

Draft

PROJECT-SPECIFIC GUIDELINES

AND

COMPREHENSIVE STUDY SCOPING DOCUMENT

ENVIRONMENTAL IMPACT ASSESSMENT

OF THE

**FORMER GUNNAR MINE SITE REHABILITATION
PROJECT**

SASKATCHEWAN RESEARCH COUNCIL

This document has been prepared to meet the requirements for Project-Specific Guidelines for the Saskatchewan environmental impact assessment process and for the federal Comprehensive Study Scoping Document as required by the *Canadian Environmental Assessment Act*. It was prepared by Saskatchewan Environment, the Canadian Nuclear Safety Commission, Natural Resources Canada and the Canadian Environmental Assessment Agency to assist the Saskatchewan Research Council with the environmental impact assessment of the proposed Former Gunnar Mine Site Rehabilitation Project.

This document is in draft form, and public comments are invited before it is made final.

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1.0 INTRODUCTION

1.1 Site History

The Gunnar uranium mining and milling site (Gunnar site) on the north shore of Lake Athabasca (59°23' N, 108°53' W) in northern Saskatchewan ceased mining operations in 1963. The site, operated by the former Gunnar Mining Limited, had commenced uranium production in 1955. Uranium ore was mined initially from an open-pit and then from an underground operation. The Gunnar site officially closed in 1964 with little or no decommissioning of facilities. Shortly after closure, a trench was blasted between the open-pit and Lake Athabasca, allowing the open-pit and underground workings to flood. Later this trench was blocked by waste rock. Between 1971 and 1980 the warehouse building near the main dock was used as a fish processing facility.

In 2001, the Canadian Nuclear Safety Commission (CNSC) enforced a legislative requirement that required sites not previously licensed under the *Atomic Energy Control Act* to be licensed under the *Nuclear Safety and Control Act*. These sites included tailings management areas resulting from the former operation of uranium mines. Under the NSCA, the Gunnar site was considered to be abandoned and under the care and control of the Province of Saskatchewan. As a consequence, the province was requested by the CNSC to submit an application to the CNSC to license the Gunnar site.

In 2006, Saskatchewan Environment (SE) took out a Miscellaneous Use Permit on the Gunnar site. The intent of this permit was to record the area in the SE Lands Branch records system so that no other SE land dispositions would be issued for the area.

In 2007, the Governments of Saskatchewan and Canada signed a Memorandum of Agreement to address the current environmental conditions of the abandoned uranium mine sites in northern Saskatchewan, including the rehabilitation of the Gunnar site. Under the Agreement, Saskatchewan Industry and Resources (SIR) is responsible for the Gunnar Mine Site Rehabilitation Project. SIR has retained the Saskatchewan Research Council (SRC) under contract to act as project manager and designated agent to manage and perform the required environmental impact assessment and rehabilitation activities. For the purpose of this document, SRC will be recognized as the “proponent” from this point forward.

1.2 Project Proposal

In April 2007, the proponent submitted a project proposal to SE and the CNSC describing the development and implementation of a plan to rehabilitate the Gunnar site.

The project as proposed by SRC includes the following components:

- Demolition of existing building, facilities and structures;
- Appropriate disposal of materials resulting from demolition;
- Installation of an appropriate cover on all or a portion of the exposed mill tailings;
- Rehabilitation of existing waste rock piles;
- Rehabilitation of additional risk(s) as warranted;
- General site clean-up;
- Re-vegetation of areas of the rehabilitated site as required; and
- Appropriate monitoring during and after rehabilitation.

The proponent has been informed that the proposed rehabilitation of the Gunnar site will require environmental assessment under Saskatchewan's *The Environmental Assessment Act* (provincial Act) and the *Canadian Environmental Assessment Act* (federal Act). The proponent is required to conduct an environmental impact assessment (EIA) and prepare an environmental impact statement (EIS) for technical and public review. This document has been prepared to assist the proponent with the conduct of the EIA and the preparation of the EIS.

1.3 Purpose of the Draft Project-Specific Guidelines and Scoping Document

This Draft Project-Specific Guidelines and Scoping Document (hereafter called the Guideline-Scoping Document) comprises the requirements of both the provincial Project-Specific Guidelines and the federal Comprehensive Study Scoping Document. Under the 2005 *Canada-Saskatchewan Agreement on Environmental Assessment Cooperation* (Cooperative Agreement), Canada and Saskatchewan can agree to produce a single document to outline the specific process and information requirements for both the federal and provincial environmental assessment processes.

The Guideline-Scoping Document has been prepared to assist SRC with the conduct of the EIA and the preparation of the EIS. The document reflects concerns and issues that have been raised by provincial and federal officials regarding the proposed project and identifies the information that should be included in the EIS.

The document is being made available to the public for their review. The public is requested to provide input into the draft guidelines and outline any additional issues of

interest that should be included in the EIS. In accordance with subsection 21(1) of the federal Act, the public is also asked to comment on the proposed scope of the project for the purposes of the environmental assessment (subsection 3.1), the factors proposed to be considered in this assessment (subsection 3.2.1), the proposed scope of those factors (subsection 3.2.2), public concerns in relation to the proposed project including the potential for the project to cause adverse environmental effects, and the ability of a comprehensive study to address issues relating to the project.

Details on how the public can submit comments are provided in Section 5 of this document.

2.0 ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Federal and Provincial Cooperation in the Environmental Assessment

Canada and Saskatchewan intend to cooperate throughout the process in a manner that meets the legislated environmental assessment requirements of both parties. Under the Cooperative Agreement, federal and provincial environmental assessment processes, directed respectively by the federal *Canadian Environmental Assessment Act* (federal Act) and the provincial *Environmental Assessment Act* (provincial Act), are coordinated for projects with federal and provincial jurisdiction, where not limited by individual statutory or process requirements of the respective processes. Accordingly, information requirements of both federal and provincial agencies have been included in the Guideline-Scoping Document so that the EIS will be sufficient to address the requirements of the environmental assessment processes of both the Government of Saskatchewan and the Government of Canada.

Under the Cooperative Agreement, the Province of Saskatchewan, Environmental Assessment Branch, is the Lead Party and contact for the Gunnar Mine Site Rehabilitation Project, and has established a Project Administration Team for the cooperative environmental assessment. Membership on the Project Administration Team includes representatives from SE's Environmental Assessment Branch, the Canadian Nuclear Safety Commission (CNSC), Natural Resources Canada (NRCan), and the Canadian Environmental Assessment Agency (Agency).

As per the Cooperative Agreement, the Project Administration Team has worked together to consolidate the information requirements of both parties in this document. Members of the Project Administration Team will also be responsible for coordinating required decisions during the administration of the cooperative environmental assessment. Under the cooperative arrangement, a single environmental assessment and review process is used to obtain the environmental assessment information needed for federal and provincial environmental processes. Both governments will use the information generated through the cooperative environmental assessment as the basis for their

respective decisions about the project. However, each government will retain its ability to make project-related decisions on matters within its own legislative authority.

Pursuant to section 17(1) of the federal Act and section 9(1) of the provincial Act, the responsible authorities delegate the conduct of the environmental assessment to the Proponent. The Proponent will prepare an EIS based on this Guideline-Scoping Document. Once completed, the proponent will submit the EIS to the Project Administration Team for review.

2.2 Provincial Environmental Impact Assessment

Following technical review of the April 2007 SRC proposal for the rehabilitation of the Gunnar site by provincial agencies and departments, the Gunnar Mine Site Rehabilitation Project is considered to be a “development” pursuant to section 2(d) of the provincial Act. As a consequence, SRC is required to conduct an EIA of the proposed Gunnar Mine Site Rehabilitation Project and prepare and submit an EIS to the provincial Minister of Environment (provincial Minister).

Once the EIS is submitted, the Environmental Assessment Branch will circulate the EIS to provincial departments and agencies for technical review. These departments and agencies include the Saskatchewan Departments of Environment, Watershed Authority, Health, First Nations and Métis Relations, Culture Youth and Recreation (Heritage Branch), Industry and Resources, Northern Affairs, and Government Relations.

Following the technical review of the EIS, the Environmental Assessment Branch will prepare Technical Review Comments that evaluate the EIS. The EIS and the Technical Review Comments, along with the federal Comprehensive Study Report (discussed below), will then be provided to the public for a minimum 30 day review. After the public review of the EIS, the submissions from the public, together with information generated during the technical review of the EIS, will be provided to the provincial Minister for his consideration prior to making his Ministerial Decision whether or not to approve the development.

2.3 Federal Environmental Assessment

2.3.1 Regulatory Context

The proposed decommissioning of the Gunnar site is an undertaking in relation to a physical work, and thus is a ‘*project*’ as defined in section 2 of the federal Act. The CNSC and NRCan have indicated that they may take steps that enable various aspects of the project to be implemented. As a result, they have determined that they are RAs under the federal Act. As such, they must ensure that an environmental assessment, as scoped

by them and in accordance with the federal Act, is conducted prior to the issuance of federal licences, authorizations, permits, approvals, and/or funding as described below.

2.3.1.1 Responsible Authorities

Canadian Nuclear Safety Commission (CNSC)

CNSC authorization of SRC's proposal would require the issuance of a license to decommission. Licences are issued by the Commission under the authority set out in subsection 24(2) of the *Nuclear Safety and Control Act* (NSCA). Subsection 24(2) of the NSCA is listed as a "trigger" under the *Law List Regulations* of the federal Act in respect of the issuance of a licence. Pursuant to paragraph 5(1)(d) of the federal Act, an environmental assessment must be conducted before a licensing decision can be made. CNSC is therefore an RA under the federal Act.

Natural Resources Canada (NRCan)

NRCan is participating as an RA under the federal Act for the environmental assessment of the Gunnar Mine Site Rehabilitation Project because it is considering providing funding for the decommissioning project. NRCan is also participating in the EA as a federal department with expertise relevant to the Project. This review will be coordinated through the Environmental Assessment Group of NRCan's Science, Policy and Integration sector.

2.3.1.2 Expert Federal Authorities

Pursuant to the *Federal Coordination Regulations* under the federal Act, the following federal departments/agencies have an interest in the project related to their mandate and are participating in the review as expert Federal Authorities (FAs) in relation to the project: Fisheries and Oceans Canada (DFO), Transport Canada (TC), Environment Canada (EC), and Health Canada (HC).

2.3.1.3 Federal Environmental Assessment Coordinator

The Canadian Environmental Assessment Agency (Agency) is the FEAC for the proposed project and is responsible for coordinating the review activities of the RAs and expert FAs in accordance with section 12 of the federal Act and in conjunction with the provincial environmental assessment process. The FEAC will coordinate the federal participation on the joint federal-provincial Project Administration Team, which will include the RA and FA departments identified above as well as the provincial Environmental Assessment Branch.

2.3.2 Type of Federal Environmental Assessment

CNSC and NRCAN have determined that components of the proposed Gunnar Mine Site Rehabilitation Project are described in paragraph 19(a) of the *Comprehensive Study List Regulations* of the federal Act, as described below:

19. The proposed construction, decommissioning or abandonment, or an expansion that would result in an increase in production capacity of more than 35 per cent, of

(a) a uranium mine, a uranium mill or a waste management system any of which is on a site that is not within the boundaries of an existing licensed uranium mine or mill;

Although the project proposal is for 'site rehabilitation', the CNSC and NRCAN consider the proposed activities to be activities related to decommissioning of a mine, mill and waste management systems. Subsection 19(a) of the *Comprehensive Study List Regulations* of the federal Act would therefore apply to this proposal.

2.3.3 Comprehensive Study Environmental Assessment Requirements

In accordance with subsection 21(1) of the federal Act, the RAs are required to consult with the public with respect to the proposed scope of the project for the purposes of the federal environmental assessment, the factors proposed to be considered, the proposed scope of those factors, and the ability of the comprehensive study to address issues relating to the project.

Following this initial public consultation associated with this document, as described in Section 5 and pursuant to subsection 21(2) of the federal Act, the RAs must submit a report to the federal Minister of the Environment (federal Minister), which will include the following:

- the scope of the project, the factors to be considered in the environmental assessment and the scope of those factors;
- public concerns in relation to the project;
- the project's potential to cause adverse environmental effects; and
- the ability of the comprehensive study to address issues relating to the project.

After taking into consideration comments from the public, the RAs must also recommend to the federal Minister whether the environmental assessment should be continued by means of a comprehensive study, or whether the project should be referred to a mediator or review panel. The recommendation document is referred to as the Track Report.

Once the Track Report is completed, the CNSC will hold a public hearing to provide the public an opportunity to review, comment and present interventions before the

Commission on the report prepared by the RAs. Following the public hearing, the Track Report will be submitted to the federal Minister to decide whether to refer the project back to the RAs to continue the comprehensive study process, or refer the project to a mediator or review panel. If the federal Minister decides that the project should continue as a comprehensive study, the project cannot be referred to a mediator or review panel at a later date.

If the federal Minister refers the project to a mediator or review panel, the project will no longer be subject to the comprehensive study process under the federal Act. The federal Minister, after consulting the RAs and other appropriate parties, will set the terms of reference for the review and appoint the mediator or review panel members. As per the Cooperative Agreement, the province will be immediately informed of this decision and will determine how the province would proceed. The public would have the opportunity to participate in the panel process.

If the environmental assessment continues as a comprehensive study, the RAs, following the review of the proponent's EIS and in consultation with SE, the Agency and the expert FAs, will conduct a comprehensive study and prepare a comprehensive study report (CSR). The CSR will be prepared based on the proponent's EIS and any additional information gathered throughout the assessment process. The RAs will ensure there are opportunities for public participation during the conduct of the comprehensive study. Once completed, the RAs will submit the CSR to the Agency.

Following submission of the CSR, the Agency will invite the public to comment on this report prior to the federal Minister taking a decision on the environmental assessment. Once the environmental assessment decision statement is issued, the federal Minister will refer the project back to the RAs for action.

A public registry for the project assessment has been established. This includes identification of the project assessment in the Canadian Environmental Assessment Registry (CEAR), which can be accessed on the Internet web site of the Agency (www.ceaa.gc.ca). The CEAR reference number for the project is 07-03-30100.

2.3.4 Funding to Participate in the Federal Environmental Assessment

Whether the environmental assessment proceeds by means of a comprehensive study or is referred to a mediator or review panel, participant funding will be made available by the Agency to facilitate public participation. This funding would become available after the federal Minister makes a Track Decision, i.e. to either refer the project back to the RAs to continue the comprehensive study process, or refer the project to a mediator or review panel. Information on the Participant Funding Program can be found on the Agency's website at <http://www.ceaa-acee.gc.ca>.

2.4 Joint Public Consultation

As is required in both federal and provincial environmental assessment processes, the public will be given an opportunity to participate in the conduct of the environmental assessment. The requirements for this participation are set out in Section 4.3 of this document.

If the environmental assessment continues as a comprehensive study, the public would also be provided with an opportunity to review the CSR prepared by the federal RAs. This review will be coordinated with the review of the proponent's EIS and the Technical Review Comments prepared by the provincial Environmental Assessment Branch. This final public review period must be a minimum of 30 days to meet provincial requirements and will be extended, if necessary, through consultation with the Project Administration Team as per the Cooperative Agreement.

The public will be requested to provide their comments on the EIS, Technical Review Comments and CSR to the Agency and/or SE. The federal and provincial ministers will take into account the CSR and Technical Review Comments, respectively, and any comments received from the public, prior to making environmental assessment decisions. The ministers may request additional information or require that public concerns be further addressed before issuing environmental assessment decisions.

3.0 PROPOSED SCOPE OF THE FEDERAL ENVIRONMENTAL ASSESSMENT

Scoping establishes the boundaries of the federal environmental assessment. The scope identifies what elements of the development proposal to consider and what environmental components are likely to be affected, and focuses the assessment on relevant issues and concerns.

3.1 Proposed Scope of Project

Pursuant to section 15 of the federal Act, the proposed scope of the project for the purpose of the federal environmental assessment, as established by the CNSC and NRCAN, includes the physical works and activities associated with the decommissioning of the Gunnar site. The scope of the project includes:

- Demolition of existing buildings, facilities and structures;
- Appropriate disposal of materials resulting from demolition and remediation activities;
- Rehabilitation of existing waste rock piles;

- Installation of cover on above-ground and submerged mill tailings, where appropriate;
- Rehabilitation of additional risk(s) as warranted;
- General site clean-up;
- Re-vegetation of areas of the rehabilitated site as required; and
- Appropriate monitoring during and after rehabilitation.

3.2 Proposed Scope of Assessment

The scope of assessment defines the factors proposed to be considered in the environmental assessment and the proposed scope of those factors.

The RAs are required to consider the factors specified in section 16 of the federal Act, taking into consideration the definitions of the environment, environmental effect and project, prior to making a decision regarding whether to take action that would permit the project to proceed.

3.2.1 Proposed Factors to be Considered

As stated in the federal Act, “environmental effect” means, in respect of a project:

- (a) *any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,*
- (b) *any effect of any change referred to in paragraph (a) on*
 - (i) *health and socio-economic conditions,*
 - (ii) *physical and cultural heritage,*
 - (iii) *the current use of lands and resources for traditional purposes by Aboriginal persons, or*
 - (iv) *any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or*
- (c) *any change to the project that may be caused by the environment*

As described in subsections 16(1) and (2) of the federal Act, an environmental assessment conducted as a comprehensive study shall include a consideration of the following factors:

- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any

cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

- the significance of the effects referred to in the previous paragraph;
- comments from the public that are received in accordance with the cooperative environmental assessment process;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
- the need for, and the requirements of, any follow-up program in respect of the project; and
- the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

Accordingly, the EIS should include information for each of the above factors.

Further to subsections 16(1) and (2) of the federal Act, the CSR will consider the factors listed above and document any issues and concerns that may be identified through any regulatory, stakeholder and/or public consultation.

3.2.2 **Proposed Scope of the Factors to be Considered**

The proposed scope of the factors to be considered by the RAs in the comprehensive study includes the following list of environmental components likely to be affected. Additional information on these factors can be found in Section 4 of this document:

- Climate, Meteorology and Air Quality
- Geology/Geomorphology
- Hydrogeology
- Surface Hydrology
- Water Quality
- Sediment Quality
- Fish and Fish Habitat
- Navigation
- Soil Quality
- Terrestrial Ecology

- Heritage Resources
- Socio-Economic Environment

3.2.3 Valued Ecosystem Components

The assessment will consider potential effects the project may have on the environment and other aspects considered to be Valued Ecosystem Components (VECs). VECs of interest in this area will be chosen through consultation with northern residents through the Environmental Quality Committee (EQC)¹, incorporating traditional knowledge and land use. The most recent list of VECs includes the following:

Terrestrial Receptors

- Birds – Mallard, Eagle, Merganser, Ptarmigan/Grouse, Scaup
- Terrestrial Mammals – Bear, Woodland Caribou, Barren Ground Caribou, Snowshoe Hare, Moose, Wolf Lynx
- Terrestrial Vegetation – Blueberries, Labrador Tea, Lichen, Cranberries, Browse, Rosehips

Aquatic Receptors

- Aquatic Vegetation – Algae, Pond Lily, Pondweed
- Consumers of Primary producers – Zooplankton, Chironomids
- Fish – Northern Pike, Lake Whitefish, Lake Trout, White Sucker
- Aquatic Mammals – Beaver, Muskrat, Otter, Mink

3.2.4 Spatial and Temporal Boundaries

Impacts with respect to spatial and temporal boundaries may vary depending on the factor being considered, and the assessment of these impacts should consider:

- Timing/scheduling of project activities;
- Natural variations of an environmental component;
- The time necessary for an effect to become evident, taking into account the frequency of the effect as well;

¹ The Northern Saskatchewan Environmental Quality Committee (EQC) was established to provide a forum to ensure consideration of concerns and recommendations of northerners on the way in which uranium development occurs in northern Saskatchewan. The EQC is currently made up of 32 representatives from "impact communities" (municipal and First Nations). Increasingly, over the years that the EQC has been operating, the EQC has become a more informed and regular voice, providing input into the decisions of both provincial and federal regulators concerning uranium mining issues in the North.

- The time required for recovery from an impact, including the estimated degree of recovery;
- Cumulative effects;
- Comments from the public; and
- Traditional knowledge and land use.

The proponent should clearly define (in text and maps) the rationale for the spatial boundaries that are used in the environmental assessment. The spatial boundaries should be determined specific to each factor being considered to effectively assess the potential environmental effects of the project. The study area, i.e., the geographic scope of the investigations, should include those local areas directly impacted by the undertakings associated with the project and also the zones within which there may be environmental effects that are cumulative, regional or global in their nature.

The temporal scale of the assessment must encompass the entire lifespan of the rehabilitation project, and will include construction, operation (including maintenance and/or modifications), decommissioning, reclamation and abandonment of project components, as well as completion of a fish habitat compensation plan, if one is required.

4.0 **PROJECT-SPECIFIC GUIDELINES**

Section 4 of this document outlines the specific studies that should be undertaken and the information that should be obtained as part of the EIA, and how these should be presented and evaluated in the proponent's EIS. This section describes what would conventionally be understood as Draft Project-Specific Guidelines under the Province of Saskatchewan's environmental review process and also provides further detail about what the federal RAs propose to include in their scope of factors to be considered. The guidelines portion of this document has been developed with input from provincial and federal experts. These guidelines reflect issues that have been raised by federal and provincial officials regarding the proposed rehabilitation of the former Gunnar mine site and identify the information that should be included in the EIS.

The EIA should focus on the identification of potential options for site rehabilitation activities (see subsection 4.2) and assess the potential for these options to eliminate or reduce environmental and public safety hazards at the site and minimize the risks to the environment and the public in the future.

Information provided in the EIS that is related to the proposed Gunnar site rehabilitation plan should be complete and detailed. Existing information on environmental parameters for the Gunnar site that will not be affected by the proposed rehabilitation activities, or information which is cited to provide context for the discussion of potential impacts, may be referenced and provided in summary form.

Public consultation is an integral component of EIA, requiring stakeholders to be fully informed about a proposed project, and the preparation of a public involvement plan (see subsection 4.3). The identification and assessment of potential options for site rehabilitation activities at the Gunnar site, and the selection of the preferred options for specific activities, should be discussed with regional residents, Aboriginal peoples, organizations and other stakeholders.

The EIS should provide a thorough description of the existing physical and environmental conditions at the Gunnar site (see subsection 4.5) and an assessment of the current and/or potential hazards these conditions represent in the short and long terms to the environment and to public safety.

Should the proposed plan to rehabilitate the former Gunnar site be found environmentally acceptable provincially and not likely to cause significant adverse environmental effects taking into account the implementation of mitigation measures as per the federal Act, the SRC would be required to apply to SE and the CNSC for the necessary approvals, permits and licences that would regulate the rehabilitation plan. SRC would have to comply with all applicable provincial and federal laws.

These guidelines should not be considered as either exhaustive or restrictive, as concerns other than those already identified could arise during the investigations associated with the EIA.

Reference to SE's General Guidelines for Conducting an Environmental Impact Assessment² is recommended. In addition, SE is prepared to provide advice and assistance throughout the EIA with regard to the identification of environmental concerns and appropriate assessment methodologies.

4.1 EIS Executive Summary

An executive summary of the EIS is required. It should briefly summarize and cross-reference the EIS under the following topic areas:

- description of the project;
- purpose of, need for, and alternative means of carrying out, the project;
- environmental effects of the project, including those from potential spills, malfunctions, or accidents;
- any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

² Contained in *The Saskatchewan Environmental Assessment and Review Process*. January 1996. Saskatchewan Environment Environmental Assessment Branch.

- the significance of the environmental impacts and technically and economically feasible mitigation measures;
- renewable resources that are likely to be affected significantly by the project, including current use of lands and resources for traditional purposes by aboriginal persons;
- comments from the public and SRC's responses;
- identification of uncertainties in regards to the project elements and/or environmental effects of the project, including those of a chemical, physical, and/or radiological nature; and
- the need for, and the requirements of, a follow-up program in respect of the project.

The executive summary, which can be under separate cover, should avoid the use of technical terms and jargon. To enhance involvement of northern Saskatchewan residents and First Nations in the public participation process, the executive summary should be translated into each Aboriginal language, Cree and Dene, and made accessible in video or audio form.

4.2 Project Description

The EIS should provide a comprehensive description of the conceptual elements of the Gunnar mine site rehabilitation project, including the need for the project, the development of the rehabilitation plan, the implementation of the plan, the development of monitoring programs for the completed works and the identification of the mechanisms for final abandonment and return of the site to institutional control³.

The EIS should also describe project management and the integration of environmental, social and economic factors, occupational and public health and safety, and public consultation into the overall project. It should also provide a statement of the radiological design objectives for the project.

Local and regional maps with identifiable features should be provided to show the location of the project and the status of current land dispositions for the Gunnar site and adjacent lands.

The EIS should include a comprehensive list of the applicable federal and provincial legislation, regulations and guidelines that will apply to the planning and implementation of the proposed project. The proponent should also briefly describe (in tabular form) the activity(s) requiring approval, the project stage the approval or the permit will be

³ As part of the decommissioning process, the proponent will need to apply for both decommissioning and abandonment licences under the *Nuclear Safety and Control Act*, prior to site being reverted back to provincial 'institutional control' i.e. responsibility of province. For additional information, please refer to the CNSC document *Licensing Process for New Uranium Mines and Mills in Canada*, March 2007.

required at, the regulatory agency in charge for the approval or permit, name of the approval or permit, and associated legislation/regulation.

4.2.1 Purpose of and Need for the Project

The EIS should establish the purpose of and need for the Gunnar Mine Site Rehabilitation Project and identify ownership and management responsibilities for the project. Under the federal Act, "purpose of" the project is defined as what is to be achieved by carrying out the project, where as "need for" is defined as the problem or opportunity the project is intending to solve or satisfy. That is, "need for" establishes the fundamental rationale for the project.

Relevant information from prior studies of the Gunnar site identifying any environmental and public concerns should be referenced. A concise history of the Gunnar uranium mine development should be provided in order to place the proposed Gunnar Mine Site Rehabilitation Project in context.

4.2.2 Development of the Rehabilitation Plan

Site Characterization and Risk Assessment

The EIS should contain a complete and detailed inventory of the abandoned physical structures (mill, mine infrastructure, maintenance and storage buildings, offices, residences); historical locations of structures no longer in place (including drum storage and tank farms, etc., that may have impacted soils); physical surface works (roads, pipelines, powerlines, drainage works, etc.); effluent treatment systems; waste disposal sites, including those for tailings, waste rock, sludges, sewage, chemicals, garbage, etc.; and residual wastes and hazardous goods, as well as contaminated soils, that are present at the former Gunnar mine site. Waste materials should be characterized chemically and physically and evaluated for their potential as environmental contaminants.

In particular, any residual materials produced by mining should be analyzed to determine whether they are mineralized, non-mineralized or potentially acid generating. Analytical results should include but not be limited to physical, chemical, and radiological characteristics, key metal contaminants, leachate data, oxidation potential, and quantity and quality of any airborne emissions e.g., SO_x, NO_x, dust, radon, and radionuclides. Any runoff or leachate from stockpiles or potentially contaminated areas should be characterized.

The current environmental status of the abandoned Gunnar pit should be described in detail with particular emphasis on water quality and hydraulic connections to local and regional surface and ground water systems.

Relevant details of prior studies or evaluations of the Gunnar site should be reviewed and incorporated where appropriate.

A key component of the development of the Gunnar rehabilitation plan will be the identification of the risks to the environment and the public from the abandoned Gunnar mine site. The potential environmental and public hazards associated with the abandoned features of the mine should be identified and an assessment of the current level of risk to the environment and the public from these hazards should be conducted. The EIS should provide an overview of the nature and source of any potentially significant risks, including radiological risks, from the project to the workers and the public.

The environmental database in the EIS should identify environmental contaminants at the former Gunnar mine and evaluate the current levels of impacts on air quality, surface water and groundwater quality, soil, sediment, flora and fauna from these contaminants. An evaluation should be undertaken of these contaminants assessing whether, in the future, the contaminant levels would remain stable or would increase or decrease with or without rehabilitation activities. The proponent should address all contaminants of concern at the site, including contaminants not directly related to mining and milling operations. Areas of concern could include but may not be limited to the former tank farm, maintenance shop, sewage treatment facility and garbage disposal area.

The Canadian Council of Ministers of the Environment (CCME) risk assessment guidance documents should be referenced for further information on standard risk assessment methodologies⁴.

Identification of Rehabilitation Options/Alternative Means of Carrying out the Project

The EIS should provide a detailed description of the rehabilitation options, documenting the pros and cons of each option for the Gunnar site based on the identification of the current and potential hazards and levels of risk to the environment at the site. The preferred option(s) should be identified and justified.

The EIS should discuss, in detail, the criteria (environmental, engineering, economic) used by SRC to evaluate alternative means and/or options for the rehabilitation plan and justify the environmental acceptability of the preferred option using these criteria. Alternative means are defined as the various technically and economically feasible ways that the project can be implemented. The discussion should describe how radiological doses to workers and the public were considered in the assessment.

The criteria used to evaluate alternative means should reflect the potential concern for both the short-term (during implementation of the plan) and long-term (after

⁴ Canadian Council of Ministers of the Environment (CCME). 1996. "A Framework for Ecological Risk Assessment: General Guidance". Winnipeg, Manitoba;
CCME. 1997. "A Framework for Ecological Risk Assessment: Technical Appendices". Winnipeg, Manitoba.

abandonment of the rehabilitated Gunnar site) physico-chemical stability and environmental impacts of the project.

An important factor to consider, when developing rehabilitation options and the scope of physical rehabilitation works, is the impact of natural biological and geochemical processes on the site since abandonment. Since abandonment, natural processes may have mitigated site hazards and reduced the level of risk to the environment and the public. If natural mitigation has been significant, the current level of risk to the environment and to the public may be acceptable without additional physical rehabilitation work. Proposed physical rehabilitation work should be evaluated in terms of the current level of risk to the environment and of the potential for disturbance to effective natural mitigation processes.

The EIS should identify the objectives of the rehabilitation plan and address:

- post-rehabilitation landforms and drainage systems;
- post-rehabilitation land use options for the Gunnar site; and
- any potential opportunities for environmental enhancement.

The EIS should describe:

- removal, disposal and rehabilitation procedures for all abandoned mine, mill and waste management structures and surface disturbances, including identification of radiological criteria for defining material as "clean" for the purpose of removal from the site;
- salvage of materials from structures;
- environmental mitigation and reclamation measures, including contouring, stabilization of waste rock and soil materials, installation of cover on above-ground and submerged mill tailings, where appropriate, and re-vegetation procedures;
- salvage and/or disposal of merchantable and unmerchantable timber, slash and debris; and
- any technical issues or technological requirements specific to the project.

Specifically, the proponent should document in the EIS how the plan will address methods to isolate hazards that are potential contaminant sources from surface and ground waters, and evaluate potential post-rehabilitation contaminant loadings from the rehabilitated Gunnar site to local surface drainage systems and groundwater.

The proponent should identify and document in the EIS any hazards that cannot be mitigated by the proposed rehabilitation plan so that the long-term level of risk to the environment and the public is acceptable and that would require long-term management after the implementation of the rehabilitation plan.

The EIS should include should performance goals and objectives for the rehabilitation plan, including decision criteria to determine the need to adjust mitigation, continue monitoring as designed, modify monitoring or conclude mitigation and monitoring.

4.2.3 **Implementation of the Rehabilitation Plan**

The EIS should provide a detailed description of the logistics and implementation of the rehabilitation plan. This should include:

- anticipated commencement and schedule;
- estimated manpower and skill requirements;
- manpower housing and support facilities;
- materials, transportation, and power requirements;
- transportation of decommissioning equipment to the Gunnar site;
- transportation of any materials from the site;
- construction and decommissioning of any roads built to facilitate rehabilitation activities;
- any proposed use of the Uranium City airport and anticipated level of service;
- sourcing of materials;
- equipment requirements and maintenance;
- worker health and safety considerations, including conventional and radiological concerns;
- fire prevention and suppression programs, including wildfire; and
- emergency measures, contingency plans or procedures.

4.3 Public Involvement

Regional residents or organizations should be fully informed of the proposal to rehabilitate the former Gunnar Mining Ltd. site.

It is noted that, in the proposal, SRC discusses the formation of an Advisory Forum to facilitate public and stakeholder consultations regarding the development and implementation of the rehabilitation plan for the abandoned Gunnar site. SRC also identifies key stakeholders including First Nations, communities, planning groups, federal and provincial government agencies and industry groups. It is suggested that the provincial government agencies include: Northern Municipal Services, Saskatchewan Government Relations (community development and economic opportunities for local people); First Nations and Métis Relations (building co-operative relationships with Aboriginal people and consultation on Aboriginal and Treaty Rights), Mineral Sector Steering Committee, Saskatchewan Advanced Education and Employment (maximizing northern training and employment and possible training co-funding through Multi-Party Training Plan); and the Population Health Unit with the Athabasca Health Authority, Keewatin Yatthé and Mamawetan Churchill River Health Regions (identification of stakeholders).

The EIS should describe the program for consultation with northern residents and Aboriginal peoples. The consultation program also should provide a basis for discussion of enhancement of regional business and employment opportunities with these groups. Public involvement and any concerns raised should be documented in the EIS and their significance evaluated.

The program should promote a broader understanding of the project, the identified environmental and public hazards at the Gunnar site, and the current levels of environmental and public risk associated with these hazards. Efforts should be made to involve the public in the development of the rehabilitation plan, including the identification of issues and objectives, options for final land forms and end uses, alternative methods of rehabilitation, and the determination of the preferred alternative for rehabilitation.

Elements of the public information/consultation plan should involve the contribution of traditional knowledge to the development of the rehabilitation plan and the identification of VECs and any current and traditional uses of the Gunnar site and environs.

The EIS should describe any public consultation activities that already have been conducted regarding the planning of the former Gunnar mine site rehabilitation project.

As interest in the Gunnar Mine Site Rehabilitation Project may extend beyond the project area, SRC should be prepared to provide project information to, and address issues identified by, persons residing outside of the project area.

4.4 **Description of Socio-Economic Environment**

4.4.1 **Land and Resource Use**

The EIS should provide a description of existing and proposed future land and resource use at the project site and within the study boundaries, as well as any current use of lands and resources for traditional purposes by Aboriginal persons. The EIS should describe terrestrial and aquatic recreational activities, cultural activities and culturally significant sites, and use of renewable and non renewable resources (e.g. trapping, hunting, fishing, and gathering).

4.4.2 **Business and Employment**

The EIS should provide a description of employment requirements, including skill levels and training, required to implement the Gunnar rehabilitation plan. Jobs and contractor opportunities targeted for Northerners and commitments to potential local, regional and Saskatchewan suppliers should be noted.

It is noted that, in the proposal, SRC commits to provide a forum for meaningful discussion of enhanced regional business, training and employment opportunities.

4.4.3 **Public and Occupational Health and Safety**

The EIS should identify potential occupational health and safety concerns, both conventional and radiological, that would require management during the implementation of the Gunnar rehabilitation plan. Programs for conventional and radiological worker health and safety should be described.

Any previous reviews of the Gunnar site identifying potential hazards to public and worker safety should be referenced.

The EIS documentation should include:

- calculations of radiation exposures of all employees at the Gunnar site during the rehabilitation project, including a discussion that is provided in terms that will be understood by the public;
- potential non-radionuclide hazards to workers, including inhalation, dermal, and incidental ingestion exposure pathways;
- programs proposed to control worker radiation doses and intake of radioactive and non-radioactive substances in airborne dust;
- measures designed to provide for the health and safety of workers during the implementation of the rehabilitation project, including demolition of structures,

- cleanup of hazardous and waste dangerous goods, disposal of waste materials and earthmoving activities;
- the development of occupational health and safety training modules for site workers; and
 - an assessment of the potential effects of any environmental changes on human health or the use of lands, waters and resources for traditional purposes by aboriginal persons and on the quality of any country foods that may be harvested. Potential entry of contaminants of concern in liquid and airborne waste streams, e.g., radionuclides, heavy metals, into food chains and the terrestrial or aquatic environment should be described.

Programs should meet the regulatory requirements of The Occupational Health and Safety Act, 1993, The Occupational Health and Safety Regulations, 1996, The Radiation Health and Safety Regulations, 1993 and The Saskatchewan Mines Regulations, 2003.

The EIS should provide an assessment of the potential safety risks to the public following the completion of the implementation of the rehabilitation plan and following the final abandonment of the rehabilitated Gunnar site.

4.5 Description of the Environment

4.5.1 Environmental Database

The EIS should contain a description of the local environment which may be reasonably affected by the proposed Gunnar Mine Site Rehabilitation Project and allow an evaluation and prediction of the potential environmental effects of the project. The EIS should discuss whether historic exploration and industrial development activities have influenced the current status of the environment, fisheries, wildlife or resource use at the Gunnar site.

All environmental data that are included in the EIS should be collected using accepted methodologies and be made available to the federal and provincial regulators in digital form. These methodologies should be consistent in order to allow comparative use of the data and facilitate ecosystem management. The Mines Pollution Control Branch Environmental Monitoring Guidelines (March 31, 1989) should be consulted regarding baseline studies.

The database in the EIS should provide a sound basis not only for the environmental impact assessment of the rehabilitation project, but also for environmental monitoring and post-rehabilitation abandonment. The environmental data should contribute to, and be in a form compatible with, the existing environmental effects monitoring database for the assessment of potential effects on a regional scale.

Therefore, the data in the EIS should satisfy the following criteria:

- (i) that the baseline data accurately describe the existing environment that may be affected by the project as proposed, as well as relevant background/reference conditions;
- (ii) that the data provide a sound statistical basis for comparative monitoring to verify effects predictions, confirm effectiveness of mitigation and the development of sound abandonment procedures; and
- (iii) that the EIS be self-supporting, in terms of data availability and presentation.

It is noted, however, that databases of environmental information have been compiled previously for the Gunnar site. Existing data on environmental parameters that will not be affected by the proposed rehabilitation of the Gunnar site, but are cited to provide context for the discussion of potential impacts, may be referenced or provided in summary form.

4.5.2 Climate, Meteorology and Air Quality

Any current databases of climatic, meteorological and air quality information, including dust, radon and gamma radiation data, should be referenced in the EIS. Any implications for the project e.g., effects on hydrologic balances, airborne dispersal of dust, arising from on-site conditions should be discussed. Any use of off-site data must be thoroughly discussed and qualified with an understanding of local and regional variability and the geographic locations of on-site and off site meteorological stations.

The EIS should include a description of baseline radiological conditions of sufficient detail to allow the impacts of the project to be assessed using subsequent monitoring information. This would include but not be limited to the results of surveys of the radiological conditions of the existing environment, including a description of any significant gaps or uncertainties in the measurements.

The EIS should include the current status of the Gunnar site with respect to climate change parameters.

4.5.3 Geology/Geomorphology

The EIS should contain a description of the regional and local geology and geomorphology of the Gunnar site sufficient to discuss the implications of the proposal to rehabilitate the Gunnar site. Relevant information should be discussed in terms of any potential effects on the project e.g., ground stability, slumping and piping and material weathering and acid/metal release.

Any other geological features, such as faults, fractures, shears, and seismic activity that may have an impact on the project should be identified and their significance described.

4.5.4 **Hydrogeology**

The EIS should contain a description of the existing regional and local hydrogeology, including the stratigraphic, hydrogeological, geophysical and geochemical properties of the geological units, such as the permeability, porosity, retardation factors, fractures and fault zones, etc. It should provide an understanding of the regional and local ground water flow patterns and rates, recharge and discharge zones, and an assessment of the interaction between the hydrogeology and the proposal. The scale should be sufficient to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond.

4.5.5 **Surface Hydrology**

The EIS should provide information on the regional and local hydrology, including data on watershed areas, drainage patterns, precipitation, evapotranspiration, water balance of natural and man-made water bodies (lakes, rivers, ponds, etc.), records and statistics (frequencies) of water levels and flows rates. The scale should be sufficient to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond. There should also be a discussion of the interaction between the hydrology, hydrogeology and the proposed project and the impact under current and changing climate conditions. The scale should be sufficient enough to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond.

The proponent should note that any works involving the diversion of surface waters would require approval by the Saskatchewan Watershed Authority.

4.5.6 **Water Quality**

The EIS should discuss the existing surface and ground water quality within the project boundary as well as in the background. It should provide the sampling parameters, frequencies, locations, history and analyses of the results varying with time. The anticipated quantity, quality and flow rates of surface and groundwater likely to be affected by the proposal should be provided.

4.5.7 **Sediment Quality**

The EIS should discuss the existing sediment quality of any potentially affected waters in and around the Gunnar site. The EIS should include physical, chemical, and radiological sediment data, including the sampling parameters, frequencies, locations, history and analyses of the results varying with time.

4.5.8 Fish and Fish Habitat

For the purpose of the assessment, “fish” refers to all life stages of resident fish, shellfish and crustaceans. “Fish Habitat” refers to the spawning grounds, nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life support processes.

Relevant information on fish and fish habitat likely to be affected (positively or negatively) by the proposed Gunnar Mine Site Rehabilitation Project should be included in the EIS. Sufficient physical, chemical, radiological and biological data should be obtained to quantify any gains or losses in the productive capacity of fish habitat resulting from the proposed Gunnar Mine Site Rehabilitation Project. This information should include the following:

- biological indicators for the project area, including a rationale for their selection;
- data on benthic invertebrate species composition and abundance;
- fish abundance/density and biomass; fish species diversity, growth rate and condition for various fish species for various trophic levels; fish movement and migration patterns; and habitat use according to fish species, life stage, time of year, etc. for both waterbodies and watercourses within the project area;
- information on fish species designated as “rare”, “endangered”, “threatened” and “species of special concern” under the *Species at Risk Act* and the *Saskatchewan Wildlife Act*. (refer to Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (www.cosewic.gc.ca)).
- fish habitat assessments, through collection of data on bathymetry, substrate type, aquatic vegetation, etc., and the identification of important or limiting habitat types (e.g., spawning habitat) for both waterbodies or watercourses within the project area;
- sediment quality and limnology of any potentially affected waters adjacent to the Gunnar site;
- results of any previous studies at the Gunnar site predicting impacts to water quality, sediment quality, benthic invertebrates, fish, fish habitat and aquatic vegetation.

The proponent should note that provincial Special Collection Permits will be required for components of the fish data collection program.

The EIS should identify the species within the aquatic environment that are important components of food chains leading to, and used by, people living in the region. The status of these species in the impact area in regards to their relative abundance and any measured levels of contaminants in their tissues, especially heavy metals and radionuclides, should be documented.

The proponent should note that meeting the requirements of the *Fisheries Act* is mandatory, irrespective of any other regulatory or permitting system. Section 36(3) of the

Fisheries Act specifies that unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The legal definition of deleterious substance provided in subsection 34(1) of the *Fisheries Act*, in conjunction with court rulings, provides a very broad interpretation of deleterious and includes any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat.

4.5.9 Navigation

SRC's 2007 project proposal includes a number of potential remedial options that will be investigated as part of the environmental assessment process. Should the preferred alternatives have the potential to impact navigation, SRC would be required to submit an application to Transport Canada's Navigable Waters Protection Program. This application should be done as early as reasonably possible to avoid potential future delays.

To satisfy requirements under the federal *Navigable Waters Protection Act*, the following details should be provided in the application and should be summarized in the EIS:

- All proposed works in, on, over, under through or across any navigable waterway must be clearly identified;
- An appropriately scaled map illustrating the location of all in-water works;
- Latitude and longitude at proposed work locations;
- Chart and topographic map number;
- Photographs of the proposed work location (across, upstream and downstream views are required);
- Name of waterways and dimensions of these waterways (width and depth at point of crossing);
- Any known waterway users (including recreational, commercial and traditional) should be identified and details regarding any consultations with these user groups and/or individuals;
- Detailed drawings (both plan and profile views) of the proposed in-water work;
- Plans and descriptions of all temporary works including coffer dams, temporary crossings, or other infrastructure;
- A description of proposed construction schedules and methods for all in-water works; and

- Details regarding the predicted impacts on navigability that result from a change in the environment and a description of any proposed measures for the protection of navigation safety during and upon completion of the project.

Based on the information, the predicted impacts to navigation should be determined and measures should be proposed to improve navigational safety.

4.5.10 Soil Quality

The EIS should discuss the existing soil quality at the Gunnar site. The EIS should include information on soil profiles, including thickness of organic and mineral horizons and buffering capacities, as well as suitability for reclamation. Analyses of selected soil parameters should establish baseline conditions for monitoring potential contaminant movement and/or contaminant accumulation. Sample site selection should be sensitive to prevailing wind direction. Sample site selection should also be sensitive to plume dispersion due to the drainage pattern and the groundwater flow direction.

4.5.11 Terrestrial Ecology

Relevant information on terrestrial ecology likely to be affected by the proposed Gunnar Mine Site Rehabilitation Project should be included in the EIS. The information should address:

- description of plant communities, including species lists, dominant species and densities for canopy, understory and ground cover;
- numbers and characteristics of any potentially affected wildlife species e.g., woodland caribou, moose, bear, aquatic and riparian furbearers, avifauna, sensitive habitats, resident/migrant populations and species with commercial and/or subsistence values as well as their critical habitats;
- any “rare”, “endangered”, “threatened” and plant or animal “species of special concern” that may occur in the study area that are listed in SARA, the *Saskatchewan Wildlife Act* and/or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, www.cosewic.ca) shall be identified.

Relevant data on potentially affected vegetation, including rare, endangered and/or threatened flora, should be described for the project area. Analyses of selected vegetation parameters should establish baseline conditions for monitoring potential contaminants and/or contaminant accumulation. Sample site selection should be sensitive to prevailing wind direction, topography. Sample site selection should also be sensitive to plume dispersion due to the drainage pattern and the flow of ground and surface water.

The EIS should identify species that are important ecological receptors including species within the terrestrial environment that are important components of food chains leading

to, and used by, people living in the region. The status of these species in the impact area in regards to their relative abundance and any measured levels of contaminants in their tissues, especially heavy metals and radionuclides, should be documented. In particular, due to the mercury levels reported in fish from the Gunnar Pit, the level of mercury in the tissues of species found in proximity to the Gunnar Pit should be considered.

The EIS should address results of any previous studies at the Gunnar site that predicted impacts to wildlife and plants. It should comment on how representative the results are over space and time and biological populations; clearly separate factual lines of evidence from inference; and state any limitations on the inferences or conclusions that can be drawn from the results.

4.5.12 **Heritage Resources**

In the EIS, the proponent should note that following their review of the proposal, the Heritage Resources Branch, Saskatchewan Department of Culture, Youth and Recreation advised that, since the proposed Gunnar Mine Site Rehabilitation Project would take place in the footprint of the former mine disturbance, the Heritage Resources has no further concerns with the project proceeding as planned. The proponent should confirm these conclusions with local First Nations during the conduct of the EIA.

4.6 **Environmental Impact Assessment**

4.6.1 **General Concepts**

An assessment of the potential environmental effects of the Gunnar Mine Site Rehabilitation Project, and their significance, must be described in the EIS. This assessment should be supported by technical data in sufficient detail and scope to ensure an accurate assessment of the potential environmental impacts of the project, the likelihood of significant adverse effects, and whether the Gunnar Mine Site Rehabilitation Project could be justified on environmental grounds. The assessment should allow a determination whether the Gunnar Mine Site Rehabilitation Project would potentially affect the current use of lands and resources for traditional purposes by Aboriginal persons.

The assessment also should include the potential environmental effects of malfunctions or accidents that may occur in connection with the project. Any residual environmental effects that cannot be mitigated by the Gunnar Mine Site Rehabilitation Project should be identified and their significance discussed.

The changes that would occur to the Gunnar site as a consequence of implementing the proposed rehabilitation plan, and the potential environmental impacts of the rehabilitation plan, should be placed in context with the existing environmental conditions.

4.6.2 Assessment Methodology

The assessment methodology must be described in the EIS, and should follow the general methodology listed below:

- Identify the potential interactions between all project activities and the existing environment during all phases of the project.
- Describe the resulting changes (positive and negative, direct and/or indirect) that would likely occur to the components of the environment and VECs as a result of the identified interactions with the project. Quantitative ecological risk assessment modeling and qualitative methods will be used to identify and describe the likely adverse environmental effect. As indicated in subsection 4.2.2, the proponent is advised to refer to CCME guidance on risk assessment.
- Identify and describe technically and economically feasible mitigation measures that may be applied to each likely adverse environmental effect (or sequence of effects). Mitigation strategies should reflect avoidance, precautionary and preventive principles. Describe how each mitigation measure proposed will affect the effect based on the assessment criteria used above, e.g., implementation of mitigation measure “X” will result in a “Y” change to the potential adverse environmental effect.
- Describe the significance of the residual environmental effects that will likely occur as a result of the project, having taken into account the implementation of the proposed mitigation measures (i.e. residual environmental effects). For each identified effect, the predicted magnitude, timing, duration, frequency of occurrence, degree of reversibility, geographic extent, temporal boundaries (short or long term), probability of occurrence, and ecological context (sensitivity of the valued ecosystem components (VEC) to environmental disturbance) should be considered in determining if it is a likely significant adverse effect. The EIS must clearly explain the method used to determine effects level for each of the above listed determinants and how these levels were combined to produce an overall conclusion. This method should be transparent and reproducible. All applicable federal and provincial laws must be respected.

The results of the assessment process should be clearly documented in the text as well as in summary matrices and tables. The analysis must be documented in a manner that readily enables the reader to draw conclusions on the significance of the environmental effects.

The assessment should consider scientific analysis of ecosystem effects, along with traditional ecological knowledge (TEK), local knowledge and available experience in determining the significance of potential effects. Mitigation to manage or avoid adverse effects shall be described for these components and for each undertaking in relation to the project.

4.6.3 **Project-Specific Impacts**

The EIS should document and evaluate the significance of positive and adverse project-related impacts of the rehabilitation project on all components of the environment. The EIS should specifically state whether the predicted project-related impacts would alter the current levels of environmental impacts associated with the abandoned Gunnar mine site.

Impact predictions should be categorized according to defined criteria, and should be as specific and quantitative as possible. Source terms for potential surface water, ground water and atmospheric impacts, together with any contaminant transport and plume dispersion modeling results should be provided. The results of field monitoring studies and quantitative ecological risk assessment modeling should be used to derive predictions of bio-physical impact, including details of model verification (peer review of model theory), calibration (site-specific adjustment), corroboration (comparison of predicted and observed), sensitivity and uncertainty analysis. It must be clear how predicted effects to the biota exposed to the project stressor compare to the expected “reference condition” for unexposed biota on a biological population basis, taking into account natural variation. All assumptions and levels of uncertainty related to potential adverse effects should be documented.

Specific guidance on assessing effects to human health, surface and groundwater and the atmosphere are provided below. However, the EIS shall include assessment of all potentially impacted environmental components.

Guidance on Assessing Potential Impacts to Human Health

The EIS should assess the potential effects of any environmental changes on human health or the use of lands, waters and resources for traditional purposes by Aboriginal persons and on the quality of any country foods that may be harvested. Potential entry of contaminants of concern in air, liquid and airborne waste streams, e.g., radionuclides, heavy metals, into food chains and the terrestrial or aquatic environment should be described and any potential impacts and benefits from decommissioning activities should be determined.

Effects to local resources (e.g., surface and groundwater, fish, food, fur animals and plants), habitat losses and resource disruption can affect activities such as subsistence hunting and fishing, gathering, outfitting, and ceremonial/burial sites for local First Nations and non-First Nations resource users. A health impact assessment of these potential effects for people using First Nations traditional lands and public lands shall be conducted. The potential for any effects to the quality and quantity of local foods and the sport fishery also needs to be assessed from the perspective of human health impact(s).

An exhaustive list of potential contaminants that could result from the project, and those that are currently on-site, in vegetation and wildlife that would be consumed by humans shall be provided in the EIS.

To assess whether a project may have adverse effects on workers or the public (including local First Nations and non-First Nations resource users) it is necessary to assess potential radiological doses to workers and the public. A dose assessment for workers and a health impact assessment for the public, including people using First Nations traditional lands and public lands, shall be conducted. The assessment should consider normal and accidental exposure conditions from expected airborne and waterborne releases as well as from other reasonably significant sources, e.g., transport, waste, for all phases of the project.

Please note that Health Canada recommends that the proponent determine an objective concentration of radioactivity in water and gamma radiation for rehabilitation purposes. For radiological constituents in water, the Maximum Acceptable Concentration (MAC) levels suggested for drinking water are usually used to be conservative (see Health Canada 2007, Tables 7 and 8)⁵. For gamma radiation, a dose rate should be determined based on a current acceptable risk and the exposure pathways being considered.

The Proponent must clearly identify the criteria and the content to be included in the human health assessment in the EIS. Key components of the human health assessment process include the identification of potential project-human interactions (potentially exposed groups of individuals and potential exposure pathways), radiological and non-radiological constituents of potential concern (COPC), human receptors and assessment criteria. Include the following information in the description of the human health assessment method:

- predicted sources, quantities, and points of release of contaminants of concern including but not limited to radionuclides, heavy metals, and asbestos;
- selection process for constituents of potential concern; (An exhaustive list of potential contaminants that could result from the project in vegetation and wildlife that would be consumed by humans shall be provided in the EIS.)
- identification of pathways to human receptors
- identification and characterization of human receptors; Describe the use of lands, waters and resources for traditional purposes such as subsistence hunting and fishing, gathering, outfitting, and ceremonial/burial sites by aboriginal persons. Consumption of country foods should be quantified.
- method used to convert radionuclide exposure and intake by the various human receptors from the various pathways into a dose (e.g. conversion factors);

5 Health Canada. 2007. Guidelines for Drinking Water Quality. Summary Table. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html

- criteria used to determine significance of impact (e.g. percentage of radiation dose limits).

Provide the following information for both the worker dose and human health assessment results:

- the resulting radiological (radiation doses) changes that likely would occur to workers and the public as a result of interactions with the project.

Dose to workers and the public should be assessed as a result of considering all reasonably credible routes of exposure, and (as applicable) age-dependant data, e.g., occupancy factors, breathing rates, dietary data, shielding data (for dwellings, other buildings). For public exposures this should be based on environmental fate modelling and available environmental monitoring data, while for workers this should be based on source term data and expected occupancy factors.

Guidance on Assessing Potential Impacts to Surface and Ground Water

A key element in the proposal to rehabilitate the former Gunnar mine site mine is the potential quality of local and regional surface and ground water systems following the rehabilitation of the site and its eventual abandonment. The EIS should address the following general impact assessment elements:

- hydrologic conditions and potential groundwater management problems e.g., permeability, porosity and fractures, and implications for containment/isolation of potential contaminants from groundwater systems;
- predictions for any contaminant flows and concentrations of key metal contaminants e.g., arsenic, molybdenum, selenium, in any potentially impacted groundwater, surface waters and/or sediments based on current groundwater information and results from any environmental impact pathway and contaminant transfer pathway models, including model sensitivity analyses;
- potential impacts on the local and regional hydrogeology, including re-establishment of any local and regional groundwater levels following completion of rehabilitation;
- evaluation of the potential impacts on any adjacent surface waters, including regional lake levels and water/sediment quality;
- contingency plans if contaminant migration predictions are not met, or if site-specific remediation objectives or risk management objectives are not met;
- monitoring programs for potentially-affected surface and ground waters; and
- potential effects of malfunctions, accidents or spills and contingency plans for mitigation and cleanup of spills to land or water (hazard identification including pathways to valued receptors, mitigation, environmental damage and recovery assessment, restoration).

If, at any location (e.g., waste rock storage areas), contaminated flows to the environment are anticipated the EIS should address:

- short and long term aquatic environmental effects of the loading of chemical parameters on receiving waters and predicted mixing effect zone (water quality and sediment quality change);
- potential impacts to benthic invertebrates, fish, wildlife and plants based on contaminant transport modeling results;
- potential impacts on surface and ground waters;
- evaluation of the aquatic and terrestrial environmental effects of this project using abiotic and biotic monitoring programs; and
- current or proposed studies for the tracking of changes to aquatic, terrestrial and/or human health.

Potential impacts at any stream crossing locations along existing or proposed access roads should be identified and appropriate mitigative measures proposed. Setbacks of 90 m and 30 m, respectively, are required for development activities adjacent to fish-bearing and non-fish-bearing waters.

The potential impacts from all contaminant sources at the Gunnar site following implementation of the project should be combined to provide a cumulative assessment of potential contaminant loadings to the environment. This assessment should be discussed in the context of criteria for the design of monitoring programs and abandonment planning.

Guidance on Assessing Potential Atmospheric Impacts

The EIS should discuss whether the proposal to rehabilitate the Gunnar site would contribute to greenhouse gases and/or other climate change parameters.

4.6.4 Effects of the Environment on the Project

The assessment must take into account how the environment could adversely affect the project, e.g. effects from severe weather events, forest fires, or earthquakes. The assessment must consider any potential effects of climate change on the project, including an assessment of whether the project is sensitive to changes in climatic conditions during its lifespan e.g., impact on multi-year water balance calculations and/or impacts on permafrost.

Possible important interactions between the natural hazards and the project should be identified, followed by an assessment of the effects of those interactions, the available mitigation measures, and the significance of any remaining likely adverse effects on the project.

4.6.5 Effects on the Capacity of Renewable and Non-renewable Resources

The potential interactions between the project and the environment will be identified and assessed in order to determine the likelihood of interactions between the project and resource sustainability.

4.6.6 Mitigation and Contingency Planning

The EIS must identify and describe technically and economically feasible mitigation measures that may be applied to each likely adverse environmental effect. Mitigation strategies should reflect avoidance, precautionary and preventive principles. All mitigation measures described throughout the EIS must be documented in the mitigation section.

The EIS should also document mitigation and contingency plans which would be implemented in the event of any potential containment failures, spills, malfunctions, accidents or inadvertent waste releases associated with the project. The proponent should identify commitments for response procedures to be followed should monitoring or follow-up identify unacceptable or unforeseen environmental impacts.

Although the detailed mitigation and contingency plans would be designed in consultation with regulatory agencies during licensing, the EIS should document mitigation and contingency plans that would be implemented in the event of failures of the rehabilitation procedures.

A hazard analysis or other risk-based approach should be used to identify situations where mitigative measures may be needed, and if engineering or administrative control solutions are not technically and economically feasible, then contingency plans should be developed.

The proponent should describe any legislation, regulations, guidelines, policies and specifications that will be adhered to during the rehabilitation project that will lead to avoidance or mitigation of adverse environmental effects.

4.6.7 **Significance of Residual Adverse Environmental Effects**

The EIS should describe the nature and extent of any residual environmental effects of the project including any residual contamination that is not addressed by the remediation project. As well, the EIS shall include a characterization as to whether residual environmental effects are significant or not significant, and the rationale for such characterization. It shall provide a detailed plan for responding to any known or predicted residual effects, and provide a procedure for identifying and responding to effects that were not predicted or foreseen. The proponent is encouraged to consult guidance materials from the Canadian Environmental Assessment Agency on determining significance of adverse environmental effects.

4.6.8 **Cumulative Effects**

The EIS should discuss whether existing environmental conditions, including effects from other former uranium developments in the area, would influence the project. The discussion should address whether the project-specific effects of the proposed Gunnar Mine Site Rehabilitation Project, combined with the impacts from existing and planned developments in the region would result in, or contribute to any cumulative environmental effects.

The Canadian Environmental Assessment Agency guidance documents on addressing cumulative environmental effects should also be consulted regarding the scope of cumulative impacts to be evaluated in the EIS⁶.

4.7 **Monitoring Programs for the Completed Rehabilitation Work**

The EIS should identify the need for, and requirements of, any monitoring programs for the rehabilitated Gunnar site.

Although the detailed monitoring programs would be designed in consultation with regulatory agencies during licensing, the EIS should provide a description of proposed technically and economically feasible monitoring procedures, including parameters, locations, sampling frequency and methodology. Taking into consideration improvements in monitoring techniques, the programs should be consistent with baseline data sampling methodology and be compatible with the existing regional environmental database.

⁶ Canadian Environmental Assessment Agency. 1999. "Operational Policy Statement OPS-EPO/3-1999 Addressing Cumulative Environmental Effects Under the Canadian Environmental Assessment Act" (http://www.ceaa-acee.gc.ca/013/0001/0008/guide_e.htm#cumulative); Canadian Environmental Assessment Agency. 1999. "Cumulative Effects Assessment Practitioners Guide" (http://www.ceaa-acee.gc.ca/013/0001/0004/index_e.htm).

The EIS should address:

- monitoring programs for any potential environmental impacts, including potential contaminant loadings to plant and animal species that are significant in the food web and that are considered relevant Valued Ecosystem Components (VECs); and
- monitoring programs for ground water and surface water quality in the vicinity of the rehabilitated Gunnar site.

Monitoring should not only ensure compliance with any regulatory requirements but also should allow the systematic audit of the implementation of the rehabilitation plan and the predicted success of the rehabilitation procedures. The monitoring programs, in verifying the success of the rehabilitation procedures, should confirm the design criteria for rehabilitation plan.

4.8 Follow-Up Program

The need for, and requirements of a federal ‘follow-up program’ in respect of the project is a requirement under the federal Act. The purpose of the follow-up program is to assist in determining if the environmental and cumulative effects of the project are as predicted and to confirm whether the mitigation measures are effective. Information gathered during the follow-up will be posted on the CEAR, allowing others to review the results. Therefore, the monitoring program must describe a specific federal follow-up program that includes the detailed scope of the program together with schedule and reporting milestones. The federal follow-up may be a component of the larger monitoring program, but should be specifically defined and presented.

Effects, predictions, assumptions and mitigation actions that are to be tested in the follow-up monitoring program will need to be converted into field-testable monitoring objectives. The monitoring design should include a statistical evaluation of the adequacy of existing baseline data to provide a benchmark against which to test for project effects, and the need for any additional monitoring to establish a firmer project environmental baseline.

The follow-up program plan should be described in the EIS in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), confirm EIS assumptions and confirm effectiveness of mitigation. The EIS should include a description of the objectives of the follow-up program, the elements of the plan required to achieve the objectives, the implementation plan and reporting commitments.

The follow-up program should include an assessment of radiation exposures to members of the public using environmental monitoring results collected after implementation of the project. The program should be designed to collect information to replace important assumptions and reduce measurement uncertainties.

4.9 **Site Abandonment and Return to Institutional Control**

The EIS should include proposed criteria for abandoning the rehabilitated Gunnar mine site and commitments for monitoring the success of the rehabilitation work prior to final abandonment of the site.

Provisions for the long-term institutional control should be discussed, including, but not being limited to:

- record keeping or archiving that fully describes the current site conditions, the rehabilitation plan and completed works, assessments, final configurations, and release verification;
- post-abandonment site monitoring and verification;
- need for passive site management;
- land controls; and
- long term financial liabilities for monitoring, care, and maintenance, or contingency remediation.

4.10 **Summary**

The EIS should provide a concise, complete statement of the anticipated net environmental costs and benefits of the proposed rehabilitation of the former Gunnar mine site in both the short and long-terms. The discussion should include, if possible, any intangible costs and benefits that cannot be expressed in economic terms.

To satisfy requirements under the federal Act, this statement must include conclusions specifically on whether the project is likely to cause significant adverse effects on the environment.

5.0 **INVITATION FOR COMMENTS ON DRAFT PROJECT-SPECIFIC GUIDELINES AND SCOPING DOCUMENT**

Public consultation is a key component of both the provincial and federal environmental assessment processes. By policy, SE makes Draft Project-Specific Guidelines available to the public so that they can provide input into the guidelines and outline any additional issues of interest to the public that should be included in the guidelines. The federal RAs make the project scope and guidelines available to the public to meet the requirements of subsection 21(1) of the federal Act.

The federal and provincial environmental assessment agencies, therefore, jointly invite the public to comment on this Guideline-Scoping Document, comprising the provincial

Project-Specific Guidelines and federal Comprehensive Study Scoping Document. Specifically, the public is asked to comment on the following:

- the proposed scope of the project;
- factors proposed to be considered in the assessment;
- proposed scope of the factors;
- any concerns in relation to the project;
- the potential for the project to cause adverse environmental effects;
- whether any additional studies are considered necessary to evaluate the impacts of the proposed project; and
- whether all issues of interest to the public have been adequately addressed in the Guideline-Scoping Document;

Specifically related to the federal environmental assessment process, the public is also requested to comment on the ability of the federal comprehensive study to address issues relating to the project, as opposed to a review panel or mediator.

Interested persons may submit their comments on the above issues to:

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Environmental Assessment Branch
Saskatchewan Environment
3211 Albert Street
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306-787-6190
Fax: 306-787-0930
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Persons wishing to submit comments on the proposed project may do so in writing. Comments should be sent to Saskatchewan Environment, Environmental Assessment Branch or the Canadian Environmental Assessment Agency at the addresses or facsimile transmission numbers provided above, and must be received no later than 2 May, 2008.

Please reference the file name, Former Gunnar Mine Site Rehabilitation Project in your submission. SE and the Agency will receive and share all public comments on this document, and will distribute them to the RAs, expert FAs, and relevant provincial departments.