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# **Directives**

Matoush Uranium Exploration Project  
Stratco Resources Inc.

February 2009

**Evaluating Committee (COMEV)**



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# **1. INTRODUCTION**

These directives are intended to help Strateco Resources Inc. (the proponent) prepare the environmental and social impact statement required for its uranium exploration project on the Matoush property. Given the nature of the project, the impact statement must discuss, in a satisfactory manner, the environmental issues associated with uranium exploration and outline the impacts related to future phases of the project to bring a uranium mine into production. The preliminary information regarding the Matoush exploration project was transmitted to the Evaluating Committee (COMEV) on August 11, 2008, so that it could make recommendations to the provincial and federal administrators of Section 22 of the James Bay and Northern Québec Agreement (JBNQA) on the advisability of submitting the project to the environmental and social impact assessment and review procedure provided for in Section 22 of the JBNQA and Chapter II of the *Environment Quality Act* (EQA). On September 19, 2008, COMEV recommended that the project be subject to impact assessment. Consequently, in accordance with section 158 of the EQA and paragraph 22.5.14 of the JBNQA, these directives set out the recommendations regarding the extent of impact assessment to be carried out by the proponent.

## **1.1 Matoush Uranium Exploration Project**

The aim of the Matoush exploration project is to confirm mineral reserves and evaluate the economic viability of bringing a mine into production. The underground exploration program consists of site preparation, excavation of an access ramp and exploration drifts for definition drilling. Excavation will take place in waste rock and ore. The exploration work will also allow assessment of the quantity and processing of mine water, ventilation, mining methods and ore stockpiling. Excavation of the ramp is slated to begin in early June 2009 and the other work will continue until July 2012.

## **1.2 Legal and Regulatory Framework for the Project**

Strateco Resources must obtain the authorizations required under Section 22 of the JBNQA and the applicable federal and Québec statutes and regulations. The impact statement must discuss the legal framework within which the project is being carried out, including all agreements, treaties, statutes and regulations applicable to the project. The proponent must specify all government policies, guidelines and directives relating to the sector of activity concerned (e.g. Directive 019) as well as comply with all applicable regulations. It must also explain how the various authorization processes relate to each other and where the proponent is at in them.

## **1.3 Communication and Consultation**

The proponent must inform and consult the communities concerned by the project (elected officials, groups, organizations, land users and the general population) under a program adapted to the cultural and social context of the project. Special attention must be given to aspects of the project that are associated with radioactivity, such as the local population's perception of potential radiation problems. The planned mining phase following exploration should be taken into consideration here so that significant elements liable to affect the project's overall acceptability can be more accurately foreseen and the concerns expressed by the population, addressed. Risks must be discussed separately for each phase

Information and consultation activities must deal with, among other things, radioactivity and the environment, project description and impacts, mitigation measures, monitoring and follow-up programs, etc., and allow citizens to express their opinions, views and concerns regarding the project.

The impact statement must discuss, in a clear manner, the proponent's communication program and the outcome of information and consultation activities. The proponent must also explain any changes made to the project in light of the concerns expressed by those consulted.

## **2. GENERAL CONSIDERATIONS FOR THE IMPACT STATEMENT**

These directives are neither restrictive nor exhaustive. The proponent is required to include any other element in the impact statement that it deems pertinent to the project's environmental and social assessment. The impact statement must be designed and prepared following the generally accepted rules of good practice. Appropriate scientific methods must be used to collect, process and analyze data. The impact statement must satisfy the recognized requirements relating to project definition, impact assessment, public consultation and decision-making and explain the process of putting together a project that is socially and environmentally acceptable, in particular:

- the implementation context, rationale and characteristics of the project;
- the state of the biophysical and human environments in which the project will be carried out and the predicted alterations in those environments during and after the project;
- integration of the project into the environment, including a comparative analysis of the impacts of each of the alternative means of carrying out the project, where necessary, and the planned measures for minimizing or eliminating negative environmental and social impacts and maximizing positive impacts;
- the proposed monitoring and follow-up programs and procedures to satisfy government requirements and track changes in certain environmental components affected by the project.

Given the specific nature of the project, the impact statement must describe the radioactivity-related aspects that make this project different from other types of mining activities. Furthermore, given the anticipated extension of the Matoush exploration project, the environmental and social impact assessment and review must illustrate, insofar as possible, the specifics of the impacts associated with mining and mill operations. Indeed, the contentious elements of bringing a uranium mine and mill into production must be taken into consideration so as to determine the acceptability of advanced uranium exploration. In particular, the proponent must document the potential impact of effluent containing radioactive substances on surface and groundwater quality, of disposal of radioactive waste in underground mine drifts on groundwater quality, and of the storage of radioactive tailings on air, groundwater and surface water quality. This section must provide a detailed description of the management of radioactive tailings sites, the impact of radioactive dust emission on air quality and the fate of project elements in the event that work is halted earlier than planned.

The information in the impact statement must be presented in a clear and concise manner and be limited to aspects enabling a thorough understanding of the project and its impacts. Whatever can be illustrated in diagrams or mapped must be done so by way of appropriate-scale thematic and synthesis maps and plans according to the type of data and presentation standards. Wherever possible, the proponent should use photographs to illustrate salient information so as to enable a thorough understanding of the project and its setting. The best-quality data must be used to prepare the impact statement based on possibilities. All information sources must be identified and supplied where required. In addition, the methods used to prepare the impact statement (survey, inventory, comparative analysis, criteria, etc.) must be presented and explained, giving the proper references.

### **3. CONTENT OF THE IMPACT STATEMENT**

The environmental and social impact statement covers seven main elements: project background, project description, description of the receiving environment, impact assessment and mitigation, risk management, monitoring program and follow-up procedures.

#### **3.1 Project Background**

The purpose of this section of the impact statement is to explain the reasons for the project. The project background must be explained in such a way as to enable readers to grasp the environmental, social, economic and technical issues relating to the project at the local, regional, provincial and international levels, as the case may be.

##### **3.1.1 The proponent**

The impact statement must provide a succinct description of the proponent and, if applicable, its environmental consultant, including general information on their background relative to the project in question and the sector of activity concerned. This section will include an explanation of the company's administrative structure, its capacity to provide the required financial guarantees for environmental restoration measures, and the principles of its environmental and sustainable development policy. The information provided must show where the company stands (its size) within its sector of activity in Canada and internationally.

##### **3.1.2 General project description**

The proponent must give the historical background to the main phases and stages of previous exploration campaigns that led to the current project, mentioning existing infrastructures, environmental and social issues encountered and any agreements entered into for the use of services or the carrying out of remedial work to mitigate the impacts of the current exploration program. This section of the impact statement must include a brief description of the project, including the location of infrastructures and the principal technical characteristics at the initial planning stage. It must also compare the Matoush project with uranium mining technologies used elsewhere in Canada.

These things must be described in enough detail to highlight the extent of planned work and the social context of the project. Emphasis will be placed on the general context and aims of the project, related components, and the project schedule and costs. Planned future expansions or developments associated with the project must also be explained.

### **3.1.3 Project rationale and justification**

This section of the impact statement must justify the project, i.e. objectives and activities, and identify the environmental, social, economic and technical issues at stake. The proponent must describe the environmental and socioeconomic context of general mining development in the region as well as the economic spinoffs of the uranium project at the local, regional and provincial levels, relating them to the life of the project.

This project is competing against numerous other projects in Canada and around the world. Several factors are key to its success. The proponent must describe those factors and explain why they would give its project an advantage over other uranium projects, considering that some have been refused in the Northwest Territories and Yukon. In this regard, the proponent must explain the criteria, aside from profitability, that will be used to decide whether the project will move to the mining phase.

## **3.2 Project Alternatives**

The proponent must determine the best alternatives to the project, placing emphasis on specific elements liable to influence the final choice. Using appropriate supporting documents, the proponent will describe the alternatives (location and technologies) capable of achieving the project objectives. The rationale and criteria used to select the final technologies and locations must be explained, along with how environmental and social criteria were considered. The proponent will explain what set the optimal alternatives apart from the other alternatives considered and why they were selected for in-depth impact assessment for the purposes of the impact statement.

### **3.2.1 Alternative locations**

The proponent must describe the various locations considered for the infrastructures required for uranium exploration, including excavation of the access ramp, development of waste rock and ore stockpile areas and groundwater protection. The geological, geotechnical, hydrological and hydrogeological features of the area must be considered and supported by photographs of each of the possible sites and surrounding area. Consideration must also be given to potential technical and financial constraints and the extent of impacts arising from the selected locations.

The description must be detailed enough to enable a comparison of the locations considered and evaluate the environmental, social, technical and economic advantages of each.

### **3.2.2 Alternative technologies**

The promoter must briefly describe the advantages and disadvantages of the principal ore extraction and environmental protection technologies considered, explaining the role mineralogy played in making the final decision. The preferred technologies must then be described, including the technical, economic and environmental reasons and criteria for choosing them. If need be, the project can be compared with the mining technologies used for other uranium deposits in Canada and around the world.

This section of the impact statement must discuss the advantages and disadvantages of the principal technologies considered for environmental and social protection in terms of achieving



liquid effluent discharge targets, air emission standards and waste management rules with a view to protecting aquatic, terrestrial and atmospheric environments.

### **3.3 Project Description**

The proponent must describe the planned work and the location thereof, supporting the information by means of the appropriate data (maps, plans, 3-D schematic diagrams, drawings of the mine site and its infrastructures currently and after the project, analyses, photographs, etc.). The following information must also be provided: the location, surface area, and property titles of deposits and land where planned infrastructures will be built; site preparation (clearing, blasting, watercourse diversion, earthwork, backfilling, buildings, etc.), providing details on the sites, quantities, boundaries and collection, haulage, storage and disposal methods; the projected duration of mineral exploration; the project schedule; the average rate of waste rock and ore extraction (considering that no ore will be processed during this phase); and justification for mining work and methods. Descriptions of ore, waste rock, acid generation potential, leach or radioactivity tests must be based on a sufficient number of representative samples and sufficiently accurate estimates so as to reduce uncertainties in the modelling of contaminant discharges into the environment.

#### **3.3.1 Preparatory activities**

The following must be included in the description of the construction phase:

- a plan view, at a suitable scale, of all project components and, as needed, elements such as the design plan for the access ramp and drifts;
- a perspective drawing showing all of the project components within the landscape and, if possible, aerial photos or other recent photographs of the project area;
- overburden (amount, nature, storage, reuse, etc.);
- solid waste (type, quantity, sites, disposal methods, etc.).

#### **3.3.2 Exploration work**

The purpose of this section of the impact statement is to describe the proposed methods for underground extraction, storage, loading and hauling of ore, as the case may be. The proponent must describe:

- permanent facilities and infrastructures (access ramps, dikes, ore pads, water treatment units, parking areas or sheds for machinery and equipment, discharge points in receiving waters, etc.);
- excavation of the ramp (geomechanical stability, stabilization methods, groundwater inflow rates, amount of ore and waste rock), duration of work and possibility of carrying out other development phases;
- description of ore and waste rock (types, quantities, all mineralogical characteristics, radiological characteristics, storage time) based on representative samples and sufficiently accurate estimates;
- determination of acid-generating potential, leach and radioactivity tests based on representative samples and sufficiently accurate estimates to correctly simulate contaminant discharges into the environment;
- mining method(s) that ensure worker safety and generate less waste rock;

- types of explosives used, their in-situ fabrication and storage, the approximate amount required per amount of ore extracted, and the principal residual chemical products resulting from their use;
- amount of ore to undergo testing (processing), ore management and haulage and the type of truck needed to haul ore to the processing site;
- determination of ore storage sites, if any, and reasons for choosing those sites; storage capacity and maximum storage time; detailed description of management and control methods according to assessed characteristics (radioactivity, acidity, etc.);
- emissions of radioactive dust (source, characteristics, quantity) and the prevention methods adopted by the proponent; technical characteristics and underground ventilation;
- nuisance sources (noise, odours, etc.) and the associated facilities and equipment;
- means taken to prevent wind and water erosion of ore/waste rock stockpiles;
- energy-generating equipment, including its location, generating capacity, etc.;
- garages, sheds, warehouses (hydrocarbons and other products), concrete plant, etc.;
- all related activities or work, whether permanent or temporary, including roads, watercourse crossings, deforestation;
- installation, repair or modification of culverts and any work or activities planned below the natural high water mark.

### **3.3.3 Waste rock management**

The proponent will compare potential waste rock storage areas from a technical, economic and environmental perspective in order to make an informed decision on the preferred site. The proponent must demonstrate that the rules of good practice were followed and that the proposed infrastructure for adequate waste rock management affords the greatest environmental protection.

This section of the impact statement must include the following information:

- a detailed description of the planned methods for managing and controlling waste rock based on the determined characteristics (tailings that are acid-generating, radioactive or entail a high risk, etc.);
- estimated surface area and capacity of required waste rock stockpiles, justification for the final site selection, including hydrogeological conditions and drainage;
- geographical location of the site in relation to nearby watercourses and the inventoried uses or values (importance) of the receiving environment;
- minimum and maximum waste rock storage time;
- possibility of disposing of waste rock underground following exploration work.

### **3.3.4 Water management**

The proponent must provide a water budget that ensures maximum recirculation of water with a view to minimum discharge into the environment. It must identify and specify the location of drinking water supplies, the wastewater disposal method and the effluent discharge point. The

planned measures for protecting against contamination of clean water entering the site must also be specified.

Special attention should be given to the treatment of elements that may be associated with uranium based on the mineralogy and known history of uranium mining (radionuclides, selenium, molybdenum, etc.). The proponent must identify metals requiring special monitoring during final-effluent treatment.

#### *3.3.4.1 Water budget*

The impact statement must include a complete balance sheet of water used and discharged (in m<sup>3</sup>/day and m<sup>3</sup>/yr) in driving the ramp and drifts and in services provided on the entire mine site. The balance sheet must be detailed and cover one full year of operation to take into account seasonal variations.

More specifically, the proponent must include the following information:

- water supply sources for exploration work, indicating required volumes and catchment works;
- household water needs;
- description of the flow pattern and rates of water used in extraction operations, specifying circulation and recirculation systems and providing a table showing daily and annual rates of water consumption and the use of water for these operations;
- uncontaminated runoff entering the water management system on the mine site.

#### *3.3.4.2 Contaminated water treatment and discharge*

##### **Treatment**

The proponent must define and justify the methods used to treat all mine and household wastewater (sedimentation, chemical and biological treatment, etc.) as well as describe treatment techniques in detail, including:

- physico-chemical characteristics of wastewater to be treated;
- design criteria and maximum treatment capacity, anticipated efficiency (percent pollutant reduction, toxicity level, etc.);
- list of and data sheets for chemical products used, their points of addition and quantities used. The proponent may also verify whether the input chemicals are covered by government programs;
- holding time and capacity of ponds, characterization and management of treatment residues (sludge, etc.) and characterization of sites where treatment residues will be stored, etc.;
- volume and management of treatment by-products.

##### **Final effluent**

The impact statement must contain the following information relating to final effluent:

- predicted mean daily effluent flows and volumes;
- an appropriate-scale map showing the location of all effluent discharge points for treated mine water and a description of the receiving environment and measures to prevent erosion;
- description of final effluent discharge techniques (piping, conduits, pumping, diffuser);
- location and description of the measurement site, including flow measuring devices.

The proponent must indicate the minimum distances planned between watercourses (including wetlands) and access roads and ore and waste rock stockpile areas to prevent contamination of the aquatic environment from surface runoff and dust emission. The proponent must also include a calculation of environmental discharge objectives (EDO) for final effluent from its project and show that the calculation has been validated by the authorities concerned.

### **3.3.5 Borrow pits and quarries**

The proponent must indicate the location of as well as map all existing and planned borrow pits and quarries, specifying access roads, surface areas and the required amount of borrow material, taking into account material required for maintenance needs of the project. The proponent must explain how optimum use of borrow material has been ensured. The impact statement must contain enough information to determine the proponent's actual needs and possible alternatives. The criteria used to decide on borrow pits and quarries must include the ecological value of the areas in question and the costs associated with alternatives. The proponent must describe possibilities for using the rock from ramp excavation.

Lastly, this section must include an overview of site decommissioning and rehabilitation measures.

### **3.3.6 Related infrastructures**

The proponent must give the historical background to existing infrastructures and describe related infrastructures required for this project, indicating whether they are public or privately owned and whether any will also be used for purposes other than those required by the project or are liable to be reused after the project has been completed (for example, by the tallyman). The predicted life of infrastructures and, if applicable, planned decommissioning work must also be described.

The following infrastructures must be described in greater detail.

#### **3.3.6.1 Access routes**

The proponent must describe the existing road network in the exploration zone, taking into account known and frequently used snowmobile trails (Cree or otherwise) or ATV trails.

While ensuring that these infrastructures comply with the *Regulation respecting standards of forest management for forests in the domain of the State*, particularly in the area of ensuring the free passage of fish and maintaining the navigability of waterways, the proponent must describe the technical characteristics and principal work to be carried out to repair and build the planned access roads.

#### **3.3.6.2 Lodging**

The proponent must specify the location, layout and components of lodging facilities for the exploration phase of the project, including foreseen modifications. It must indicate whether facilities already exist and, wherever possible, use existing sites. The information in this section must include the accommodation capacity and duration and periods of use of lodging facilities, and the proponent must highlight the anticipated environmental impacts of these facilities.

The proponent must provide the following information:

- drinking water supply facilities;
- means of wastewater management, discharge areas, dilution rates following treatment;
- types and quantities of residual materials generated and how effectively they can be managed with existing facilities;
- waste disposal methods and sites, anticipated quantities, location and state of existing or future management sites, life of the site and planned facilities;
- recycling program;
- energy supply;
- source of borrow material and type of material required for development;
- management of any other infrastructure required for the camp that might have an environmental impact (garage, gas station, warehouse, etc.).

#### *3.3.6.3 Residual materials, fuel and hazardous material storage sites*

The proponent must specify the location and nature of structures, equipment and facilities for storing and containing residual materials, fuel and hazardous material (chemical products, explosives, radioactive materials), indicating the quantity of each product for each structure, piece of equipment and facility. The proponent must demonstrate compliance with the laws and regulations in effect and explain the planned preventive and emergency measures.

The planned means for recovering or disposing of outdated products (tires, etc.), equipment or machinery, or environmentally harmful material (batteries, barrels, tanks, etc.) must be explained. Taking into account the remaining capacity of the site in relation to the authorized capacity, the proponent must assess the option of disposing of waste on an approved disposal site elsewhere in the region or burning it in an incinerator. More specifically, the proponent must estimate the quantity of residual radioactive material (contaminated material, etc.) that will be produced and describe how it will be managed.

#### **3.3.7 Labour requirements**

For each mining component, the proponent must explain the construction and operating schedules, distribution of labour and the skills required for each job group. A description of labour must be provided for each project phase, placing emphasis on employment opportunities for Crees. The proponent must also include a description of company policies respecting local hiring and on-the-job training.

This section must also specify language requirements and the planned measures for facilitating the hiring of Crees.

The proponent will indicate the exact location of lodging facilities, as well as the accommodation capacity, length and periods of use of facilities.

### **3.4 Description of the Biophysical and Social Environments**

This section of the impact statement delineates the study area and describes the components of the biophysical and human environments relevant to the project (baseline radiological conditions, current radiation exposure of the populations concerned, Cree use of the area for traditional

pursuits, etc.). The environmental and socioeconomic parameters of mining development in the region must also be explained.

### **3.4.1 Delineation of the study area**

The proponent must define a study area and justify the boundaries, taking into account the areal extent of anticipated impacts and the appropriate ecological boundaries for the various environmental components. If necessary, the study area may consist of various sectors delineated according to the impacts studied. It must be large enough to encompass all planned activities, including project-related activities, and all direct and indirect environmental and social impacts of the project.

The study area should include the site itself and describe the local as well as regional environment. The regional environment should include control sites for the purposes of comparing project impacts and natural variations in various environmental components.

### **3.4.2 Description of relevant components**

The proponent must describe the state of the environment in the study area prior to the carrying out of the advanced exploration project (at time zero). The biophysical and human components liable to be affected by the project must be described on the basis of qualitative and quantitative inventories so as to identify and delineate potentially sensitive elements. The inventories must reflect the social, cultural and economic values of surrounding populations, particularly Cree, in relation to the described components as well as take into account the land use cycle of Cree hunters affected by the project. If the data available at government, municipal or other bodies are insufficient or not up to date, the proponent must round them out by conducting its own inventories or surveys following the rules of good practice. Any information that will facilitate the understanding or interpretation of data (survey methods and dates, location of sampling stations, etc.) must be included in the impact statement.

#### *3.4.2.1 Biophysical environment*

##### **Geology, climate and hydrogeology**

The principal geological formations in the project area must be identified on maps drawn to an appropriate scale. The proponent must describe the geomorphology of the region. The geological description must include such information as fracturing, *in-situ* constraints and geomechanical properties. The location of zones prone to erosion and ground movement as well as of likely borrow areas must be indicated. Drawing on the most recent knowledge, the proponent should identify natural hazards such as earthquakes, land subsidence, landslides, high water and floods, etc.

The direction of prevailing winds, average and maximum 10-year precipitation and, if available, return periods, as well as annual evaporation (cm) must also be indicated, specifying the data sources and calculation methods used.

Given that this is an underground exploration project, the hydrogeological context must be defined and described, including aquifers, water quality and susceptibility to pollution, etc.

### **Hydrous environment and wetlands**

The proponent must describe the drainage pattern and wetlands in the study area, placing emphasis on drainage and surface runoff. To accurately define the local drainage pattern and boundaries of drainage basins, the proponent must include a detailed map enabling identification and assessment of basin and sub-basin areas and drainage network configuration. Continuous and intermittent streams shall be identified as such, and wetlands shall be classified (e.g. bogs).

This section of the impact statement must include a description of the physical and physico-chemical characteristics, inventoried uses and water balance (flow, bathymetry, etc.) of watercourses in general and, in particular, those that currently receive or will receive effluent or could be affected by any of the project components (permanent or temporary). The standard limnological parameters (sediment, mean and maximum depth, surface-volume-perimeter ratios) shall be discussed for lakes.

To the extent that the proponent envisages the production of metals other than uranium, even trace amounts, or considers that such metals may affect the toxicity of mine effluent, their concentrations in receiving waters must be determined. It is recommended that analysis techniques (e.g. ICP-MS scan) be used to detect trace elements present during sampling campaigns to determine background levels in receiving waters and groundwater.

### **Vegetation**

Using maps, the proponent must provide a detailed description of the vegetation cover, including the presence of fragile or exceptional plant communities or habitats in the study area. The surface areas to be logged and any rare, threatened or endangered species liable to be affected by the work must be identified. The proponent can consult the competent government authorities for this purpose. It must also give the forest fire history of the area and indicate burned areas.

### **Wildlife**

The proponent must include a map depicting all terrestrial and aquatic habitats (dens, wintering areas, spawning grounds, nesting sites, etc.) found in the study area and explain the value they hold. Special attention must be given to sites providing suitable habitat for fish and game. An attempt must be made to define habitat quality indicators based on the species present and their sensitivity to radioactive material (for instance, the scientific literature cites mollusks as good indicators of radiological contamination).

Where necessary, rare or threatened species must be identified, taking into account their current or contemplated protection status. The proponent shall consult the appropriate government agencies in this regard.

#### *3.4.2.2 Human environment*

This section of the impact statement must situate the mining project in relation to communities liable to be affected. The human environment includes both Cree and non-Aboriginal communities in the study area. The proponent must document the various aspects of the way of life of the people inhabiting the study area, including community life, land use and the social fabric. As needed, it can examine other elements deemed pertinent for project assessment in addition to those mentioned below. Where possible, reference should be made to other uranium exploration projects in Canada.

## **Human health**

The level of exposure of the local population to nuclear substances must be taken into account when assessing the project's human health impacts. The proponent must describe how the principal components of the assessment will be presented, i.e. identification of potential contaminants (especially radiological contaminants) and exposure pathways (sources, mechanisms, effects), human groups potentially exposed to those contaminants, the method used to estimate exposure levels, doses of radiation received by exposed individuals, and the criteria used to evaluate exposure levels.

## **Socioeconomic aspects**

The impact statement must contain a demographic profile and discussion of the economic situation of communities in the study area (jobs, employment opportunities, sectors of activity, income sources, etc.). The proponent must also describe the regional labour pool and companies, especially Cree, qualified to fill jobs or perform contracts for the planned mining operations and project construction, and explain how it plans on training, hiring and integrating Crees into the workforce.

## **Heritage and archaeology**

The proponent must describe all prehistoric, historic and spiritual sites in the study area, as well as sites of special interest, such as burial grounds, sacred and favoured sites. In addition, studies must be conducted to determine the archaeological potential of the area based on criteria established by the competent government organizations. This means identifying known archaeological sites, areas with archaeological potential and other elements of heritage interest.

## **Occupation of the territory**

The impact statement must describe current occupation of the territory, including the following information to be gathered during consultations with the appropriate stakeholders:

- tenure and boundaries of Category I, II and III lands;
- occupation of the territory by Crees and non-Aboriginal people (mining or forestry operations, outfitting operations, wildlife reserves/sanctuaries, vacation leases, etc.);
- mineral potential and existing mining rights and leases in the territory;
- recreational-tourism products in the study area;
- location and description of dwellings, erected structures and various buildings located near the project;
- existing services and infrastructures within and on the edges of the project area (camps, power transmission lines, etc.);
- Cree and non-Aboriginal land use;
- traditional hunting grounds in the study area, including associated infrastructures (roads, portages, camps, etc.);
- traditional travel routes and when they are used by families whose hunting grounds will be affected by the project and by the residents of Mistissini;
- designated protected and conservation areas (temporary or final status) and other proposed protected areas.



The impact statement should include a synthesis map showing the significant elements of occupation covered by the assessment.

### **3.5 Environmental and Social Impact Assessment**

This section of the impact statement must evaluate the probable environmental and social impacts of the Matoush uranium exploration project. The evaluation must identify the anticipated impacts over the short, medium and long terms, as well as their significance. Elements of the planned mining phase that could affect the environmental or social acceptability of the current project should also be highlighted. The analysis must be based on the previous descriptions of the project and receiving environment. The impact statement must explain the impacts and assess their significance using an appropriate method and appropriate criteria. The positive and negative, direct and indirect impacts and, where applicable, the cumulative, synergetic and irreversible impacts of the project must be considered. This assessment will serve to establish thresholds or levels of acceptability, as well as determine impact mitigation objectives and monitoring and follow-up needs.

Assessing the significance of an impact depends first and foremost on the component affected, i.e. its intrinsic value for the ecosystem, as well as on the social, cultural, economic and visual values attributed to these components by the local population. The more a component of the ecosystem is valued by the population, the more the impact on this component is likely to be significant. The basic concerns of the population, in particular when elements of the project pose a significant health or safety risk or a threat to archaeological sites, will influence how significant an impact is considered to be.

Variations in the extent, frequency, duration or intensity of an action or effect may also influence the significance of an impact. These variations can alter the significance of the changes to affected environmental components in a positive or negative manner. As the case may be, the impact must be put in perspective and situated in spatial (study area, region, province, etc.) or temporal (e.g. loss of biodiversity) terms.

The impact statement must describe the method used to assess impacts as well as the related uncertainties or biases. The methods or techniques employed must be objective, concrete and reproducible. The reader must be able to easily follow the proponent's reasoning in determining impacts. The proponent must discuss project activities and structures in relation to the surrounding environment using summary tables, checklists or impact fact sheets. To enable a full understanding of the environmental and social impacts, the information in this section must be supported by schematic representations (plan view, map, etc.) of points of releases into the environment, the valued components of the biophysical and human environments affected, such as rare, threatened or endangered species, species hunted or fished by the Crees, etc.

#### **3.5.1 Impacts on the biophysical environment**

Changes in natural conditions and environmental losses must be assessed based on occurring resources, land occupation and use, the purpose of sites and the carrying capacity of ecosystems (e.g. analysis of the short, medium and long-term impact of runoff from waste rock stockpiles and sewage sludge on the hydrous environment). Special attention shall be given to describing the impacts associated with radioactivity (radioactive effects). The proponent must also determine irreversibility thresholds for all impacts, taking the following aspects into account:

### **Air and soil quality**

- drainage and erosion from wind or runoff;
- increase in dust emission from ground transportation;
- radioactive contaminants liable to be emitted into the atmosphere;

### **Hydrous environment**

- permanent or temporary alterations in the aquatic environment as a result of work;
- quality of water bodies receiving any effluent;
- radioactive contaminants liable to be released into the hydrous environment;
- possible alterations in the local hydrology (surface and groundwater) caused by dewatering and the keeping dry of the ramp and underground facilities;

### **Vegetation**

- fragile or exceptional plant communities and rare, threatened or endangered species liable to be affected by the project;

### **Wildlife**

- maintenance of fish populations and habitat, taking into account possible chemical and radiological toxicity of effluent and the life cycle of the species concerned;
- free movement of fish;
- effects on the aquatic or terrestrial environment of an accidental hazardous spill;
- survival and movement of terrestrial wildlife and bird life as well as the loss of preferred habitat or possible destruction of rare, threatened or endangered species, taking into account precedents set by uranium mines;
- effects on the population dynamics and behaviour of wildlife and impacts of environmental toxicity on wildlife and wildlife habitat.

### **3.5.2 Impacts on the human environment**

The proponent must determine and assess all potential human impacts of the project so as to identify the major issues at stake. A comprehensive assessment must be made of the probable changes to the way of life of communities inhabiting the study area, while considering how those impacts are seen by land users. The proponent must discuss the benefits Cree communities will derive from the project compared with the negative impacts and perceptions that will affect the Crees. As much as possible, the proponent must refer to other projects of this type in Northern Québec and past experiences elsewhere in Canada.

A minimum of the following impacts must be discussed in this section:

#### **Human health**

- effects of contaminants (radioactive and metals) in traditional food, water and air;
- radiation doses likely to be received by the exposed population, including workers, as a result of the project;
- proposed mitigation measures;

#### Quality of life and culture

- nuisances from noise, dust, etc.;
- effects of lengthy absences on Cree workers' family life;
- Cree perception and fears with regard to possible environmental contamination (radioactive or other), in particular from deposition of dust in water bodies from ground transportation;
- Environmental impacts of an accidental radioactive or chemical spill;

#### Economic benefits

- for each project phase, the number and type of temporary and permanent jobs created for Crees and non-Aboriginal people;
- availability of skilled labour or workers who can be trained, taking into consideration the subsequent phases of the uranium project as well as other mining projects in the same area, whether underway or foreseen;
- the nature of training programs to be established, if applicable, in collaboration with the Cree Regional Authority's Human Resources Department;
- contracts granted to Cree people and companies;
- predicted short and long-term economic benefits for local companies;
- job or economic losses for local companies whose activities would be affected by the present project;
- development prospects in related sectors for local or regional communities;
- development outlook for recreational-tourism products for this region and surrounding areas as well as the potential positive or negative impacts of the present development project on future development in this sector of activity;

#### Land use

- impact of infrastructures on Cree land use and traditional travel routes, particularly on the project site;
- changes to traditional hunting and fishing activities in the study area;
- wildlife use by sport hunters and fishers;

#### Heritage and archaeology

- impact on prehistoric, historic and spiritual sites in the study area, as well as sites of special interest, such as burial grounds, sacred or favoured sites, and archaeological sites.

### **3.5.3 Cumulative impacts**

The proponent must identify and put into perspective the potential cumulative environmental and human impacts of the project combined with the effects of other work or activities currently being carried out or that can be reasonably foreseen in the same area as the project, taking into consideration natural phenomena such as burn sites, prescribed burning, etc. Cumulative impacts should be determined based on literature dealing with similar projects carried out elsewhere in Canada or around the world. A minimum of the following components must be considered for this purpose:

- endangered wildlife and plant species;
- quality of life of the Cree people;
- Cree land use;

- Recreational-tourism activities, including sport hunting and fishing.

### **3.6 Mitigation and Remediation Measures**

The proponent must describe the planned measures for maximizing the positive environmental and social impacts of the project as well as the planned corrective measures for minimizing its negative impacts. The proponent shall include an overview of the measures taken to prevent anticipated impacts on environmental contamination (surface and groundwater, etc.), erosion, radioactive contaminants liable to be released into the environment and any other impact identified during impact assessment.

Special attention must be given to the following measures:

- measures to mitigate the impact of radiation exposure of the public, including workers;
- specific environmental protection clauses in the various contracts awarded;
- restoration and remediation standards for quarries and borrow pits and, if applicable, parts of decommissioned roads and disturbed sites;
- sensitization of workers on the jobsite to hunting and fishing rights and customs in the territory covered by treaties and measures to ensure that those rights and customs are respected;
- protection of archaeological sites;
- use of Cree labour or contractors during preparatory and exploration work.

As regards mitigation measures for the advanced underground exploration, the proponent must explain the measures implemented during the exploration phase (including temporary work stoppage) separately from those to be applied during decommissioning of the mine site. In particular, the proponent shall describe:

- containment and monitoring procedures during temporary shutdowns (including access to the underground ramp);
- restoration plan, including restoration of tailings sites, redevelopment of waste rock stockpiles and their stabilization to combat erosion from wind or runoff in the event of early work stoppage;
- possibility of using overburden for restoring decommissioned sites;
- recovery of certain equipment and facilities.

Lastly, the proponent must explain the nature and significance of residual impacts subsequent to implementation of mitigation measures. Development and compensation proposals and commitments for offsetting the loss of wildlife habitat must be made.

### **3.7 Management of Accidents and Malfunctions**

Given the remote location of the mine site, the proponent is responsible for initial response to technological disasters, malfunctions, spills, natural disasters, etc. The impact statement must discuss the proponent's emergency response capability, handling procedures and communication plan. If applicable, the proponent must provide its code of practice for serious accidents. It must describe the sources, quantities, mechanisms, characteristics and consequences of contaminants and materials (physical, chemical or radiological) liable to be released into the environment

during accidents and malfunctions. The impact statement must discuss the proponent's emergency response capability and handling procedures in the following cases:

- transportation of radioactive material or chemical products (petroleum products, explosives, etc.) or material or products deemed potentially hazardous;
- radioactive spill on the roadside or mine site, placing emphasis on rapid response and on-site response techniques;
- oil or toxic spill on the roadside or mine site, placing emphasis on rapid response and on-site response techniques;
- storage of chemical/petroleum products and dangerous goods;
- fire risks on the roadside, mine site or camps built during the construction and exploration phases;
- potential natural disasters identified for the project (weather and climate events, earthquake, etc.).

The proponent must evaluate the incidence or probability of such accidents and include a detailed explanation of the proposed restoration methods for each situation.

### **3.8 Monitoring and Follow-up Programs**

The proponent must describe its planned environmental management program (compliance with standards, code of good practice, etc.) based on the environmental and social impacts defined during the study. The program must ensure implementation of the identified mitigation measures and that possible legislative and regulatory requirements or conditions are met. The proponent must indicate whether monitoring and follow-up will be carried out in-house or contracted out (specialized firm) and to what extent they could be carried out by Cree-owned companies.

The program must be in place and make it possible to characterize the environment before project-related activities begin. A reference state must be defined for the purposes of assessing the project's long-term impacts (background levels, monitoring devices, indicators). The impact statement must set forth sampling frequency and methods and analyzed parameters (activity of selected radionuclides, aquatic invertebrates, etc.), as well as identify the planned measures relating to biophysical (fish, birds, wildlife and their habitats, plant species, hydrogeology, etc.) and socioeconomic components. The proponent must also explain how it intends to comply with the prescribed standards regarding public exposure, including workers, to nuclear material generated by the project.

Using methods recommended by experts in the field, the proponent must determine the minimum level of radiological contamination *in situ* before work begins and characterize element fluxes in the Matoush site environment, taking into consideration documented cases of potential contamination from metals associated with uranium exploitation (selenium, molybdenum, etc.). The proposed follow-up program must reflect the proponent's understanding of the reference state of radiological levels in the study area (e.g. characterization of surface water and sediment, sedimentary profile, etc.). The results of characterization must be compared with the applicable criteria.

In addition, the proponent must include a detailed description of its planned protocols for characterization of wastewater, soil and air emissions, including the installation and number of observation wells required to monitor groundwater quality, taking into account such things as acid mine drainage and leaching potential, toxicity and wind erosion at waste rock and ore

stockpile areas. Special attention must be given to radioactive contamination of water, soil and air.

Runoff from the mine site and waste rock/ore piles must be analyzed and the effects of treated effluent on the receiving environment, monitored. This sampling effort must enable an accurate assessment of foreseen and accidental impacts and the effectiveness of mitigation measures in offsetting the adverse effects of tailings. The proponent must also specify the quality control measures related to analyses.

Measures for monitoring the economic benefits of the project for local communities, notably Cree, must be put forward.

These measures are an integral part of the project and should aim to provide knowledge of real events which occur as a result of this type of development in the North.

### **3.9 Public Consultations**

The impact statement must include a section discussing and assessing all consultations held during planning and conducting of the environmental and social impact study for the Matoush uranium exploration project. The proponent must explain the communications established between it and the Aboriginal and non-Aboriginal communities concerned, along with the outcome of exchanges with Crees who harvest wildlife in the project area. The purpose is to determine exactly how the project, its impacts and the proposed mitigation measures are perceived at the local level.

The proponent must adopt a communications plan that initiates consultation of all parties concerned (individuals, groups, communities, government departments and public and parapublic organizations, particularly those based in the administrative regions concerned) at the beginning of the impact study. It is important that consultations begin as early in the process as possible so that all parties have input and their input serves to accurately determine the issues to be studied, alternatives and decision criteria. The elements of the communications plan that will be deployed during the carrying out of the project must be explained.

## **4. PRESENTATION OF THE IMPACT STATEMENT**

These directives are intended as guidelines to help the proponent conduct an environmental and social impact study of the Matoush uranium exploration project and prepare an impact statement that satisfies Québec and federal government requirements.

The methods used relate to the decision-support function of environmental assessment and make it possible to assess project impacts and their significance as well as structure the content of the impact statement so that readers can more easily find information and consult the document.

The proponent must provide 15 copies of the impact statement, a non-technical summary and supporting documents (sectoral studies, etc.) in French, 10 copies of the impact statement and summary in English, and 2 copies of the impact statement in PDF (Portable Document Format).