



**Written submission from  
Saskatchewan Research Council**

**Mémoire du  
Saskatchewan Research Council**

In the Matter of

À l'égard du

Saskatchewan Research Council

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Saskatchewan Research Council

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Application for the renewal of the waste nuclear substance licence for the Gunnar Mine Remediation Project for a 18-month period

Demande de renouvellement du permis de déchets de substances nucléaires pour le projet de remise en état du site de la mine Gunnar pour une période de 18 mois

Hearing in writing based on written submissions

Audience par écrit fondée sur des mémoires

**November 2024**

**Novembre 2024**

July 4, 2024,

12194-442-41A24

Candace Salmon  
Commission Registrar  
Commission Registry  
Canadian Nuclear Safety Commission  
280 Slater Street, P.O. Box 1046, Station B  
Ottawa, ON K1P 5S9

**RE: Renewal of the Waste Nuclear Substance Licence WNSL-W5-3151.00/2024 – Saskatchewan Research Council Gunnar Legacy Uranium Mine Site**

Dear Commission Registrar,

The Saskatchewan Research Council (SRC) is applying for renewal of the Canadian Nuclear Safety Commission (CNSC) licence WNSL-W5-3151.00/2024 for the Gunnar Legacy Uranium Mine, which expires on November 30, 2024. This is a revised application from our application dated October 20, 2023. With the current application, we are requesting a renewal of the licence for an 18-month period.

Remediation of Gunnar Legacy Uranium Mine (Phase 2) is anticipated to be completed by November 2025. An 18-month renewal would bring us past the completion of Phase 2 and would allow time to apply for the next licence renewal which would be an application to transfer to a Phase 3 licence (post-remediation monitoring).

The information required for this application is presented in our application dated October 20, 2023. We are not requesting any additional authorizations with the current request, only for continuation of current activities at the site.

We trust this letter meets your current requirements. Please do not hesitate to contact us with questions.

Sincerely,



David Sanscartier  
Senior Engineer, Environmental Remediation, SRC  
[david.sanscartier@src.sk.ca](mailto:david.sanscartier@src.sk.ca)  
306-716-8109

CC: George Bihun, Environmental Project Officer, Ministry of Environment  
Dana Pandolfi, Senior Project Officer, CNSC  
Skye Muirhead (SRC), Gunnar Records (SRC)

**Original Application**  
**dated October 20, 2023**

October 20 , 2023,

12194-442-32A23

Ms. Dana Pandolfi  
Senior Project Officer, Regulatory Operations Branch  
Canadian Nuclear Safety Commission/ Government of Canada

via email [dana.pandolfi@cnsccsn.gc.ca](mailto:dana.pandolfi@cnsccsn.gc.ca)

**RE: Renewal of the Waste Nuclear Substance Licence WNSL-W5-3151.00/2024 – Saskatchewan Research Council Gunnar Legacy Uranium Mine Site**

Dear Ms. Pandolfi,

The Saskatchewan Research Council (SRC) is applying for renewal of the Canadian Nuclear Safety Commission (CNSC) licence WNSL-W5-3151.00/2024 for the Gunnar Legacy Uranium Mine for a 10-year period. This license expires on November 30, 2024.

We suggest that a hold point be included to the licence for transition to Phase 3 (post-remediation monitoring) approximately 18 months after issuing the renewed licence. This will provide SRC sufficient time to complete and submit the Gunnar post-remediation monitoring to CNSC.

The information required for this application for renewal is enclosed.

We trust this letter meets your current requirements. Please do not hesitate to contact us with questions.

Sincerely,

David Sanscartier  
Senior Engineer, Environmental Remediation, Environment and Biotech Division  
[david.sanscartier@src.sk.ca](mailto:david.sanscartier@src.sk.ca)  
306-716-8109

CC: George Bihun, Environmental Project Officer, Ministry of Environment  
Jesse Merilees (SRC), Skye Muirhead (SRC), Gunnar Records (SRC)

Enclosure 1: Waste Nuclear Substance Licence Renewal Requirements

## Enclosure 1 - Waste Nuclear Substance License Renewal Requirements

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Attachment C: SRC Programs and Plans:

- Communication Program
- Environmental Protection Program
- Occupational Health and Safety Program
- Quality and Training Program
- Discovery Response Plan
- Discharge Response Plan
- Environmental Management Plan
- Environmental Monitoring Plan (Gunnar)
- Emergency Response Plan (Gunnar)
- Emergency Medical Plan (Gunnar)
- Hazardous Materials Management Plan
- Legacy Waste Management Plan
- Occupational Health and Safety Plan
- Radiation Protection Plan (Gunnar)
- Site Security Plan (Gunnar)
- Waste Management Plan
- Wildfire Prevention and Protection Plan

Attachment D: Prime Contractor (QM Points) plans:

- Emergency Spill Response Plan
- Environmental Management Plan
- Health and Safety Management Plan
- Radiation Protection Plan

Attachment E: Financial Assurance Letter

Attachment F: Community Engagement Table

## 1 Name and Address

**Regulatory requirements: GN 3(1)(a)** the applicant's name and business address.

### **SRC Response**

The Saskatchewan Research Council (SRC) is managing the Gunnar Legacy Uranium Mine project on behalf of the Saskatchewan Ministry of Energy and Resources.

Saskatchewan Research Council (SRC). Bay 2D, 820 51st Street East, Saskatoon, SK S7K 0X8.

Please note that SRC address has changed and is different from the address in the current Licence Condition Handbook.

## 2 Activities and Purpose

**Regulatory requirements: GN 3(1) (b)** the activity to be licensed and its purpose.

A) possess, manage, and store nuclear substances that are required for, associated with or arise from Phase 2 activities associated with the remediation of the Gunnar Legacy Uranium Mine Site, described fully in Appendix A to licence WNSL-W5-3151.00/2024.

B) possess, transfer, manage and store the nuclear substances except Category I, II and III nuclear-material as defined in section 1 of the Nuclear Security Regulations, that are required for, associated with or arise from Phases 2 and 3 of the Gunnar Remediation Project – Gunnar Legacy Uranium Mine Site (hereinafter Gunnar Site), described fully in Appendix A to this license.

### **SRC Response**

#### 2.1 Phase 2 - Remediation

The Gunnar Remediation Project consists of the remediation of an abandoned uranium mine and mill in northern Saskatchewan. It was operated from 1955 to 1963 and closed in 1964 with minimal decommissioning. Uranium ore originating from the open pit and underground mines was generated. This resulted in approximately 2.5 million m<sup>3</sup> of waste rock and over 5 million tonnes of unconfined tailings that were directed to nearby valleys, depressions, and lakes, covering a total of over 70 ha of land.

The licenced area shown in the current licence has been updated with the actual haul roads. The Beaver Pond Tailings Area has also been expanded slightly based on the cover constructed. The revised map is found in Attachment A

The purpose of the Gunnar Site Remediation Project is to reduce the risks the Gunnar Mine and Mill (the "Site") poses to the health and safety of the public and environment. The remediation objectives are:

- Containment and stabilization of the unconfined tailings and waste rock piles to minimize human health risks posed by gamma dose rates.
- Minimization of contaminants releases from the tailings and waste rock to Lake Athabasca.

- Permanent disposal of demolition wastes and hazardous materials in a manner that is environmentally sound and meets regulatory requirements.
- Remediation and contouring of the landscape in a manner that is compatible with the natural surroundings and future use of the site; and
- Taking measures to ensure conventional health and safety.

Remediation activities (Phase 2) at the Gunnar project have been separated into two sub-projects: the Tailings project and the Other Site Aspects (OSA) project. Phase 2 activities to achieve these objectives and to meet the regulatory requirements of the “Activities and Purpose” has been on-going since 2016, and have included:

Tailings project:

- Completion of engineered covers over the Gunnar Main Tailings (GMT) area and the Beaver Pond Tailings (BPT) area.
- Partial completion of the engineered cover over the Gunnar Central Tailings (GCT) area. Approximately 90% of the cover is completed. All tailings are covered. What remains is the construction of the GCT channel, and installation of soil borrow cover.
- Seeding of completed covers.

Other Site Aspects Project:

- Reshaping of the waste rock piles
- Covering of elevated gamma areas. Elevated gamma areas are defined as areas with gamma radiation dose rates above the radiological objectives, which are as follows:
  - Objective 1: The dose rates from gamma radiation exposure averaged over a hectare of the covered area not to exceed 1  $\mu\text{Sv/h}$  above local background (i.e., 1.14  $\mu\text{Sv/h}$ ), and
  - Objective 2: The dose rates from gamma radiation exposure at any point of the covered area shall not exceed 2  $\mu\text{Sv/h}$  above local background (i.e., 2.64  $\mu\text{Sv/h}$ ).
- Seeding of completed covers.
- Demolition of buildings and structures including abatement of asbestos-containing materials (ACM).
- Legacy waste sweep throughout the Site.
- Disposal of hazardous and non-hazardous wastes in on-site engineered landfills or off-site as appropriate (see Section 7).
- Construction of the historical drainage channel through the waste rock piles.

This work has been reported in the following documents submitted to CNSC:

- Tailings as-built reports:
  - Gunnar Main Tailings As-built Report,
  - Catchment 3 As-built Report and
  - Beaver Pond As-built Report.
- SRC’s Gunnar Mine and Mill Site Remediation Annual Reports from 2016 to 2022.



As-built reports for the OSA project will be submitted upon completion of the project (anticipated to be completed in summer 2023 with subsequent delivery of reports), and as-built reports for the remaining Tailings scope (GCT and LBT) will be submitted upon completion.

### Remaining Phase 2 Scope

The main Phase 2 activities remaining at the Site is the construction of an engineered cover over the Langley Bay Tailings (LBT) area and completion of the GCT cover. The construction of the LBT was stopped in 2020 due to high lake water level that submerged the tailings. The water has since then receded, and construction of the LBT cover should resume this field season. Minor activities remaining include covering minor elevated gamma areas, reclamation of borrow areas and haul roads, construction of the Gunnar Pit Outlet, decommissioning of the camp, and closure of Landfill A (non-hazardous waste landfill).

For the remaining activities, the nuclear substances found on site that have not been addressed by remediation to date (LBT area tailings and waste rock with elevated gamma radiation) will be covered. Some nuclear substances may be removed from one location at the site and consolidated into another location at the site (e.g., LBT) prior to being covered. For example, elevated gamma material will be removed from the GCT area and placed onto the LBT area as per design. This approach will be used because all tailings in the GCT area have been covered by an engineered cover or waste rock (to be covered with borrow material as per design once LBT cover construction is completed).

Nuclear substances have not and will not be removed from the Site.

## 2.2 Phase 3 – Long-term Monitoring and Surveillance

SRC is currently developing a post-remediation monitoring and maintenance plan to meet its commitments made in the Gunnar Project Environmental Impact Statement (EIS) and the monitoring and maintenance requirements for the engineered features on site. We anticipate submitting a plan to CNSC for review in winter 2024. As mentioned in the cover letter, we suggest that a hold point be included for transition to the licence approximately 18 months after issuing the renewed licence. This will provide SRC sufficient time to complete and submit the Gunnar post-remediation monitoring to CNSC.

## 3 Management System

**Regulatory requirements: GN 3 (1)(k)** the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the Act and the regulations made under the Act, including the internal allocation of functions, responsibilities, and authority.

### **SRC Response:**

#### 3.1 Project Organizational Chart and Roles and Responsibilities

A team of SRC specialists manages the Gunnar Mine and Mill Remediation Project to ensure project objectives are met. The project organization chart is presented in Attachment B.

Roles and responsibilities for the project team, as well as consultants, contractors and visitors to the Site, are described in the Environmental Remediation Business Unit's management system (ERMS) that was developed to provide guidance for all work activities. Each Program or Plan within the ERMS includes specific requirements for managers, SRC supervisors, SRC employees, contractors, consultants

and visitors if applicable. SRC ensures that the requirements of the ERMS are communicated to all workers as appropriate through orientation training and review cycle updates.

At the Site, SRC employees, contractors, consultants, and visitors operate within the Prime Contractors management system which SRC reviews prior to work starting to make sure it meets or exceeds the requirements in the ERMS.

### 3.2 Management System

SRC maintains Policies and Procedures that provide consistent guidance and direction to employees in relation to health and safety, quality, and the environment. Documents are regularly reviewed to ensure continuous improvement and client satisfaction.

SRC's Environmental Remediation Business Unit manages the Gunnar Mine and Mill Remediation Project and operates under the umbrella of SRC's Policies and Procedures. The business unit developed the ERMS for all Project CLEANs sites, which provides guidance while conducting work at the Site, and is utilized for planning all activities during Phase 2 and 3 of the Gunnar Mine and Mill Remediation Project.

The ERMS is comprised of the following programs:

- Occupational Health and Safety (OHS) Program,
- Environmental Protection Program,
- Communication Program, and
- Quality and Training Program,

Each program includes associated plans, standard operating procedures, safe work procedures, and supporting documents. The programs and select plans are attached to this application. The Occupational Health and Safety (OH&S) Program provides guidance in support of SRC's corporate OH&S policy and objectives. SRC is committed to protecting and maintaining the health and safety of all its employees, contractors and visitors. The purpose of the Environmental Protection Program is to ensure the protection of the environment during all Environmental Remediation Business Unit's remediation project activities. The Communication Program outlines how Environmental Remediation Business Unit communicates internally and with interested third parties. The program includes a commitment to and protocol for ongoing timely communication regarding activities related to projects. The Quality and Training Program outlines the process that governs how SRC ensures quality work for its remediation projects and aligns with SRC's corporate Quality Management System.

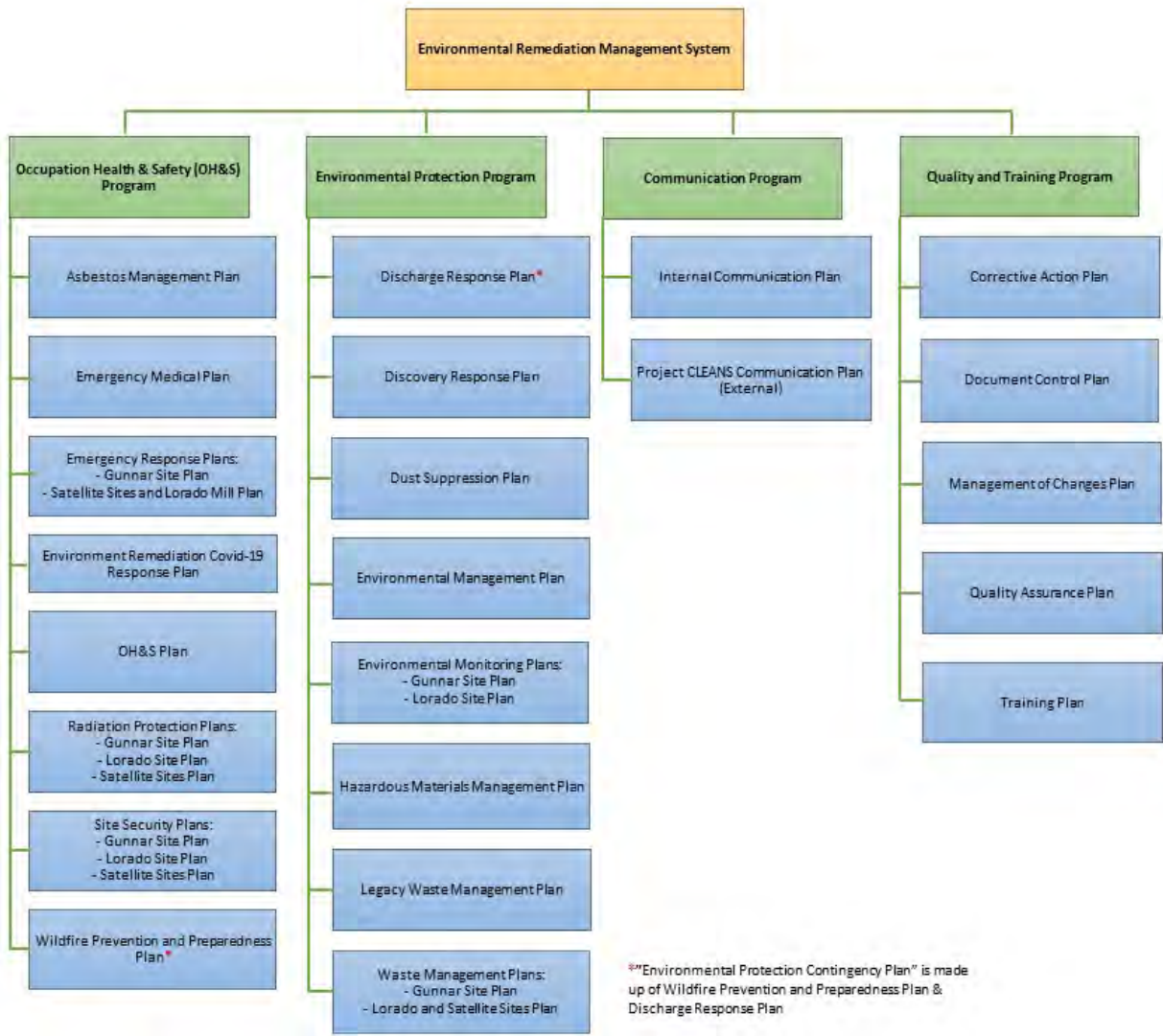
Emergency Management is covered under the OHS and Environmental Protection Programs – the plans that cover this safety control area are presented in Figure 1.

The Plans are guiding documents used to coordinate work done on the Site and undergo minor revisions (i.e., Plans do not require version control as part of the LCH). Each Plan is a stand-alone document and may have supporting documents such as forms or templates that can become the records for a section.

The ERMS documents have undergone changes over the years as Environmental Remediation Business Unit and the project requirements changed. Initially, the Gunnar management system began as a project-specific management system designed to meet the requirements of the Gunnar CNSC Licence. These documents were expanded to create and meet requirements on other Project CLEANs sites and create an Environmental Remediation Business Unit-level management system that would bring

together all common practices and procedures. Gunnar Mine and Mill specific documents were retained but edited to contain only project relevant information.

The ERMS, and all updates to the Gunnar-specific management system documents, were reviewed and updated in the fall of 2022 and 2023. Figure 1 shows the structure of the ERMS. SRC will continue to conduct reviews in the frequency outlined within each management system document, based on regulatory compliance for the Gunnar Mine and Mill remediation project. Select plans are presented in Attachment C and all plans are available upon request.



- EnRem Safe Work Procedures:**
- Air Travel
  - Collecting Small Amounts of Asbestos Containing Material
  - Dustfall Jar Sampling
  - Explosives
  - Field Work
  - Movement of Asbestos Containing Material
  - Operation of 12 Volt Fuel Pump
  - Operation of Powered Ice Auger
  - Safe use of Snowmobiles
  - Transportation of Dangerous Goods
  - Unknown Material Discovery
  - Use of ATV/UTV
  - Use of Throw Bag
  - Winter Field Work
  - Working Around Heavy Equipment
  - Working Around Underground Openings
  - Working in Canoes
  - Working on Ice

- EnRem Standard Operating Procedures:**
- Downloading Gunnar Weather Station
  - Environmental Monitoring Quality Assurance and Quality Control
  - Field Check-in
  - Gamma Surveys
  - Groundwater Sampling
  - Gunnar Food Waste Dehydrator
  - Kingfisher Power Boat
  - Lock Out/Tag Out
  - Operation and Calibration of the YSI
  - Operation of the Drone (Mavic)
  - Radioactive Waste Scanning and Identification
  - Replacing Radtrak Radon Detectors
  - Response Escalation
  - Soil Contamination Sampling
  - Surface Water Sampling
  - Waste Rock Sampling
  - Work Hours

Figure 1. Environmental Remediation Business Unit Management System diagram.

### 3.3 Contractor Management System

SRC designated a prime contractor to oversee and coordinate the health and safety activities at the Site. QM Points Contracting LP, a limited partnership between QM Environmental and Points is the prime contractor at the Site. QM Points has a Prime Contractor Management Plan to govern safety at the Site that meets regulatory requirements, approvals, and licences as well as the ERMS. The plan consists of the following documents listed in alphabetical order:

- Asbestos Control Plan
- Community Engagement Plan
- COVID19 Site Response Plan
- Emergency Spill Response Plan
- Environmental Management Plan
- Hazardous Material Management Plan
- Health and Safety Management Plan
- Legacy Waste Management Plan
- Mobilization and Site Setup Plan
- Prime Contractor Management Plan
- Remediation Execution Plan
- Radiation Protection Plan
- Wildfire Prevention and Preparedness Plan.

Select plans are presented in Attachment D and all plans are available upon request. Emergency response is covered in the following plans: Emergency Spill Response, Environmental Management, and Health and Safety Management.

## 4 Operating Performance

**Regulatory requirements: NSRD 3 (1)** An application for a licence in respect of a nuclear substance or a radiation device, other than a licence to service a radiation device, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*:

- (a) the methods, procedures and equipment that will be used to carry on the activity to be licensed.

### **SRC Response:**

The methods, procedures and equipment that have been used and will continue to be used to carry on the activity to be licensed are presented below for the required aspects.

#### 4.1 Conduct of Licensed Activity

To ensure that licensed activities are carried out adequately, SRC is carrying out the following:

- Implementation of the Radiation Protection Plan – covered in Section 6.
- Implementation of Environmental Remediation Business Unit quality and training program.
- Implementation of Gunnar site security plan as part of the occupational health and safety program. Access to site is controlled by the prime contractor. Members of the public are not authorized on site. During the off season, monthly site visits are completed.

- Hiring of qualified contractors and consultants through competitive procurement processes where vendors are evaluated for their qualification, expertise, experience, safety performance, and other criteria.
- A representative of the engineer of records is present at the Site during work and performs QA/QC activities to ensure specifications are met.
- A radiation safety officer, part of the prime contractor's team, is present on-site during work.
- The SRC Environmental Remediation team employs a radiation subject matter expert who advises the prime contractor on radiation matters and reviews all the contractor's deliverables related to this topic.
- All radioactive material at the site remains on site. Management of this material is presented in Section 7. Prior to leaving the site, equipment is cleaned and scanned.

#### 4.2 Keeping Records (Required to Carry on Activity)

SRC follows all reporting and record keeping requirements as per the General Nuclear Safety and Control Regulations (SOR/2000-202) and the Radiation Protection Regulations (SOR/2000-203) as well as any other document as referenced within the ERMS. This is described in SRC's Quality and Training Program and applicable Plans.

For example, records required to carry out activities include radiation exposure reports, gamma radiation survey data, scanning records and a wide range of reports (reports from consultants and contractors such as QA/QC engineer daily reports, environmental daily reports, prime contractor daily reports, annual reports, etc.).

#### 4.3 Procedures on Protecting the Environment.

The environmental protection program (attached) presents the procedures for protecting the environment. The program includes the following activities:

- Environmental sampling program described in Section 8.
- Operational monitoring to ensure environmental compliance during Phase 2 activities. It is performed by an environmental monitor (qualified person), hired by SRC. An environmental monitor is always present on-site during remediation activities to provide operational environmental monitoring to ensure compliance with regulatory requirements and SRC commitments included in the Gunnar EIS. In addition, the environmental monitor's responsibilities include providing suggestions and advice to the remediation contractors on adjusting construction approaches to address environmental concerns, and identifying changes required during project activities to maintain environmental objectives throughout construction. More specifically, the environmental monitor roles and responsibilities include:
  - providing daily communication with contractor(s) and client representatives,
  - monitoring adherence to all environmental conditions and permits issued for construction,
  - advising client representatives in the event of non-compliance or non-conformance,
  - completing pre-construction vegetation surveys for listed plant species, where applicable,
  - conducting pre-construction nest searches where applicable, establish appropriate avoidance buffers if required, and monitor nest avoidance if necessary.
  - documenting wildlife encounters and observations and provide suggestions to limit or avoid wildlife conflicts,

- documenting caribou encounters and observations,
  - documenting that equipment is clean (e.g., free of debris and in good working condition),
  - completing camp inspections,
  - providing recommendations to SRC representatives to prevent spread of weeds on-site and monitor documented noxious and nuisance weed occurrences on-site for avoidance and signs of spreading,
  - confirming proper waste (hazardous and non-hazardous) storage method and location are implemented and followed,
  - monitoring, recording, and reporting discharges of hazardous materials and tracking the proper management of the discharges,
  - providing input into suitable erosion and sediment control measures around disturbed areas (e.g., silt fence, straw wattles, rock check-dams) to limit sedimentation of surrounding waterbodies,
  - monitoring water diversion construction for compliance with applicable permits and approvals,
  - monitoring topsoil stripping to minimize admixing, loss due to erosion, and proper slope and cover,
  - monitoring discharges and repour, and
  - reporting on the activities above (daily and summary in annual report).
- For Phase 3 maintenance activities, operational monitoring will be performed by SRC or designate. The need to hire an environmental monitor will be based on the scope of the maintenance work.
  - Implementation of erosion and sediment control measures to protect water bodies such as the installation of silt fences, turbidity curtains, stopping work during high rain fall, etc.
  - Postponing work in areas where active nests are found.
  - Abiding to timing windows (e.g., fish spawning).
  - Dust suppression.
  - Discharge response plan and managing spills during remediation activities, and
  - Waste management for hazardous waste (see Section 7).

#### 4.4 Procedures for Conducting Internal Compliance, Monitoring, Enforcement, and Verification of all Licensed Activities.

In addition to the programs, plans and procedures described above and in other sections, the following procedures are carried out:

- Daily inspection of work by and regular testing by QA/QC site engineer (e.g., particle size distribution [PSD], depth of soil layers placed, compaction).
- Daily inspection and oversight of the contractor by SRC site representative.
- Frequent inspections (approx. monthly) by a hazardous waste specialist (hired by SRC) of all hazardous waste disposal and storage facilities,
- Regular site visit by SRC safety officer (approx. once a month during active work), and
- If out of compliance, SRC informs contractors of deficiencies and may issue non-conformance reports if needed.



## 5 Fitness for Service

**Regulatory requirements: NSRD 3(1) (h)** the proposed inspection program for the equipment and systems that will be used to carry on the activity to be licensed.

### **SRC response**

Fitness for Service at the Gunnar Project is based on and secured by the ERMS described in Section 3, and as-built reports for the completed tailings covers submitted to CNSC (GMT, Beaver Pond and Catchment 3).

The inspection program for the equipment and systems includes the following components.

- Equipment inspection and maintenance logs – details below
- Engineer-of-record supervision of the work and inspections – details below
- Oversight by SRC site representative (one SRC representative is always on site during remediation activities)
- Daily inspections during construction by contractor, consultants and SRC
- Geotechnical monitoring
- Post-remediation gamma surveys (described in Section 8)
- Calibration of radiation measuring devices, and
- Regular review of SRC and Prime Contractor management systems and revisions as needed.

### Equipment Inspection and Maintenance Logs

Inspection and maintenance of equipment is the responsibility of equipment owners (prime contractor, consultants or SRC). All contractors working on Gunnar are required to keep equipment maintenance logs associated with the heavy equipment (e.g., excavator) and small equipment (e.g., gamma survey) utilized on this project to ensure quality and uninterrupted work.

### Supervision of Work and Inspections by Engineer-of-record

Independent supervision of the contractors' work quality is provided by dedicated engineering consultants for the Tailings (O'Kane Consultants) and OSA (SRK). Both companies provide ongoing supervision and regular inspections.

As part of the monitoring and maintenance of the Gunnar site, O'Kane conducts semi-annual inspections. During these inspections, the consultant collects pertinent data and information that are key indicators of the condition of the constructed landforms. The inspections give a better understanding of monitoring and maintenance requirements of each landform and assist with assessment of risks and mitigation for the current climate and landform conditions. O'Kane will use findings from the site inspections to assist SRC in developing a monitoring and maintenance program for Transitional Monitoring Phase. O'Kane oversees the Tailings work, provides engineering field guidance, and performs QA/QC inspection and testing (e.g., PSD). Visual inspections are documented with photos in daily field reports.

SRK monitors all work on the waste rock piles including grading and gamma cover placement, nuclear densometer testing, PSD tests, and Proctor density tests. SRK provides field guidance to ensure the slopes are within the design criteria, positive drainage is achieved on all crests, and regrading is adequate. As part of SRK's daily activities, visual inspections are performed to ensure that all



remediation objectives are met as the design is being implemented. Visual inspections are documented with photos in daily field reports.

Ongoing geotechnical performance (e.g., former tailings dam, engineered covers) is monitored by consultants and reported annually. Upon completion of the active remediation phase, the final geotechnical performance will be inspected as part of Phase 3 monitoring (plan under development).

## 6 Radiation Protection

**Regulatory requirements: GN 3(1) (e)** the proposed measures to ensure compliance with the *Radiation Protection Regulations*, the *Nuclear Security Regulations* and the *Packaging and Transport of Nuclear Substances Regulations, 2015*

### **SRC Response:**

Radiation safety at the Gunnar Remediation Project during Phase 2 is secured under the Radiation Protection Plan (RPP) that has been developed and implemented by the Prime Contractor in conjunction with SRC and is a part of Prime Contractor's (QM Points) management system. Phase 3 activities will be carried out under SRC's RPP.

In line with the current CNSC Licence requirements, the purpose of the Gunnar RPP is to keep the amount of exposure to radon progeny and the effective dose and equivalent dose received by and committed to persons as low as reasonably achievable (ALARA), social and economic factors being considered, through the implementation of:

- Management control over work practices,
- Personnel qualification and training,
- Control of occupational and public exposure to radiation, and
- Calibration of instruments
- Planning for unusual situations.

The RPP is to assist in establishing a safe work environment for all on-site workers, and to provide guidance to operations personnel with respect to anticipating, recognizing, evaluating, and controlling radiation exposures in their work environments while performing remediation activities at the Site.

The RPP includes detailed roles and responsibilities of management, hazard, and risk assessment, sets action and administration levels for radiation dose loads obtained due to remediation activities, sets the corresponding rules for ascertaining and recording radiation doses, and outlines control measures and precautions including education and training regarding radiation safety.

To ensure proper implementation of the RPP, the Prime Contractor in conjunction with SRC subject matter expert regularly review the RPP content and implementation. The review includes an evaluation of equipment, procedures, dosimetry records, inspection findings, and incidents. A summary of the results of each annual review, including a description of actions proposed and taken is documented and discussed with management.

SRC follows all reporting and record keeping requirements as per the General Nuclear Safety and Control Regulations (SOR/2000-202) and the Radiation Protection Regulations (SOR/2000-203) as well as any other document as referenced within the RPP.

A Radiation Protection Implementation Report is completed annually. It addresses in detail the effectiveness of the Radiation Protection Program. This report is provided to CNSC as a part of SRC annual reporting.

Gamma radiation monitoring devices such as Ludlum dose rate meters and probes (components of the gamma survey equipment) and CT007 (field hand-held radiation detectors) are calibrated on an annual basis by qualified facilities (e.g., Stuart Hunt & Associates [Canada], Environmental Restoration Group [USA]) and calibration certificates obtained. SRC performs pad calibration of Ludlum gamma survey equipment annually to determine detector sensitivity and establish conversion factors from counts per second (survey equipment output) to microSieverts per hour ( $\mu\text{Sv/h}$ ) This is done by using a specifically designed set of doped concrete pads with known radionuclide concentrations of potassium, thorium, and uranium as well as a blank pad to estimate natural background.

In compliance with the RPP, warning signs are mounted at key site locations to make the workers and public aware of potential radiological hazards at the Site. Currently, the signs are posted at five locations: marina breakwater, ice road entrance on beach, barge landing by former fish plant location, GCT haul road by ramp to GCT, and LBT (facing Langley Bay). The signs bear the radiation warning symbol and the words "RAYONNEMENT — DANGER — RADIATION".

## 7 Waste Management

**Regulatory requirements: GN 3(1) (j)** the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste.

### **SRC Response:**

Waste management at the Gunnar Project is carried out in accordance with the plans listed below and approved remediation designs for the tailings covers, gamma shield covers, and landfills.

- Asbestos Management Plan
- Discharge Response Plan
- Discovery Response Plan
- Hazardous Materials Management Plan
- Legacy Waste Management Plan
- Waste Management Plan (Gunnar).

Two landfills are being constructed as part of the OSA project. Landfill A is the on-site engineered landfill designated to contain all non-hazardous, non-contaminated legacy waste and demolition debris. Landfill B is a non-pervious containment cell for the on-site disposal of Low-Level Radioactive Waste (LLRW), legacy petroleum hydrocarbon (PHC)-impacted soil, LLRW PHC-impacted spilled material created during remediation, and legacy pH-impacted material (treated with lime prior to placement in landfill). The construction of Landfill B is complete while the construction of Landfill A is yet to be completed.

## Low-Level Radioactive Waste

The inventory of radioactive waste includes waste rock, tailings and assorted LLRW. Approximately 2.5 million m<sup>3</sup> of waste rock (some of it radioactive) was produced during operation of the mine and mill and stockpiled at the site. To date during Phase 2 activities, the waste rock was used in the construction of the tailings covers. The remaining waste rock deposits have been regraded and covered with 0.5m-thick gamma shield covers whenever there is/was a gamma radiation objectives exceedance (see Section 2.1). Approximately 5 million tonnes of unconfined tailings was produced during operation of the mine and mill and released to the environment resulting in four tailings areas (GMT, BPT, GCT and LBT) which are being covered with engineered cover systems. The engineered covers at GMT and BPT are completed, and most of the tailings at GCT has been covered and will be completed along with the LBT cover. The construction of LBT cover has not started yet.

Approximately 198 m<sup>3</sup> of LLRW has been placed within Landfill B from 2020-2022. This waste includes the following items:

- PHC-impacted Solids (spilled on Waste Rock and Tailings)
- PHC-impacted liquids collected during PHC spills cleanup
- Sulphur-impacted material
- Assorted debris (wood, rubber, etc.)
- Radiation protection equipment (PPE, tarps, etc.)
- Laboratory samples.

The origins of this waste include both legacy and remediation waste. More details, such as, origins, amounts and scanning results have been included in previous SRC annual reports.

## Hazardous Waste

The approach to disposing of hazardous waste, both legacy and produced during remediation, is as follows:

- Legacy PHC-impacted soil was disposed of in Landfill B.
- Approximately 7,430 m<sup>3</sup> of pH-impacted material (treated with lime) has been disposed of in Landfill B.
- PHC-impacted soil created during remediation is disposed of off-site, except when also radioactive. In the latter case, it was disposed of in Landfill B.
- Approximately 15,650 m<sup>3</sup> of asbestos-containing material (ACM) has been disposed of in Landfill A. The ACM includes friable, non-friable, mixed materials and wood mixed ACM. The ACM was covered with non-hazardous waste and other materials as per design.
- All other hazardous waste is disposed of off-site in accredited facilities. Hazardous waste includes both legacy and remediation waste listed in Table 1. This waste is stored on site in facilities approved by the Saskatchewan Ministry of Environment and is shipped off site annually. This is reported in SRC annual reports.

Table 1. List of Hazardous Waste Materials to Potentially be Stored at the SRC Gunnar Hazardous Material Area

<b>Waste Material<sup>1</sup></b>	<b>Anticipated Amount<sup>2</sup></b>	<b>TDG Class<sup>3</sup></b>
Alkaline and Lithium Batteries	10 kg	8
Hydrocarbon Contaminated Materials (e.g., absorbent pads, oil filters)	10 m <sup>3</sup>	NA
Hydrocarbon Contaminated Soil	10 m <sup>3</sup>	4.1
Hydrocarbon Contaminated Water	1 m <sup>3</sup>	3
Incinerator Ash	20 m <sup>3</sup>	n/a
Mercury-Containing Materials (fluorescent bulbs/lamps, thermometers, thermostats)	50 units	8 (6.1)
Miscellaneous Non-Hazardous Materials	100 kg	n/a
NiCd Batteries	10 kg	8
Paint Associated Wastes	10 m <sup>3</sup>	3 or 8 <sup>3</sup>
Petroleum Substances (e.g., diesel, oil, gasoline)	3 m <sup>3</sup>	3
Used Aerosol Cans	50 kg	2.1 or 2.2 <sup>3</sup>
Used Oil	10 m <sup>3</sup>	2.3 (2.1)
Waste Antifreeze	10 m <sup>3</sup>	3

Notes:

- 1) The list includes types of materials which have been previously stored at site, materials currently stored at the site, and materials anticipated to be stored at the site.
- 2) The maximum projected amount which can be accumulated at the Hazardous Material Area.
- 3) TDG class depends on waste content.

## 8 Environmental Protection

**Regulatory requirements: GN 3(1) (i)** a description and the results of any test, analysis or calculation performed to substantiate the information included in the application.

### **SRC Response:**

Environmental protection at the Gunnar Project includes environmental sampling and environmental compliance program. It is based on and secured by the Environmental Protection Program (Section 3). This section presents the environmental sampling while measures taken for environmental compliance is described in Section 4.3.

The Gunnar Environmental Monitoring Plan is based on the SRC commitments made in the Gunnar EIS and includes extended environmental sampling as follows:

- Climate (weather station)
  - Continuous monitoring of weather parameters (air temperature, relative humidity, wind speed and direction, and pressure) at one-hour intervals.
- Water quality
  - Surface
    - 16 sampling stations.
    - Sampled monthly during the active remediation season.
    - Analyses: trace metals, radium-226, and general chemistry.
  - Groundwater
    - 10 sampling stations.
    - Sampled twice during the active remediation season.
    - Analyses: trace metals, radium-226, and general chemistry.
- Water quantity (surface hydrology)
  - Monitored at four stations.
- Radon
  - Concentrations measured in ambient air.
  - 10 sampling stations.
  - Collected twice annually (detectors changed in spring and fall).
- Dustfall
  - 13 sampling stations.
  - Sampled monthly during the active remediation season.
  - Analyses: dust mass, volatile dust mass, trace metals, and radionuclides (radium-226, thorium-230, lead-210, and polonium-210).
- Gamma surveys
  - Pre-remediation surveys.
  - Remediation surveys.
  - Post-remediation surveys.
  - Gamma surveys results collected to date have been submitted as part of SRC Annual Reports.

All the environmental sampling is performed by trained SRC staff or dedicated consultants. The samples are analyzed at SRC Environmental Analytical Lab, a laboratory accredited with the Canadian Association

for Laboratory Accreditation. All analytical results and other collected data are reviewed by a qualified subject matter specialists and then reported as part of the SRC Annual Reports.

The purposes of the gamma surveys are to (i) comply with the requirements of health and safety procedures (including the RPP), (ii) identify a need for remediation and mitigation measures, and (iii) confirm the adherence of the completed remediation work (e.g., covers) to the Project-specific radiological objectives (described in Section 2.1). Gamma data collection and processing is performed in line with the SRC Gamma Radiation Survey Approach. The procedure and technical details including QA/QC documents are available upon request.

Upon completion of the Active Remediation Phase of the Gunnar project, both the EIS-based monitoring and Operational monitoring will be replaced with a Phase 3 Monitoring Program (under development).

## 9 Financial Guarantee

**Regulatory requirements: GN 3(1) (I)** a description of any proposed financial guarantee relating to the activity to be licensed.

### **SRC Response**

The Ministry of Energy and Resources has been assigned the responsibility for the management of all activities on the Site on behalf of the Government of Saskatchewan. SRC has been contracted by the Ministry of Energy and Resources to act as project manager for the Gunnar project. The Government of Saskatchewan is the legal landholder and retains all legal and financial responsibilities for reclamation, decommissioning, monitoring and maintenance activities that are required under a CNSC licence. It is the Ministry of Energy and Resource's intent to remediate the Site to an acceptable condition to where the Site qualifies for a CNSC licence exemption and may enter Saskatchewan's Institutional Control Program (ICP). A financial assurance letter was provided by the Ministry of Energy and Resources, and is found in Attachment E.

## 10 Communication Program

**Requirement:** The licensee shall implement and maintain a Communication Program for the facility, including a public disclosure protocol, for each Phase of activities at the Gunnar Site.

### **SRC Response**

Presented below are the stakeholders identified by SRC, communication tools being used in the Gunnar project and SRC's overall community engagement approach. Outreach efforts performed over the licensing term are presented in Attachment F

#### Stakeholders

SRC identified the stakeholders listed below for Project CLEANs sites. We keep them engaged as needed.

- Minister responsible for SRC.
- The Government of Saskatchewan represented by the Ministry of Energy and Resources.
- Other government stakeholders.
- Regulators:
  - Canadian Nuclear Safety Commission (CNSC).

- Saskatchewan Ministry of Environment (MOE), particularly the Environmental Assessment Branch and the Environmental Protection Branch.
- Saskatchewan Labour Relations and Workplace safety.
- Other.
- Municipal and Indigenous government representatives from Northern Settlement of Uranium City, Northern Hamlet of Stony Rapids, Northern Settlement of Camsell Portage, Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Hatchet Lake Denesuline First Nation, and Northern Settlement of Wollaston Lake. In Alberta the target audiences are Athabasca Chipewyan First Nation and the Mikisew Cree First Nation.
- Métis Nation – Saskatchewan.
- Prince Albert Grand Council (PAGC).
- Athabasca Basin region residents.
- Athabasca Basin region business owners.
- Saskatchewan citizens.
- Ya'thi Néné Land and Resource Office.
- Elected representatives (MLAs and Saskatchewan MPs).
- Media.
- Contractors and consultants interested in working on Project CLEANS or currently involved in the project.
- Interest groups.
- Mining and remediation industries.
- Economic development and training organizations.
- Potential SRC clients.
- Potential employees of SRC and potential employees of contractors.

### Communication Tools

Some of the communication tools that are used to inform the targeted audience include:

- Online, for example:
  - Project CLEANS section of the SRC corporate website ([Project CLEANS | Saskatchewan Research Council \(src.sk.ca\)](https://src.sk.ca)), which contains project information and updates.
  - Social media (e.g., Facebook, Twitter, LinkedIn and YouTube) which are used for project updates, annual videos on project progress (e.g., [Project CLEANS Update \(Summer 2022\) - English - YouTube](#)), etc.
- Media relations activities – media pitches, news releases, interviews, events, for example:
  - Radio: Missinipi Broadcasting (MBC), CBC, CKOM.
  - Print: Opportunities North, Saskatchewan Sage, Eagle Feather News, Prairies North, and web-based media.
- Advertising, for example:
  - Radio: MBC.
  - Print: Opportunities North, Saskatchewan Sage, Eagle Feather News, Prairies North, Up Here Business, and other industry publications.
  - Social Media: promoted tweets (Twitter) and Facebook ads/post promotion.

- Print Material – fact sheets, posters, public announcements, invitations, signage.
- Public Meetings – annually in each of the Athabasca Basin Region communities.
- Workshops – periodically throughout the year as needed.
- Workshops, conferences, tradeshow, and open houses – as appropriate opportunities arise.
- Newsletter – project updates, notices, and images; sent to a subscriber list; issues are also posted on SRC's website and social media.
- Site visits by local leadership – annually.
- Ad hoc conversations and responses to questions from residents by project staff working in the Uranium City area.

#### Local Community Consultation and Engagement

SRC employs an Indigenous Senior Advisor who leads communication with Chiefs and Councils and different leadership in the Athabasca Basin Region (e.g., PAGC, Northern Labour Market Committee). This includes weekly discussion on Project CLEANs with both community members and community contractors as SRC strives for open and transparent communication allowing the project to flourish under the guidance from Athabasca leaders.

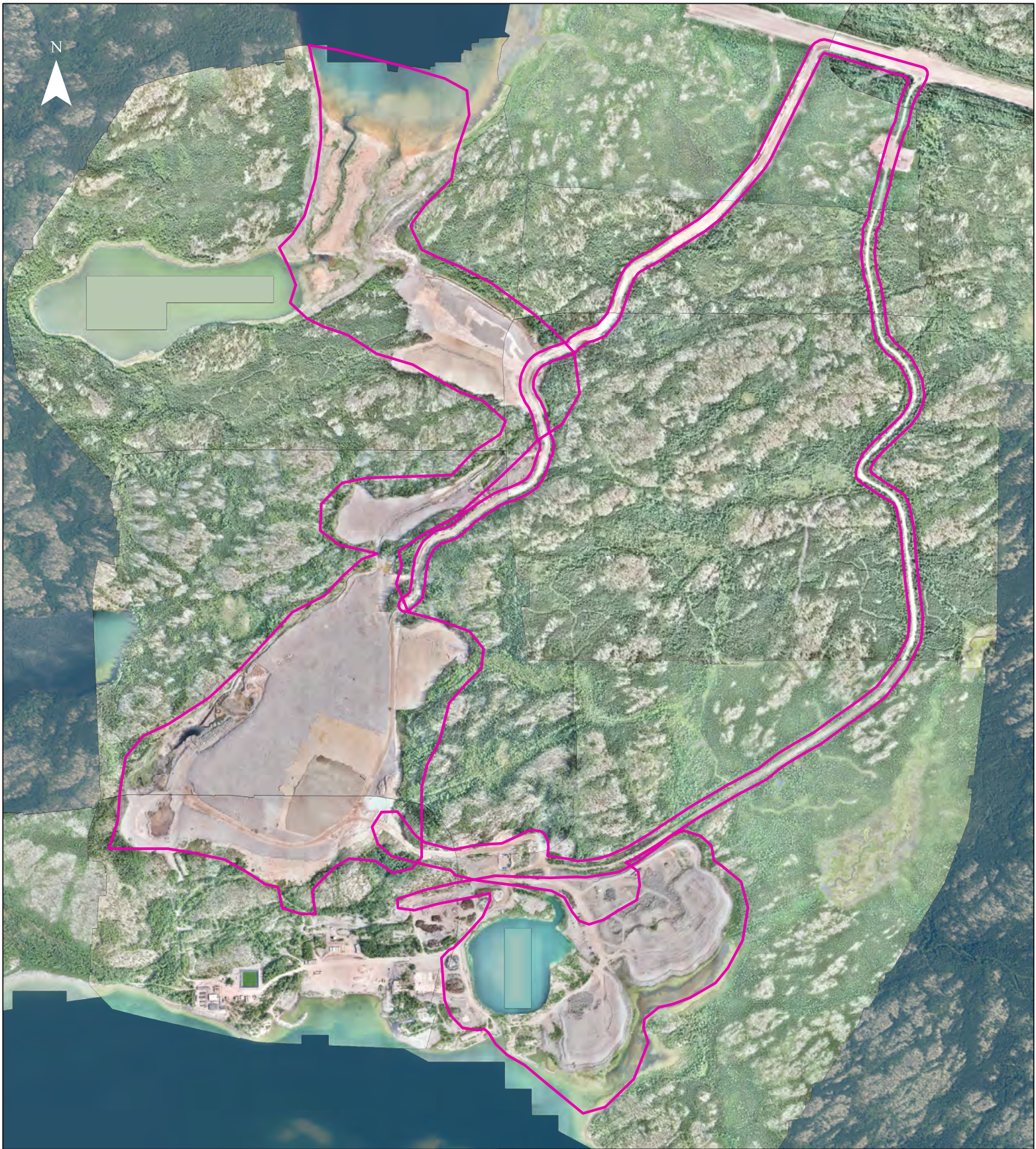
SRC is working with Ya'thi Néné Land and Resource Office (YNLR), an organization created by the Athabasca Basin Region to oversee resource development in the region (created after Gunnar Remediation Activities began). YNLR is a conduit for SRC to utilize traditional knowledge and keep lines of communication open for Project CLEANs and beyond (e.g., assessment of the abandoned uranium exploration site Homer Yellowknife, revegetation of cutlines within the Athabasca region for Caribou land development).

All large-value contracts (e.g., Gunnar contractors) include Athabasca Basin Regional content inclusion metrics that vendors must meet as part of their contractual obligations. Typical metrics include Indigenous labor content, local equipment utilization and overall project spend in the region. These contractual obligations encourage companies to diversify their workforce, have resulted in capacity building and direct engagement from local communities and have supported both SRC and its contractors with the Project social license. SRC also invites all companies involved with Project CLEANs to attend the Project community meetings to discuss with community members and leadership.



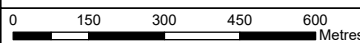
**Attachment A:**  
**Boundary Map**





# Gunnar Mine

 CNSC License

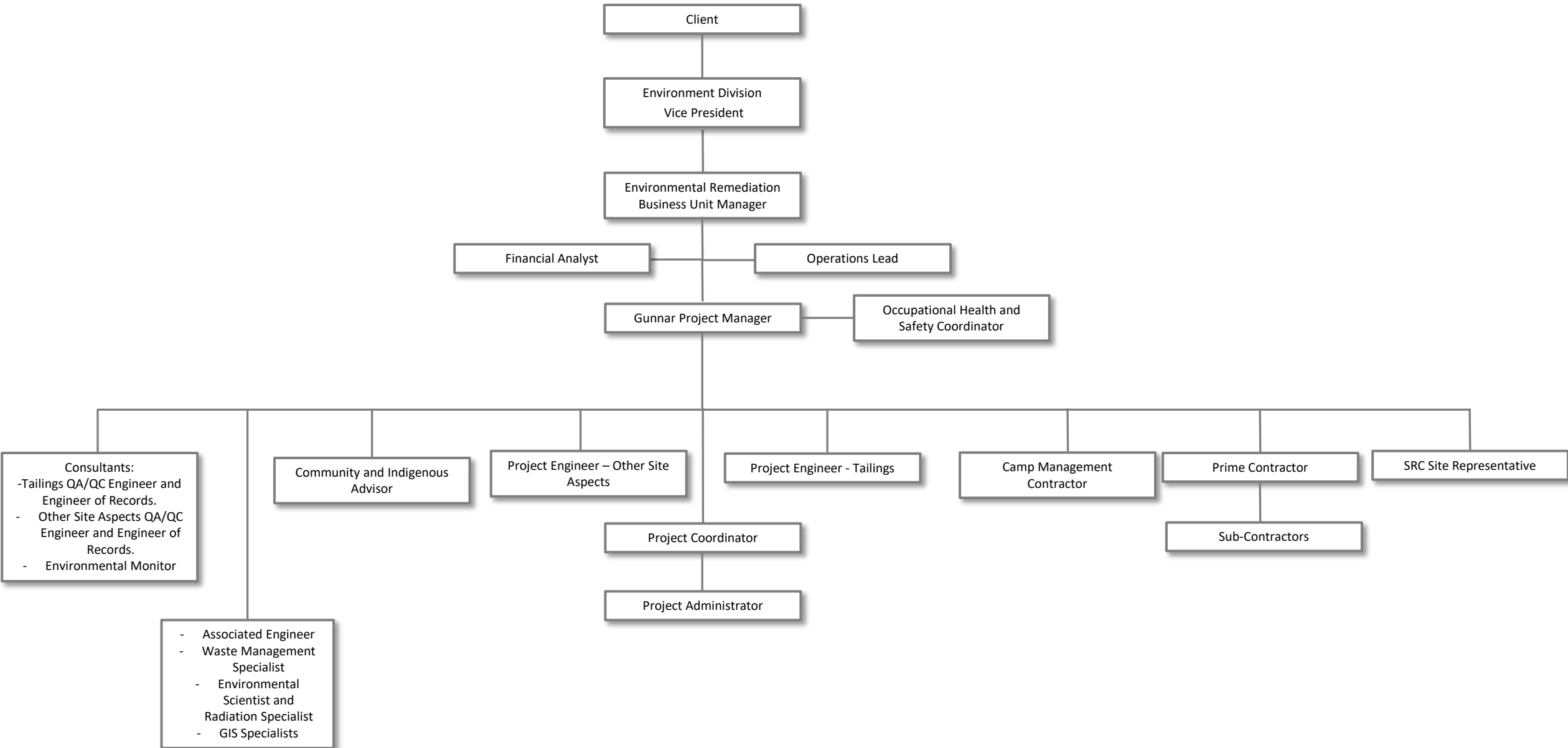
PROJECT	CLEANS - GMP Remediation (SRC)	
TITLE	Updated Gunnar Mine CNSC License Areas	
PROJECT #	12194-455	REFERENCE: Coordinate System: NAD 1983 CSRS UTM Zone 12N Datum: North American 1983 CSRS
DESIGN	CS	
CHECK	DS	NOTES: 1. Aerial image provided by SGIC 2. UAV image provided by SRC (2019)
FIGURE	01	
DATE	2023-09-12	
SCALE	1:15,000	





**Attachment B:**  
**Project Organizational Chart**

# Gunnar Legacy Uranium Mine Organization Chart



**SRC has submitted a Request for Confidentiality for Attachments C, D, E, and F.  
The Request for Confidentiality including a summary of the attachments, is available on  
the CNSC website or upon request.**