

ROOK I PROJECT

Project Description

Submitted to:

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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.

ENVIRONMENTAL 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).