would have to be provided for approximately 2.2 million tonnes of tailings, which would likely require a storage volume of approximately 1.5 to 1.8 million cubic metres.

In-Pit Tailings Disposal

In-Pit Tailings Disposal, similar to that currently used at the Rabbit Lake, Key Lake, and McClean Lake uranium mining facilities, would require the excavation of a single purpose-built open pit and construction of related infrastructure. This tailings option maintains a hydraulic gradient towards the pit to prevent migration of potential contaminants away from the facility, and to enhance consolidation of the deposited tailings. This facility involves the discharge of thickened or paste tailings sub-aqueously in order to reduce the potential freezing of the deposited tailings. Underdrainage of the tailings deposit, at the base and along the pit slopes, would promote consolidation of the tailings at the end of the operating period. Water drainage would be pumped to the mill for treatment. A cap of material would be placed over the consolidated tailings, to prevent intrusion and exposure, following closure of the facility. This disposal option is the current accepted practice for disposal of uranium tailings in northern Saskatchewan. The regulatory agencies and local communities are familiar with the concept, and the current operations.

This tailings option would require the construction of sufficient capacity for all expected tailings to be developed during the initial construction phase. The potential development of additional capacity in the future would require modification of the initial tailings facility or the construction of another purpose-built pit.

Cellular Surface Pits

This option involves the development of the tailings facility as a series of smaller purpose-built open pits. This initial facility would be developed through excavation of a pit with sufficient capacity for the initial two to three years of operation. During this initial operating period a second pit would be excavated in preparation to receive tailings on completion of filling the first pit. This process would continue over the operating life of the mine. Each pit would have a depth of half those proposed for the In-Pit Tailings option. The overall operation of the facility would operate on the same principles as In-Pit Disposal (described previously). This option allows the initial capital expenditure to be reduced, and for the capital for tailings disposal to be distributed over the operating life of the mine. Such an approach would likely have a larger environmental footprint in comparison with the single In-Pit Tailings Disposal option. It is expected that this option could allow for progressive reclamation of the tailings facility, allowing for monitoring of the performance of the closed facilities to be carried out during mine operations.

Above Ground Tailings Disposal

A conventional Above Ground Tailings Disposal facility would likely require the construction of a complete perimeter dyke around the entire facility. Due to the geology of the area, it is also expected that the facility would have to be fully lined to prevent the migration of contamination away from the facility. Although design details were not developed, it is expected that the containment dyke would be constructed of compacted earthfills and the liner for the facility could potentially utilize synthetic or bituminous geomembranes, however the longevity of such options cannot be demonstrated to meet the long-term (10,000 year) closure design period required for uranium tailings facilities.

2.11.3 Underground Mining Equipment Fleet

Given advancement in electric and autonomous industrial equipment technology, the adoption of an electric fleet versus conventional diesel mining equipment fleet, including remote and/or autonomous mining for high grade zones, was examined in the pre-feasibility phase. The analysis considered capital and operational expenditure estimations for fleet and associated infrastructure (e.g., battery bays and charging stations), and aspects of operability and maintainability (such as battery management).

While the principal benefit of adopting a battery electric fleet is a reduction in fossil fuel usage and a reduction in emissions underground, resulting in consequent reduction in ventilation requirements as well, these benefits are significantly diluted for the Project where ventilation requirements are driven principally by radon gas management, and electrical energy itself is derived from diesel power generation. Therefore, this initial study concluded that the electric fleet option was not feasible in a situation where the mine remains on diesel-generated power, and with no consequent savings to be expected in ventilation either. The electric fleet demonstrated to be a saving over diesel in the case of a move to grid or renewable power. Further consideration of this option will be evaluated as part of future power supply studies.

2.11.4 Power Supply

The region in which the Project is located is not serviced by a high voltage power grid and the nearest sub-stations with adequate capacity are far removed (approximately 200 km) from the Project. As a result, a stand-alone power system supplying a local power grid on the mine site is required. Given the widespread use and demonstrated capacity in mine operations, a diesel power generating station is currently planned for the Project (for the main camp as well as the mine site and operations), for both construction and operation phases. However, alternatives such as LNG and renewables, including wind and solar photovoltaic are actively being investigated.

The use of LNG generation for supplying part or all of the Project power demands has been identified as a potentially viable option requiring further evaluation given the limited demonstrated application in the mining industry. Benefits of LNG may include reductions in emissions of CO_2 and lower supply costs. For the purposes of the EA process, the adoption of LNG is still considered preliminary but may be further considered during the design process.

A high-level trade off to consider renewables, specifically wind and solar, to provide lower cost power during construction as well as provide a portion of baseload offset during operations was evaluated. The analysis also considered heat recovery from acid production and mill process, and from the diesel (or LNG) generators. These options would supplement, not replace, the use of fuel powered electrical generation on-site, as it would not be possible to supply power requirements from renewable sources alone, but would lower overall fuel demand through application.

This evaluation concluded that the renewable energy sources considered have the potential to reduce the requirements for fuel burning power generation and could provide cost savings over the life of the Project. This may have further benefits offsetting potential increases in fuel costs and decreases in direct greenhouse gas emissions. Further investigation will provide more detailed projections of the daily and annual load requirements, more detailed assessment of the available wind and solar potential at the site, and a better understanding of the technical requirements associated with constructing and operating a microgrid using a variety of power generating methods. The potential inclusion of these power sources in the Project design is to be considered during subsequent design phases.

2.11.5 Gypsum Disposal

Gypsum from the mill is currently envisioned to be stored in the UGTMF as paste backfill. However, laboratory test work has indicated potential for the generation of a relatively pure gypsum by-product through the application of an additional purification step in the gypsum precipitation process. This presents an opportunity to potentially market gypsum as a by-product or to pursue alternate disposal options given the inert characteristics of gypsum. While additional testing is pending, test results to-date indicate that gypsum can meet clean waste rock criteria, therefore, gypsum storage has been considered for incorporation with clean waste rock in the footprint presented in Figure 2.3-1. The results of further testing will provide the necessary detail to confirm the viability of this approach.

2.12 Ancillary Projects

At the time of submission of the Project Description, NexGen has not planned any ancillary projects., However, NexGen will continue to evaluate opportunities to optimize the design and performance of the Project and may consider the application of ancillary projects where reasonable while continuing to consider the health and safety of workers and the public and environmental performance through all stages of development.

3.0 EXISTING ENVIRONMENT

This section provides an overview of on-going or completed baseline monitoring programs and studies of the biophysical and socio-economic components of the environment in relation to the proposed Project. Much of the information in this overview was obtained from preliminary field surveys and existing literature regarding the local and regional area surrounding the Project location. As part of the EA, additional baseline programs will be completed in support of a detailed analysis and comprehensive baseline reports will be compiled describing the detailed sampling methodology, field survey results and analysis of data. The baseline programs have and will continue to be developed in concordance with available regulatory documents (i.e., REGDOC 2.9.1) and best practices.

The objectives of the initial baseline programs were to:

- characterize the existing environment in the area of the Project, to the extent possible;

- inform pre-feasibility engineering design work;
- determine the needs for additional environmental characterization; and
- establish a basis for long term monitoring programs to be continued throughout the life-cycle of the Project.

3.1 Regional Environmental Studies

The Project is located approximately 80 km south of Cluff Lake, a former uranium mine and mill owned and managed by Orano Canada Inc. (formerly AREVA Resources Canada Inc.). Cluff Lake began operations in 1981 and operated for more than 20 years prior to ceasing operations, in 2002. Following operations, Cluff Lake entered into decommissioning which occurred largely between 2004 and 2006. Since completion of major decommissioning activities, Cluff Lake has been subject to a comprehensive environmental monitoring program to assess conditions relative to established decommissioning criteria, as well Cluff Lake is also monitored as part of CNSC's Independent Environmental Monitoring Program (IEMP). The IEMP results for 2017 confirm that the public and the environment in the vicinity of the Cluff Lake site are protected and that there are no expected health or environmental effects following decommissioning.

3.2 Atmospheric Environment

3.2.1 Climate

The Project is located within the southwest portion of the Athabasca basin which has a sub-arctic climate typical of mid-latitude continental areas (Government of Canada 2018). Temperatures range from greater than 30 degrees Celsius (°C) in the summer to colder than –40°C during the winter. Winters are characterized as long and cold, with mean monthly temperatures below freezing from October to April. Annual precipitation is approximately 0.45 m with approximately 70% of this occurring as rain during the warmer months and the remainder as snow during the winter. Lake freeze-up typically starts in October and break-up occurs in May.

3.2.2 Air Quality

An air quality program was initiated in 2018 to measure air quality characteristics in the vicinity of the Project. Data collected during this program will be used to establish a baseline against which potential Project-related air quality effects can be assessed.

Meteorological monitoring has been ongoing since November 2015. The remainder of the baseline air quality program was deployed in September 2018 and will continue to acquire data throughout 2019. The program was designed, at a minimum, to meet the needs of the Saskatchewan Air Quality Modelling Guideline (AQMG, SMOE 2012). Data is being collected at a local scale within the immediate vicinity of the Project as well as on a regional scale to allow for the analysis of longer-term meteorology data sets and to account for more distant sources that may affect air quality at the Project location.

The air quality program consists of the following components:

- meteorological monitoring, including rainfall monitoring;
- particulate monitoring;
- dustfall monitoring;
- passives monitoring; and
- radon monitoring.

Meteorological monitoring consists of continuous sampling for standard meteorological variables such as temperature, precipitation (rain and snowfall), wind speed and direction, relative humidity and barometric pressure. In addition, rainfall will be collected for analysis of dissolved ions and metals to assess any regional influences.

Particulate monitoring consists of continuous sampling for total suspended particulate (TSP) and fine particulate matter of mean aerodynamic diameter less than 2.5 microns ($PM_{2.5}$). A gravimetric sample is also being collected. Dustfall monitoring consists of sampling for total and fixed dustfall, and deposited metals. Passives monitoring consists of sampling for ambient nitrogen dioxide (NO_2) and sulphur dioxide (SO_2). Radon monitoring consists of sampling for ambient radon.

3.2.3 Noise

A noise field program was completed for the Project in September 2018. Data collected during the noise field program will be used to establish a baseline, against which potential Project-related noise effects can be assessed.

The noise field program was conducted in accordance with methods set out in *Alberta Energy Regulator (AER) Directive 038: Noise Control* (AER 2007) and *Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment – Noise* (Health Canada 2017). The results will be evaluated in accordance with these documents. The monitoring stations were established to characterize noise levels experienced by human and terrestrial receptors near the Project.

Sound level meters were deployed at three stations and were used to log:

- total energy equivalent sound levels over one-minute averaging periods (Leq,1min) in A-weighted decibels (dBA);
- one-third octave-band Leq,1min data in unweighted decibels (dBZ); and
- audio data in wav-format digital files.

Pocket weather stations were deployed at each station and were used to log wind speed, wind direction, and air temperature.

3.2.4 Light

A light field program was carried out for the Project in September 2018 to characterize ambient light trespass and sky glow levels in the natural environment. Data collected during the light field program will be used to establish a baseline against which potential Project-related light trespass and sky glow effects can be assessed.

The field program was carried out in accordance with guidance from the Illuminating Engineering Society of North America (IESNA) and the Commission Internationale de l'Eclairage (CIE). Light measurements were collected during the nighttime period during a period when the sky was almost completely clear of cloud cover and the moon was absent. The data will be evaluated in accordance with these guidance documents.

3.3 Geological and Hydrogeological Environment

3.3.1 Geology

3.3.1.1 Regional Geology

The Athabasca Basin is a Palaeoproterozoic, intracontinental, sedimentary basin covering a large portion of northwestern Saskatchewan and a smaller portion of northeastern Alberta. This basin is comprised of the Athabasca group and is composed primarily of sandstones with local conglomeratic beds. The basin is oval-shaped with approximate dimensions of

450 km by 200 km (Figure 3.3-1) and has a thickness of approximately 1,500 m approaching its centre (Jefferson et al. 2007). The Athabasca Basin and the underlying rocks are host to the highest-grade uranium deposits in the world.

The Athabasca Group sediments lie unconformably atop Archean to Palaeoproterozoic, crystalline basement rocks of the Hearne and Rae provinces, with a portion of the basin to the southwest underlain by the Talston Magmatic Zone (TMZ). Granitoids interleaved with supracrustal metasediments characterize both the Rae and Hearne Provinces and are separated by the Snowbird Tectonic Zone with the Hearne Province to the east and the Rae Province to the west (Card et al. 2007). The TMZ is a basement complex intruded by continental magmatic arc granitoids and peraluminous granitoid rocks (Grover et al. 1997).

3.3.1.2 Local Geology

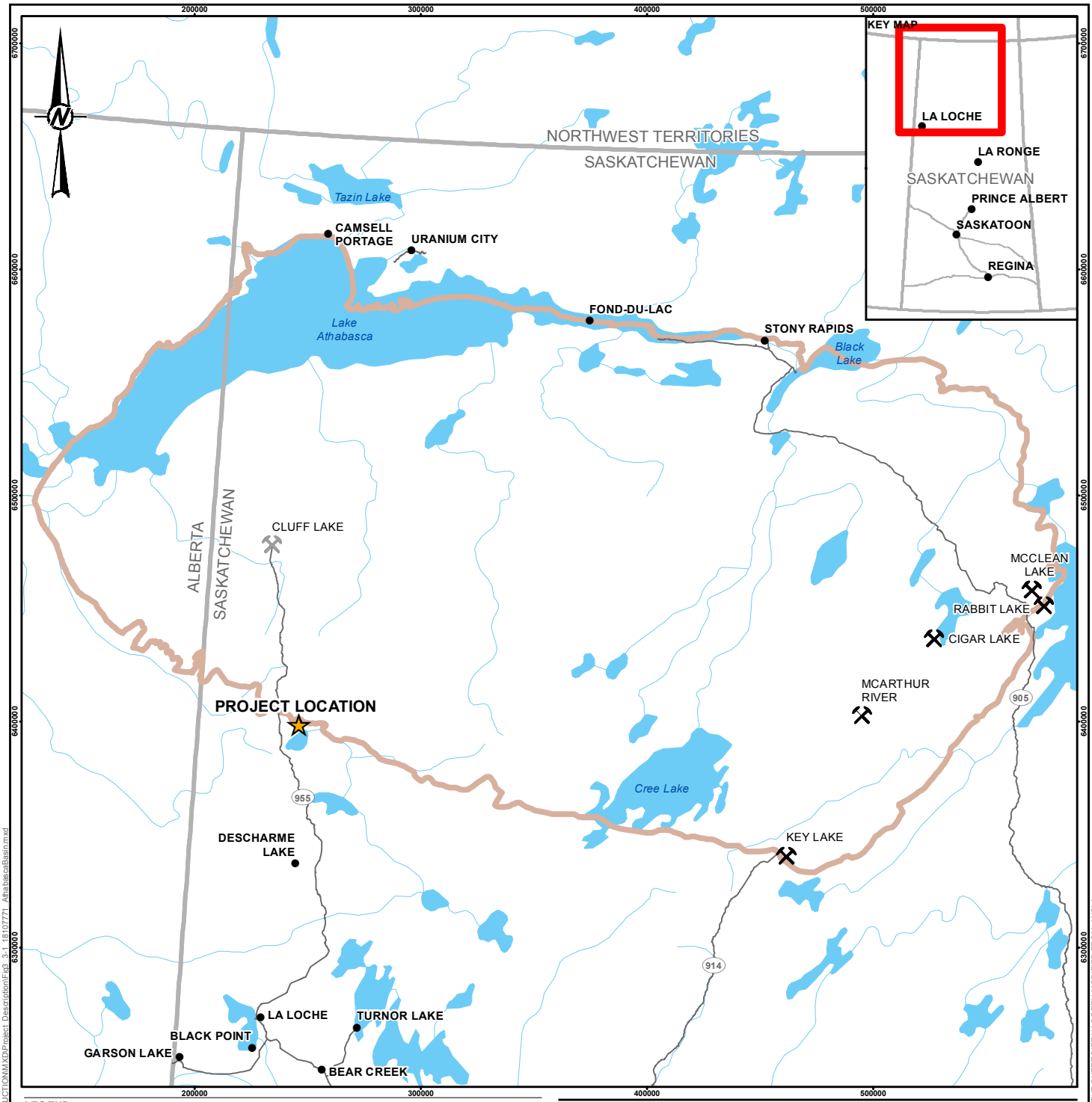
The Project site is covered by 30 to 100 m-thick glaciofluvial till over Cretaceous mudstone. The glaciofluvial till is comprised primarily of sand with gravels, cobbles, and boulders. The glacial deposits have formed topographic features in the property area such as drumlins, outwashes, hummocky terrain, and kettle lakes.

Flat lying Cretaceous mudstones, siltstones, and sandstones form the top of the bedrock sequence and commonly contain thin coal seams. Aside from a frequently intersected, thin, impermeable, and competent layer, the Cretaceous rocks are generally weak and are most often geotechnically treated as soil.

Below the Cretaceous rocks and overlying the rocks of the Athabasca Group, Devonian sandstones are often present. Situated along the southwestern margin of the Athabasca basin, the rocks of the Athabasca Group are not always intersected; however, where they exist, the Athabasca Group sandstones unconformably overly the basement rocks and have a maximum thickness of approximately 70 m.

The TMZ orthogneisses is the main lithological package intersected by drilling. Basement rocks surrounding the Arrow Deposit are competent and comprise north-northeast trending and steeply dipping quartz-rich gneisses that host mineralization and include thin, mafic, mylonitic, sub-vertical shear zones.

Geotechnical and hydrogeological characterization of the rock mass to the northwest of the Arrow Deposit has been conducted to understand wall-rock conditions for underground development, including proposed underground tailings management. Preliminary results indicate that the competent footwall rock mass is relatively unaltered with generally low hydraulic conductivities. Local, relatively thin, sub vertical brittle structures are present in the footwall and are oriented parallel to the deposit, no significant cross-cutting structural features have been observed. Discrete, discontinuous trace to low-grade mineralization is locally observed in the rock mass surrounding the Arrow Deposit in factures and gouges.



LEGEND

- POPULATED PLACE
- URANIUM MINING FACILITY (ACTIVE)
- URANIUM MINING FACILITY (DECOMMISSIONED)
- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- PROJECT LOCATION
- ATHABASCA BASIN BOUNDARY

0 50 100

1:2,500,000 KILOMETRES

REFERENCE(S)

1. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED, GEOLOGICAL ATLAS OF SASKATCHEWAN VIEWER © 2018, GOVERNMENT OF SASKATCHEWAN, ALBERTA GEOLOGICAL SURVEY. OR IHS MARKIT CANADA LIMITED.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

ATHABASCA BASIN

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**3.3-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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PATH: G:\Clients\NexGen\Rook1\Project SASK\99 PROJECTS\18107771 Rook1 EA\Rook1 EA\02 PRODUCTION\MXD\Project Description\Fig6_3_1_18107771 AthabascaBasin.mxd

3.3.1.3 Arrow Deposit

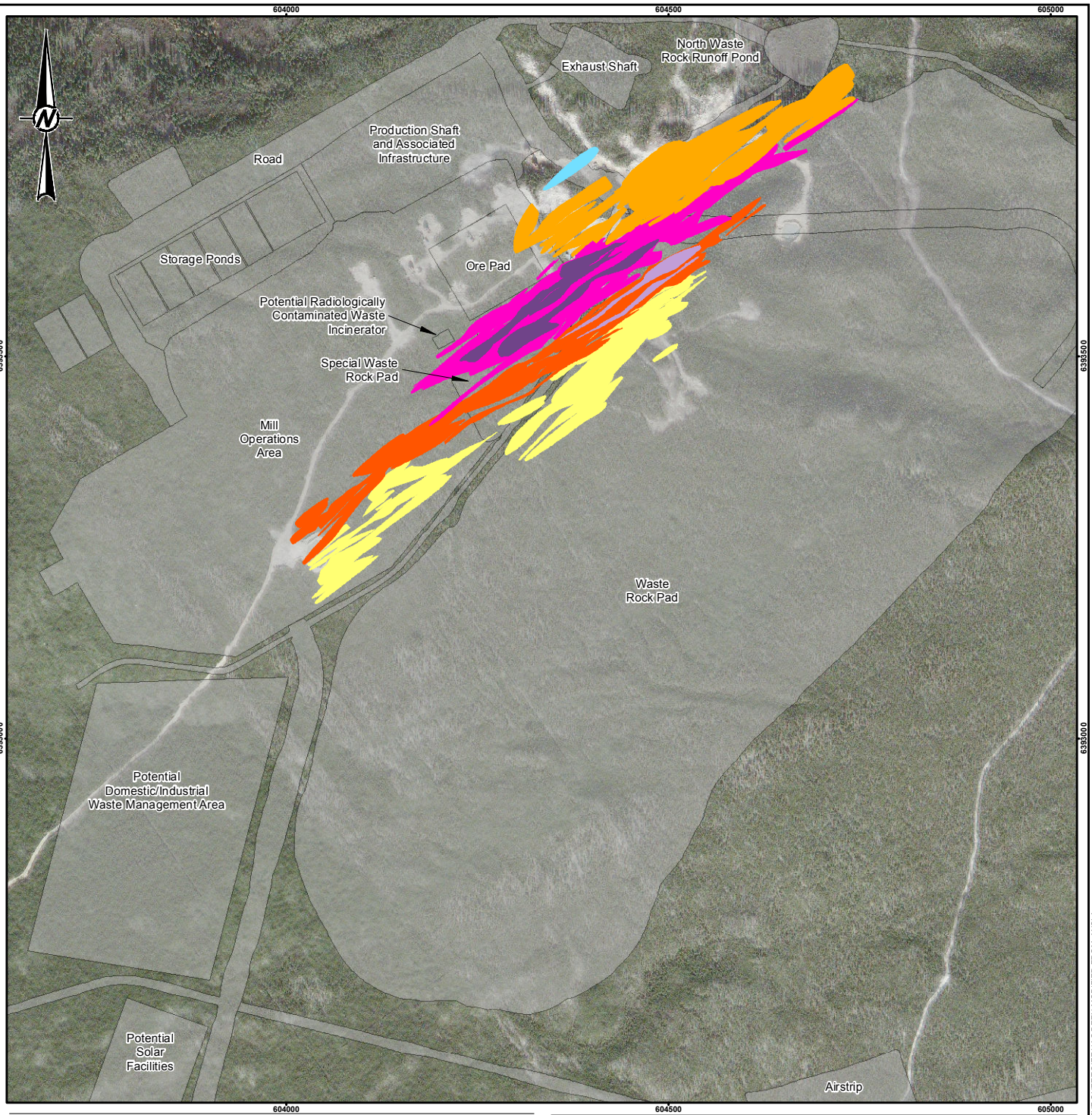
The Project is host to the Arrow Deposit, which is the resource basis for future mine development at the site. The Arrow Deposit is hosted within the crystalline basement rocks, interpreted as gneisses of the TMZ now dominated by quartz as well as garnet porphyroblast pseudomorphs. The pseudomorphs are now almost exclusively chlorite, hematite, illite, or sudoite. Other minor mineral phases present include plagioclase, potassium feldspar, biotite, muscovite, and amphibole, in varying concentrations. The geology of the immediate area of the Arrow Deposit is also marked by the presence of a large sill-like intrusive body containing granitic to gabbroic gneisses that are locally cross-cut by minor veins of uranium mineralization.

Uranium mineralization at the Arrow Deposit is closely associated with narrow, strongly graphitic, discrete shear zones (Figure 3.3-2). High grade uranium zones often occur immediately adjacent to strongly sheared graphitic zones, but never within them. The main foliation in the vicinity of the Arrow Deposit is northeast-trending and dips sub-vertically to vertically. Currently, mineralization occurs within five discrete, parallel shear panels referred to as the A1 though A5 shears. Each shear panel is approximately 50 m wide and contains a number of narrow graphitic shear zones that are oriented sub-parallel to foliation striking and dipping vertically to sub-vertically. These graphitic shear zones have undergone brittle reactivation and are host to the uranium mineralized lenses and pods which are also oriented parallel and sub-parallel to the regional foliation. Slickenstriae observed on fault surfaces within the graphitic shear zones close to high grade uranium mineralization show two general orientations, an older dip-slip orientation and a younger overprinting strike-slip to oblique-slip orientation. Mineralization closely follows the plunge of these slickenstriae, supporting the strong structural control of the deposit.

3.3.1.4 Surficial Soils

The Project is located along the southwestern rim of the Athabasca Basin, a large Paleoproterozoic-aged, flat-lying, intracontinental, fluvial, redbed sedimentary basin that covers much of northern Saskatchewan and part of northern Alberta (RPA 2017). The topography of the Project site is dominated by distinct glacial features of positive relief with dominant features including eskers and drumlins (largely drumlinoid structures) locally modified by the strong winds that followed the retreating glaciers. Drumlins, lakes, wetlands, rivers and muskegs are common in the area of the Project. Elevations in the region range from 583 masl at the crest of major drumlins to 480 masl (surface elevation) for some of the lowland lakes. The surface elevation of Patterson Lake is approximately 499 masl. The proposed Project location is dominated by sandstone; bedrock outcroppings are rare but are known to exist in areas to the eastern half of the exploration lease.

In 2018, terrain and soils studies were initiated to describe the existing terrain and soils conditions and establish the baseline conditions prior to the development of the Project. Soil quality has an effect on capability to support vegetation and effective ecosystems. The terrain and soils baseline program was designed to obtain information on existing terrain, soil quality and distribution within the immediate area of the Project, as well as within the area of potential influence from the Project activities. This information will be used to support the assessment of potential direct and indirect effects of the Project on terrain and soils.



LEGEND

- PROPOSED FOOTPRINT

MINERALIZATION SHEAR LENSES

- A0
- A1
- A2
- A2 HIGH GRADE
- A3
- A3 HIGH GRADE
- A4

0 150 300

1:7,500 METRES

REFERENCE(S)

1. SHEAR LENS DATA OBTAINED FROM RPA AND NEXGEN ENERGY LTD, 2018.
2. IMAGERY OBTAINED FROM NEXGEN ENERGY LTD., DATED 2015.
PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

MINERALIZATION SHEAR ZONES

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**3.3-2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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3.3.2 Hydrogeology

3.3.2.1 Local and Regional Conditions

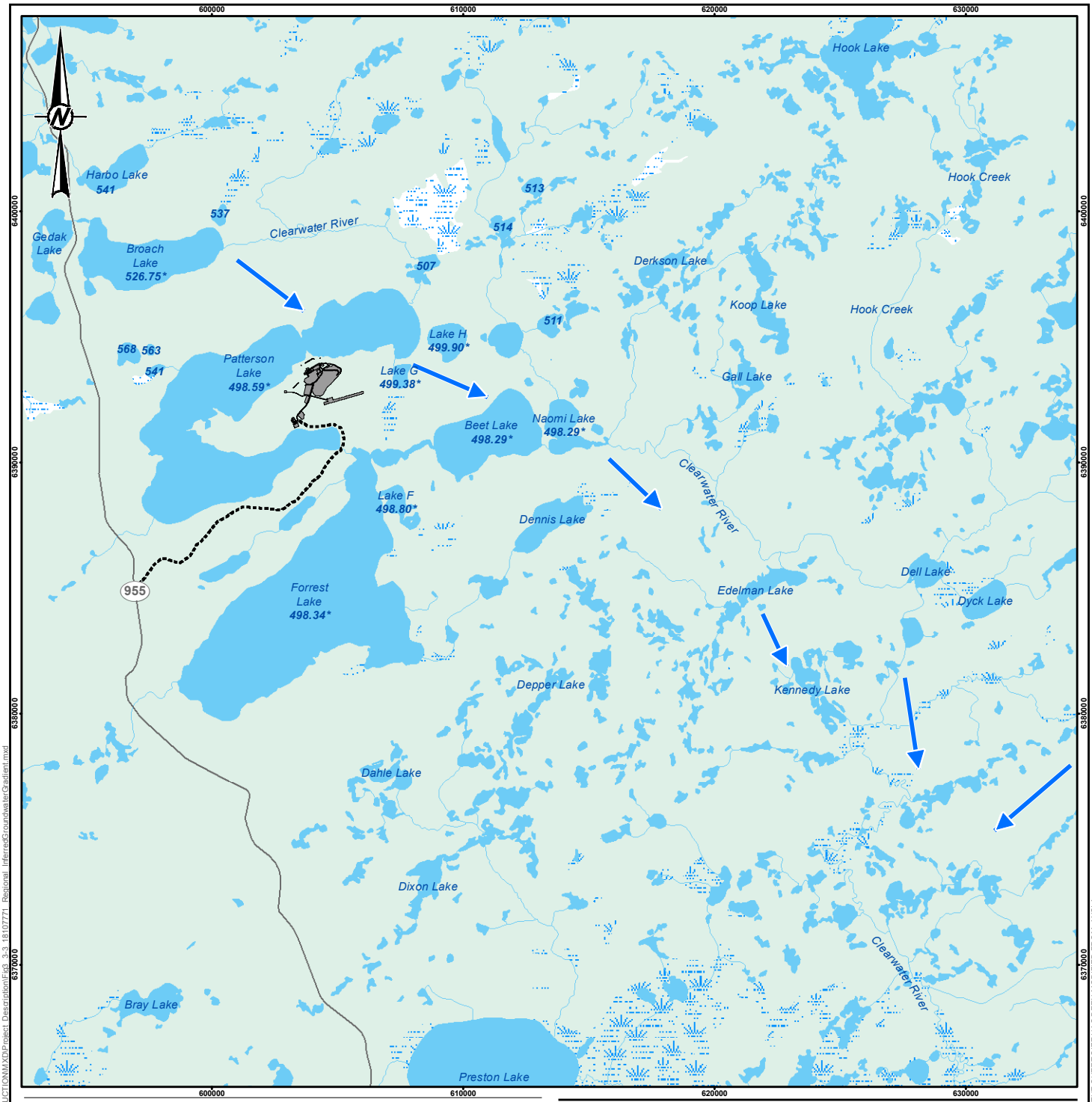
Groundwater conditions at the Project are controlled by the low regional topography, as is observed at other underground mines in the Athabasca Basin. Regional flow gradients and direction in low-lying areas such as northern Saskatchewan generally mimic lake elevations for gradient and flow direction, and so provide the large-scale basis for boundary conditions for the site-scale flow system. Lake elevation data taken from site surveys and regional topographic information indicate a southeastern flow gradient towards the Clearwater River, as shown on Figure 3.3-3.

Shallow groundwater flow is generally affected by local-scale topography which is representative of conditions at the Project. Shallow groundwater flow movement is from the topographic high located south of the proposed mine and mill development in a northerly direction towards Patterson Lake to the north (Figure 3.3-4), opposite to the deeper flow system. An additional ten nested (i.e., two wells per drillhole) monitoring wells were installed in November 2018 to provide long-term monitoring locations related to surface infrastructure and design (e.g., clean waste rock pile, mill and associated features).

Hydrogeological conditions at the Project site can be split into a shallow till based system with direct interaction with surface water, and a deeper groundwater system in the basement granitic and metasedimentary gneisses. Interaction between the two systems will be characterized and monitored using hydrogeochemistry and piezometric pressure data to determine groundwater flow direction and potential for vertical groundwater movement in the current pre-mining conditions and later in the operational and closure conditions.

The baseline groundwater monitoring program is designed to provide data from the shallow till based flow system in relation to surface infrastructure and key features, and select locations within the deeper flow system in the basement rocks relative to the mine and the proposed UGTMF. Interaction between the two systems, and with surface water, will be assessed on an ongoing basis to determine potential for constituent transport from the Project site throughout the operating, decommissioning and post-closure period of the Project.

A deep, multilevel monitoring well produced by Westbay Instruments was installed in September 2018. The monitoring well has 10 discrete sampling and pressure monitoring ports at select depths to monitor specific geological zones in relation to the proposed underground mine design. Repeat water sampling, hydraulic testing, and piezometric pressure monitoring from this installation will allow for assessment of any changes in hydrogeochemistry and hydraulic conditions over the life of the project. Additional deep wells will be integrated based on results from established wells and the locations of infrastructure as determined through the ongoing feasibility design. Well installations will consider long-term monitoring needs and will be incorporated into the groundwater monitoring program.



LEGEND

- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- WETLAND
- WOODED AREA

PROJECT FEATURES

- EXISTING ACCESS ROAD
- PROPOSED FOOTPRINT

507 LAKE SURFACE ELEVATION (mASL)

INFERRED GROUNDWATER FLOW DIRECTION

0 5,000 10,000

1:225,000 METRES

REFERENCE(S)

1. *LAKE SURFACE ELEVATIONS INDICATED WITH AN ASTERISK WERE OBSERVED BY GOLDER ASSOCIATES LTD., AUGUST 2018.
2. REMAINING WATER SURFACE ELEVATIONS AND FLOW DIRECTIONS OBTAINED FROM SRK CONSULTANTS, 2018.
3. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED OR IHS MARKIT CANADA LIMITED.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

LAKE SURFACE ELEVATIONS AND INFERRED GROUNDWATER GRADIENT IN THE BASEMENT ROCK

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**3.3-3**

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LEGEND

- POTENTIAL INTAKE/DISCHARGE LOCATION
- PROPOSED FOOTPRINT
- SHALLOW GROUNDWATER FLOW DIRECTION

0 200 400

1:10,000 METRES

REFERENCE(S)

1. MONITORING WELL DATA OBTAINED FROM SRK CONSULTANTS, 2018.
2. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED OR IHS MARKIT CANADA LIMITED.
3. IMAGERY OBTAINED FROM NEXGEN ENERGY LTD., DATED 2015.

PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

LOCAL GROUNDWATER FLOW DIRECTION

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	**3.3-4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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In addition to water levels and physical parameters, all wells will be initially sampled on a quarterly basis for the collection of baseline water chemistry data for constituents within the following broad categories,

- dissolved metals;
- general chemistry and nutrients; and
- radionuclides and stable isotopes.

The parameters selected for inclusion in the baseline groundwater monitoring program represent those commonly associated with uranium mining and milling operations in the Athabasca basin while considering available geochemistry data specific to the deposit and surrounding geology.

3.3.2.1.1 Shallow Groundwater System

The shallow groundwater system at the Project is defined as flow taking place in the unconsolidated glaciofluvial tills. Underlying the till layer is a weathered mudstone (MST) and sandstone (SST) interfaces overlying the regional unconformity, and then intrusive lithology (basement rock).

Glacial morphology has deposited two distinct units; a basal till and a glacial fluvial till. The basal till, deposited below the advancing ice sheet, is typified by heterogeneous grain size distribution, but highly consolidated. Because of this, the basal till will be significantly lower hydraulic conductivity than the less compacted glaciofluvial deposit. Shallow groundwater flow is shown to be concentrated on the basal till, proving a defined monitoring target for assessing infiltration and groundwater movement under and away from the surface infrastructure.

3.3.2.1.2 Deep Groundwater System

Hydraulic testing (i.e., packer based) was carried out in select exploration holes within the basement rock during the 2017 and 2018 drill programs. Results of 88 hydraulic tests to date in the bedrock in the vicinity of the Arrow deposit indicate a low hydraulic conductivity (4×10^{-9} m/s: geomean), with only 15 tests greater than 1×10^{-7} m/s and 2 above 1×10^{-6} m/s. These higher values are observed in discrete structural features with brecciated quartz infilling and form the dominant flow features observed to date.

A baseline hydrogeological study was initiated in 2017 and expanded in 2018 to help characterize hydrogeology in relation to the site and to provide input to the shallow and deep monitoring system design. Local and regional data were used initially to characterize the regional flow system and local-scale controls on groundwater flow. This conceptualization of groundwater flow will be updated as additional data are collected during the mine feasibility and EA process.

3.4 Geochemistry

In 2018, NexGen completed a preliminary screening level assessment to geochemically characterize non-mineralized waste rock material utilizing samples collected from boreholes within the hanging wall, shaft location and UGTMF area. Clean waste rock generated from these locations will be stored on surface as part of construction and operation activities.

Eleven rock samples were analyzed for a variety of static geochemical characterization tests, including: acid-base accounting (ABA), solid phase elemental analysis and short-term leaching tests by shake flask extraction. Results from ABA tests indicated limited acid generation potential with eight of the 11 samples classified as non-potential acid generating (NPAG) and three samples classified as potentially acid generating (PAG) material.

Results from solid-phase elemental analyses identified bismuth and selenium as constituents of potential concern but did not provide any indication of their leaching potential. Shake flask extraction (SFE) testing identified aluminum, cadmium

and arsenic as constituents elevated in the leach testing. The results from the 2018 screening level assessment are considered preliminary and additional testing will be completed during the mine feasibility and EA process to further characterize the waste rock for design, planning and source term characterization.

3.5 Surface Water and Aquatic Environment

3.5.1 Hydrology

The Project is situated within the Patterson Lake watershed which is part of the larger Clearwater River watershed. The Project is bordered by Patterson Lake and Forrest Lake (Figure 3.5-1), which are part of the headwaters of the Clearwater River watershed and are the largest waterbodies within a 100 km radius of the Project. The Clearwater River flows south and is part of the MacKenzie River watershed. It is also designated as a Canadian Heritage River.

Baseline hydrological field investigations were initiated in August 2018 and September/October 2018 throughout the upper and lower reaches of the watershed. In addition, a cursory snow survey was completed in April 2018.

Prior to conducting the field program, a preliminary desktop assessment, including watershed delineation and predicted outflow volumes, was completed. The results of this assessment aided in the design of the field program and predictions were subsequently validated in the field. The 2018 baseline field program included hydrometric monitoring of watercourses and waterbodies within the immediate proximity of the Project area, upstream of the Project area, as well as in the downstream areas as far as Warner Rapids. The programs included geodetic surveys of hydrometric station benchmarks, a geodetic stream channel survey, a dye tracer mixing study and bathymetric data collection. In addition to hydrometric monitoring activities, observations of total suspended solids (TSS), bedload, and stream bed substrate grain size analysis were collected to inform characteristics of sediment transport. The results of the field program are being analyzed and compiled.

3.5.2 Surface Water and Sediment Quality

A water quality monitoring program was initiated for the Project in the spring of 2018 with the objective of obtaining seasonal data from waterbodies adjacent to and downstream of the Project. Water quality data were collected in the spring, summer and fall of 2018. During each sampling period, limnological characteristics (i.e., temperature, dissolved oxygen, specific conductivity, and pH) and water transparency were measured *in situ*. Water samples were collected for chemical analyses of physical properties, nutrients, major ions, metals and radionuclides. The results of the field program are being analyzed and compiled.

In general, waterbodies near the Project can be characterized as typical oligotrophic lakes that are common throughout northern Saskatchewan. Surface dissolved oxygen levels are above the lower limit of the Saskatchewan Environmental Quality Guidelines (SEQG) (Government of Saskatchewan 2018) with relatively consistent specific conductance levels ranging between approximately 20 microsiemens per centimeter (µS/cm) and 50 µS/cm. Surface pH levels are near neutral in most lakes and are within the SEQG range of 6.5 to 9.0. Water chemistry results from 2018 indicate that, with the exception of iron, levels of metals and radionuclides are low.

Sediment characterization studies were carried out in September 2018. Within the areas of investigation, five replicate stations were established from which composite sediment samples were collected. The 0 to 2 cm, 2 to 4 cm, and 4 to 6 cm sediment horizons were retained for chemical analysis and sediment characterization. The results from the 0 to 2 cm horizon are pending while the other horizons were archived for potential future analysis.

LEGEND

SECONDARY HIGHWAY

PROJECT FEATURES

EXISTING ACCESS ROAD

PROPOSED FOOTPRINT

FLOW DIRECTION

LOCAL WATERSHED - CLEARWATER RIVER AT NAOMI LAKE

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1:175,000 METRES

REFERENCE(S)

1. IMAGERY COPYRIGHT © 20130524 ESRI AND ITS LICENSORS. SOURCE: VIVID-CANADA, DIGITALGLOBE. USED UNDER LICENSE, ALL RIGHTS RESERVED.
2. ROADS OBTAINED FROM NATIONAL ROAD NETWORK.
PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

LOCAL HYDROLOGY

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

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In most cases, the sediment sampling stations were co-located with the benthic invertebrate sampling sites; thus, they were situated at depths sufficient to capture adequate densities of benthic invertebrates. However, due to general morphology in some of the targeted sediment sampling locations, specifically high densities of sand, sediment stations in two areas of Patterson Lake and one area of Forrest Lake were re-located to provide better representation of depositional zones in these areas and were necessarily decoupled from the shallower benthic invertebrate sampling locations. The results of the field program are being analyzed and compiled.

3.5.3 Plankton

To characterize phytoplankton and zooplankton communities near the Project, samples were collected from the photic zone from water quality stations in Patterson Lake, Forrest Lake, Beet Lake, Naomi Lake, and the reference lakes (Broach Lake and Hodge Lake) in September 2018. Samples have been submitted for taxonomic identification and enumeration and biomass estimations. The results of the field program are being analyzed and compiled.

3.5.4 Benthic Invertebrates

A benthic invertebrate sampling program was completed in 2018 to collect baseline data on benthic invertebrate community structure, density, richness, and diversity relative to the Project. Benthic invertebrate samples were collected at the same locations as the sediment samples, with the exception of two locations on Patterson Lake and one location on Forrest Lake where benthic invertebrate sampling stations was maintained in shallower locations to match benthic invertebrate sampling station depths between waterbodies and to obtain an adequate abundance of organisms collected within the littoral zone of each waterbody. Composite benthic invertebrate samples were collected for taxonomic identification, enumeration and biomass estimations. The results of the field program are being analyzed and compiled.

3.5.5 Fish and Fish Habitat

Fish investigations were conducted in lakes immediately adjacent and in close proximity to the Project during 2018 to meet the following objectives:

- document fish community composition;
- locate areas that are utilized for fish spawning;
- map aquatic habitat types and document areas of critical habitat; and
- collect baseline fish chemistry data.

All fish and eggs were collected under the authority of a Special Collection Permit issued by the SMOE. Fish community and aquatic habitat surveys were conducted in select lakes located near to and downstream of the Project. Spawning surveys were conducted in the spring and fall. Where possible, five northern pike and five lake whitefish were collected for flesh and bone chemical analyses. The results of the field program are being analyzed and compiled.

Through community surveys, the fish species documented in Patterson Lake include:

- Small bodied fish: lake chub (*Couesius plumbeus*), ninespine stickleback (*Pungitius pungitius*), slimy sculpin (*Cottus cognatus*), and trout perch (*Percopsis omiscomaycus*); and
- Large bodied fish: burbot (*Lota lota*), lake whitefish (*Coregonus clupeaformis*), longnose sucker (*Catostomus catostomus*), northern pike (*Esox lucius*), white sucker (*Catostomus* commersonii), and yellow perch (*Perca flavescens)*.

In addition, lake trout and walleye eggs found in Patterson Lake indicate the presence of these species.

The littoral zone of Patterson Lake near the Project location is characterized as having a mixture of gravel, cobble, and boulder substrates interspersed with areas comprised almost entirely of sand. There is limited aquatic macrophyte growth and where present, is primarily submergent species. One rare aquatic plant species (water lobelia; S2) is known to occur in the area and three rare sedge species (*Carex concinna*, *C. heleonastes* and *C. trisperma*), all ranked S3 (SKCDC 2018), are known to occur in the vicinity of the Project.

3.6 Terrestrial Environment

3.6.1 Vegetation

The Project is located within the Boreal Plain Ecozone of the Mid-Boreal Uplands Ecoregion. The area surrounding the Project consists of stands of jack pine (*Pinus banksiana*) and some black spruce (*Picea mariana*), with shrubs and lichen as ground cover. White spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*), and balsam fir (*Abies balsamea*) are also present, while white birch (*Betula papyrifera*) occur to the north and southeast respectively. Poorly drained depressions within the Churchill River Upland to the southeast are noted as having stunted growth of black spruce, and the ground cover is predominantly sphagnum moss.

Two terrestrial vegetation inventory surveys were conducted near the Project site in June and August 2018. A Species Detection Research Permit was obtained from the SMOE and the methodology conformed to SMOE guidelines (SMOE 2017). The surveys focused on documenting community composition, distribution, and abundance by identifying all plant species present, including the presence of rare/sensitive species and weed species listed under *The Weed Control Act*. Survey locations were determined prior to field work based on available ecosite information.

Twenty-eight provincially sensitive vegetation species have been observed near the Project (SKCDC 2018). Additional baseline surveys will be completed to gain further site specific information regarding the presence of rare plants near the Project.

The objective of the August 2018 vegetation chemistry baseline sampling program was to determine a baseline level for metals and radionuclides in lichen and berry-producing plants (i.e., blueberries) and to determine the distribution, abundance, and health of forage vegetation species. Vegetation species targeted for chemical analysis included blueberry (*Vaccinium* spp.) and lichen species. Blueberry fruit, leaves, and stems were collected and analyzed individually for metals and radionuclides. Sample locations were determined based on suitable habitat for target species and predominant wind directions (from the South-South East and West). Results of the surveys are being analyzed and compiled.

A characteristic feature of the area is the prevalence of forest fire activity and the related influence of this frequent fire regime on the vegetative communities. Forest fire activity in the vicinity of the Project has been relatively recent, within the past year and up to over 73 years ago. The majority of the forest near the Project site, as well as beyond into a regional context, is characterized by forest aged less than 40 years of age. An ecosite map for the area is being developed to include the recent survey results, as well as current anthropogenic and natural (forest fire) disturbance.

3.6.1.1 Wetland Classification

Wetland ecosite classifications were completed in June 2018 near the Project site, as well as outside of the immediate Project area. Prior to conducting the field program, a preliminary desktop assessment was completed and, in part, the field program was designed to confirm the desktop assessment. The results of the field program are being analyzed and compiled.

There are four wetlands within the immediate vicinity of the Project, plus one in the area of the proposed permanent camp location. These wetlands consist of ten bogs, three fens, and two swamps. Bog classes include three black spruce treed bogs and seven Labrador tea bogs. The two bog classes are both largely dominated by ericaceous shrubs but differ in the proportion of Sphagnum to feather mosses, tree cover, and composition. The fen classes include one tamarack treed fen, one willow shrubby rich fen and one graminoid fen. These fen classes differ in species composition and tree and shrub cover but share similar moisture regimes. Both of the swamps are black spruce/balsam poplar/river alder swamps. These swamps can be dominated by black spruce (*Picea mariana*) or balsam poplar (*Populus balsamifera*) and may contain scattered patches of white birch (*Betula papyrifera*), with river alder (*Alnus tenuifolia*) abundant in the understory. Sphagnum mosses are dominant in this wetland class, but feather mosses are also common (National Wetlands Working Group 1997, Smith et al. 2007, McLaughlan et al. 2010).

3.6.2 Wildlife and Wildlife Habitat

Study areas for the 2018 baseline wildlife studies were specific to the survey type and were established with consideration of the preliminary site plans, provincial requirements, and study area sizes for other baseline wildlife investigations completed for other uranium mining developments in northern Saskatchewan. The studies were conducted in areas preliminarily identified as site, local and regional study areas, with further delineation to be defined during the EA process.

Wildlife data were gathered through a variety of methods, including broadly the deployment of automated recording units (ARUs) and species detection surveys. Field survey methodologies met standards published by the SMOE (2014a, b, c; 2015) for species detection survey protocols. Species Detection Research Permits were obtained from the SMOE for each of the surveys completed.

Numerous wildlife surveys have been completed, with some of the work continuing through the winter of 2018/2019 (see Table 3.6-1). The results of the field programs will be analyzed and compiled into a baseline report.

Table 3.6-1: Wildlife Surveys Completed for the Project

Survey Type	Timing of Survey
Winter track count survey	March 2018, December 2018 and March 2019
Ungulate pellet group and browse availability survey	June 2018
Vegetation survey	August 2018
Semi-aquatic furbearing mammal survey	September 2018
Small mammal trapping and chemistry analysis	September 2018
Remote game camera survey	Deployed March 2018 and on-going
Aerial waterfowl and stick nest survey	July 2018
Breeding bird survey	May to August 2018
Bat detector survey	May to October 2018
Common nighthawk and yellow rail surveys	June 2018
Amphibian auditory survey	May and June 2018

Initial wildlife survey activities (track counts, pellet surveys) identified the following wildlife species/species groups (Table 3.6-2). Additional wildlife surveys will be completed to gain an understanding of the available habitat and the species present in the area and will include a focus on the occurrence of species of interest such as woodland caribou. The Project is located within the provincially designated SK2 Boreal Plain Woodland Caribou Conservation Unit (SMOE 2013).

Eighty-six bird species were documented as part of the avian surveys, four of which are listed under Schedule 1 of SARA:

- common nighthawk (*Chordeiles minor*) (listed as Special Concern);
- rusty blackbird (*Euphagus carolinus*) (listed as Special Concern);
- olive-sided flycatcher (*Contopus cooperi*) (listed as Special Concern), and
- barn swallow (*Hirundo rustica*) (listed as Threatened) (SARA 2002).

Two amphibian species were identified near the Project, the wood frog (*Rana sylvatica*) and Canadian toad (*Anaxyrus hemiophrys*). Northern leopard frogs (*Lithobates pipiens*), which are listed as rare to uncommon (S3) by the SKCDC (2018) and as a species of Special Concern (SARPR 2018), were not identified during any of the field surveys.

Table 3.6-2: Terrestrial Wildlife Documented as part of the Rook I Project Baseline Monitoring Program

Common Name	Scientific Name
Snowshoe hare	*Lepus americanus*
Red squirrel	*Tamisciurus hudsonicus*
Grouse or Ptarmigan	*Phasianidea spp. or Lagopus spp.*
Fisher	*Pekania pennant*
American marten	*Martes Americana*
Red fox	*Vulpus vulpus*
Ermine	*Mustela erminea*
Mink	*Mustela vison*
Southern red-backed vole	*Myodes gapperi*
Deer mouse	*Peromyscus maniculatus*
Masked shrew	*Sorex cinereus*
Meadow vole	*Microtus pennsylvanicus*
Meadow jumping mouse	*Zapus hudsonius*
Water shrew	*Sorex palustris*
Canada Lynx	*Lynx canadensis*
Black bear	*Ursus americanus*
Moose	*Alces alces*
Woodland caribou	*Rangifer tarandus caribou*
Beaver	*Castor canadensis*
Muskrat	*Ondatra zibethicus*

3.7 Cultural Resources

A Heritage Resources Impact Assessment (HRIA) was completed for the Project from June 19 to 22, 2018. The field assessment was completed under the Archaeological Resource Investigation Permit No. 18-068. A Heritage Study Area (HSA) was established which encompassed the Project area, and three general areas within the HSA required a HRIA based on defined criteria.

In total, 180 ha were assessed using a combination of pedestrian reconnaissance, post-impact inspections of disturbed areas, and the excavation of 239 subsurface shovel probes. No new heritage resources were identified throughout the entire survey area. On November 26, 2018, the Heritage Conservation Branch confirmed that the HRIA met the requirements of Section 63 of The *Heritage Property Act* and no further assessment is needed (Government of Saskatchewan 2018 letter to CanNorth).

3.8 Land and Resource Use

3.8.1 Traditional Land and Resource Use

The Project is anticipated to overlap with traditional land and resource use of more than one Indigenous community. Information about traditional territories is rarely public knowledge, and as such, historical (e.g., treaties) and geographic (e.g., distance to project site) factors were considered in preliminary determination of which communities to consider.

The Project is located within Treaty 8 territory, which is an area spanning 840,000 km^2 and covering parts of British Columbia, Alberta, Saskatchewan and the Northwest Territories. Treaty 8 was borne in the late nineteenth century as part of the Canadian government's response to a sudden influx of people into the area with an interest in its mineral resources. Prior to the signing of the treaties, most Indigenous communities were mobile, following their cultural and traditional land use and subsistence activities, which for well over a century was supported through their participation in the fur trade and the presence of numerous posts and outposts in northwestern Saskatchewan and into Alberta. These historic factors have contributed to contemporary relationships among communities in the region, in addition to contemporary land use patterns. It is acknowledged that the Project may overlap with numerous First Nation and Métis traditional territories; however, the current understanding of uses of the area suggests that the three First Nations listed below, and the Métis Nation of Saskatchewan, are most likely to currently undertake land and resource use activities that may overlap with Project activities. This is being confirmed through early and on-going engagement between NexGen and potentially affected communities:

- Clearwater River Dene Nation - Signatory to Treaty 8;
- Birch Narrow Dene Nation - Signatory to Treaty 10;
- Buffalo River Dene Nation - Signatory to Treaty 10; and
- The Métis Nation of Saskatchewan, which has locals based in municipalities in the vicinity of the Project.

The Project's remote location and the lack of public access mean that activities in proximity to the Project are somewhat limited. The nearest Indigenous community with access by road to the area is located approximately 150 km south of the Project. The Project site is located in the open fur block, Fur Block N-19. As this is an open fur block there are no established trap lines in the area and no identified residences of trappers in the Patterson Lake area. It is understood that hunting, fishing, trapping and gathering may be present in proximity to the Project and engagement is ongoing to provide a more robust understanding of current and traditional land use.

3.8.2 Other Land and Resource Use

Recreational and commercial land use occur in the regional area of the Project. Activities include recreational and commercial fishing, hunting, trapping, outfitting and guiding, canoeing and other watersports, forestry, and mineral exploration. The Project is located within the Patterson Lake watershed, which is in the headwaters for the Clearwater River. The Clearwater River has been designated as a heritage river under the Canadian Heritage River Systems program. South of the Project starting at the south end of Lloyd Lake, the Clearwater River is recognized as a Provincial Park. The park is a wilderness park with no services or facilities (Tourism Saskatchewan 2018). Many of the communities located near the Project are within the Northwest Term Supply License, which was assigned to Carrier Forest Products Ltd. on November 1, 2014. Carrier Forest Products is currently developing a 20-year Forest Management Plan (Carrier Forest Products Ltd. 2016).

3.9 Socio-economic Environment

The existing environment for the socio-economic assessment provides an overview of the social demographics and local economy for communities in closest proximity to the proposed Project (Figure 3.9-1). Given the remote location of the Project, there are no communities located in the immediate vicinity of the Project. The closest populated communities connected by road access (Highway 955) to the Project site include the Clearwater River Dene Nation (approximately 150 km from the Project), La Loche (approximately 155 km from the Project), and Descharme Lake, which is understood to be a seasonal settlement, (approximately 70 km from the Project). Additional communities located along Highway 155 (or with single access roads connecting to Highway 155) are also considered as part of the socio-economic environment, although are located at greater distances from the Project. Initial characterization of the existing socio-economic environment near the Project is based on publicly available sources including Census of Canada information, government databases, and published reports.

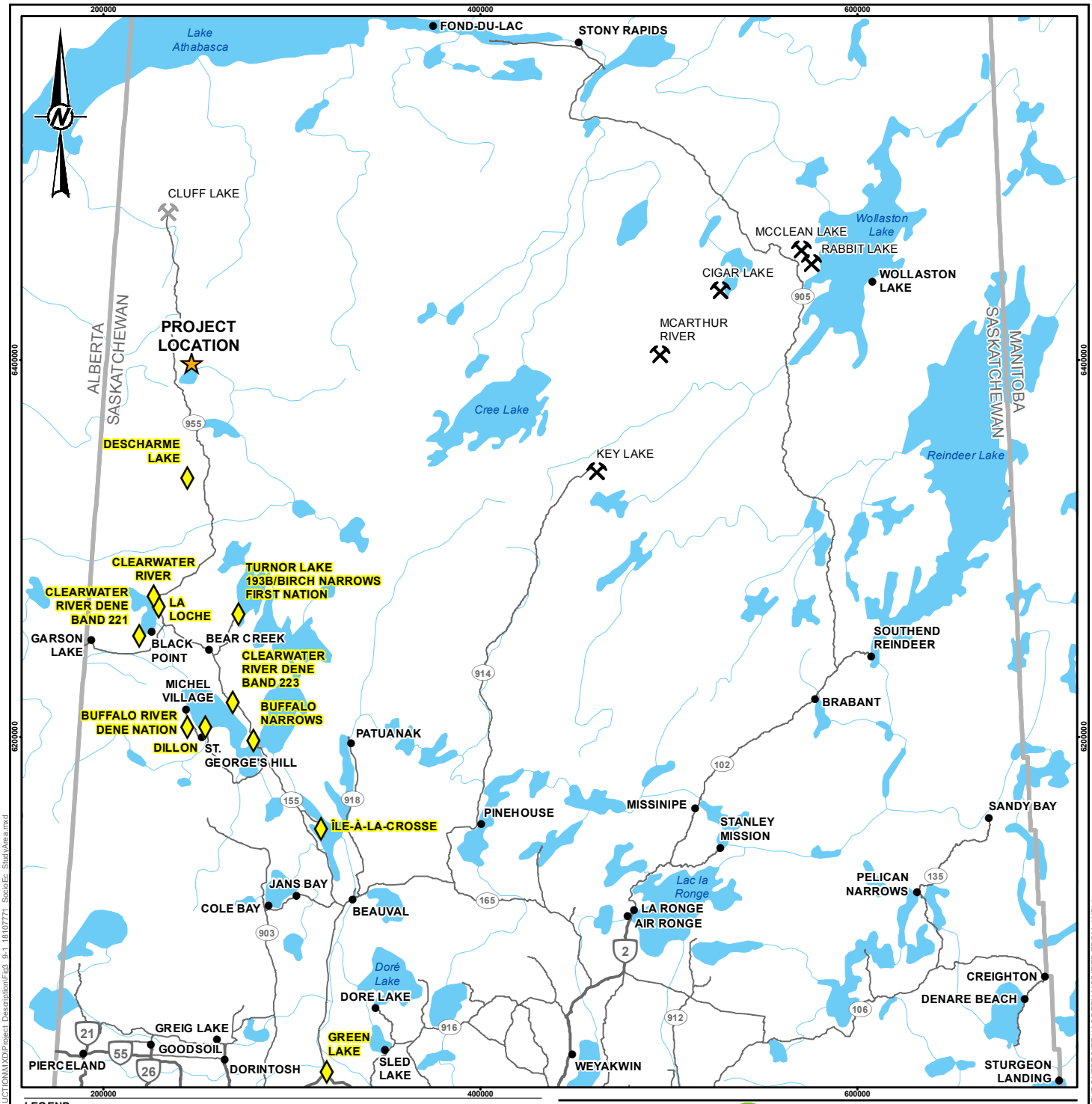
3.9.1 Population

Table 3.9-1 summarizes the population reported for each of the nine communities in the vicinity of the Project in the 2016 Census of Canada. The Northern Settlement of Descharme Lake is not enumerated by Statistics Canada, but as of 2012 was estimated to have a seasonal population of approximately 75 (Saskatchewan Ministry of First Nations and Métis Relations 2012).

Table 3.9-1: 2016 Census Population (Statistics Canada 2017)

Community Name	2016 Census of Canada Population[(a)]	Approximate Distance from Project Site
Clearwater River Dene Nation	820	160 km
Northern Village of La Loche	2,370	160 km
Birch Narrows Dene Nation	475	235 km
Northern Hamlet of Turnor Lake	145	235 km
Northern Village of Buffalo Narrows	1,110	260 km
Northern Village of Île-à-la-Crosse	1,295	320 km
Buffalo River Dene Nation[(b)]	785	330 km
Northern Settlement of Descharme Lake	75	70 km
Northern Village of Green Lake	430	460 km

(a) Data for the Northern Settlement of Descharme Lake is from 2012.
(b) The administrative centre for Buffalo River Dene Nation is in Dillon, which is an unincorporated municipality.



LEGEND

- POPULATED PLACE
- URANIUM MINING FACILITY (ACTIVE)
- URANIUM MINING FACILITY (DECOMMISSIONED)
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- PROJECT LOCATION
- SOCIO-ECONOMIC STUDY COMMUNITIES

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REFERENCE(S)

1. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED, GEOLOGICAL ATLAS OF SASKATCHEWAN VIEWER © 2018, GOVERNMENT OF SASKATCHEWAN, OR IHS MARKIT CANADA LIMITED. PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

COMMUNITIES WITHIN THE SOCIO-ECONOMIC STUDY AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

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A review of available demographic data indicates that the communities in the vicinity of the Project tend to have a larger proportion of younger people (i.e., generally younger than 40 years of age) and a smaller proportion of older people (i.e., 40 years of age or older) compared to Saskatchewan as a whole. The majority (93.6%) of the population in the communities in the vicinity of the Project self-identify as Indigenous, which includes First Nations and Métis people.

3.9.2 Infrastructure and Services

3.9.2.1 Education

The Clearwater River Dene School provides education for kindergarten to grade 12 for children living in Clearwater River Dene Nation. The Clearwater River Dene School receives funding from the federal government and the Meadow Lake Tribal Council (Indigenous and Northern Affairs Canada 2017). The town of La Loche has a daycare centre, a preschool, an elementary school (Ducharme Elementary School), and a high school (Dene High School) (Northern Business Directory 2017). The Buffalo River School provides kindergarten to grade 12 education for children living in Buffalo River Dene Nation and the neighboring community of Dillon (Buffalo River School 2018). Other communities typically have elementary school and high school services located locally either within the community or in a neighboring community.

Residents of the communities in proximity to the Project have limited access to post-secondary opportunities through facilities in La Loche and Buffalo Narrows. The Gabriel Dumont Institute in La Loche offers Adult Basic Education and skills training (Northern Business Directory 2017). Buffalo Narrows offers post-secondary courses and adult education at its Northlands College satellite campus. The Buffalo Narrows campus has a student residency with 18 double occupancy rooms available to out-of-town students (Northlands College 2018).

3.9.2.2 Health

There is an Integrated Health Centre in La Loche called the La Loche Health Centre and a Primary Care Clinic located in Buffalo Narrows, which offers on-call Registered Nurse coverage and emergency medical services 24 hours per day, seven days per week (Keewatin Yatthé Regional Health Authority 2017). As part of the Saskatchewan Health Authority, Keewatin Yatthé Regional Health Authority provides health services and programming to the communities.

The Clearwater River Dene First Nation Health Centre offers health care services to the residents of Clearwater River Dene Nation under the Meadow Lake Tribal Council (Northern Saskatchewan Health Services 2009). Services available include dental therapy, mental health and holistic health services, and primary care services provided by nurse practitioners, physician services, and maternal child health worker (Northern Saskatchewan Health Services 2009). Other communities in proximity to the Project typically have some health services available locally and also make use of the La Loche Health Centre and the Buffalo Narrows Primary Care Clinic.

3.9.2.3 Housing

The average number of persons per household is typically higher, ranging from 2.5 persons in Green Lake to 4.3 persons in Clearwater River Dene Nation, compared to the provincial average of 2.5 persons per dwelling. The percentage of households requiring major repairs is also higher, ranging from 11.8% in Green Lake to 42.6% in Buffalo River Dene Nation, compared to the Saskatchewan average of 8.7% (Statistics Canada 2017).

3.9.2.4 Emergency Services

Policing services are provided by the Royal Canadian Mounted Police (RCMP), which has detachments in La Loche, Buffalo Narrows, the community of Dillon (immediately adjacent to the Buffalo River Dene Nation), Île-à-la-Crosse, Green Lake, and Turnor Lake (Royal Canadian Mounted Police 2018). There are ambulances stationed in La Loche and Île-à-la-Crosse

(Keewatin Yatthé Regional Health Authority 2017). Fire service is typically provided by local volunteer fire departments within each community.

3.9.2.5 Transportation

La Loche is located at the northern end of Highway 155. Highway 155 is a paved highway that serves as a connection point to southern Saskatchewan extending from Green Lake to La Loche. Highway 955 connects La Loche to areas north of the community. Highway 955 extends approximately 245 km north from La Loche to the decommissioned Cluff Lake site and is unpaved. During the winter Highway 956, extending from Highway 155 south of La Loche, provides limited access to Alberta extending to Fort McMurray. Freeze over is required to cross the Christina River in Alberta (DMCA 2018).

The La Loche Airport provides regional air service. Clearwater Aviation provides charter airline service to local communities (Northern Business Directory 2017).

3.9.3 Economy

The labour force indicators for the communities in proximity to the Project reflect similar trends to other communities in Saskatchewan's Northern Administrative District. Participation rates reported in the 2016 Census were generally lower for these communities, ranging from 33.1% in La Loche to 63.8% in Île-à-la-Crosse, compared to 68.3% for Saskatchewan as a whole. Unemployment rates were typically higher, ranging from 12.5% in Buffalo Narrows to 44.4% in Clearwater River Dene Nation, compared to the provincial average of 7.1% (Statistics Canada 2017).

The largest employment sectors are typically educational services; health care and social assistance; public administration; and construction services. However, some communities also reported retail services and resource sectors as key employment sectors (Statistics Canada 2017).

Residents of the communities in proximity to the Project are generally more likely not to have completed a high school certificate, ranging from 32.7% in Buffalo Narrows to 67.2% in La Loche, compared to the provincial average, 20.7% (Statistics Canada 2017).

La Loche has a variety of community-based businesses, owned or run by local residents, ranging from retail and hospitality services to local contractors (Northern Business Directory 2017). Clearwater River Dene Nation has a convenience store with gas and catering services on-reserve (Clearwater River Dene Nation 2013), while the First Nation also owns four businesses off-reserve, including firms involved in construction management and steel fabrication (Robwel 2018). The Meadow Lake Tribal Council provides support to First Nation members for economic development ventures including helping them to identify and access funding programs (Meadow Lake Tribal Council 2018).

4.0 ENVIRONMENTAL INTERACTIONS AND ASSESMENT APPROACH

The objectives of this section are to present a summary of the potential key environmental areas of concern, and to link these to the pathways through which Project components and activities (e.g., footprint, mining and milling activities, and waste and water management) can potentially affect the biophysical and socio-economic environments. This section concludes with an overview of the assessment approach to be completed for the Project EA. The assessment approach considered relevant guidance, specifically CNSC REGDOC-2.9.1. A preliminary screening of the proposed Project was completed to identify potential high-level areas of concern to the environmental and socio-economic environments based on the interactions.

The preliminary screening was conducted by reviewing the effects pathways and interactions and identifying areas with the potential for concern. Effects pathways represent potential changes to valued components (VCs) of the biophysical and socio-economic environments resulting from the Project activities. These pathways are then used to guide the design of scientifically robust baseline programs to describe the existing environment and studies to assess environmental effects.

The list of interactions provided herein is based on current Project information and design detail and it is expected that the interactions and level of detail will evolve during the Project design, engagement and EA processes.

4.1 Environmental Interactions and Potential Areas of Further Assessment

For an environmental interaction to occur, there needs to be a source (i.e., a project activity), a valid connection (i.e., a pathway) from the source to the environment and a receptor within the environment that may be affected (i.e., valued component). Figure 4.1-1 depicts potential pathways that may occur between a mining and milling operation with the biological and human environments. The possible interactions between the project activities and the environmental components are identified in Table 4.1-1. The linkage between the activity and the change is defined as the effects pathway. Pathways are considered for the construction, operating and decommissioning phases of the Project. The EA will consider each pathway to determine the potential, nature, and significance of an environmental effects.

Within the EA, the assessment of effects from the Project will consider all pathways that may lead to environmental or socio-economic effects, after incorporating environmental design features. Environmental design features are incorporated into design, planning and operating parameters of the Project to reduce, prevent, or eliminate environmental effects and can include:

- engineered controls such as containment, water treatment, exhaust air scrubbers;
- management controls such as inspections, monitoring; and
- administrative controls such as training, environmental policies, work instructions.

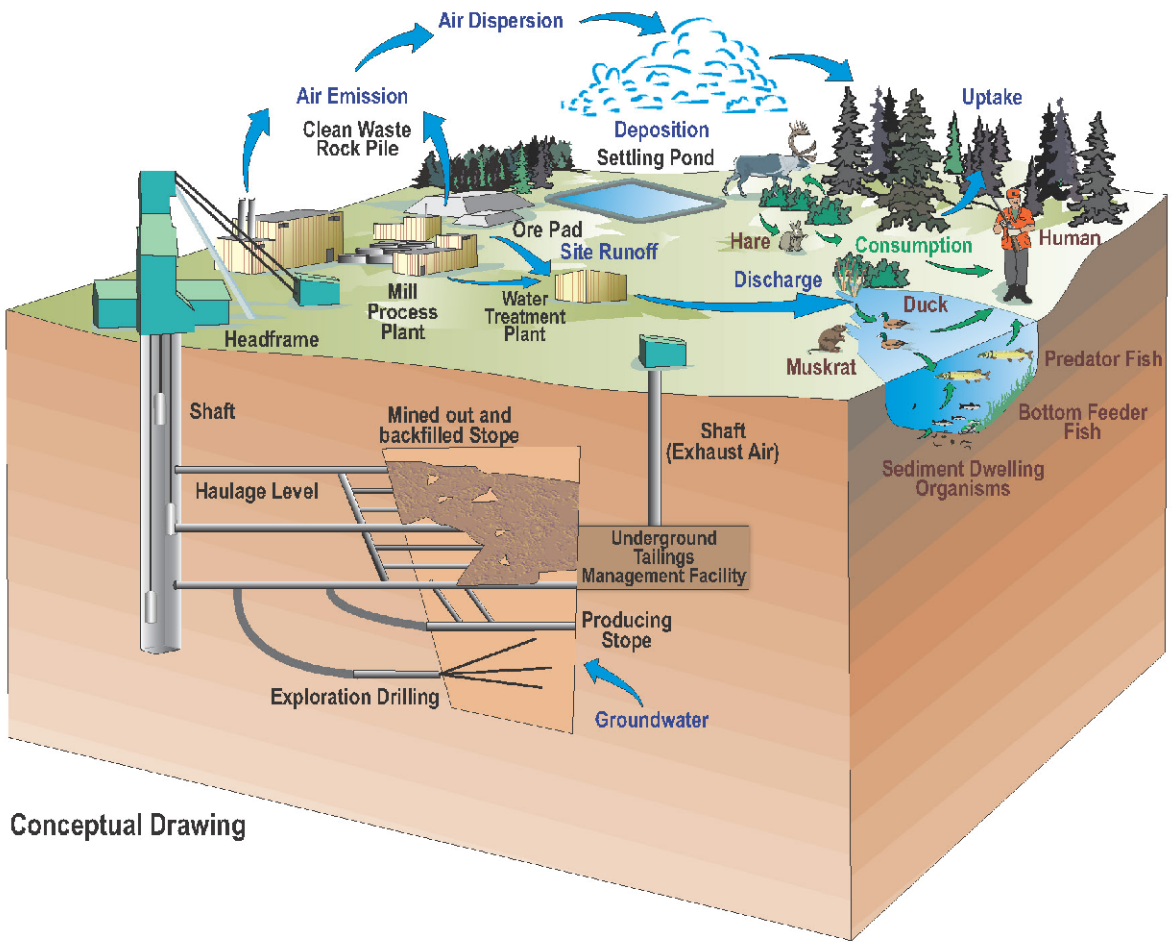
Environmental design features are developed using an iterative approach during the Project design and EA process, and are used to remove the pathway, limit (mitigate) potential effects, or to increase potential benefits.

Potential areas of concern related to the proposed Project, at this stage of the Project development and environmental review, were identified from a number of sources including:

- a review of the Project Description (Section 2.0) and completion of a preliminary screening;
- a review of the existing environment and baseline studies completed to date (Section 3.0);
- scientific knowledge and experience with other uranium mines and mills in Saskatchewan; and
- professional experience and judgment of potential interactions between the Project components and the socio-economic characteristics.

Based on the above, potential areas of concern currently identified for the Project are expected to include:

- effects to air quality related to emissions generated by Project activities and/or components;
- effects to groundwater resources related to the underground storage of process waste as engineered paste backfill;
- effects to the surface water and aquatic environment related to water management;
- effects to the terrestrial environment related to the Project footprint and Project activities;
- effects on human and ecological health associated with the Project activities;
- effects to local land and resource use; and
- socio-economic effects on local communities.



NOTE(S)

1. THIS DRAWING DEPICTS POTENTIAL ENVIRONMENTAL INTERACTIONS BETWEEN A MINE/MILL OPERATION AND THE BIOLOGICAL AND HUMAN ENVIRONMENTS. THIS DRAWING IS NOT AN EXACT REPLICATION OF THE PROJECT.

CLIENT

NexGen Energy Ltd.

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-08
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT

ROOK I PROJECT

TITLE

POTENTIAL INTERACTIONS BETWEEN A MINE/MILL OPERATION AND THE ENVIRONMENT

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	0	4.1-1

Table 4.1-1: Potential Project-Environment Interactions

Project Phase	Key Project Activity	Atmospheric Environment	Geologic and Hydrogeologic Environment	Surface Water and Aquatic Environment	Terrestrial Environment	Human and Ecological Health	Cultural Resources	Land and Resource Use	Socio-economic Environment
Construction	Land clearing	•	•	•	•		•	•	
	Water use and discharge			•	•	•		•	
	Road development	•	•	•	•		•	•	•
	Vehicle traffic	•	•	•	•			•	•
	Infrastructure construction	•	•	•	•			•	•
	Underground shaft development	•	•	•	•	•		•	
	Site overburden/ waste rock storage	•	•	•	•	•	•	•	
Operation	Vehicle traffic	•	•	•	•			•	•
	Air traffic	•	•		•			•	•
	Underground operation	•	•	•	•	•		•	•
	Mill operation	•	•	•	•	•		•	•
	Water intake		•	•	•			•	
	Treated effluent discharge			•	•	•		•	
	Waste rock and ore storage	•	•	•	•	•		•	
	Underground processed waste storage		•	•	•	•		•	
	Domestic and industrial waste management	•		•	•			•	•
Decommissioning and Closure	Vehicle traffic	•	•	•	•			•	•
	Removal of infrastructure and reclamation	•	•	•	•			•	•
	Waste removal/underground storage	•	•	•	•			•	

Note: • indicates a potential interaction

4.2 Summary of Potential Effects Related to Areas of Concern

For each key concern, a preliminary summary of the potential interaction and the pathway(s) for effects, and environmental design features incorporated into the Project, or to be considered in the detailed Project design, are identified below. As discussed above, the EA will provide a comprehensive review and analysis of the potential interactions, pathways, environmental design features and assessment of effects. For the purposes of this initial stage in the assessment process, this summary is presented as the early identification of potential effects (positive and negative) that the Project may have on the environment.

4.2.1 Atmospheric Environment

The construction, operation, and closure of the Project will potentially result in changes to air quality from air emissions generated from both point source and fugitive air source. Potential pathways through which the Project can modify air quality in the local receiving environment include emissions from stacks, mobile equipment, mine ventilation and fugitive dust from access roads, the waste rock pile, and the airstrip. Changes in ambient air quality and associated deposition may have direct and/or indirect effects on surface water quality, fish, and fish habitat. Air and dust emissions may also affect the quality of soils, vegetation, and wildlife habitat, which could subsequently lead to changes in wildlife populations. As such, environmental design features (e.g., emission controls on point sources and methods for mitigating dust generation) will be identified and considered during the design of the Project to limit or eliminate potential effects associated with air emissions. The EA will include the results of air dispersion models developed in accordance with the Saskatchewan Air Quality Modelling Guideline (SMOE 2012) to predict the influence of air emissions on ambient air quality and the associated effects on VCs, and the terrestrial and surface water environments. The EA will also include an assessment on greenhouse gas emissions as they relate to the Project activities.

Heavy equipment required for construction, operation, and closure of the Project has the potential to increase noise levels in the area. Similarly, vehicular traffic on the Project access road and use of aircraft for site access also have the potential to increase noise levels in the area. The EA will include the development of models to quantify potential noise effects from key Project activities. In accordance with AER Directive 038 (AER 2007) and Health Canada guidance (Health Canada 2017), the models will be used to predict daytime noise levels ($L_{eq,day}$) and nighttime noise levels ($L_{eq,night}$) over a study area large enough to capture potential cumulative effects. To assess potential effects to human receptors, predicted Project noise levels will be compared to baseline conditions and to assessment criteria from AER Directive 038 and the Health Canada guidance.

4.2.2 Geologic and Hydrogeologic Environment

As a mining project, interactions between the geologic and hydrogeological (groundwater) environment will occur during the construction, operation and closure phases of the Project. Development and operation of the underground workings will likely influence groundwater flow patterns as a result of the capture and removal of groundwater from the area surrounding the mine. The placement and progressive decommissioning of processed waste underground during operations and through closure will need to be considered over the long term. The extent of potential impacts will be assessed in the EA through detailed hydrogeological flow and contaminant transport models. Changes in the hydrogeological environment will further be assessed in terms of where groundwater and surface water may interface and the potential influence of this interface on the environment.

4.2.3 Surface Water and Aquatic Environment

During all phases of the Project, there is a potential for project-related activities to have an effect on the surface water and aquatic environment. Freshwater will be utilized to support the operation of the facility and effluent, treated

using best available technology to achieve optimal water quality, will be discharged into the receiving waterbody (Patterson Lake). Water from Patterson Lake and groundwater sources will be used to provide the Project's freshwater and potable water needs. As much clean water from precipitation and runoff will be diverted away from Project infrastructure while potentially contaminated runoff will be captured and delivered to the mill for treatment prior to release. Additional groundwater captured from the underground mine workings will also be sent to the mill for treatment prior to release into the receiving environment.

The assessment of potential effects associated with the release of treated effluent will be addressed in the EA through detailed modelling. The design of the Project will consider various means to minimize potential impacts on surface water quality and the aquatic environment, such as fresh water diversion, runoff capture and retention, water reuse and reduction measures, and the application of best available treatment technology. Additional mitigation measures will be considered if required. Erosion and sediment control measures will be incorporated through all phases of the Project to avoid runoff related impacts to the aquatic environment. Applicable Project activities will be assessed in regards to impacts on the aquatic environment, including, but not limited to fish and fish habitat.

4.2.4 Terrestrial Environment

Project effects on the terrestrial environment are expected to be associated primarily with direct and indirect changes to habitat quantity and quality. Land clearing during site preparation and construction activities has the potential to effect vegetation and wildlife habitat. The EA will assess the extent (spatial and duration) of these effects on the local and regional terrestrial environment. In addition, indirect effects may be anticipated from air emission sources and will be assessed as part of the EA. Where appropriate, best management practices and environmental design features will be incorporated into the Project to address any potential effects and reduce or eliminate the effects. These may include, but not be limited to, reducing or altering the site footprint, noise suppression for heavy vehicles and traffic management. Applicable Project activities will be assessed in regards to impacts on the terrestrial environment, including, but not limited to sensitive species, wildlife habitat and migratory birds.

4.2.5 Human and Ecological Health

Human and ecological health considerations will be evaluated through all phases of the Project and will consider the various potential impacts that the Project could have to various receptors. For example, specific to the direct operation of the Project, select occupations and personnel on-site could be exposed to radiation sources as part of their daily activities. These would include underground miners, ore and waste rock truck drivers and mill operators. The Project design will include appropriate mechanisms to protect the health and safety of workers and other appropriate mechanisms to keep personnel safe through all phases of the Project. In addition, exposure levels will be monitored and managed through the site's Radiation Protection Program.

The relationship of the Project to human and ecological health beyond the immediate Project area will also be evaluated in the EA. Given that the environment surrounding the Project will be influenced by various aspects of the Project, such as emissions to air and water, the potential impact to various human and ecological receptors will be evaluated.

4.2.6 Land and Resource Use

Resource use of the area by Indigenous and other recreational users will be evaluated as part of the EA. To reduce any potential impacts, the Project may infer personnel restrictions on hunting and fishing, and have a no firearms policy. Environmental design features to assist in addressing potential effects to land and resource use will continue to be developed through information gathered from key informant interviews and Indigenous engagement activities.

4.2.7 Socio-Economic Environment

Socio-economics are influenced by all components of the physical, biological, and cultural environments. For example, traditional and non-traditional uses of water, plants, animals, and other biophysical properties may be connected to the cultural, social, and economic aspects of the environment. Potential effects from the Project to the socio-economic environment will likely be assessed through predicting positive and negative changes to a number of components such as employment, training, economic development, and community services. For example, workforce and procurement requirements of the Project may increase employment and business opportunities, education and training, and economic activity at a local and regional scale. Conversely, an influx of workers required by the Project may increase pressure in community infrastructure and services.

4.3 Framework for Assessment Approach and Methods

The EA for the Project will evaluate the potential environmental effects associated with all Project activities, during all phases of the Project. The results of the assessment will be provided in the EIS. The assessment of effects from the Project on biophysical, social, cultural and economic components is generally completed using the following approach:

- **Step 1 – Define the component specific methods**. The specific methods used to first identify and then undertake the assessment of valued components (VCs), identifying the approaches and indicators used to measure direct or indirect adverse or positive/beneficial effects of the Project on biophysical and socio-economic components within defined temporal and spatial boundaries, identify the inclusion of Indigenous Knowledge (IK) within the effects assessment including consideration of IK and community input in the identification of project specific VCs.
- **Step 2 – Characterize existing conditions**. Existing conditions, including IK, for each VC are characterized to provide context and a basis for evaluating potential Project and cumulative effects.
- **Step 3 – Evaluate Project interactions and mitigation**. A pathways analysis is used to focus the assessment on interactions between the Project and affected VCs, after application of the proposed mitigation to determine the potential for residual adverse effects. IK is incorporated into the assessment process. Where potential adverse effects are adequately mitigated, and no residual effect is assessed, the reasons for concluding the analysis at this stage is explained. Primary pathways that may lead to residual adverse effects after application of mitigation are carried forward to steps 4 and 5 for further analysis. Potential positive or beneficial effects from the Project are also carried forward to steps 4 and 5.
- **Step 4 – Analyze residual effects**. Evaluates and describes the effects of the Project for each VC within the component-specific temporal and spatial boundaries, including adverse effects and positive outcomes. The residual effects analysis is presented as an integrated narrative that describes the effects of the Project over time and highlights predicted effects at the point when adverse effects of the Project are greatest. Cumulative effects from previous, existing and reasonably foreseeable developments are also analyzed, if applicable. IK is incorporated into the residual and cumulative effects assessments.
- **Step 5 – Classify residual effects and determine significance**. Summarizes the results of the residual effects analysis using effects criteria (i.e., direction, magnitude, geographic extent, duration, reversibility, frequency, and probability of occurrence). Significance for VCs is determined using the results of the residual effects analysis and classification, and for adverse effects only. Significance is determined for the maximum adverse effects of the Project during any period of temporal assessment boundary.

- **Step 6 – Describe uncertainty and define prediction confidence**. Identifies key uncertainties and explains how these uncertainties are addressed to achieve a precautionary assessment. The implications of these approaches for confidence in the residual effects analysis, residual effects classification, and determination of significance are presented.
- **Step 7 – Identify monitoring and follow-up**. Outlines the actions required to confirm effects predictions and effectiveness of mitigation, and address uncertainty. Where applicable, this may include the continued collection of IK and incorporation into future effects assessments.
- Cumulative effects will be assessed where the incremental effects of the Project could overlap with the combined effects of other existing, approved, and reasonably foreseeable developments. The Project is located in a remote, largely undeveloped region of Saskatchewan and there is currently no other industrial activities occurring in the immediate vicinity of the Project. There are two commercial outfitters operating in the area and there is active uranium exploration occurring in the area. These and any other potential industrial projects and recreational activities in the area will be considered in the detailed cumulative effects assessment.

5.0 ENGAGEMENT

NexGen recognizes the importance engaging with local and indigenous communities, residents, businesses, organizations, land users and the various regulatory authorities, collectively referred to as ‘stakeholders’, as an important aspect of responsibly developing the Rook I Project. Since exploration commenced in 2013, NexGen has:

- undertaken to meet regularly with identified stakeholders to discuss and provide updates on activities at the site;
- become involved in initiatives and activities in the local communities (i.e., breakfast program); and
- has provided opportunities directly to local residents and businesses.

NexGen was recently recognized for their involvement in community outreach initiatives by the Prospectors and Developers Association of Canada’s (PDAC) with the 2019 Environment and Social Responsibility Award. These outreach initiatives have focused on youth and relate to education, health and wellness, and fostering economic capacity.

As NexGen advances development of the site, engagement activities will evolve as necessary to certify the inclusion of applicable stakeholders in a manner that provides the opportunity for effective information exchange and dialogue specific to this stage of the Project.

For the purposes of developing effective plans for engagement, NexGen has identified three broad stakeholder categories in relation to the Project. These categories include:

- regulatory authorities;
- Indigenous communities; and
- the general public.

This section outlines NexGen’s approach to engagement in relation to each of these stakeholder categories, including the process for identification of primary interest groups, a summary of engagement completed to date and feedback provided, and an outline of plans for future engagement. While details provided in this section are largely specific to the EA, NexGen remains committed to ongoing engagement throughout the entire life-cycle of the Project.

It is recognized that engagement is a dynamic process subject to change based on the needs of the parties or as new or emerging information becomes available. NexGen will take an adaptive approach to engagement to allow adequate opportunity for engagement and that engagement activities will respond to the needs of various stakeholders, while also respecting specific government policy and/or legislation.

5.1 Regulatory Engagement

As outlined in Section 1.0, the environmental assessment of the Project falls under both provincial and federal jurisdiction. Provincially the conduct of the environmental assessment will be overseen by the EA Branch. Federally, the CNSC will act as the responsible authority, designated federally to coordinate the environmental assessment of all new uranium mine and mill projects in Canada. Under the authority delegated under CEAA 2012, the CNSC will oversee the federal assessment and will be responsible to coordinate the assessment with provincial authorities and other federal departments. It is envisioned that a cooperation agreement will be established between SMOE and CNSC such that the EA is managed as a cooperative regulatory process enabling each agency to satisfy their respective jurisdictional obligations while allowing for a collaborative and coordinated assessment process. As the authorities responsible for assessment of the Project on behalf of each jurisdiction, SMOE and the CNSC will be the primary agencies engaged by NexGen during the assessment. NexGen is committed to regular and ongoing engagement with all regulatory authorities throughout the lifecycle of the Project and will evolve engagement efforts and plans as the project advances.

While this section is focused on regulatory engagement during the environmental assessment, the Project will be subject to multiple provincial and federal acts and regulations administered by many different ministries, departments and agencies outside of the assessment process. Although not fully detailed herein, NexGen is committed to regular and ongoing engagement with all responsible regulatory authorities throughout the lifecycle of the Project and will adjust engagement efforts and plans as the Project advances.

5.1.1 Regulatory Engagement Summary

The exploration program completed to-date has been subject to regulation and permitting under the authority of the Government of Saskatchewan. To obtain approvals and monitor compliance related to various exploration activities, NexGen has routinely engaged with the appropriate regulatory authorities through formal written correspondence, in-person meetings and site inspections. A summary of the ministries and agencies with which NexGen has been actively engaged with during exploration include:

- SMOE;
- WSA;
- Ministry of Labour Relations and Workplace Safety;
- Ministry of Energy and Resources; and
- Ministry of Government Relations.

As the Project has proceeded through the early development phases, specifically the Preliminary Economic Assessment (PEA) and PFS, NexGen has provided regular updates to the provincial ministries, departments, and government officials responsible for oversight of current and potential future development of the Project. Table 5.1-1 provides a summary of recent regulatory engagement activities with various provincial ministries.

Table 5.1-1: Summary of NexGen Regulatory Engagement Activities To-Date

Date	Location	Ministries	Meeting Summary
February 14, 2018	Regina, SK	SMOE ▪ Environmental Protection Division ▪ Resource Management & Compliance Division Ministry of Economy ▪ Minerals, Lands & Resource Policy Division ▪ Trade & Export Development Ministry of Government Relations[(a)]	NexGen provided an update on exploration and project development activities, including the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ Benefits and community initiatives ▪ PEA summary ▪ Approvals and compliance summary ▪ Environmental protection measures ▪ Environmental baseline summary ▪ Community engagement
June 5, 2018	Rook I Site	SMOE ▪ Environmental Protection Division ▪ Resource Management & Compliance Division Ministry of Energy & Resources ▪ Minerals, Lands & Resource Policy Division Trade & Export Development[(a)] Ministry of Labour Relations & Workplace Safety ▪ Occupational Health and Safety Division	NexGen provided representatives from a number of ministries with a tour of the Rook I site including the following areas: ▪ Rook I camp ▪ Core processing and storage facilities ▪ Surface drill locations at Arrow deposit A presentation was provided with an update on activities and development progress. This meeting provided an opportunity for direct dialogue between NexGen and provincial officials.

(a) Invitation extended but representatives unavailable.

Engagement specific to advancement of the Project commenced following the completion of the PFS in November 2018. Meetings were held with both the CNSC and SMOE – EA Branch. The objective of these meetings was to introduce NexGen and provide an overview of the Project, to summarize the various activities being conducted to support the environmental assessment process, and to inform each agency of NexGen's intention to submit an application for an environmental assessment determination in early 2019 (Table 5.1-2).

Table 5.1-2: Summary of Project Regulatory Engagement Activities To-Date

Date	Location	Agency	Meeting Summary
November 6, 2018	Saskatoon, SK	Canadian Nuclear Safety Commission ▪ Uranium Mines and Mills Division ▪ Environmental Assessment Division	NexGen provided a presentation covering the following areas: ▪ Introduction and overview ▪ Arrow deposit and development update ▪ Summary of PFS results and select project details ▪ Summary of economic benefits and projected ▪ Environmental protection practices ▪ Community engagement initiatives NexGen provided the CNSC representatives in attendance with notification of intent to submit a Project Description in early 2019. Provincial-federal cooperative review process discussed with indication that this would be coordinated by the CNSC in cooperation with the provincial Environmental Assessment & Stewardship Branch.

Table 5.1-2: Summary of Project Regulatory Engagement Activities To-Date

Date	Location	Agency	Meeting Summary
November 16, 2018	Regina, SK	SMOE ▪ Environmental Protection Division Ministry of Energy & Resources ▪ Minerals, Lands & Resource Policy Division	NexGen provided a presentation covering the following areas: ▪ Company introduction and overview ▪ Arrow deposit and development update ▪ Summary of PFS results and select project details ▪ Summary of economic benefits and projected ▪ Environmental protection practices ▪ Community initiatives NexGen provided the provincial representatives in attendance with notification of intent to submit a Project Description (satisfying Technical Proposal requirements) in early 2019. Provincial-federal cooperative review process discussed with indication that the SMOE would work in cooperation with the CNSC in coordinating activities.
February 7, 2019	Saskatoon, SK	Provincial representatives: ▪ Ministry of Environment ▪ Water Security Agency ▪ Ministry of Government Relations ▪ Ministry of Labour Relations and Workplace Safety ▪ Saskatchewan Health Authority ▪ Ministry of Energy & Resources Canadian Nuclear Safety Commission: ▪ Uranium Mines and Mills Division ▪ Environmental Assessment Division ▪ Environmental Risk Assessment Division ▪ Health Sciences and Environmental Compliance Division ▪ Radiation Protection Division ▪ Policy, Aboriginal, and International Relations Division	NexGen hosted a workshop to review the EA and licensing documents in advance of Project submission. The workshop covered the following main elements: ▪ Project Description ▪ Terms of Reference ▪ Indigenous Engagement ▪ Initial Licensing Application NexGen provided an overview of the Rook I Project and the associated information provided in the above documents.

5.1.2 On-going Engagement

Throughout the environmental assessment, NexGen will regularly engage the SMOE and the CNSC in relation to the Project and assessment activities. It is expected that regular engagement will:

- confirm procedural aspects of the cooperative assessment are clearly understood, addressed and efforts are in line with jurisdictional requirements;
- provide an opportunity to present and share information relevant to the assessment and proposed activities;
- allow for dialogue in relation to public and Indigenous engagement efforts;

- provide opportunity to answer questions of a technical and non-technical nature; and
- confirm timelines, schedules and milestones are understood and anticipated changes communicated.

NexGen intends to employ, at a minimum, the following methods of engagement with SMOE and the CNSC throughout the EA:

- written correspondence;
- meetings;
- workshops; and
- site tours.

The following provides further detail on each type of engagement identified:

Written Correspondence

NexGen anticipates written correspondence will occur with SMOE and the CNSC in the form of technical submissions, formal letters as well as email communication. This level of engagement will provide written documentation of any requests, responses, provision of guidance or other types of information transferred in relation to the Project and/or assessment. Formal correspondence will be tracked and will be part of the documentation included in the Project file maintained by NexGen.

Meetings

NexGen will seek to meet with SMOE and the CNSC representatives at regular intervals and key milestones throughout the assessment process. Meetings will provide an opportunity for direct dialogue between parties and for the sharing of information through presentations, discussion, or other appropriate formats. Formal meetings will include a written record (minutes) shared and approved by participants with any actions or follow-up items identified and tracked to completion.

Workshops

The opportunity exists to conduct focused workshops with SMOE and the CNSC representatives at key milestones during the assessment process. These workshops may present and discuss technical information and allow dialogue between technical specialists and subject matter experts. It is expected that one or more workshops may be organized by NexGen during the assessment with participation coordinated through points of contact identified for SMOE and the CNSC. Information presented during these workshops will be shared with participants and included in the relevant Project files.

Site Tours

NexGen recognizes the value in providing representatives from SMOE and the CNSC with an opportunity to visit the location of the proposed Project to provide a first-hand understanding of the site and surroundings. NexGen intends to coordinate one or more such tours during the assessment process and will work with SMOE and the CNSC to identify appropriate timing, participants and coordinate logistics.

5.2 Indigenous Engagement

This section outlines NexGen's overall approach to Indigenous (First Nations and Métis) engagement. It includes a list of communities identified for engagement; a summary of engagement efforts conducted to-date, and an outline of

planned engagement activities. NexGen is committed to conducting meaningful engagement with Indigenous communities potentially affected by, or with expressed interest, in the Project and to maintaining relationships with these communities throughout all phases of the Project. The approach to engagement has also considered relevant guidance, specifically CNSC REGDOC-3.2.2 Aboriginal Engagement (REGDOC 3.2.2, 2016) and the Government of Saskatchewan's Proponents Guide: Consultation with First Nations and Métis in Saskatchewan Environmental Impact Assessment (2014). In consideration of REGDOC-3.2.2 and provincial requirements for engagement planning, NexGen has prepared an Indigenous Engagement Report (NexGen 2019) which provides further detail on engagement activities and plans as it relates to the Project.

NexGen respects the unique relationship Indigenous peoples have with the environment, the rights of Indigenous peoples with respect to the land; and recognizes the importance of full and open discussion with interested or effected Indigenous communities regarding the development, operation and decommissioning of the Project. NexGen's objectives when undertaking engagement with Indigenous communities can be summarized as follows:

- build sustainable relationships based on mutual trust and respect;
- communicate clearly with Indigenous communities using appropriate language and agreed upon formats;
- provide Indigenous communities with timely and accurate information on the Project including information about potential environmental effects for all phases of the Project; and
- understand how the proposed development of the Project may impact Indigenous peoples' ability to use the land for hunting, fishing, trapping, gathering and other traditional uses.

NexGen's approach to engagement is not intended to replace the government's duty to consult obligations with respect to the Project though it is recognized that engagement conducted by NexGen may be used to inform or satisfy procedural aspects of the Crown's consultation process. NexGen is committed to working with provincial and federal authorities and will provide regular update on planned activities as engagement is undertaken. NexGen is also willing to provide opportunity or facilitate federal and provincial government participation during NexGen lead engagement activities.

5.2.1 Identified Communities

Since exploration at Rook I commenced in 2013, NexGen has engaged regularly with and established relationships with local Indigenous communities, specifically those closest to the Project, the Clearwater River Dene Nation and Métis Local 39 (La Loche). Engagement has been conducted in a manner which has exceeded requirements and current guidance for this stage of exploration activity. This has included both formal engagement with elected leadership and community representatives, as well as informal involvement including participation in community events and initiatives.

NexGen has been actively involved in community outreach initiatives since 2014. NexGen's outreach initiatives focus on the youth of the community, in the areas of education, health and wellness and economic capacity building. NexGen's engagement and outreach efforts have recently been recognized by PDAC with the 2019 Environment and Social Responsibility Award. Some notable outreach initiatives undertaken to date include:

- identified, initiated, managed and sponsored breakfast programs that feed over 1100 students each school day.
- identified, initiated, managed and sponsored public skating and other recreational activities through the La Loche Sports, Recreation and Culture Board.
- annual summer mentorship programs involving local students employed at Rook I.

- bursary programs for students pursuing post-secondary education in exploration and mining related disciplines.
- youth sports sponsorship for both hockey and volleyball teams.
- support for school fieldtrips and culture camps.

As NexGen has advanced development of the Project, further review has been undertaken to identify those Indigenous communities whom, in the context of the proposed site development, may be affected by or have an interest in the Project. Within this framework, the approach to identifying Indigenous communities in relationship to the Project considered the factors outlined in *REGDOC-3.2.2 Aboriginal Engagement*. This included consideration of:

- historic and modern treaties;
- proximity of the Project to Indigenous communities;
- existing relationships between Indigenous groups and licensees or the CNSC;
- traditional territories;
- traditional and current land uses;
- settlement or on-going land claims, and/or litigation;
- existing relationships with the Project and NexGen; and
- potential Project impacts to health and safety, the environment, and any potential or established Aboriginal and/or treaty rights and related interests.

Development of a list of potentially effected or interested Indigenous communities has been further informed through direct correspondence with Indigenous and Métis communities and organizations in the region and review of publicly available information and guidance provided by provincial and governments. The factors identified above were considered in the context of the overall scope of the Project (Section 2.0), the potential environmental interactions (Section 4.0), and any issues and potential environmental effects identified (Section 4.0). This approach also took into account potential health and safety related aspects, specifically changes in traffic volumes along remote transportation routes and the movement of dangerous goods.

Given the above framework, Table 5.2-1 provides an initial list of Indigenous communities and associated organizations identified with known and/or which could potentially be affected by Project activities, including a preliminary summary of the likelihood of Project effects overlapping with potential or established Aboriginal and/or Treaty Rights and related interests, based in large part on the consideration of the factors identified for the rationale for inclusion. Figure 5.2-1 shows the location of the Project in relation to each of the identified First Nation and Métis communities. The identification of Indigenous communities and groups for engagement was approached based on NexGen's current understanding of the region, current engagement practices conducted for nearby facilities licensed by the CNSC and regulated by the Province, and early engagement with select communities to date. In some instances factors such as relative proximity to the site were a prominent consideration rather than historical context. For example, while the Project is located in Treaty 8 territory, which spans a large area of Saskatchewan, Alberta, British Columbia and the Northwest Territories, only one First Nation identified in Table 5.2-1 was signatory to that treaty, while other First Nations identified were signatories to Treaty 10 but have accessibility to the region. Orano Canada (formerly AREVA Resource Canada Inc., and previously COGEMA) has long been engaged with communities in this region in relation to the Cluff Lake Operation, which is located 80 km north of Rook I along Highway 955. The communities identified and engaged with in relation to the Cluff Lake Operation is also a key consideration. These

engagement efforts reflect a long history of dialogue with communities in the region, are linked to current licensing, and reflect engagement expectations established over a long period of time with communities in the region.

The Comprehensive Study Report for the Cluff Lake Decommissioning Project (CNSC 2003) was specifically considered in identifying communities, although the language and terminology associated with these communities has evolved in recent years to reflect more direct engagement with Indigenous communities. As such, NexGen has expanded on the list of communities identified in relation to Cluff Lake to include direct engagement with Indigenous communities, which is outlined in the rationale provided in Table 5.2-1. An example of this expanded engagement is the identification of the Métis Nation of Saskatchewan Northern Region 2 (Region 2), which was not specifically engaged in relation to Cluff Lake, although numerous communities related to Métis Locals represented by Region 2 were engaged (i.e., Buffalo Narrows, Canoe Narrows, La Loche, Michel Village, St George Hill, and Turnor Lake [CNSC 2003]), either directly or through the West Side EQC sub-committee. Although numerous Métis Locals are identified in Table 5.2-1, initial engagement with Region 2 has suggested that future engagement should be coordinated at the regional level which represents multiple Métis Locals. NexGen intends to continue to engage with Region 2 but will also engage directly with specific Métis Locals where such engagement has been requested by a Local or directed by the provincial or federal governments. It should be noted that NexGen also intends to capture additional communities engaged as part of the Cluff Lake Project, such as Buffalo Narrows, and Beauval and Île-à-la-Crosse, as part of the overall public engagement process for the Project as it relates to socio-economic impacts and transportation safety along the Highway 155 corridor.

Table 5.2-1: Indigenous Groups Identified in Relation to the Rook I Project

	Location	Rationale
First Nations		
Clearwater River Dene Nation (SK)	The Clearwater River Dene Nation has three reserve parcels, with the primary populated reserve parcel located north of Lac La Loche, approximately 155 km by road (or an absolute distance of 120 km) from the Project	▪ Treaty 8 signatory ▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Established relationship with NexGen ▪ Participation in engagement related to the Cluff Lake operation (previously included in engagement identified as La Loche)
Birch Narrows Dene Nation (SK)	Birch Narrows Dene Nation has three reserve parcels, with the only population reserve (Turnor Lake 193B) adjacent to the Northern Hamlet of Turnor Lake, approximately 230 km by road (or an absolute distance of 135 km) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen ▪ Participation in engagement related to the Cluff Lake operation (previously included in engagement identified as Turnor Lake)
Buffalo River Dene Nation (SK)	Buffalo River Dene Nation's reserve (Peter Pond Lake 193) is located adjacent to the Village of Dillon, approximately 330 km by road (or 190 km absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen ▪ Participation in engagement related to the Cluff Lake operation (previously included in engagement identified as Dillon)
English River First Nation (SK)	Population center located on Highway 918 approximately 465 km by road from the Project, while the closest reserve parcel is 130 km absolute distance from the Project.	▪ Proximity of reserve land to the Project but no access link or known residency ▪ Potential overlap with traditional territory ▪ Participation in engagement related to the Cluff Lake operation (previously included in engagement identified as Patuanak)
Fond du Lac First Nation (SK)	Populated reserve located on Lake Athabasca approximately 180 km absolute distance from the Project to the reserve boundary, or 1335 km by road (a portion of which is a winter road).	▪ Treaty 8 signatory ▪ Previous engagement with the CNSC on uranium mining/milling projects in Saskatchewan
Black Lake First Nation (SK)	Populated reserve located on Black Lake, approximately 260 km absolute distance from the Project to the reserve boundary, or 1230 km by road (portion by winter road)	▪ Treaty 8 signatory ▪ Previous engagement with the CNSC on uranium mining/milling projects in Saskatchewan
Athabasca Chipewyan First Nation (ACFN)	Located in Alberta approximately 130 km absolute distance or 620 km (including portion on a winter road) from the Project to the reserve boundary. Approximately 1350 km by all-season road.	▪ Treaty 8 signatory ▪ Previous engagement with the CNSC on the Cluff Lake Project ▪ Potential overlap with traditional territory.

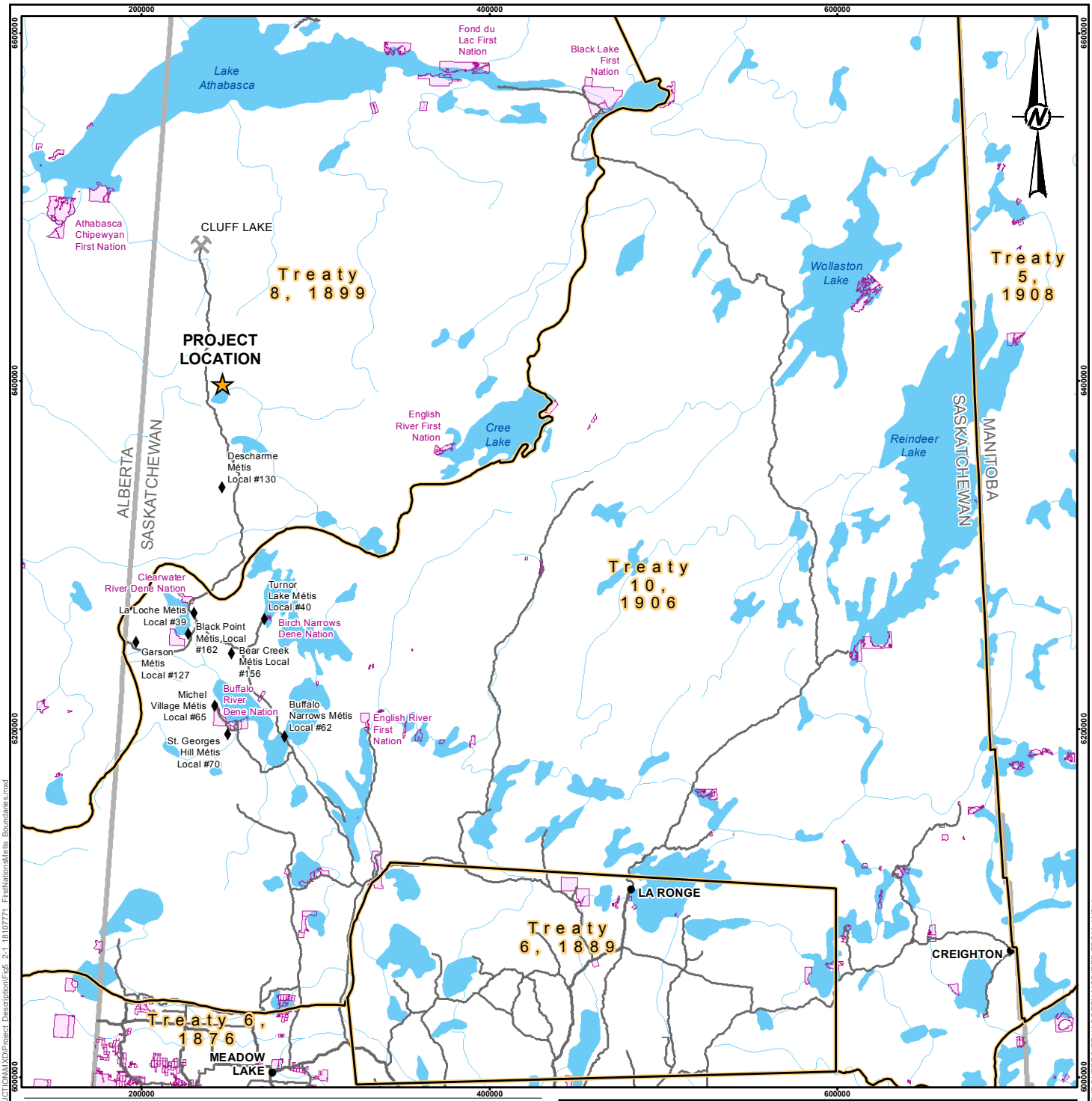
Table 5.2-1: Indigenous Groups Identified in Relation to the Rook I Project

	Location	Rationale
Métis Communities (Métis Northern Region 2)		
Local 39 - La Loche	Located on Lac La Loche approximately 155 km by road (or 130 km of absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Established relationship with NexGen
Local 130[1] – Descharme Lake	The Northern Settlement of Descharme Lake is located approximately 80 km by road (or 60 km absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen
Local 156 – Bear Creek	Located on Highway 155 approximately 195 km by road (or 155 km absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen
Local 62 – Buffalo Narrows	The Northern Village of Buffalo Narrows is located on Highway 155, approximately 260 km by road (or 205 km absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Established relationship with NexGen
Local 162 – Black Point	Located towards the south end of Lac La Loche, approximately 175 km by road (or 145 km absolute distance) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen
Local 40 – Turnor Lake	Turnor Lake is located adjacent to the Birch Narrows Dene Nation's main reserve parcel, approximately 230 km by road (or an absolute distance of 135 km) from the Project.	▪ Proximity to Project ▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen
Local 70 – St Georges Hill	Located near Peter Pond Lake on Provincial Road 925 approximately 330 km by road (or 190 km absolute distance) from the Project.	▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen

Table 5.2-1: Indigenous Groups Identified in Relation to the Rook I Project

	Location	Rationale
Local 65 – Michel Village	Located near Peter Pond Lake on Provincial Road 925 approximately 340 km by road (or 190 km absolute distance) from the Project.	▪ Potential current land uses in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen
Local 127 – Garson Lake	Located on Provincial Road 956 close to the Alberta border, approximately 220 km by road (or 160 km absolute distance) from the Project.	▪ Potential land use in proximity to the Project ▪ Potential overlap with traditional territory ▪ Increased traffic ▪ Introductory relationship with NexGen

[1] Métis Local 130 – Descharme Lake has been identified by the Province of Saskatchewan for engagement in relation to the Project. Information provided to NexGen indicates that Local 130 is not currently active. Dialogue with the Métis Region 2 leadership has indicated that Métis Local 130 is no longer established or recognized as a Métis Local and the area will instead be represented by the Region 2 council. NexGen will continue to attempt to engage with Local 130 until further clarification is provided.



LEGEND

- POPULATED PLACE
- URANIUM MINING FACILITY (DECOMMISSIONED)
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- PROJECT LOCATION
- MÉTIS LOCAL
- FIRST NATIONS RESERVE LAND
- TREATY BOUNDARY

0 75 150

1:3,250,000 KILOMETRES

REFERENCE(S)

1. BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED, OR IHS MARKIT CANADA LIMITED.
2. MÉTIS LOCAL AND TREATY BOUNDARIES OBTAINED FROM INTERGROUP CONSULTANTS, DECEMBER 2018.

PROJECTION: UTM ZONE 13 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

FIRST NATIONS AND MÉTIS GROUPS IDENTIFIED IN RELATION TO THE ROOK I PROJECT

CONSULTANT

GOLDER

YYYY-MM-DD	2019-04-12
DESIGNED	SS
PREPARED	LMS
REVIEWED	SS
APPROVED	AL

PROJECT NO.	PHASE	REV.	FIGURE
18107771	3000	1	**5.2-1**

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In addition to the communities identified in Table 5.2-1, a list of other organizations has been identified as relevant to the Project based on membership of identified Indigenous communities or based on an established role in facilitating dialogue between industry, the public and Indigenous communities within the Northern Administrative District. These include the:

- Meadow Lake Tribal Council;
- Métis Nation Saskatchewan - Region 2;
- Métis Nation of Saskatchewan;
- Northern Saskatchewan Environmental Quality Committee (NSEQC); and
- Ya'thi Néné Lands and Resources Office.

Specific to the NSEQC, in relation to Cluff Lake, Orano Canada has engaged frequently with a regional EQC sub-committee (West Side EQC) comprised of EQC representatives from this specific region of the Province. This sub-committee has also been identified in relation to the Project and will be an important organization engaged in relation to the Project.

5.2.2 Activities Completed to Date

NexGen has actively engaged with local Indigenous communities since exploration began in 2013. The focus of engagement has largely been with communities located in closest proximity and with direct road access to the area and identified land users. Early engagement during the exploration phase was conducted through various means, including provision of letters, meetings with and presentations to elected leadership and community members, and through tours of the Rook I site. In addition, numerous informal discussions, phone calls and electronic communications with leadership and community members has been conducted.

In addition to NexGen's planned engagement, letters to interest groups have been mailed out prior to undertaking exploration as per provincial permitting requirements. The list of interest groups has been provided by the province and includes local First Nations and Métis communities.

NexGen has chronicled engagement activities throughout the exploration and project development stage of the Project and maintains a database of engagement activities. A summary of Indigenous engagement activities to-date is provided in Table 5.2-2. This includes a summary of recent engagement specific to the Project.

Table 5.2-2: Summary of Indigenous Engagement Activities

Clearwater River Dene Nation			
Date	**Method**	**Audience**	**Scope**
May 8, 2014	Meeting with Elected Leadership	Chief, Council and Band Manager (6 people)	Introduction to NexGen and discussion regarding proposed exploration program.
March 15, 2016	Meeting with Elected Leadership	Chief, council and band manager (5 people)	Update on winter drill program and access road construction.
September 21, 2016	Response to letter	Chief	Letter received from Chief Teddy Clark, Clearwater River Dene Nation regarding consultation expectations.

Table 5.2-2: Summary of Indigenous Engagement Activities

Clearwater River Dene Nation			
Date	**Method**	**Audience**	**Scope**
October 14, 2016	Meeting with Elected Leadership	Chief	▪ Introductory meeting with new NexGen manager. Discussion included: ▪ The creation of a regional economic development group; ▪ Clearwater River Dene Nation band office; ▪ Meadow Lake Tribal Council; ▪ Background on La Loche, Clearwater River Dene Nation and the Métis Local; ▪ Engagement/Consultation Strategies; ▪ History of Big Bear and future economic opportunities; and ▪ A tour of the Big Bear Camp.
October 12, 2017	Meeting with Elected Leadership	Chief, Director, President and Mayor (4 people)	Meeting identified the close ties between the Northern Village of La Loche, Métis Local, Métis Region and the Clearwater River Dene Nation and that they, collectively, want to ensure that La Loche and the Clearwater River Dene Nation are considered for economic opportunities that arise from NexGen's exploration and development activities.
August 17, 2018	Site Tour	Chief, council and invited community members (9 total)	NexGen provided a tour of the Rook I site for Chief and Council (plus community members invited by Chief and Council). The tour included an overview presentation of the 2018 activities followed by a tour of the following areas: ▪ Rook I camp ▪ Core processing and storage facilities ▪ Surface drill locations at Arrow deposit ▪ Cuttings management facility ▪ Weather station This tour provided an opportunity for dialogue and an opportunity for the Chief and Council to increase their knowledge of activities at Rook I.
October 4, 2018	Response to letter	Chief	Letter from Clearwater River Dene Nation to express interest in the proposed development of the Rook I Project and requested additional information and to set up a meeting.
December 13, 2018	Meeting and presentation	Chief, Band Manager, lawyer and consultants	At the request of Chief Teddy Clark, NexGen met in Edmonton with Chief, General Manager and representatives to learn more about the project and discuss a process for ensuring meaningful engagement. NexGen provided an update on exploration and project development activities, including the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and summary of PFS results ▪ Environmental baseline summary ▪ Community commitment to training and procurement ▪ Commitment to Engagement

Table 5.2-2: Summary of Indigenous Engagement Activities

Métis Local 39 – La Loche			
Date	**Method**	**Audience**	**Scope**
May 19, 2013	Meeting with Elected Leadership	Chairman, member and translator (3 people)	Introduction to NexGen and discussion regarding proposed exploration program.
February 27, 2017	Meeting with Elected Leadership	President, Region 2 Director, Council and representative from Ministry of Economy (4 people)	NexGen provided an update presentation on exploration and project development activities, including the following: ▪ Overview and history of the Arrow Deposit ▪ Highlights of metallurgical work ▪ Conceptual project design ▪ Update on studies planned to support a future EA ▪ Proposed 2017 activities including baseline studies and engagement planning
October 12, 2017	Meeting with Elected Leadership	Chief, Director, President and Mayor (4 people)	Meeting identified the close ties between the town, Métis Local, Métis Region and the Clearwater River Dene Nation and that they, collectively, want to ensure that La Loche and the Clearwater River Dene Nation are considered for economic opportunities that arise from NexGen's exploration and development activities.
January 23, 2018	Meeting with Elected Leadership	President, Vice President, Council, Program Coordinator and members of the public (9 people)	NexGen provided an update presentation that included the following: ▪ Overview of the Rook I site ▪ Exploration History and 2018 plans ▪ Update on timeline for PFS ▪ Overview of planned environmental baseline studies ▪ Conceptual mine design ▪ Highlights of community outreach initiatives.
July 10, 2018	Meeting with Elected Leadership	President and council (3 people)	NexGen provided a tour of the Rook I site for President and Council. The following areas were visited: ▪ Rook I camp ▪ Core processing and storage facilities ▪ Surface drill locations at Arrow deposit ▪ Cuttings management facility ▪ Weather station This tour provided an opportunity for dialogue and an opportunity for the President and Council to increase their knowledge of activities at Rook I. Note that due to a last minute event, several members of the Métis Local were unable to attend.

Table 5.2-2: Summary of Indigenous Engagement Activities

Métis Local 62 – Buffalo Narrows			
Date	**Method**	**Audience**	**Scope**
March 16, 2016	Meeting with Elected Leadership	MLA, president, council and community members (12 people)	Update on the activities at Rook I including results to date for the winter drill program. Introduction of planned activities for 2016 including environmental baseline and engagement.
Métis Local 130 – Descharme Lake[1]			
Date	**Method**	**Audience**	**Scope**
March 6, 2016	Meeting with Elected Leadership	President, chairman, council and community members (12 people)	Update on winter drill program and access road construction.
April 5, 2016	Public Meeting	Chairman, Métis Local Presidents and community members (17 people)	A planned information session for elected leadership turned into a public meeting. NexGen provided an introduction of the Rook I Project and the team, as well as the planned 2016 work program. There was a request for more information, more consultation and financial compensation.
April 6, 2016	Letter	President and Chairman (2 people)	Response to April 5 meeting, and commitment to ongoing engagement.
Métis Nation Saskatchewan – Region 2			
Date	**Method**	**Audience**	**Scope**
March 15, 2016	Meeting with Elected Leadership	President	Update on the activities at Rook I including results to date for the winter drill program.
October 5, 2018	Meeting with Elected Leadership	Region 2 Area Director, Senator, Local Presidents and associated educational and economic institutes (11 people)	NexGen provided an update on exploration and project development activities to begin dialogue on the Rook I Project. The topics included the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and the current PFS ▪ Environmental baseline summary ▪ Community commitment to training and procurement ▪ Commitment to Engagement

Table 5.2-2: Summary of Indigenous Engagement Activities

Birch Narrows Dene Nation			
Date	**Method**	**Audience**	**Scope**
February 1, 2017	Meeting with Elected Leadership	Chief and council (3 people)	NexGen provided an update presentation on exploration and project development activities, including the following: ▪ Overview and history of the Arrow Deposit ▪ Highlights of metallurgical work ▪ Conceptual project design ▪ Update on studies planned to feed into the EA ▪ Proposed 2017 activities including baseline studies and engagement planning
October 30, 2018	Meeting with Elected Leadership	Council and Band Manager (3 people)	NexGen provided an update on exploration and project development activities to begin dialogue on the Rook I Project. The topics included the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and the current PFS ▪ Environmental baseline summary ▪ Community commitment to training and procurement ▪ Commitment to Engagement *Note: due to weather, the meeting was delayed, and some participants were unable to attend.
Buffalo River Dene Nation			
Date	**Method**	**Audience**	**Scope**
February 1, 2017	Meeting with Elected Leadership	Chief, council, band manager and consultant (10 people)	NexGen provided an update presentation on exploration and project development activities, including the following: ▪ Overview and history of the Arrow Deposit ▪ Highlights of metallurgical work ▪ Conceptual project design ▪ Update on studies planned to feed into the EA ▪ Proposed 2017 activities including baseline studies and engagement planning
October 16, 2018	Meeting with Elected Leadership	Chief, council, band manager and consultant (7 people)	NexGen provided an update on exploration and project development activities to begin dialogue on the Rook I Project. The topics included the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and the current PFS ▪ Environmental baseline summary ▪ Community commitment to training and procurement ▪ Commitment to Engagement

Table 5.2-2: Summary of Indigenous Engagement Activities

Meadow Lake Tribal Council			
Date	**Method**	**Audience**	**Scope**
July 19, 2016	Meeting with Elected Leadership	Chief	Introductory meeting to introduce NexGen and learn more about the MLTC.
Northern Saskatchewan Environmental Quality Committee			
Date	**Method**	**Audience**	**Scope**
July 31, 2018	Meeting	NSEQC Manager	Introductory meeting and discussion of the role of the NSEQC in facilitating dialogue between industry and northern communities.
August 20, 2018	Site Tour	NSEQC Representative for La Loche	NexGen provided a tour of the Rook I site. The following areas were visited: ▪ Rook I camp ▪ Core processing and storage facilities ▪ Surface drill locations at Arrow deposit ▪ Cuttings management facility ▪ Weather station
November 28, 2018	Meeting	Members of NSEQC (19 people), representatives from the Ministry of Government Relations (3 people) and SMOE (3 people), as well as members of the public (~5 people)	NexGen provided an update on exploration and project development activities, including the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and summary of PFS results ▪ Environmental baseline summary ▪ Community commitment to training and procurement

[1] Métis Local 130 – Descharme Lake has been identified by the Province of Saskatchewan for engagement in relation to the Project. Information provided to NexGen indicates that Local 130 is not currently active. Dialogue with the Métis Region 2 leadership has indicated that Métis Local 130 is no longer established or recognized as a Métis Local and the area will instead be represented by the Region 2 council. NexGen will continue to attempt to engage with Local 130 until further clarification is provided.

In late 2018 NexGen enhanced engagement efforts in relation to the Project with elected leadership of those communities and organizations identified as being most likely to be affected by or to have expressed interest in the Project, as identified in Table 5.2-1. A presentation was provided at each meeting which included:

- an introduction to NexGen and key representatives;
- an overview of the project development process;
- an introduction to the proposed Rook I Project; and
- a discussion of environmental baseline studies.

During these meetings, NexGen provided an opportunity to discuss how each community would like to be engaged on the Project going forward so that future engagement specific to the Project can be conducted in a manner closely aligned with the specific needs of each community. A summary of these meetings is provided in Table 5.2-2.

In its commitment to environmental stewardship, NexGen has incorporated a number of design features providing industry leading environmental performance and this approach and concepts have received positive feedback from Indigenous communities and organizations such as the Northern Saskatchewan Environmental Quality Committee, including:

- the design to permanently store all tailings from the project underground in mined-out stopes and a purpose-built Underground Tailings Management Facility (UGTMF);
- the selection of a strong acid strip metallurgical process to eliminate ammonia from the processing facility which removes ammonia as a constituent of potential concern in treated effluent;
- the design and configuration of surface infrastructure to optimize water management, reduce freshwater consumption, optimize water treatment and minimize surface footprint of activities.

Table 5.2-3 provides a summary of key comments received during early engagement specific to Project development and responses provided to these comments. Any responses requiring further follow-up have been identified and are tracked to conclusion. A number of comments and questions have been received through these meetings and feedback is generally characterized within one of the following categories:

- Employment, business, training and general economic opportunities;
- Interest in participation, consultation and sharing of information;
- General questions about environmental performance related to uranium, mining and monitoring activities;
- Health and safety considerations related to future operation and transportation; and
- Consideration of land use and traditional knowledge in process.

Table 5.2-3: Summary of Feedback Received during Engagement Activities

Métis Nation Saskatchewan – Region 2	
Feedback Received	**NexGen Response**
Interested in participating in the drill helper training course.	The opportunity will be advertised locally, and all candidates will be from the local region.
Interested in job opportunities for recent environment student graduates.	Interested students can apply for work with either NexGen or the consulting firms doing many of the baseline studies.
Would like to negotiate an MOU that will feed into an Impact Benefit Agreement (IBA) as the project progresses.	NexGen is committed to providing opportunities to local residents and businesses; we are working on evaluating impacts and are not in a position to discuss formal agreements at this point in time.
Would like to create economic opportunities for Métis communities within the region.	We look forward to working together in support of this goal.
Would like employment opportunities to go beyond entry level positions.	We look forward to working together in support of this goal.

Table 5.2-3: Summary of Feedback Received during Engagement Activities

Métis Nation Saskatchewan – Region 2	
Feedback Received	**NexGen Response**
Employment forecasting would be useful in developing training plans for community members.	We will provide forecasting once the PFS is released and are happy to work with you to help prioritize and ensure timing is aligned with project development.
Will we be able to fish and trap in the area, or will the lake (Patterson Lake) be blocked off?	The lake will not be blocked off though access to the work site will be restricted; you will be able to continue to fish and trap in the area.
Are their regional environmental studies available to show cumulative effects?	There are regional studies (Eastern Athabasca Regional Monitoring) in northern Saskatchewan around the uranium operations in the east that show water and food sources remain safe. There are no studies specific to the area that we are aware of but environmental baseline studies will provide further details.
Information on if there is a link between uranium mining and increased cancer rates.	The CNSC sponsored a study to look at relationship between lung cancer and radon exposure from modern (post 1975) uranium mines in northern Saskatchewan. ACTION: We can search out this information and provide at a later date.
Concerned about the transportation of mined uranium through the communities.	A transportation plan will be created as part of the licensing documents that will address concerns related to transportation of uranium concentrate by road.
Buffalo River Dene Nation	
Feedback Received	**NexGen Response**
Interested in economic opportunities and to be included in tendering.	NexGen is committed to providing opportunities to local residents and businesses.
Interested in increasing participation of First Nations, and long-term benefits to First Nations by considering partnerships.	NexGen is committed to providing opportunities to local residents and businesses.
Training opportunities for environmental positions, not just labour or entry-level.	We look forward to working together in support of this goal.
Is NexGen doing wildlife behavior studies, will changes to wildlife over time be considered, and will there be an impact to wildlife?	We are collecting baseline data on wildlife that will feed into design to minimize impact on wildlife, and so that we can track changes over time. As these studies are ongoing it is too early to speak to any impacts on wildlife.
Would like to Include elders in environmental monitoring.	Noted.
Request to see the project boundaries in relation to the treaties.	ACTION: This information will be provided for our next meeting.

Table 5.2-3: Summary of Feedback Received during Engagement Activities

Birch Narrows Dene Nation	
Feedback Received	**NexGen Response**
Requested to be included in postings for the summer student/mentorship program.	We will notify you directly when applications are open.
Interested in training opportunities, including the drill training course and others.	We are looking to continue the drill training program throughout 2019 and will notify you when applications are open.
Interested in the opportunity to participate in economic opportunities at all project stages. Please include us in tendering opportunities.	NexGen is committed to providing opportunities to local residents and businesses; we will notify you of any tendering opportunities.
Concerned with the potential impact on the waterways.	As we work on developing the proposed mine and mill designs, and at all stages of the project, NexGen is looking to minimize the impact on the environment.
Requested a community forum/meeting to ensure that all community members have an opportunity to participate.	NexGen is committed to early and ongoing engagement. While at this stage of early engagement, we are focused on building relationships with elected leadership, there will be opportunities for public meetings so that all community members have the opportunity to participate.
What is NexGen's consultation plan?	NexGen is committed to early and ongoing engagement. We will work together with you to determine how to best engage on the project.
Noted a lack of capacity to engage in a meaningful way, and that there are no staff dedicated to lands and resources.	There is participant funding available from the government during the consultation process.
Interest in the Crown's role in the engagement and permitting process.	This is early, proponent-lead engagement as it relates to the proposed mine and mill development at Rook I.
Northern Saskatchewan Environmental Quality Committee	
Feedback Received	**NexGen Response**
Noted that land use studies mean different things to different people, and that traditional land use requires input from the local communities and that traditional lands often overlap. There is a desire for government to assist communities with completing land use studies that are done by academics and are legally valid. We applaud the efforts by industry, but their needs are specific to their projects. The government should assist in broader reports.	As part of the EA process we are planning on working with communities to identify traditional and current land use.
We are glad to hear that you are planning to put tailings back underground. Is this expensive, and has it been done before?	There is a cost associated with putting tailings underground, but when considering the environmental benefits, including progressive decommissioning, there is a business case to support it.
Have you done any studies on Woodland Caribou?	As part of the terrestrial baseline studies, Woodland Caribou are considered along with other terrestrial wildlife.
Is it true that you will be draining a lake?	No, the deposit is located below land. There are no plans, and never have been any plans, for NexGen to drain a lake to develop the Arrow Deposit.
Will you be releasing treated discharge into a large lake?	Early designs have treated effluent reporting north into Patterson Lake. We are working to incorporate design features that minimize water consumption and reuse water when possible.

Table 5.2-3: Summary of Feedback Received during Engagement Activities

Clearwater River Dene Nation	
Feedback Received	**NexGen Response**
Would like environmental consultants to have local employees in the field with them; Clearwater would like input into selecting who is hired and would also like to see independent environmental monitoring and water stations.	During the baseline studies the consultants hired members from the local community, with candidates identified through recommendations such as from the N-19 Fur Trappers Association.
The community should have input into what they are using the land for and which plants are important for medicine etc. as part of the baseline studies.	Baseline studies were planned using regulatory guidance as well as information from past studies in northern Saskatchewan. Identifying valued components (VCs) is an important part of the environmental assessment and would be happy to work with the communities to identify relevant VCs for further studies.
Land use studies are important to look at how treaty rights are being exercised and putting it into context with what's going on in the region. We want to be very involved in the development of the land use studies to make sure they are accurate. There are no land use studies completed for this area.	We are committed to working together in this regard and to considering any land use studies that are done specific to the Rook I project area.
Insufficient support from the Province to date in regard to consultation.	Noted, no response provided.
Would like to see and have input into the project description prior to it being submitted. Once items are put into the project description it is difficult to get them changed.	This is not the usual process, and during the environmental assessment there will be opportunities for review and input. The parallel process of completing the environmental impact statement while completing the feasibility study will include engagement and allow for information provided during engagement to be considered in the design. However, we will consider your request to see the project description before it is submitted.
Clearwater River Dene Nation	
Feedback Received	**NexGen Response**
We would like to define an engagement process and set out steps and timelines. We will issue a letter in this regard.	We are committed to working together in this regard and look forward to receiving your letter.
Capacity and funding will be a concern throughout this process. Participant funding provided by the government is inadequate and provided too late in the process.	Participant funding is available through the environmental assessment process.
Why are you using paste fill, and has it been done before?	We are considering using paste fill to minimize the surface disturbance and avoid long-term storage of tailings on surface. It has been done before in other mining sectors.
How many trucks per day (or per week) will be leaving site?	Unsure of the exact number, but as uranium production is measured in pounds, not tonnes, it is a relatively small number of trucks required to transport the concentrated product.
Why aren't you considering using an existing mill?	It would require putting a road in across a significant portion of the province and transporting a significant volume of broken muck or slurry. The Arrow deposit justifies a stand-alone operation, including a mill.

Table 5.2-3: Summary of Feedback Received during Engagement Activities

Clearwater River Dene Nation	
Feedback Received	**NexGen Response**
Independently and through MLTC we are involved in many business ventures that could support development. We don't want another Cluff Lake, where La Loche was overlooked and did not see benefits from the development.	We are committed to doing things better than they have been done in the past. NexGen supports the local breakfast program and minor sports, and we also use and actively see out local businesses to provide goods and services for Rook I. We ask that you continue to judge us by our actions.

5.2.3 Engagement Plan

NexGen has developed an engagement plan specific to the Project and the EA process. The approach to engagement represents an extension of engagement activities that have been conducted to-date, reflects NexGen's emphasis on meaningful engagement and takes into consideration guidance provided by both provincial and federal governments. NexGen is committed to listening to community concerns and responding appropriately. While the engagement plan outlined below has identified specific activities, it is acknowledged that engagement is a dynamic process and, in this context, NexGen intends to maintain a degree of flexibility in this approach in order to incorporate feedback from the communities on the process.

This engagement plan takes into consideration CNSC guidance with respect to the Consultation Activity Spectrum as outlined in REGDOC-3.2.2 (Figure 5.2-2). The Activity Spectrum reflects that potential impacts to Indigenous and/or treaty rights will vary between communities with engagement conducted proportionally to the likelihood of an impact on these rights. In short, not all communities will desire or require the same degree of engagement.

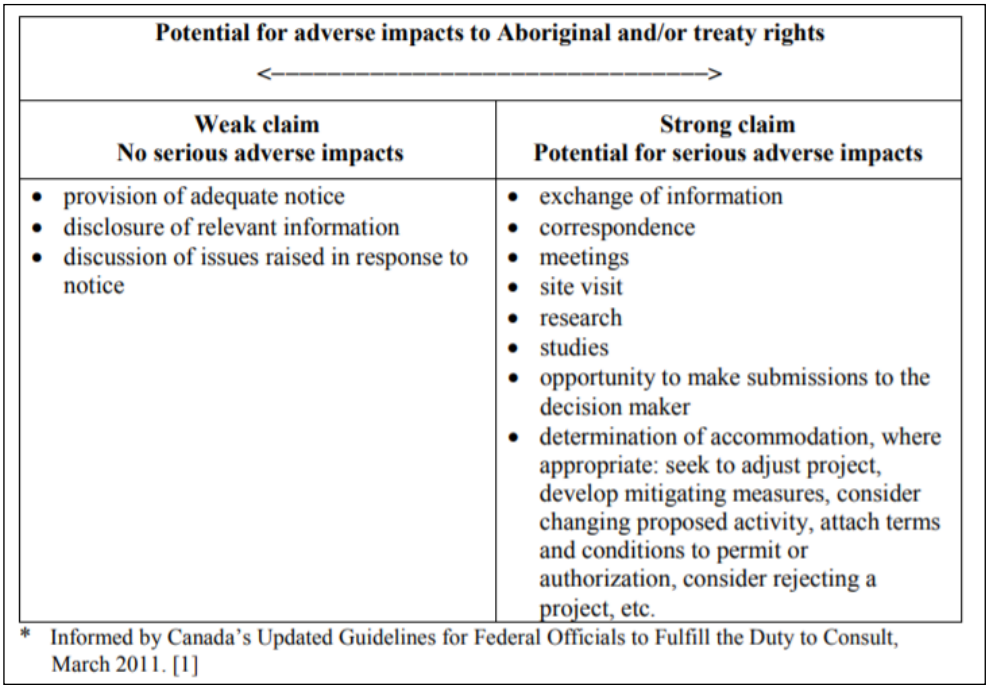

Figure 5.2-2: CNSC's Consultation Activity Spectrum

As relationships already exist with several communities, NexGen will continue to engage in a progressive manner reflective of each community's level of understanding of the Project to date. The overall process is intended to begin with notification about the commencement of the EA and licensing process, and will seek to work collaboratively with communities in determining the exact process.

The following provides a summary of NexGen's Indigenous Engagement Plan for the Project:

Notification: Upon initiation of the EA and licensing process, NexGen will provide notification by mail to all First Nations and Métis communities and organizations identified in Table 5.2-1. The mail-out package will provide a complete overview of the Project, where to find additional information, contact details and mechanisms for providing comments and/or questions to NexGen. Follow-up will be conducted by phone to make sure information has been received and to provide further opportunity for questions or comments. From there, NexGen will work with communities to determine the need or desire for further dialogue on the Project.

Meeting to initiate engagement on the EA process: An initial meeting to introduce the Project (and/or review the Project Description) will be arranged with those communities or groups with an expressed interest in being engaged on the Project. The meeting will provide an introduction, information specific to the Project, and an opportunity for discussion of any potential Indigenous or treaty rights, land use or other interests or concerns in relation to the Project. The initial meeting will also seek clarification from communities on how they want to be engaged in the EA process as it moves forward.

Joint Work Planning: As part of and in follow-up to these initial meetings, NexGen will work with interested communities and groups to define the process for Project engagement specific to each community or group. The nature and extent of future engagement is expected to vary among communities and groups, but NexGen is committed to keeping interested communities and groups informed at each stage of the process. Community-specific engagement may include a variety of methods to gain feedback from First Nations and Métis groups or organizations and the most appropriate methods of engagement will be determined in dialogue with community representatives. NexGen is also committed to working with communities to support their involvement in the EA process and build capacity as it relates to the Project.

The types of approaches and capacity building provisions that may be considered in the process include:

- meetings with elected leadership;
- workshops, presentations and/or open-house events in communities and/or at site;
- dedicated NexGen contact for communications;
- establishment of a regional community liaison office in La Loche;
- development of a community advisory committee with representation from each community;
- articles or announcements in local or regional media; and
- information provision through the company website (www.nexgenenergy.ca).

Work Plan Implementation: NexGen will undertake engagement with communities based on the workplans developed for each community and organization for which workplans were developed.

Follow up Activities: Based on outcomes of the various meetings and engagement forums, follow-up will be conducted throughout the engagement process.

Project related information shared or exchanged during this process is expected to include but not be limited to the following:

- Project details, including design features and anticipated project related activities;
- information on the EA process, associated activities and other regulatory processes;
- information on environmental interactions and potential or identified impacts;
- as applicable, information specific to potential effects on land use or traditional activities;
- information pertaining to any health and safety concerns;
- as applicable, information on changes in the project design, planning or timelines; and
- as applicable, follow-up on feedback/questions from engagement activities.

The overall process will also seek to enable dialogue that supports the inclusion of Indigenous Knowledge (or Traditional Knowledge), Traditional Land Use, and other studies as may be considered of value to these communities as part of the assessment process. Capacity funding to support engagement for each Indigenous community or group will be considered and provided by NexGen on a case-by-case basis, with the overall intent to provide meaningful opportunities to share and exchange information. This may include, but is not limited to, provision of funding to support Indigenous knowledge and traditional land use studies, technical reviews, and community workshops. Future communication with Indigenous communities and groups will seek to provide clarity on NexGen's approach to supporting capacity development for each group.

Meetings will be documented through detailed meeting notes and/or minutes. NexGen maintains a database of engagement records and information will continue to be added to compile a complete record of formal engagement activities during the initial licensing phase and continuing through the life-cycle of the Project.

While the planned engagement activities outlined above are largely specific to the EA, licensing, design and planning process, NexGen remains committed to ongoing sustainable engagement with the communities and will continue to update and evolve plans for continued engagement as the Project proceeds.

Interim status reports will be provided annually to the CNSC outlining progress against the plan outlined above. Information provided in the report will include a summary of meetings and activities, feedback received through engagement and any other relevant information pertaining to engagement with identified communities. A consultation report will be included in the EIS submission.

NexGen's approach to engagement is not intended to replace the government's duty to consult obligations with respect to the Project though it is recognized that engagement conducted by NexGen may be used to inform or satisfy procedural aspects of the Crown's consultation process. NexGen is committed to working with provincial and federal authorities and will provide regular update on planned activities as engagement is undertaken. NexGen is also willing to provide opportunity or facilitate government participation during NexGen lead engagement activities.

5.3 Public Engagement

Engagement with the public in relation to the Project, both in a local and general context, is recognized as an important component of the environmental assessment process. While the public will have the opportunity to review and provide feedback on Project-related regulatory submissions as part of the provincial and federal EA processes, NexGen is also

committed to disclosing relevant Project information to the public during this process. In a local and regional context, NexGen is also committed to meaningful dialogue with members of the public with direct interest in the Project and to considering this feedback during the EA, planning and design phase and throughout the lifecycle of the Project.

NexGen's approach to public engagement has been developed with consideration for the CNSC *REGDOC-3.2.1 Public Information and Disclosure* and is based on ensuring that engagement is inclusive, timely and that the information provided is accurate, accessible, and understandable. The public engagement plan for the Project is intended to:

- achieve a consistent and accurate understanding among public stakeholders of the Project activities, components, scope, and the measures proposed for preserving human health and protecting the environment;
- encourage feedback from public stakeholders, systematically document any feedback received, and address and/or incorporate relevant comments into the Project design, where possible; and
- fulfill all applicable legal obligations.

For the purposes of public engagement, public stakeholders fall into one of the following categories:

- individuals: includes property owners and land users (e.g., trappers, recreational users);
- businesses: includes providers of goods and services;
- organizations: includes trade associations, special interest groups, and non-profit organizations; and
- communities: includes elected leadership and community members.

NexGen has identified and will utilize a number of communication methods to share information with the public, including, but not limited to:

- letters;
- emails;
- brochures, pamphlets and newsletters;
- presentations;
- meetings, open-houses, townhalls, site tours;
- advertisements and articles in local and regional media, and
- postings on the Corporate website.

Typically, the influence of the Project on the public, and the level of anticipated interest, are based on their relative geographic proximity to the Project site. Consequently, NexGen has adopted a proximity-based approach to public engagement. While transparent, complete, accessible, and understandable information will be made available to all interested members of the public, more direct engagement will be undertaken with members of the public in closest proximity to the Project. A summary of NexGen's approach to public engagement and associated means of communication are summarized in Table 5.3-1.

Table 5.3-1: Public Engagement Categories and Communication Methods

Category	Description	Communication Methods
General	Includes the general public, interested citizens and other interest groups not likely to be directly or indirectly influenced by the Project whom may be interested in learning about the Project.	▪ Local media (print, radio, social media) ▪ Corporate website ▪ General inquiry phone line and email address
Northern Administrative District	Includes the larger Northern Administrative District (NAD) of Saskatchewan and the broader organizations and groups representing or represented within this region.	▪ Regular meetings and updates ▪ Annual tour to northern communities ▪ Meetings with designate representatives ▪ Site tours ▪ Local media (print, radio, social media) ▪ Corporate website ▪ General inquiry phone line and email address
Regional	Includes communities, business and community organizations, and other interest groups located in the northwest region of Saskatchewan located along or accessed primarily from Highway 155 or Highway 955.	▪ Letters to elected leadership/representatives ▪ Direct meetings with leadership/representatives ▪ Public meetings or open houses ▪ Workshops ▪ Regional liaison office (La Loche) ▪ Local media (print, radio, social media) ▪ Corporate website ▪ General inquiry phone line and email address
Local	Includes individuals, communities, businesses, or organizations located within close proximity of the Project or whom could reasonably be expected to be directly influenced by the Project.	▪ Letters and information packages ▪ Direct meetings and presentations ▪ Site tours ▪ Public meetings and open houses ▪ Workshops ▪ Regional liaison office (La Loche) ▪ Local media (print, radio, social media) ▪ Corporate website ▪ General inquiry phone line and email address

The following sub-sections provide information on public engagement conducted to date in relation to the Project, and an overview of the ongoing public engagement plan for the Project.

5.3.1 Activities Completed to Date

Since exploration began in 2013, NexGen has worked to proactively share information regarding exploration activities and to establish relationships with residents, businesses, organizations, and leadership from communities in closest proximity to the Project and in 2016, expanded this engagement to communities beyond the local area. This includes both formal engagement as well as participation in community events, initiatives and programs.

As Project development has advanced, outreach activities have shifted to focus on Project-specific engagement which includes the sharing of information related to Project status, scope, and conceptual mining, milling, and waste management strategies. Communication with the public has occurred in many forms, including but not limited to, the following:

- notification letters (prescribed list of stakeholders);
- email communication;
- local media;
- meetings;

- site tours; and
- participation in local events.

An overview of all public engagement completed to date including any feedback received is provided in Table 5.3-2.

Table 5.3-2: Summary of public engagement activities

Date	Method	Audience	Scope
Northern Village of La Loche			
May 18, 2013	Meeting with Elected Leadership	Mayor and council (5 people)	Introduction to NexGen and discussion regarding proposed exploration program.
November 25, 2013	Meeting with Elected Leadership	Mayor and council (5 people)	Update and discussion regarding proposed exploration program.
August 25, 2015	Meeting with Elected Leadership	Mayor, council and community member (6 people)	Exploration Update
January 14, 2016	Meeting with Elected Leadership	Mayor, council and community member (7 people)	Discussion regarding the upcoming drill program and highlights of the planned environmental baseline studies. Discuss local employment and procurement opportunities.
March 15, 2016	Meeting with Elected Leadership	Mayor and council (7 people)	Update on winter drill program and access road construction.
February 27, 2017	Meeting with Elected Leadership	Mayor and Council (7 people)	NexGen provided an update presentation on exploration and project development activities, including the following: ▪ Overview and history of the Arrow Deposit ▪ Highlights of metallurgical work ▪ Conceptual project design ▪ Update on studies planned to feed into the EA ▪ Proposed 2017 activities including baseline studies and engagement planning
April 26, 2017	Site Tour	Council and Methy Construction (5 people)	NexGen provided a tour of the Rook I site for council and members of the town-run construction company. The following areas were visited: ▪ Rook I camp ▪ Core processing and storage facilities ▪ Surface drill locations at Arrow deposit This tour provided an opportunity for dialogue and opportunity for the council to increase their knowledge of activities at Rook I.
October 12, 2017	Meeting with Elected Leadership	Chief, Director, President and Mayor (4 people)	Meeting requested by the town, Métis Local, Métis Region and the Clearwater River Dene Nation to acknowledge the close ties between their communities and to communicate that they, collectively, want to ensure that La Loche and the Clearwater River Dene Nation are considered for economic opportunities that arise from NexGen's exploration and development activities.

Table 5.3-2: Summary of public engagement activities

Date	Method	Audience	Scope
Northern Village of La Loche			
January 23, 2018	Meeting with Elected Leadership	Mayor and Council (5 people)	NexGen provided an update presentation that included the following: ▪ Overview of the Rook I site ▪ Exploration History and 2018 plans ▪ Update on timeline for PFS ▪ Overview of planned environmental baseline studies ▪ Conceptual mine design ▪ Highlights of community outreach initiatives.
December 5, 2018	Meeting with Elected Leadership	Mayor, Council & Town Administrator (6 people)	NexGen provided an update on exploration and project development activities, including the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and summary of PFS results ▪ Environmental baseline summary ▪ Community commitment in relation to training and procurement
Northern Settlement of Descharme Lake			
Date	**Method**	**Audience**	**Scope**
March 11, 2014	Meeting with Elected Leadership	President and community members (6 people)	Update and discussion regarding proposed exploration program.
February 14, 2016	Letter	President and community member (2 people)	Notification of exploration permit application.
March 6, 2016	Meeting with Elected Leadership	President, chairman, council and community members (12 people)	Update on winter drill program and access road construction.
April 5, 2016	Public Meeting	Chairman, Métis Local Presidents and community members (17 people)	A planned information session for elected leadership turned into a public meeting. NexGen provided an introduction of the Rook I Project and the team, as well as the planned 2016 work program. There was a request for more information, more consultation and financial compensation.
April 6, 2016	Letter	President and Chairman (2 people)	Response to April 5th meeting, and commitment to ongoing engagement.
Northern Village of Buffalo Narrows			
Date	**Method**	**Audience**	**Scope**
April 6, 2016	Meeting with Elected Leadership	Mayor, council & economic development board members (6 people)	Update on exploration activities to date at Rook I, and an overview of planned activities for 2016 including proposed environmental and engagement activities.

Table 5.3-2: Summary of public engagement activities

Buffalo Narrows Economic Development Corporation			
Date	**Method**	**Audience**	**Scope**
April 6, 2016	Meeting with Elected Leadership	Board Members (5 people)	Introduction and discussion of economic opportunities.
February 16, 2017	Meeting with Elected Leadership	Board Members (11 people)	NexGen provided an update presentation on exploration and project development activities, including the following: ▪ Overview and history of the Arrow Deposit ▪ Highlights of metallurgical work ▪ Conceptual project design ▪ Update on studies planned to feed into the EA ▪ Proposed 2017 activities including baseline studies and engagement planning
N-19 Trappers Association			
Date	**Method**	**Audience**	**Scope**
November 25, 2013	Meeting with Elected Leadership	Chairman, board and community members (26 people)	Requested by N19 Trappers Association to discuss trappers' rights and recent dissolution of Descharme Lake community.
March 15, 2018	Meeting with Elected Leadership	Chairperson	Introductory meeting with the Chairperson of the N-19 Trappers Association.
December 5, 2018	Meeting with Elected Leadership	Chairperson and Board (4 people)	NexGen provided an update on exploration and project development activities, including the following: ▪ Company introduction and overview ▪ Description of Rook I and Arrow deposit ▪ PEA highlights and summary of PFS results ▪ Environmental baseline summary ▪ Community commitment to training and procurement
La Loche Friendship Center			
Date	**Method**	**Audience**	**Scope**
March 15, 2016	Meeting	Director	Update on the activities at Rook I including results to date for the winter drill program.
RCMP - La Loche Detachment			
Date	**Method**	**Audience**	**Scope**
March 16, 2016	Meeting	Staff Sargent	Introductory meeting.
April 5, 2016	Letter to	Staff Sargent	Update Letter.

Table 5.3-3 provides a summary of key comments received during early engagement, specific to Project development, and any responses provided to these comments.

Table 5.3-3: Summary of Feedback Received during Public Engagement Activities

Northern Village of La Loche	
Feedback Received	**NexGen Response**
Concerns regarding water use, treatment and ongoing monitoring.	Current use for exploration is permitted and work is done in accordance with the permits. The proposed mine development design will look to minimize water use, maximize recycling and optimize the overall system. During operations there will be programs in place to monitor water quality and prevent adverse impact to the environment.
Would like the opportunity to review the project details and have input into the design to protect the environment and provide opportunity for local employees. We want to ensure that we don't make the same mistakes we did with Cluff Lake.	We are committed to working together throughout the entire life-cycle of the project. As evident by our work to date, NexGen is committed to providing opportunities locally. We will work to continue this trend.
N-19 Trappers Association	
Feedback Received	**NexGen Response**
Previously the general area was used for trapping by some local families. While those who actively used the area have passed away, the families may want to trap there again in the future. Would like to set up a meeting with the families of the deceased trappers from the area to discuss further.	We are unaware of this situation but would be happy to meet with these individuals.
Would like environmental jobs and monitoring to include members from the local community, especially if that person is able to explain things to the community.	The recent baseline environmental work included employees from the local community.
We would like to set up a site tour for the N-19 Trappers Association.	We would be happy to provide a tour; will touch base in the new year.

5.3.2 Engagement Plan

A preliminary listing of public stakeholders identified with known or potential interest in the Project is provided in Table 5.3-4. The number of stakeholders involved as part of the public engagement process is anticipated to evolve as the Project advances, engagement continues and information is more widely disseminated.

Engagement with the public has been ongoing at all levels, however efforts will be expanded following initiation of the EA process. Information disclosed through the corporate website will be updated regularly to provide current and relevant information on the Project. Communications through media will be expanded to provide broader information within the region and broader NAD. Specific to local and regional areas, meetings will be held with elected leadership, organizations as well as local business and residents to provide information on the Project and directly solicit feedback following the initiation of the EA process.

NexGen will work with provincial and federal authorities to provide updates on the progress of engagement activities and the feedback received. Opportunities will be provided for authorities to observe or participate during the engagement process, through invitation to attend public meetings, open-houses or other forums.

As noted above, NexGen is fully committed to ensuring relevant Project-related information is disclosed to members of the public throughout the entire life-cycle of the Project. In addition to the public engagement strategy noted herein, a program specifically outlining NexGen's public information and disclosure plans will be developed and submitted to the CNSC for approval as part of the CNSC licensing process. This program will further detail NexGen's approach to disclosure of relevant and important information to the public through all phases of the Project.

Table 5.3-4: Public Stakeholders Currently Identified

	Individuals	Communities	Businesses	Organizations
General	▪ Various (none currently specified)	▪ Various (none currently specified)	▪ Various (none currently specified)	▪ Various (none currently specified)
Northern Administrative District	▪ None currently specified	▪ None currently specified	▪ None currently specified	▪ Northern Saskatchewan Environmental Quality Committee ▪ Northern Career Quest ▪ Beaver River Community Futures ▪ Clarence Campeau Development Fund ▪ SaskMétis Economic Development Corporation ▪ Northlands College ▪ Gabriel Dumont Institute
Regional	▪ None currently specified	▪ La Loche ▪ Bear Creek ▪ Turnor Lake ▪ Dillon ▪ Buffalo Narrows ▪ Ile-a-la-Crosse ▪ Beauval ▪ Green Lake	▪ None currently specified	▪ La Loche Economic Development Corporation ▪ Buffalo Narrows Economic Development Corporation ▪ Sakitawak Economic Development Corporation
Local	▪ Cabin owners (Jed Lake)	▪ Northern Settlement of Descharme Lake	▪ Big Bear Contracting ▪ Forrest Lake Outfitters ▪ Wolverman Wilderness Outfitters ▪ PR Services Co ▪ Crudge Holdings	▪ N-19 Trappers Association

6.0 CONCLUSION

The Project includes the development and operation of a new uranium mine and mill in northern Saskatchewan to be operated by NexGen. The Project includes underground and surface facilities to support the mining and processing of uranium ore from the Arrow deposit. The main components include:

- underground mine development;
- an on-site mill to process an average of 1,400 tonnes of ore per day;
- surface facilities to support the short and long-term storage of waste rock and ore;
- an UGTMF;
- water handling infrastructure and an effluent treatment circuit with associated treated effluent discharge; and
- additional infrastructure that will include a camp for personnel, an airstrip and supporting waste and water management facilities, a maintenance shop, warehouse, and offices.
- NexGen understands that the Project likely meets the requirements of a federal and provincial environmental assessment and that this document provides sufficient information for regulators to make such a determination and determine the basis for the EA. NexGen believes that the coordinated federal-provincial environmental assessment will adequately assess the impacts of the Project on the biological and socio-economic environments.

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APPENDIX A

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
	1.0	GENERAL INFORMATION		1.0
1	1.2.1	Name of the Project	Name of the designated project	1.2 Project Overview
1	1.1	Nature of the Project	Nature of the designated project	2.0 Project Information
1	1.1	Proposed location of the Project	Proposed location of the project	1.2 Project Overview
2	1.2	Name of the Proponent and contact information, and the name and contact information of their primary representative for the purpose of the project description.	Provide proponent contact information: ▪ Name of the proponent ▪ Address of the proponent ▪ Chief Executive Officer or equivalent ▪ Principal contact person for purposes of the project description	1.3 Proponent Information
3	1.3	A description of and the results of any consultations undertaken with any jurisdictions and other parties including Aboriginal peoples and the public.	Provide a list of any jurisdictions and other parties including Aboriginal groups and the public that were consulted during the preparation of the project description	1.6 Overview of Engagement to Date 5.0 Engagement
4	1.4	The environmental assessment and regulatory requirements of other jurisdictions.	Provide information on whether the designated project is subject to the environmental assessment and/or regulatory requirements of another jurisdiction(s)	1.6 Environmental Assessment and Regulatory Requirements
4.1	1.5	A description of any environmental study that is being or has been conducted of the region where the project is to be carried out.	Provide information on whether the designated project will be taking place in a region that has been the subject of an environmental study.	3.0 Existing Environment
	2.0	PROJECT INFORMATION		2.0
5	2.1	A description of the project's context and objectives.	Provide a general description of the project, including the context and objectives of the project. Indicate whether the designated project is a component of a larger project that is not listed in the *Regulations Designating Physical Activities*	2.0 Project Information
6	2.2	The provisions in the schedule to the *Regulations Designating Physical Activities* describing the project in whole or in part.	Indicate the provisions in the schedule to the *Regulations Designating Physical Activities* that describe the designated physical activities that are proposed to be carried out as part of the designated project	2.0 Project Information
7	2.3		Components and activities. Provide a description of the components associated with the designated project, including:	2.2 Project Phases and Schedule 2.3 Project Activities Components

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
7	2.3.1	A description of the physical works that are related to the project including their purpose, size and capacity.	The physical works associated with the designated project including their purpose, approximate dimensions, and capacity. Include existing structures or related activities that will form part of or are required to accommodate or support the designated project.	2.3 Project Activities and Components
8	2.2.2	The anticipated production capacity of the project and a description of the production processes to be used, the associated infrastructure and any permanent or temporary structures.	Anticipated size or production capacity of the designated project, with reference to thresholds set out in the *Regulations Designating Physical Activities*, including a description of the production processes to be used, the associated infrastructure, and any permanent or temporary structures.	1.2 Project Overview 2.3 Project Activities and Components
	2.2.3		If the designated project or one component of the designated project is an expansion, describe the size and nature of the expansion with reference to the thresholds set out in the *Regulations Designating Physical Activities*	N/A
9	2.3.4	A description of all activities to be performed in relation to the project	A description of the physical activities that are incidental to the designated project	2.12 Ancillary Projects
10	2.4	A description of any waste that is likely to be generated during any phase of the project and of a plan to manage the waste.	Provide a description of any waste that is likely to be generated during any phase of the designated project and plans to manage that waste, including the following:	Section 2 and Section 4
10	2.4.1		Sources of atmospheric contaminant emissions during the designated project phases and location of emissions	4.2.1 Atmospheric Environment
10	2.4.2		Sources and location of liquid discharges	2.4 Water Management
10	2.4.3		Types of wastes and plans for their disposal	2.7 Waste Management
11	2.5	A description of the anticipated phases of and the schedule for the project's construction, operation, decommissioning and abandonment.	Provide a description of the timeframe in which the development is to occur and the key project phases, including the following:	2.2 Project Phases and Schedule
11	2.5.1		Anticipated scheduling, duration and staging of key project phases, including preparation of the site, construction, operation, decommissioning and abandonment	2.2 Project Phases and Schedule
11	2.5.2		Main activities in each phase of the designated project that are expected to be required to carry out the proposed development	2.2 Project Phases and Schedule

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
	3.0	PROJECT LOCATION		
12	3.1	A description of the project's location, including:	Provide a description of the designated project's location including:	
12(a)	3.1.1	Its' geographic coordinates	Coordinates (i.e. longitude/latitude using international standard representation in degrees, minutes, seconds) for the centre of the facility or, for a linear project, provide the beginning and end points	Section 1.2 Project Overview
12(b)	3.1.2	Site maps produced at an appropriate scale in order to determine the project's overall location and the spatial relationship of the project components	Site map/plan(s) depicting location of the designated project components and activities. The map/plan(s) should be at an appropriate scale to help determine the relative size of the proposed components and activities	Figures 1.2-1 and 2.3-1
12(b)	3.1.3	Site maps produced at an appropriate scale in order to determine the project's overall location and the spatial relationship of the project components	Map(s) at an appropriate scale showing the location of the designated project components and activities relative to existing features, including but not limited to: ▪ watercourses and waterbodies with names where they are known ▪ linear and other transportation components ▪ other features of existing or past land use ▪ location of Aboriginal groups, settlement land (under a land claim agreement) and, if available, traditional territory ▪ federal lands including, but not limited to National parks, National historic sites, and reserve lands ▪ nearby communities ▪ permanent, seasonal or temporary residences ▪ fisheries and fishing areas ▪ environmentally sensitive areas ▪ provincial and international boundaries	Section 1.2; Figures 2.3-1; 3.3-1; 3.4-1 and 3.9-1
	3.1.4		Photographs of work locations to the extent possible	Figure 2.3-1
12(d)	3.1.5	The project's proximity to any permanent, seasonal or temporary residences	Proximity of the designated project to: ▪ any permanent, seasonal or temporary residences	Section 3.8

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
12(e)	3.1.5	The project's proximity to reserves, traditional territories as well as lands and resources currently used for traditional purposes by Aboriginal peoples	▪ traditional territories, settlement land (under a land claim agreement) as well as lands and resources currently used for traditional purposes by Aboriginal peoples	Sections 3.7 and 3.8
12(f)	3.1.5	The project's proximity to any federal lands	▪ any federal lands	Section 1.2
	3.2		Land and Water Use To the extent that is known at this time, describe the ownership and zoning of land and water that may be affected by the project, including the following:	Not applicable
	3.2.1		Zoning designations	Not applicable
12(c)	3.2.2	The legal description of land to be used for the project, including the title, deed or document and any authorization relating to a water lot	Legal description of land to be used (including information on sub-surface rights) for the designated project, including the title, deed or document and any authorization relating to a water lot	Section 1.0
	3.2.3		Any applicable land use, water use (including ground water), resource management or conservation plans applicable to or near the project site. Include information on whether such plans were subject to public consultation	Sections 3.8.1 and 3.8.2
	3.2.4		Describe whether the designated project is going to require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Aboriginal peoples	Section 3.8
	4.0	**FEDERAL INVOLVEMENT – FINANCIAL SUPPORT, LANDS, & LEGISLATIVE REQUIREMENTS**		
13	4.1	A description of any financial support that federal authorities are, or may be, providing to the project	Describe if there is any proposed or anticipated federal financial support that federal authorities are, or may be, providing to support the carrying out of the designated project	Section 1.2
14	4.2	A description of any federal land that maybe used for the purpose of carrying out the project	Describe any federal lands that may be used for the purpose of carrying out the designated project. This is to include any information on any granting of interest in federal land (i.e., easement, right of way, or transfer of ownership)	Section 1.2
15	4.3	A list of permits, licences or other authorizations that may be required under any Act of Parliament to carry out the project	Provide a list of any federal permits, licences or other authorizations that may be required to carry out of the project	1.5 Environmental Assessment and Regulatory Requirements

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
	5.0	ENVIRONMENTAL EFFECTS		
16	5.1	A description of the physical and biological setting	A description of the physical and biological setting, including the physical and biological components in the area that may be adversely affected by the project	Section 3.0
17	5.2	A description of any changes that may be caused, as a result of carrying out the project, to (a) fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act* (b) aquatic species as defined in subsection 2(1) of the *Species at Risk Act* (c) migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*	A description of any changes that may be caused as a result of carrying out the designated project to: ▪ fish and fish habitat, as defined in the *Fisheries Act* ▪ marine plants, as defined in the *Fisheries Act* ▪ migratory birds, as defined in the *Migratory Birds Convention Act, 1994*	Section 4.0
18	5.3	A description of any changes to the environment that may occur, as a result of carrying out the designated project, on federal lands, in a province other than the province in which the project is proposed to be carried out, or outside of Canada	A description of any changes to the environment that may occur, as a result of carrying out the designated project, on federal lands, in a province other than the province in which the project is proposed to be carried out, or outside of Canada	Section 4.2
19	5.4	Information on the effects on Aboriginal peoples of any changes to the environment that may be caused as a result of carrying out the project, including effects on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposed or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	A description of the effects on Aboriginal peoples of any changes to the environment that may be caused as a result of carrying out the designated project, including effects on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	Sections 3.8 and 4.0

Table of Concordance with CEAA 2012 Regulation SOR/2012-148 ("Regulation") and Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act, 2012 ("Guide")

Regulation Clause	Guide Section	Regulation Requirement	Guide Requirement	PD Section(s)
	6.0		**PROPONENT ENGAGEMENT AND CONSULTATION WITH ABORIGINAL GROUPS**	
	6.1		A list of Aboriginal groups that may be interested in, or potentially affected by, the designated project	5.2.1 Aboriginal Engagement - Engagement Plan
	6.2		A description of the engagement or consultation activities carried out to date with Aboriginal groups, including: ▪ names of Aboriginal groups engaged or consulted to date with regard to the designated project ▪ date(s) each Aboriginal group was engaged or consulted ▪ means of engagement or consultation (e.g., community meetings, mail or telephone)	5.2.2 Aboriginal Engagement - Activities Completed to Date
	6.3		An overview of key comments and concerns expressed by Aboriginal groups identified or engaged to date, including any responses provided to these groups	Section 5
	6.4		A consultation and information-gathering plan that outlines the ongoing and proposed Aboriginal engagement or consultation activities, the general schedule for these activities and the type of information to be exchanged and collected (or, alternatively, an indication of why such engagement or consultation is not required).	5.2.1 Aboriginal Engagement - Engagement Plan
	7.0		**CONSULTATION WITH THE PUBLIC AND OTHER PARTIES**	
	7.1		An overview of key comments and concerns expressed to date by stakeholders and any responses that have been provided	Section 5
	7.2		An overview of any ongoing or proposed stakeholder consultation activities	5.3.1 Public Engagement – Engagement Plan
	7.3		A description of any consultations that have occurred with other jurisdictions that have environmental assessment or regulatory decisions to make with respect to the project	5.3.2 Public Engagement - Activities Completed to Date
	8.0		**SUMMARY OF THE PROJECT**	
	8.0		Proponents are to include as part of the project description a standalone section that summarizes the information	Executive Summary and Section 6 Summary

APPENDIX B

Concordance of Project Description with requirements for a Technical Proposal under The Saskatchewan Environmental Assessment Act (SEAA)

Concordance of Project Description with requirements for a Technical Proposal under The Saskatchewan Environmental Assessment Act (SEAA)

REQUIREMENT	SECTION	NOTE
EXECUTIVE SUMMARY		
Provide a brief project summary, including the proponent's name and corporate structure. Key project personnel should be identified, along with their experience with similar projects and technical expertise used in the planning and design of the proposed project. Include the length, schedule and location of the project, key environmental impacts and mitigation, the number and type of people to be employed and the need for and benefits of the project, including the demand for the project. This could include potential impact to local communities in terms of jobs and contracts.	Executive Summary	
PROJECT DESCRIPTION		
The project description should include the following, keeping in mind the need to protect the environment from impacts at all stages of a project's lifecycle:	Section 2	
▪ site preparation and construction;	Section 2	
▪ operation and maintenance (including cycles of operation and maintenance);	Section 2	
▪ proposed expansions or alterations;	Not applicable	
▪ decommissioning and reclamation during site closure; and	Section 2.8	
▪ post-decommissioning.	Section 2.8	
PROJECT DETAILS		
Relevant project details include size, length (for linear projects), layout, capacity, production rates, process information, dimensional characteristics and life span of the project.	Section 2	
Descriptions should be accompanied by site and regional maps, flow charts, diagrams, graphs and photographs that will assist reviewers to understand the proposed project. Include examples of where best management practices will be incorporated into construction, operation and decommissioning of the proposed project. Itemize permits and notifications required to undertake the development. While final design details will not usually be available when the proposal is prepared, preliminary design details, including the anticipated maximum project footprint, should be presented. Final design will be reviewed as part of follow-up regulatory procedures administered by the ministry and other agencies.	Section 2	
Provide a detailed description of the location. Include maps to show the location of the proposed project relative to other land uses, developments and communities.	Figure 1.2-1 and Figure 3.9-1	
Outline the possible impact on local communities in terms of potential jobs and contracts. Information should detail the types of jobs and contracts, the inputs that will be purchased locally, and the proponent's policy on the hiring of local employees for both labour and managerial positions. Also, outline any negative impacts on social or economic factors including impacts on community infrastructure (e.g., schools, housing, medical facilities).	Section 2.8 and Section 4.0	
All inputs (e.g., water, other natural resources, electricity, process chemicals, hazardous substances) should be identified and their quantities and sources described. Outputs (e.g., services and products) should be described and quantified.	Section 2	

Concordance of Project Description with requirements for a Technical Proposal under The Saskatchewan Environmental Assessment Act (SEAA)

REQUIREMENT	SECTION	NOTE
The amount and type of all by-products and wastes should be described, including: ▪ recyclable materials ▪ hazardous and nonhazardous wastes ▪ wastewater ▪ air emissions and ▪ domestic waste. The means by which these materials will be treated, stored, contained, transported, used and/or disposed should be described.	Section 2	
Any alternatives considered feasible during project planning should be outlined (e.g. location, process, route) and the rationale for rejecting explained. Any environmental considerations relevant to selection of the preferred alternative should be identified	Section 2.11	
Ancillary projects include any associated or related projects whose planning, construction and/or operation are outside the scope of the technical proposal and may be proposed by another proponent (e.g., pipelines, borrow pits, roads, treatment plants). A general description of anticipated ancillary projects should be included as part of the technical proposal.	Section 2.12	
DESCRIPTION OF THE ENVIRONMENT		
The proposal should identify and quantify vegetation types (e.g., native prairie, woodland, seeded grassland, agronomic crops) and aquatic habitats at and around the project site, the presence of wildlife in the project area and the value of the project area as wildlife habitat. Occurrences of rare species (plants and animals) and their habitat should be identified, particularly where the project will affect uncultivated lands. *Efforts should be made to ensure surveys are conducted at appropriate times to ensure reliable results regarding species detection. Where seasonal or other factors preclude a full field appraisal, a risk assessment will be required to evaluate potential conflicts with features of concern.*	Section 3	
Describe physical conditions, including unique landforms, slopes, runoff characteristics and soil types as well as proximity to streams or waterbodies. Subsurface stratigraphy and depth to groundwater should be determined and baseline surface and ground water quality should be described where appropriate. Field evaluations may be necessary to provide site-specific data. Climate and weather parameters that may impact the project should be described.	Section 3	
Describe social and economic conditions, including land use at and around the project area, special land use designations (e.g., parks, local zoning) and existing infrastructure (e.g., roads, utilities). Existing contamination or disturbances should also be described. Nearby residents and communities should be identified, as well as any site that may have significant cultural or heritage value. Contact the Ministry of Parks, Culture and Sport, Heritage Conservation Branch early in the planning process to ensure that potential heritage conflicts are identified and avoided.	Section 3	

Concordance of Project Description with requirements for a Technical Proposal under The Saskatchewan Environmental Assessment Act (SEAA)

REQUIREMENT	SECTION	NOTE
Describe the effects (positive and negative) that the project may have on the environmental features previously identified. The level of evaluation will vary according to project complexity and potential impacts on particular environmental components. For example, any special risks or hazards posed by wastes and by-products should be described together with contingency plans to deal with emergency situations (e.g., spills or plant malfunctions). Other impacts may relate to wildlife or plant species. Measures to avoid, minimize or manage impacts should be described. Consider the potential for impacts to occur in different locations and at different geographical scales, including: ▪ on-site – above or below ground; ▪ on adjacent properties; ▪ in the local neighborhood or community; ▪ in other regions within the province; and ▪ province-wide.	Section 4	
Consider how any changes to the natural environment relate to social, cultural and economic conditions, and how the project affects residents, local communities and land uses. Early engagement with local communities and First Nations and Métis communities helps identify potential impacts to the local environment and potential early mitigation measures.	Section 4	
Mitigation measures for each impact should identify the magnitude, geographic extent, duration, reversibility, frequency and probability of occurrence of the impact, along with the methods or best management practices that will be used to mitigate. Any project changes or mitigation implemented in response to public concern should be identified. Any residual impacts that cannot be mitigated should be justified. Mitigation measures that address all adverse environmental impacts will be considered favorably during a review of the technical proposal.	Section 4	
MONITORING		
Monitoring programs for minimizing impacts during the construction and operation phases should be outlined. Address planned programs for ongoing monitoring of the mitigation practices. Monitoring and follow-up studies include: ▪ monitoring compliance with commitments made in the technical proposal for environmental protection; ▪ monitoring for risk management, accidents and contingencies; ▪ monitoring valued ecosystem components to ensure unforeseen impacts are not occurring; and ▪ monitoring the extent to which impacts predicted in the proposal occurred or not (e.g., monitoring for any adverse environmental implications, which cannot be mitigated, or only partially mitigated).	To be included in the EA and licensing documents	
DECOMMISSIONING AND RECLAMATION		
Provide conceptual plans for project decommissioning and describe how the area affected by the project will be reclaimed or otherwise restored.	Section 2.9	
STAKEHOLDER ENGAGEMENT		
The proponent should actively solicit public input within the project area and from other individuals or groups that may have an interest in the project. Proponents are expected to hold public meetings and/or open houses in local communities to describe the details of the project and to receive feedback on potential issues, interests or concerns related to the project. Engagement may also include informal discussions with landowners and nearby residents and meetings with community associations, municipal governments, First Nations and Métis communities, businesses, regional planning agencies, or special interest groups.	Section 5	

Concordance of Project Description with requirements for a Technical Proposal under The Saskatchewan Environmental Assessment Act (SEAA)

REQUIREMENT	SECTION	NOTE
Documentation of any public engagement, planned or undertaken, should be included as well as any documentation (e.g., news articles, meeting minutes, etc.) illustrating any community acceptance, public interest or concern about the project. Information about future engagement planned to deal with public issues will assist in evaluating whether there is local, regional or widespread public concern about the proposed project. Describe discussion activities, including people and groups involved, and dates and means of engagement (e.g., via mail, phone, meetings). Provide a summary of all comments and concerns, and any responses received. Identify ongoing or proposed discussions. If available, provide an overview of information on First Nations and Métis communities' traditional or heritage uses in the area.	Section 5	
The Crown has a legal obligation to consult with First Nations and Métis communities in advance of decisions or actions that may adversely impact Treaty and Aboriginal rights, such as the right to hunt, fish and trap for food and carry out traditional uses. The duty to consult (DTC) may be triggered for projects that require an Environmental Impact Assessment.	No information required	
At the technical proposal stage, interest-based engagement can be beneficial and is strongly encouraged.	Section 5	
Information provided in the technical proposal will assist the ministry in meeting consultation obligations if the DTC is triggered. The information provided in the technical proposal will also be helpful to both the proponent and the EA Branch if, after the EA screening, the project is deemed a development under the Act, and the proponent is required to develop the Terms of Reference for an EIA.	Terms of Reference document	