

Addressing Environmental Issues: A Land and Resource Management Toolbox

As First Nations engage in an increasing number and variety of land and resource developments, the need for sound environmental assessment that addresses community concerns gains greater importance. Challenges such as limited financial resources, human resources and technical expertise can be met by employing environmental tools and strategies that increase First Nations' participation, understanding, and capacity.

- Introduction to Environmental Assessments
- Local participation in the environmental planning and assessment process
- Building on existing knowledge and expertise
- Effective information management
- Understanding regulatory and enforcement components of developments
- A land and resource management case study

BIOGRAPHY

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November 6 – 7, 2003

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1.0 Introduction

Sustainable development was defined in a 1987 report of the World Commission on Environment and Development (the Bruntland Commission) as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*” As such, environmental, economic and social characteristics of any project must be fundamental components of decision-making for that project.

As First Nations engage in an increasing number and variety of land and resource developments, the need for sound environmental assessment that addresses these components and community concerns gains greater importance.

In adequately addressing environmental issues on Reserve, a number of challenges may be present. These often include limited ‘in-house’ financial resources and limited human resources with relevant technical expertise. Particularly diligent environmental planning and management is necessary when developing resources within a fixed land base.

Employing a variety of strategies can reduce these challenges, and help increase First Nations’ participation, understanding, and capacity. This paper presents an introduction to environmental assessments under the *Canadian Environmental Assessment Act (CEAA)*, and highlights practical tools and strategies in the following areas:

- increasing local participation in the environmental planning and assessment process;
- building on existing knowledge and expertise;
- effective information management; and
- understanding regulatory and enforcement components of developments.

A case study highlighting the common environmental planning and assessment tool of Environmental Constraints Mapping will also be presented within this context.

2.0 Introduction to Environmental Assessments

The Canadian Environmental Assessment Agency's (the Agency) dedication to sustainable development is evident within *CEAA*, which reads:

"...The Government of Canada seeks to achieve sustainable development by conserving and enhancing environmental quality and by encouraging and promoting economic development that conserves and enhances environmental quality. ...Environmental assessment provides an effective means of integrating environmental factors into planning and decision-making processes in a manner that promotes sustainable development."

One of the primary roles of the Agency is to administer the federal environmental assessment (EA) process. The responsibility for implementing *CEAA*'s requirements for EA lies with the federal department(s) or agency(ies) that exercise specific powers or that perform specified duties or functions in respect of the proposed development. EA is a critical planning and decision-making tool that requires the identification of the potential impacts of a project, the evaluation of the significance of these potential impacts, and development of the means of mitigating these impacts. These requirements must be met before the project is approved and commenced.

There are four types of Environmental Assessment under *CEAA*:

1. Screening, which includes most applications;
2. Comprehensive Study;
3. Mediation; and
4. Panel Review, by a fully independent panel appointed by the Minister of the Environment.

The factors that must be considered in an EA depends on the type of EA that is required. The following factors are common in all four types:

1. The environmental effects of the project must be identified, including:
 - cumulative effects likely to result from the project in combination with past, current, and future projects/activities; and
 - effects of potential project malfunctions or accidents.
2. The significance of the effects must be assessed.
3. Comments and concerns raised during public consultation must be included in the EA.

4. Feasible mitigation measures for adverse environmental effects must be presented.
5. Other issues including the need for the project and alternatives must be addressed.

If the EA requirement is for a Comprehensive Study, Mediation or Panel Review, the following additional factors must be addressed:

1. purpose of the project; and
2. technically and financially feasible alternative means to carry out the project, including the associated environmental effects of these alternatives.

2.1 Components of an Environmental Assessment

As Screenings are the most common type of EA completed under CEAA, the following outlines the primary components of a Screening-level EA.

Scope of the Project and Assessment

The scope of the project is outlined, including the purpose and background of the project, the project components and structures, activities, and location and site selection. The scope of the assessment is determined and outlined by considering the project location, project development schedule, and factors such as malfunctions and accidents.

Issues Scoping and Selection of Environmental Components

An issue scoping is the critical first step of the assessment process. The issues scoping process often involves consultation with public stakeholders, First Nations' communities, and regulatory agencies. An increasing value is placed on the consultation process, as stakeholders are often the most knowledgeable about the subject area, and subsequently add to a greater understanding of the value of the resource and issues associated with its development.

A literature review, field studies (e.g. focussing on vegetation, wildlife, fisheries, historical resources), and professional judgement are also used in the issues scoping process and during the selection of environmental components on which to focus the environmental assessment.

In addition to preliminary fieldwork, existing information about the area is collected from a number of sources including:

- air photos;
- Provincial Natural History Information Centres;
- Provincial Fish and Wildlife Service;
- Canadian Wildlife Service;
- Statistics Canada;
- various internet websites; and
- published and unpublished literature.

Preliminary field studies help identify sensitive areas and historical resources that could be adversely affected by the development of the Project. In addition, the studies allow for the collection of evidence of wildlife use in the Project area and the identification of areas of potentially important wildlife habitat. During issues scoping activities, a key outcome is to identify the best way to organize or “package” issues identified into selected environmental components on which to focus the analysis of potential environmental effects. As per the definition of “environmental effect” under *CEAA*, selected environmental components pertain to both biophysical and socio-economic issues. The information collected during the field studies and literature searches provides the basis for the description of existing conditions for selected environmental components within the EA.

Boundaries

An important aspect of EA is the determination of boundaries, as they focus the scope of work, thus allowing for a meaningful analysis of potential environmental effects associated with a project. There are two distinct types of boundaries:

- temporal and spatial boundaries of the Project and the environmental component; and
- administrative and technical boundaries of the assessment.

Temporal boundaries include all phases of the Project, including components such as site preparation and construction, operations and maintenance, and decommissioning. Spatial boundaries include the extent of all components within the scoping (e.g. roads, transmission

lines). Administrative and technical boundaries of an EA address the limitations on the scope of, or approach to, work during the assessment of environmental effects. These include such factors as availability of information, time constraints for the EA, and jurisdictional differences that may result in varying levels of information and requirements.

Existing Conditions

Existing conditions (*i.e.*, pre-Project development) are described for each environmental component. The description is discussed relative to the status and characteristics of the environmental component within the boundaries established. In order to improve the focus and readability of the assessment, the description centers on aspects that are relevant to potential interactions.

The setting in which the Project is proposed is described to give context to the description of existing conditions for each environmental component. The environmental setting, which includes a description of not only biophysical surroundings, but also socio-cultural conditions, may include the following:

- physiography and topography;
- soil quality;
- geology;
- hydrogeology and groundwater;
- surface water, aquatic life forms, and aquatic vegetation;
- wildlife and wildlife habitat;
- vegetation;
- climate and atmospheric environment;
- cultural and historical resources;
- air quality;
- land use; and
- socio-economic conditions, including potential benefits to local employment and local communities, potential effect on existing land use, and potential effect on aesthetics.

Traditional Knowledge

Recent amendments to *CEAA* now formally recognize traditional knowledge in the EA process, for which there were previously no special provisions for its incorporation. Guidelines for obtaining and incorporating traditional knowledge into EA will be developed by the Agency and a yet-to-be-established Aboriginal advisory committee.

Public Consultation Programs

Consultation with both local communities and regulators are an important means of collecting and confirming information collected for the EA. Issues and concerns raised during this process are documented within the EA and must be addressed to the satisfaction of the regulators.

Potential Interactions, Issues, Concerns and Environmental Effects

When there is an interaction between a Project-related activity and an environmental component, an environmental effect could potentially occur. Potential interactions between Project-related activities and the environmental components are described, and any issues or concerns related to the environmental components.

Significance Definition

Under *CEAA*, the determination of significance (*i.e.*, a significant environmental effect or a not-significant environmental effect) is central to decision-making. In an assessment, significance is specifically defined and determined for each environmental component and is defined based on information obtained in issues scoping, available information on the status and characteristics of the environmental component, existing standards or regulations, and professional judgement.

Mitigation

Mitigation measures are identified, described, and applied as a means to minimize or avoid potential environmental effects. Mitigation measures can include design of the project to meet provincial or federal regulations and industry-tested and accepted practices or standards. Mitigation measures may also include siting and design factors identified in the early stages of Project development to avoid potential environmental effects (*e.g.*, avoidance of native grassland and key wildlife habitat; setback requirements from residences).

Evaluation of Cumulative Environmental Effects

Cumulative environmental effects are defined in *CEAA* as:

“An effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities.”

Under *CEAA*, an environmental assessment must determine whether the project under review adds to the combined adverse effects of past, existing and imminent projects and activities. Specifically, the assessment must determine the degree to which a single project is contributing to the total cumulative effects of human activities and developments in the region. As directed by the Agency, the assessment of cumulative environmental effects must consider:

- changes in the environment caused by the Project;
- the effects of any such changes on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - current use of land and resources for traditional purposes by aboriginal persons; or
 - any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance; and
- any change to the project caused by the environment.

The following five steps are followed in assessing cumulative environmental effects:

- Step 1 Identify environmental effects resulting from Project-related activities.
- Step 2 Identify other projects or activities that could interact with Project-related environmental effects.
- Step 3 Exclude environmental effects of other projects or activities that are not likely to act in combination with the environmental effects of the Project.
- Step 4 Identify the likely cumulative environmental effects that could result from the interaction of Project-related environmental effects with other past and future projects and activities.
- Step 5 Evaluate the significance of likely cumulative environmental effects.

Evaluation of Residual Environmental Effects

Residual environmental effects are described as those effects that are predicted to persist after mitigation measures have been implemented. A summary matrix is used to describe in tabular form the residual environmental effects that could result for each environmental component during each Project phase. The Agency recommends that residual environmental effects be evaluated according to the following criteria:

- magnitude;
- geographic extent;
- duration;
- frequency;
- reversibility; and
- context.

These evaluation criteria are described in greater detail in the residual environmental effects summary tables and specifically for each environmental component.

In general, the evaluation of residual environmental effects follows three steps, as outlined by the Agency (1994):

- determining whether environmental effects are adverse;
- determining whether adverse environmental effects are significant; and
- determining whether the significant adverse environmental effects are likely to occur.

During the evaluation, the significance definition is applied to any residual adverse environmental effects that have been identified. As a result, residual adverse environmental effects are predicted to be either **significant** or **not-significant**.

Follow-Up and Monitoring

Recommendations for follow-up studies or monitoring activities are identified within the EA, where appropriate.

3.0 Local Participation in the Environmental Planning and Assessment Process

Becoming engaged in the environmental planning and assessment process allows for an understanding of the proposed project, and the timely expression of concerns and their resolution. There are a number of ways to engage in the process without the requirement for strong technical expertise, or extensive human and financial resources. Meaningful participation begins with awareness of the project, the proponent, and the Responsible Authority.

Projects located off-reserve, it is important to understand the local municipality's process for the approval of development permits, land use changes, and subdivision. Once their specific process is understood, interested landowners can become involved through the public notification, hearing, and appeal process. The purpose of the circulation and referral period is to solicit comment from interested parties. When a project is adjacent to the reserve boundary, a referral, or circulation, is distributed to the Band contact person/agency. A specified response period is indicated during which time, comments and concerns can be voiced. If the project requires a public hearing, the Band will be notified accordingly. Proposed projects that may be of local concern, but are located outside of the set notification area are frequently advertised in local newspapers. These public notifications stipulate a comment solicitation period, and do not preclude expression of concern by relative location to the project.

At a higher organizational stage, community-level organizations speak for the collective interests of the community at large or a particular group, such as Hunters and Trappers Committees, Community Corporations, and co-management bodies. Such organizations can work together with project proponents, regulators, and others involved in the EA process to help ensure that local issues are adequately expressed.

On an individual level, there are a number of ways to become involved in the EA process. These include;

- Participate in local open houses, public hearings, and other forums that provide an opportunity to understand the project and provide feedback.
- Review and comment on an EA prior to regulators making a final decision on the project.
- Access the Canadian Environmental Assessment Registry for further information regarding projects that are proposed within your area.
- Apply for federal government funding to assist participation by yourself or your organization/group in comprehensive studies, review panels and mediations through the Agency's Participant Funding Program.
- Take advantage of training, capacity-building, and work opportunities that may be made available by a project proponent.

4.0 Building on Existing Knowledge and Expertise

The common challenge of limited human resources with relevant technical expertise, and limited financial resources can be mitigated in part by utilizing existing knowledge and expertise. Accessing publicly available documents and resources, and seeking the assistance of trained specialists, can assist in increasing one's understanding of a project and, in turn, afford more effective participation.

Readily available sources of public information include:

- Regional land use studies;
- Canadian Environmental Assessment Registry;
- Federal and provincial databases and studies;
- Existing Environmental Operating Guidelines and Best Management Practices;
- Federal and provincial publications;
- Acts and Regulations;
- Internet; and
- Public, college, and university libraries.

Organizations and personnel that can be of assistance include:

- Provincial and federal government agencies and personnel;
- Industry and proponent representatives;
- Representatives of the company preparing an EA;
- Co-management bodies and management groups;
- Advisory councils;
- Non-government organizations (NGOs); and
- Industry organizations.

In addition, developing a strong relationship with Industry can be advantageous not only financially, but can allow for valuable sharing of information, data and expertise.

5.0 Effective Information Management

To allow for accessibility and optimal use of existing information retained on-site, it is necessary to ensure effective management of such information. At minimum, complete copies of all studies, reports, and assessments completed for projects located on-reserve should be retained and properly filed for reference.

Establishing a central repository for reports, maps, digital information and other resources allows for information sharing and ease of reference between departments and personnel. While it is not necessary that the amount of material be substantial, an organized collection of resources accompanied by a simple reference or indexing system is invaluable.

6.0 Understanding Regulatory and Enforcement Components of Developments

Upon review and acceptance of an EA, an approved project will be subject to a number of operational constraints that ensure sustainable development. These conditions and restrictions are outlined within the operating approval and all associated licences, permits, and authorizations. Project operations that are not in adherence with these conditions may be subject to enforcement action. Such conditions include:

- Those identified in applicable legislation;
- Specific terms and conditions stipulated by the approving agency and stated within the approval; and
- The project description and associated mitigation measures identified within the EA.

Many projects provide an opportunity for local participation in the development as an environmental monitor. This position also provides an additional means in which to observe project operations relative to the applicable conditions and restrictions. The role of the environmental monitor in an enforcement capacity may be limited; but still ensures the ability to report instances of non-conformance to regulators and those with enforcement mandates.

7.0 Case Study: Environmental Constraints Mapping

Environmental constraints mapping is a valuable tool to aid in environmental characterization using a variety of scales and data sources that can provide critical early input to factors such as project routing and alternatives feasibility, as well as a strategy for conducting a focused EIA. The objective of high-level environmental constraints mapping, using a Geographic Information System (GIS), is to confirm that there are no apparent limitations within the route or corridors that would preclude the identification of an environmentally acceptable route at least in some location within the corridor over its entire length.

Environmental constraints mapping applications are frequently completed for linear corridor projects including proposed transmission lines, transportation routes, and pipelines. Factors such as significant historical sites, wetlands, sensitive flora and fauna areas, wildlife and First Nations concerns, oils spill sensitivity mapping, aquaculture suitability, commercial fisheries, and other considerations are compiled using a GIS and are analyzed and presented in a visually pleasing and informative manner.

During this exercise, biophysical and socio-economic environmental data sources are reviewed for suitability of information and appropriate scale. Data sources that are frequently used include 1:250,000 and 1:50,000 NTS topographical mapping, LANDSAT imagery, Biogeoclimatic

Mapping, Ecological Land Classification, and Forest Cover Maps. It is highly recommended that the first stage of work be supported by direct consultation with appropriate regional regulators and First Nations communities to solicit input on additional environmental or other constraints that may limit the feasibility of any candidate site.

The initial tasks include a high-level analysis of environmental concerns and issues (biophysical and socio-economic), and identify areas of constraint within the region. Following a large-scale (1:50,000) inventory and characterization task, the potential project routes or corridors can be identified with further environmental characterization then occurring at the 1:20,000 scale level.

Such detailed analysis allows for evaluation and comparison for both environmental and engineering constraints. Upon selection of a particular route or corridor, a focused evaluation can be made of project-environment interactions and a rational basis for decision-making and final detailed planning for required biophysical and socio-economic environmental baseline studies.

The outcome of Stage 2 of this Comparative Feasibility Assessment would be the confirmation of one or more technically and economically feasible project routings or corridors, which would then be carried forward into Stage 3 of the Comparative Feasibility Assessment.