



Tools for Environmental Management:

A guide for First Nations

Baseline Information | Environmental Assessment | Engaging Communities | Monitoring
Information Management Systems | TEK | Land Use Planning | Integrated Planning

Tools for Environmental Management: A Guide for First Nations

First Nations (Alberta) Technical Services Advisory Group

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Disclaimer

This Guide is for Information purposes only NOT for legal advice. Legal and environmental advice is dependent upon the specific circumstances of each situation. The information contained in this guide is not necessarily up to date please refer to www.tsag.net for any changes.

Acknowledgements for Section 8

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The First Nations Environmental Assessment Technical Working Group employs a voluntary model that is open to participation by environmental assessment practitioners who are appointed by First Nations or First Nations organizations, representatives of federal and provincial government agencies that are involved in environmental assessments, and others by invitation of FNEATWG.

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Contact information:

FNEATWG administration, Canadian Columbia River Inter-tribal
Fisheries Commission
phone (250) 417-3474, fax (250) 417-3475, e-mail
ccrffc@cyberlink.bc
FNEATWG coordinator, e-mail coordinator@fneatwg.org

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1.0 INTRODUCTION

1.1 Why was this Manual created?

First Nations in Alberta are facing a growing number of opportunities and challenges related to natural resource management. Increasing resource development in the province along with concerns about the long term health and sustainability of the environment have led many First Nations to look for opportunities to become more involved in the environmental management decisions that affect their communities.

As a means of increasing capacity at the community level, the First Nations (Alberta) Technical Services Advisory Group (TSAG) retained the Human Environment Group of Calgary to consult with First Nation environmental managers and land administrators and develop a reference manual that could be used as a tool by First Nations when making environmental management decisions; both on Reserve, and within traditional territories.

In developing this Manual, the Human Environment Group met with fifteen First Nations communities and Aboriginal organizations from Alberta to set the scope and content of the manual. These consultations:

- Provided information related to the issues and challenges First Nations communities face in providing environmental management services to their communities;
- Identified common themes and gaps in the existing capacity; and
- Revealed innovative methods to address and deal with environmental management issues from a First Nation perspective.

The Human Environment Group was then tasked with synthesizing these themes into a manual. The manual is not intended to be an exhaustive instructional manual, but rather a guide that can help First Nations' leaders, administrators and environmental people learn more about the environmental management tools and approaches being used in the province. The manual uses short case studies to share information about the experiences some communities have had in developing and implementing these tools at the Reserve and traditional territory level. While the case studies used to develop the manual are only from Alberta, they are also likely to be relevant to other First Nations across the country. Finally, the reference manual can be used to find out where and how to go about

collecting more information about these tools. A list of useful websites, government departments and other reference material is provided in each section.

1.2 What are the objectives of the Manual?

This manual is primarily written for First Nations leaders, administrators and environmental people seeking information and options for managing their natural resources. Specifically the manual aims to answer the following key questions:

- What are some of the key environmental management tools and approaches needed for sustainable land management?
- How have these tools and approaches been used by other First Nations in Alberta?
- How can these tools and approaches be useful for my community?
- What are some of the issues and challenges associated with implementing these tools at the Reserve level?
- How can I learn more?

1.3 Overview of the Manual

This manual highlights some key environmental management tools and approaches being used by First Nations in Alberta including:

- Engaging the Community in Environmental Management (Section 2.0)
- Local and Traditional Knowledge (Section 3.0)
- Environmental Baseline Information (Section 4.0)
- Fuel Storage (Section 5.0)
- Waste Management (Section 6.0)
- Environmental Assessment, which includes Environmental Assessment Tools, Environmental Impact Assessment (EIA), Environmental Site Assessment (ESA), Environmental Audits, Follow-up Environmental Impact Assessment (FEIA) and Issues and Challenges (Section 6.0)
- Information Management Systems (Section 7.0)
- Land Use Planning (Section 8.0)
- Environmental Monitoring (Section 9.0)
- Integrated Planning and Management (Section 10.0)
- Common issues and Challenges facing First Nations (Section 11.0)

These tools are recognized as useful for dealing with many on-Reserve issues such as housing, water and sewage treatment, road development and tourism. These are also critical to dealing with many resource development activities that are occurring off-reserve such as large scale oil and gas development, forestry, agriculture and urbanization.

Each section of the manual provides some basic information about each tool and discusses why they are important for environmental management. Case studies highlighting successful applications of these tools from First Nations across Alberta are also included. These case studies, which are based on a series of interviews with First Nations' environmental people, provide valuable insight into the effects of oil and gas activity, forestry, and other activities on First Nations' lands and the opportunities and challenges that exist to managing these activities. A list of references is also provided to help you find more information about these tools and approaches.

After reading the manual, First Nations should have a greater understanding of:

- A range of tools and approaches that can be used to build the capacity in a community to make sustainable land management decisions;
- Some of the opportunities and challenges facing First Nations in Alberta in using these tools and approaches;
- Options for communities to work together with other First Nations, governments and industry to achieve sustainable environmental management goals.

1.4 Why are First Nations becoming more involved in managing their natural resources and traditional lands?

Many First Nations across Alberta have become actively involved in the management of their lands or natural resources in recent years. Some communities are interested for political and cultural reasons – they wish to recognize and explore their rights and natural heritage. For other communities, the social and economic benefits including training, education, employment and business development are the primary interest. For most First Nations, there is also a strong belief in the importance of protecting the land and natural resources for future generations.

The term “natural resources” has a variety of meanings. It is often used in relation to the extraction or development of the biophysical environment. This could include oil and gas exploration, forestry or agriculture. In this manual we use the term natural resources similarly to the term “environment” referring to the water, air, trees, soils, wildlife and other resources valued by First Nations peoples (Text Box 2.1).

The term Environment means the components of the earth and includes:
Land, water and air, including all layers of the atmosphere,
All organic and inorganic matter and living organisms,
The social, economic, recreational, cultural, spiritual, and aesthetic conditions and factors that influence the life of humans and communities, and
A part or combination of those things referred to in (a), (b) and (c) and the interrelationships between two or more of them.

Innu Nation, 1996
Voisey's Bay, MOU

Text Box 2.1

In Alberta, many different government departments, industries and communities are involved in the management of natural resources. In recent years, First Nations have been playing an increasing role in the management of resources both on Reserve, as well as, on their traditional lands. This increased participation is the result of many political, economic, social and

cultural factors. Section 3.2 of the Canadian Constitution (1987) is recognized as fundamental to the recognition of Aboriginal rights and interests in natural resources. Supreme Court decisions from across the country over the last thirty years have also created new opportunities for First Nations to become involved in natural resource management (Text Box 2.2).

Cases and other Issues to Consider

Calder v. British Columbia (1973):

Supreme Court recognized that lands claimed by the Nishg'a in the Nass River Valley generally corresponded to fishing places that they had traditionally used;

Baker Lake v. Canada (1979):

Baker Lake Inuit asked for declaration of their title to area around their community to prevent mining from interfering with caribou migration; court case was won based on recognition of the Inuit land use and occupancy of that region;

Guerin v. Queen (1979):

Musqueam Band in Vancouver opposed the development of a golf course; lands recognized as belonging to the Musqueam were being held in trust by the Federal Government; show that this trust was violated;

Delgamukw v. British Columbia (1997):

Gitksan and Wet'suwet'en claimed separate portions of 58,000 square kilometres in British Columbia; their claim was based on historical use and ownership and used oral histories (TK) to support their claim.

Dene Tha' v. Canada (2007):

Government of Canada failed to fulfill its obligation to consult with the Dene Tha' in relation to the Mackenzie Valley Pipeline. The Court decided that the breach was in setting up the regulatory and environmental review processes related to the MVP starting from the first steps in early 2002 and continuing up until the present time.

Text Box 2.2

At a provincial level, both the *Natural Resources Transfer Act* (NRTA) (1930) and the provincial government's policy document *Strengthening Relationships; the Government of Alberta's Aboriginal Policy Framework* (2000) influence the role of First Nations in development and resource management decisions in Alberta. The NRTA; particularly sections 10 and 12, obligates the provincial government to participate in land claim settlement processes as well as consult with Aboriginal people about development activity that may affect their treaty rights. In this legal context, First Nations in Alberta, have an important and valuable role in decisions related to environmental management.

The federal and provincial government recognize the importance of involving First Nations in environmental management decision-making in Alberta.

While the primary interest is in the management of resources on Reserve lands, there is also recognition of Aboriginal rights and interests in off-Reserve; programs such as the *Reserve Land Management Plan*, *First Nations Land Management Act* and the *Environmental Stewardship Strategy* that have all been designed to increase the level of responsibility and authority for environmental management to First Nations communities. The common thread in many of these programs is a commitment to sustainability.

Sustainability:

The ability to meet the needs of current generation without sacrificing the ability of future generations to meet their needs.

Gro Harlem Bruntland
Our Common Future 1987

Many first Nations have similar ideas about sustainability that revolve around their belief in the Creator and the need to protect the land for seven generations (Text Box 3). It is with this interest in sustainable land management decision-making or belief in protecting the land for future generations that this manual was developed.

Protecting the Land for Future Generations:

We the Indigenous Peoples, walk to the future in the footprints of our ancestors.

From the smallest to the largest living being, from the four directions, from the air and in the land and the mountains, the creator has placed us, the Indigenous peoples upon our Mother the earth.

The footprints of our ancestors are permanently etched upon the lands of our peoples.....

...We maintain our inalienable rights to our lands and territories, to all our resources – above and below – and to our waters. We assert our ongoing responsibility to pass these onto the future generations..

Kari-Oca Declaration (1992)

Text Box 3

Engaging Communities



2.0 ENGAGING THE COMMUNITY IN ENVIRONMENTAL MANAGEMENT

Resource and environmental management decisions can benefit from the perspectives and ideas that members of the community generate. By empowering community members so that they have a good understanding of key issues and feel comfortable sharing their ideas, the Nation can enhance their environmental management planning.

The other chapters in this manual describe tools for enhancing technical understanding of environmental management issues. This section will focus on the options for community engagement and its role in environmental management decision making.

2.1 What is community engagement?

Community engagement is the involvement of community members in the process of environmental management. The level of involvement can vary depending on the First Nation and the environmental management issue, but generally there is a spectrum of levels of involvement to choose from.

Leaders including Band Councils, environmental managers and administrators play an important role in engaging communities in resources management decision-making. They are usually the individuals and organizations most often involved in the decision-making processes and therefore have the greatest role and responsibility to ensure that their decisions are sustainable and address the issues of greatest concern to the community.

2.2 What are the various levels of Community Engagement?

Community engagement can occur in a variety of forms. At the simplest level, community engagement may include providing information to community members; at its highest level, it may mean empowering the community to make key resource and environmental management decisions. The spectrum of engagement is illustrated in Figure 3.1 and has been adapted from a model for community involvement and the process championed by the International Association for Public Participation (IAP2).

By defining the level of engagement, a First Nation can formalize the role they want community members play in the management of natural resources.

The various levels described in the spectrum provide for a different level of participation. All of them (except for Empowerment) keep the final decision making powers in the hands of the environmental management officer or First Nation management.

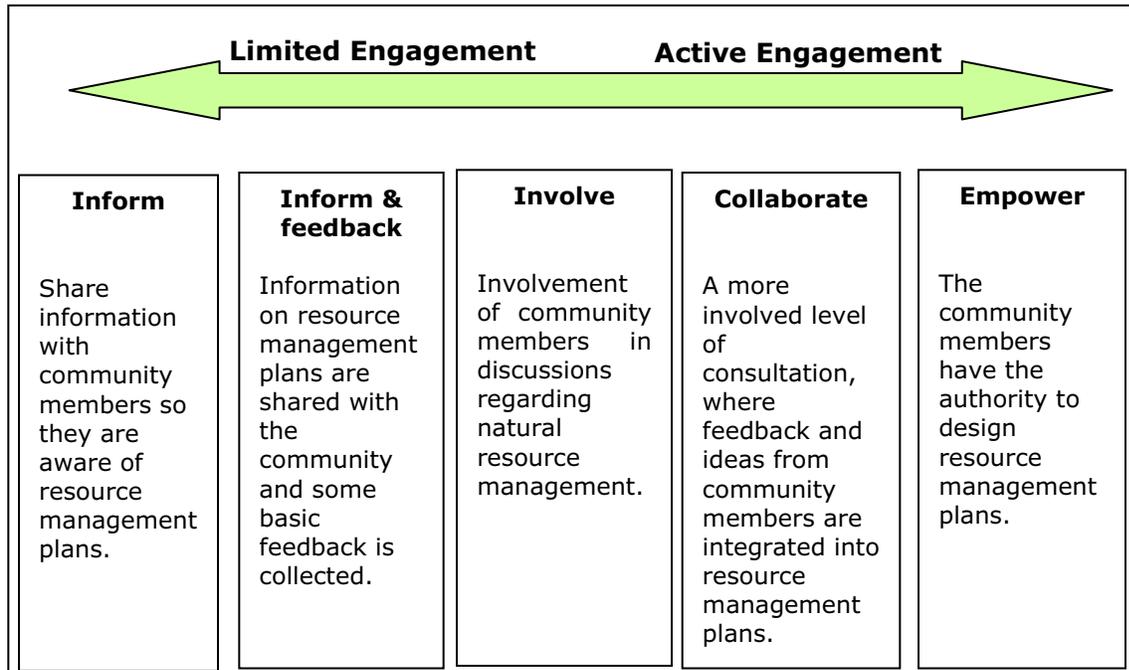


Figure 3.1 Spectrum of Engagement

2.3 Why is it useful?

Depending on the level of involvement, community engagement can be a useful tool to environmental managers in several areas. Perhaps the two most important benefits of community engagement are described below.

1. It can be used to strengthen the planning process related to environmental management. It provides a broad spectrum of "visions for environmental management" that reflects the diversity of ideas that often exists in First Nations communities. It is also very helpful if used at the very beginning of environmental management planning as it gives the First Nation a good understanding of the key concerns held by members before any management decisions are made.
2. It can be useful in evaluating the options for developing a specific environmental and in getting community support for eventual decisions. Community engagement can help the First Nation ensure that they have considered the different perspectives of community members and it

allows the management to indicate that their decision was based on discussions with community members.

2.4 What are some Engagement Processes?

There are many ways in which individual community members can become engaged in environmental management processes. These include:

- Decision Making Circles
- Ceremonial Feasts or Events
- Workshops
- Focus Groups
- Open Houses

2.4.1 Decision Making Circles

Some First Nations use a decision making circle as a means to discuss issues and make decisions. This can be applied to decisions related to environmental management. The process varies from community to community, but some of the common features include a:

- Facilitator/Ceremonialist, who defines the roles and responsibilities within the circle;
- Recorder/tobacco cutter, who records the discussion and assists the facilitator/ceremonialist;
- Elders, who support the facilitator/ceremonialist and ensures the operation of the circle is followed and respected;
- Host, who begins the process by making an offering and asking the ceremonialist to facilitate the discussion.

The titles, roles and responsibilities may vary from First Nation to First Nation, but the general concept of a decision making circle should be considered as an effective method to ensure that a number of people participate in the decision making process and that more than one view is represented.

2.4.2 Ceremonial Feast or Events

Most First Nation communities have a variety of annual events or special ceremonial feasts. These events or feasts are often very popular events on Reserve and have a large number of community members in attendance. As such, these events can provide an opportunity to meet with a large number

of individuals from the community. The objective of this type of tool is usually more focused on providing information to the community, with a limited opportunity for feedback.

It is important that the information presented at these types of events is technically accurate and easy to understand, often times a booth is set up with posters and information handouts available to the community members. To effectively present this information it can be expensive (printing costs) and it runs the risk that if the information is not presented well the credibility of the project can be questioned.

2.4.3 Workshops

These are informal public meetings where a group of community members meet to discuss a specific topic. The topic can be broad, such as, how to management natural resources on Reserve, or very specific, such as, what route should a drinking water pipeline take through the community.

It is usually a good idea to provide some information to the workshop participants before the discussions. Sometimes this information is in the form of presentation made at the start of the workshop by specialist. These specialists can also be available to answer questions that come up during the discussions.

For large workshops it is sometimes helpful to divide the workshop participants into small groups to allow for a more informal setting where community members feel comfortable expressing their views.

Using Local and traditional knowledge in Decision making: Blood (Kanai Nation) Swift Fox (Sinopa) re-introduction program.

Until recently the swift fox was considered extirpated in Canada. That is, the swift fox could no longer be found in the areas it used to occupy in Canada, but it could still be found elsewhere in the world. The last documented record of a wild swift fox in Canada was in 1928, at Govenlock, near the Saskatchewan-Alberta border. Although the swift fox can occasionally be sited across the prairies, (thanks to re-introduction programs) the population is small and continues to be listed under the *Wildlife Act* as an endangered animal in Alberta.

The Swift fox is a significant animal in Blackfoot culture. There is a Swift fox (Sinopa) or Kit Fox Society and a Kit Fox medicine bundle. The Blood Tribe recently recovered the Kit Fox Medicine Bundle from a museum in the United States. Since this recovery, Kanai Elders of the "Mookakin Foundation" want to see the Swift fox back on the Reserve.

Historically, swift fox were common throughout the mixed and short-grass prairie regions of the Great Plains. Their range extended from southwestern Manitoba westward to the foothills of the Rocky Mountains and from central Alberta southward throughout the midwestern United States. The Blood Indian Reserve 148; known locally as "The Big Reserve" supports one of the largest tracks of native mixed grass prairie in Canada.

Wildlife biologists have learned that in addition to unfragmented prairie, several other habitat features are necessary to support Swift Fox populations. Swift Foxes use multiple den sites year round for shelter and rearing young, and as escape routes from predators (Carbyn et al. 1994). The presence of digging or burrowing animals, such as Badgers and Richardson's Ground Squirrels, is a crucial feature for release sites as Swift Foxes use existing burrows to modify for their own use. Similarly, the presence of other animals may negatively affect successful release. The Coyote is a major competitor for the swift fox and considered one of the primary reasons for the species decline.

The Blood Tribe Lands Management Department has been working with the community and the Cochran Ecological Institute – Cochran Wildlife Reserve to re-introduce the swift fox to the Big Reserve. This initiative is using traditional and local knowledge to complement scientific knowledge about the habitat requirements of the Swift fox and to identify potential release sites on the reserve.

The community has been asked to help the project by voluntarily plotting (with pins on a colored air photo mosaic) locations of specific wildlife they have seen recently on the Big Reserve. The wildlife species being plotted share certain characteristics with the Swift Fox (i.e. Hawks – share food, Badgers – provide fox with den sites, coyotes – compete with fox, red fox -- to distinguish from swift fox and so on). This information will be considered by the lands Department and Kainai elders to determine re-release locations. The poster is in the front waiting area of the Lands Administration Office.

In 2004 the first permit of its' kind was issued by Environment Canada to the Blood tribe to release swift fox on the Big Reserve.

2.4.4 Focus Groups

A focus group allows the Nation to “test” their proposed environmental management plan on a select group of community members. The group is usually selected to reflect a number of different stakeholder groups within the community. By “testing” the ideas related to environmental management on a focus group, the Nation can make modifications to their plans that more accurately reflect the ideas and concerns of community members.

To successfully implement this engagement tool, the Nation will likely need a skilled facilitator who can lead the discussion within the group and ensure that the environmental management ideas are properly presented to the participants.

2.4.5 Open Houses

An open house is a public event where information on environmental management issues can be presented to the community members. The presentation of the information can be adapted to meet the objectives of the specific event. Some open houses have a stage at the front, where the Nation can make presentations to its members in the audience. Another, less formal, style is to have a series of tables set up in a room with information about specific aspects of natural resource management presented. The tables will typically be staffed by a specialist who can answer the member’s questions as they walk around the room looking at the various tables.

2.5 What Does this Mean to My Community?

The concept of engagement has two key components for an aboriginal community. First is the duty to consult and engage with the community by outside parties like industry, government or individuals. Secondly is the duty a community has to consult with membership and/or outside parties on their activities. The choice of which end of the spectrum engagement and how to engage is a very dependent on the scale and potential affects a project may have. When a community engages internally and externally it is important to note that you must manage participants expectations of the goal of engagement and make it as clear as possible as early as possible.

2.6 Issues and Challenges

Communicating the level of participation the Nation is looking for.

It is very important that community engagement programs are clear in describing what the Nation is asking from its members, and what the Nation is going to do with this information. If the Nation is only interested in informing the membership about a proposed environmental management initiative, but undertakes a process of "consultation", community members may end up frustrated that their ideas were not actively considered in the final resource plan.

For these reasons, it is important that communities wanting input from the community develop a plan for how to get this input early in the planning process.

Variety of interest groups

It is important to make sure that a variety of stakeholders groups within the Nation participate in the engagement program and that small but vocal special interests groups do not manipulate the process. To help avoid this problem, the Nation should actively seek out the participation of a variety of groups.

These interest groups may have a wide range of capacity (literacy levels, familiarity with environmental issues, understanding of regulatory processes etc.) to effectively participate in the process. For example, it can be difficult for an elder to become fully engaged in discussions related to "acidification effects on the terrestrial environment through cat ion transfers" when the concept is new and perceived as extremely foreign and technical. For these reasons, adequately describing the issues at hand and providing adequate background information to participants before asking for their input is an extremely important step.

Resources

It is important that the Nation does not announce a complex and far-reaching engagement process, if it does not have the resources (trained people, time etc.) to implement the program. The Nation may lose trust among its membership and appear to be uncommitted to real engagement if the program they have publicly announced is not implemented.

Feedback

If community members spend the time and energy to share their ideas on resource management issues, it is important that the Nation reflect back to them how their ideas were incorporated (or not) into the final plan. If the

membership does not feel as though they have been listened to, then they will be less likely to accept the environmental management decision and less likely to participate in future engagement programs.

2.7 Where can I find out more?

A wide variety of information sources exist on how to engage communities. The following are a few of the sources.

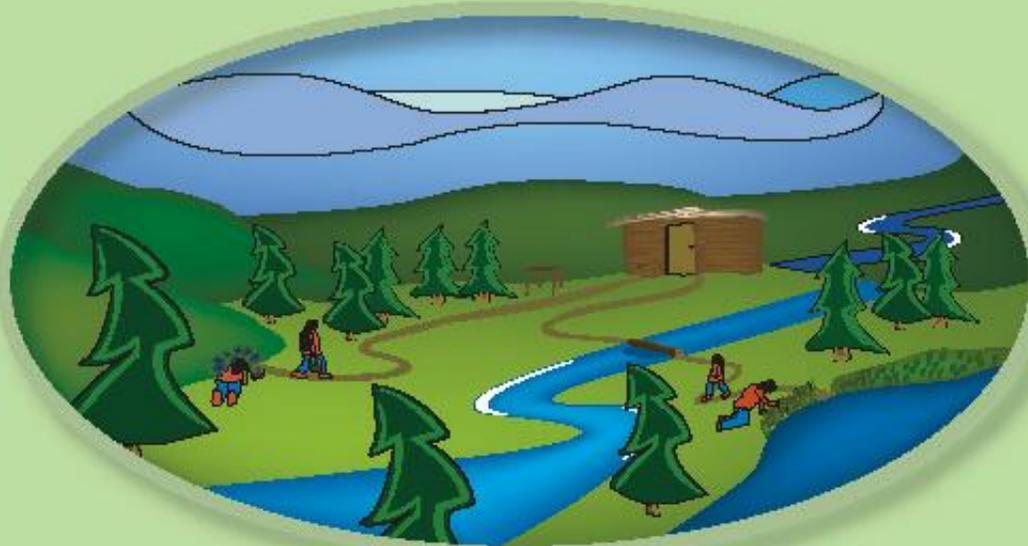
International Association for Public Participation (IAP2); www.iap2.org. This is a very well respected international association that brings together a broad spectrum of public participation practitioners. The association offers training courses in Western Canada and has some resources on-line which communities can download.

Canadian Environmental Assessment Agency (CEAA); http://www.ceaa.gc.ca/011/index_e.htm. This site has information on the CEAA and ways in which they encourage community engagement in the assessment act process. This site also offers some training modules.

Social Science Research Network (SSRN), www.ssrn.com/index.html is an organization devoted to the rapid worldwide dissemination of social science research. This site has a variety of publications on community engagement and public consultation issues, and also offers links to training programs.

Guide for Effective Public Involvement - CAPP, <http://www.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=73244>, this publication from the Canadian Association of Petroleum Producers includes a discussion of various approaches to public involvement, especially in relation to the oil and gas industry.

Local and Traditional Knowledge



3.0 LOCAL AND TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

The knowledge, practices and beliefs of First Nations in Alberta are many generations old; however, it has only been in recent years that Local and Traditional Ecological Knowledge (TEK) have been recognized by international agencies; such as the United Nations, and in Canada by the Canadian Environmental Assessment Agency (CEAA) [Section 13 – cooperation agreement] as an important body of knowledge that provides valuable insight into sustainable land management. There is growing interest on the part of industry, government and other organizations to include these vast bodies of knowledge to in the management of natural resources.

What is local knowledge?

Many First Nations in Alberta have ways of seeing, understanding and living within the environment that is different from other cultures in the province. Local knowledge is the knowledge about a person, place, thing, event or process that has been developed using the skills, capacities and values of a local group of people. Local knowledge is not, however, fixed in time. It changes and develops as do communities.

Local “ecological” knowledge is:

- specific to a local natural resource(s), or ecosystem;
- developed by a group of individuals (community) that have a social, cultural, economic or spiritual relationship to the local resource or ecosystem;
- reflects local skills, capacities and values;
- is often recorded and shared through oral tradition

Interest in local knowledge is based on the assumption that:

- land-based societies, including Aboriginal peoples in Canada, hold valuable knowledge based on observation and experience in their local environments;
- recognition and use of local knowledge in resource management decision-making has many social, economic and cultural benefits for local peoples

3.1 What is Traditional Ecological Knowledge (TEK)?

Local knowledge that has developed over many generations can be described as traditional ecological knowledge.

Traditional knowledge is as a cumulative body of knowledge and beliefs evolving by adaptive processes and handed down through generations by cultural transmission. It can sometimes be described as "knowledge from the land", indigenous knowledge or ethno-science.

Berkes 1999:9

This level of traditional knowledge is different from what is termed "local Knowledge" in that it involves the religion, ethics and more generally, the belief systems that round out a communities "way of Life". It has been said that TEK has 3 pillars: "knowledge – practice – and belief".

TEK is recognized and valued as distinct from the conventional western scientific knowledge in the following ways:

Traditional Knowledge	Western Science
Qualitative	Quantitative
Holistic and integrative	Reductionist
Oral	Textual
Long term observation	Short term experimentation
Intuitive	Analytical
Nature-oriented (ecocentric)	Human-centred (anthropocentric)

In Alberta, a number of First Nation communities have been involved in documenting or using their TEK in forest ecosystem planning and management. First Nations Forestry Programs have put significant resources towards increasing the capacity of communities to develop their own community-based environmental management systems. The Sustainable Forest Management Network has also dedicated resources to forest related traditional knowledge research. There is also growing interest by regulatory agencies such as the Energy Utilities Board (EUB) and Alberta Sustainable Resource Development to incorporate TEK in the assessment and regulation of industrial activity (including oil and gas, forestry and hydro-electric

developments). In response, various industry sectors are investigating opportunities for integrating TEK into development planning, operation, monitoring and reclamation programs. A variety of other agencies (including NGOs such as Ducks Unlimited (DU), World Wildlife Fund (WWF), and the Canadian Parks and Wilderness Society (CPAWS)) are developing programs and projects aimed at including TEK in addressing key resource management issues such as wildlife and wildlife habitat conservation.

Traditional knowledge and land use studies are the process of compiling and documenting a body of knowledge, handed down orally from one generation to the next, within a community, that connects people to their natural environment. (Garvin et al. 2001)

In the 1990s, many agencies and organizations attempted to find definitions and standards for collecting and using TEK in resource management that could be applied in all First Nations communities across Canada. Such a broad based approach, however, provides limited insight into the complexity and diversity of First Nations' knowledge, practice and belief systems. In Alberta there are five language groups and over forty First Nation communities, each with unique social, cultural, economic, political and ecological histories, experiences and visions for the future. As such, there is no single approach or methodology for carrying out TEK research.

None the less, TEK is commonly gathered through "Traditional Land Use and Occupancy Studies". These studies usually involve a series of community workshops, interviews with Elders and other custodians of knowledge and mapping. Some definitions of Traditional Land Use Studies are listed below:

Land use and occupancy mapping is about documenting those aspects of the individual's experience that can be shown on a map. It is about telling the story of a person's life on the land. Over time individual experience becomes part of the collective oral tradition, a story of much grander proportions. In this respect, use and occupancy studies mapping is a means to help record a nation's oral history. (Tobias 2000)

3.2 How is TEK being used in environmental management decision making?

Those interested in using traditional ecological knowledge in environmental management decision-making have generally focused on the land and resource use practices of Aboriginal peoples including hunting, fishing, trapping and the gathering of plants including traditional medicines. Land use and occupancy studies have been particularly useful in identifying key harvesting areas and cultural sites. This knowledge has been applied in environmental assessment processes, the design of mitigation, reclamation and monitoring programs. Ensuring the confidentiality of sensitive areas, practices are a critical aspect of applying this knowledge.

In recent years, greater emphasis has been placed on identifying culturally appropriate and meaningful indicators or criteria for environmental management decision-making. For many First Nations, it is also very important to document the cultural narratives, including elders' life stories. These narratives provide tremendous insight into the value and meaning of the land and resources to the communities. Despite best efforts, the process of documenting TEK can be problematic for many communities. According to elders, it is by being on the land, experiencing the environment and the gifts of the Creator, that TEK can be truly understood.

What is a Traditional Land Use Study

A project that is designed to capture and record patterns of traditional use by Aboriginal communities. Generally three types of data collection characterize a Traditional Land Use Study

- Interviews and discussion with Elders and Custodians of Knowledge
- Historical and other types of research
- Mapping and recording of traditional uses, including sites and activities

(Alberta Aboriginal Affairs and Northern Development 2003).

**Using Science and Local and Traditional Knowledge
to Monitor Contaminants in Country Foods
A Case Study from the Lesser Slave Lake Tribal Council**

The Swan Hills Treatment Plant is located within the traditional territory of the Lesser Slave Lake First Nation. The plant currently accepts hazardous waste from across Canada, ranging from household waste gathered in community toxic-roundups, chemical laboratory waste from schools to industrial wastes. Construction of the facility began in 1985. In July 1991, Chem-Security (Alberta) Limited (CSAL) filed for approval to add an incinerator (40,000 tonnes annual capacity) to the existing 13,500-tonne capacity Alberta Special Waste Treatment Centre (ASWTC). The Alberta Government approved the expansion, however, in 1996, a series of hazardous material leaks from the facility led to concerns about human health and the environment.

The Lesser Slave Lake Tribal Council immediately raised concerns that the facility was affecting the health of local communities. There was particular concern from the communities of Swan River, Driftpile and Sucker Creek about the bioaccumulation of contaminants in traditional foods.

Because of these concerns, the Lesser Slave Lake Tribal Council, the Government of Alberta and Health Canada developed a monitoring program to identify contaminants in country food including berries, plants and wildlife (moose). The monitoring program was developed in 1997. A local community member (Edna Willer) was trained in scientific research methods for the program. Her main responsibility has been to gather samples of berries, plants, small rodents and moose within a thirty (30) km. of the facility for testing at the government lab in Edmonton. Once the analysis was complete, Edna is provided a summary of results that she uses to report to the Tribal Council.

In addition to these scientific results, the study was also designed to involve local and traditional knowledge from the affected Aboriginal communities. Local harvesters were involved in the monitoring program by providing tissue samples from moose and other wild game and reporting any relevant observations to the Tribal Council. "The elders and hunters in the communities are valuable resources for the monitoring program". Particularly valuable is their knowledge about the health of wildlife from the region. "If the moose is fat, it is considered healthy" according to local harvesters.

One year following the leak, government tests found mercury in fish near the plant and elevated concentrations of polychlorinated biphenyls (PCBs) in small rodents and vegetation as far as five km. from the treatment centre. Between 1997-2001, results showed that exposure of local residents to contaminants such as PCBs and dioxins had improved significantly. However, levels of contaminants in the organ meat of some wild game are still four times higher than allowable limits under Health Canada advisory (2 grams).

The monitoring program is a good example of how scientific testing and local and traditional knowledge can be used to address issues of significant community concern. The Lesser Slave Lake Tribal Council continues to be concerned about the long term health of their community and the environment, however, feel that their strong working relationship with Earth Tech Environmental Ltd, who currently operate the facility, and Health Canada will enable them to deal with future issues.

References:

http://www.health.gov.ab.ca/resources/publications/pdf/SwanHillsReportJune_04.pdf
<http://www.sierraclub.ca/national/postings/toxicanada-july-2001.pdf>

3.3 What does this Mean to My Community?

As can be seen in the section on Issues and Challenges that follow there are often ongoing issues related to the collection, protection, and use of Traditional Knowledge. How a community collects, stores and uses this information should be a topic of discussion at the highest levels of leadership. Many communities are making the preservation of TEK one of their highest priorities and have developed offices for the management and collection of this information. Governments and industry should be lobbied to support the collection and management of this very valuable and increasingly threatened source of knowledge.

3.4 Issues and Challenges

Information or Environmental Management Systems?

Those interested in incorporating TEK into environmental management decisions may consider it at many different levels. At a very basic level, TEK can be considered simply as data and information that can be documented and included in a variety of environmental management contexts, such as land use planning and environmental assessment. To many First Nations, TEK is more than just data; it is a system of values, beliefs and practices distinct from conventional environmental management. For example, forestry companies may ask communities to create data points on maps to represent cultural sites that should be avoided during clear cutting. In most cases, the value of these sites is much greater than can be described on a map through data points. It may not be possible to separate a cultural site from the surrounding ecological attributes of the area (a healthy river, a diversity of wildlife or habitats, sacred or traditionally significant vegetation or a series of trails), that may be affected by forest industry activities. Despite this challenge, there is no doubt that the traditional holistic views Aboriginal hold of ecosystems is crucial to sustainable integrated resource management. First Nations, governments, academics and industry continue to discover effective ways to integrate TEK into resource management.

Loss of Traditional Knowledge

There is growing concern about the loss of traditional knowledge in many parts of the world including Alberta, Canada. The past five hundred years of western development, has significantly eroded the social, cultural and ecological well-being of many communities. As elders' who lived their life on the land have passed away, and fewer community members are engaged in

hunting, trapping, and gathering activities, there is growing concern about the future of TEK. As a result, communities are anxious to document and preserve many aspects of their traditional way of life as a legacy for future generations. For other communities, traditional knowledge is not being lost. They do not perceive it as tied to historical practices, but as a process of living and adapting to new opportunities and changed environments. For these communities, the fact that fewer people are trapping, hunting and gathering does not mean that their TEK is deteriorated; it means it is evolving.

Intellectual Property Rights

Intellectual property rights and traditional knowledge has been an issue of concern in many parts of the world. Organizations such as the World Indigenous Peoples Organization (WIPO) and the Assembly of First Nations have developed policies and principles on how to respect and protect TEK particularly as it relates to medicinal plants, valued cultural landscapes or heritage sites. Individual First Nations and communities in Canada, such as the Gwich'in Social and Cultural Institute, have also developed specific policies and processes which may be a model for other communities in Alberta seeking to protect and respect their knowledge for future generations.

3.5 How can I learn more?

Canadian Environmental Assessment Act
Traditional Knowledge and the Canadian Environment Assessment Agency
http://www.ceaa-acee.gc.ca/012/atk_e.htm

First Nations Forestry Program
<http://www.fnfp.gc.ca/>

Sustainable Forest Management Network
<http://sfm-1.biology.ualberta.ca/english/home/>

Gwich'in Social and Cultural Institute
<http://www.gwichin.nt.ca/socialAndCulturalInstitute.htm>

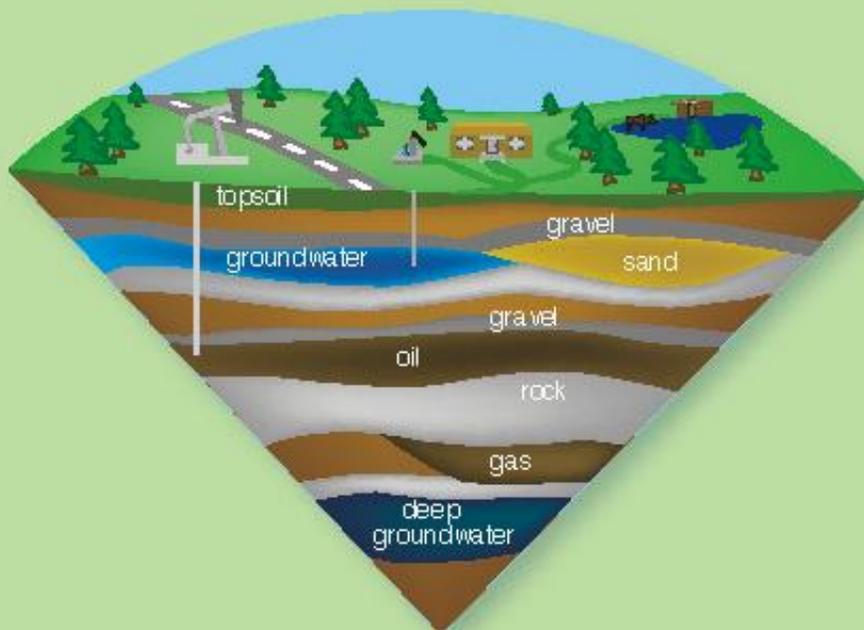
Tobias, T. (2000) Chief Kerry's Moose: A Guidebook to land use and occupancy mapping, research and design and data collection. Vancouver: Union of BC Indian Chiefs and Ecotrust
<http://www.ubcic.bc.ca/tus.htm>

Alberta Aboriginal Affairs and Northern Development 2003. Best Practices Handbook for Traditional Use Studies

(Garvin, T.; Nelson, S.; Ellehoj, E.; Redmond, B. 2001. A guide to conducting a traditional knowledge and land use study. Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre, Edmonton, AB)

Berkes, Fikret. 1999. Sacred Ecology: Traditional Ecological Knowledge and Resource Management. Philadelphia: Taylor and Francis.

Baseline Information



4.0 ENVIRONMENTAL BASELINE INFORMATION

4.1 What is Environmental Baseline Information?

Environmental Baseline Information is a term used to describe the physical (geology, soils, water, air) and biological (fish, plants and animals) resources that are found in an area. The process of documenting this information is often referred to as a "Biophysical Inventory". Commonly collected information includes:

- Air climate and weather
- Surficial geology and landforms
- Bedrock geology
- Hydrogeology
- Soils
- Surface water
- Fish and other Aquatic Resources
- Vegetation
- Wildlife and wildlife habitat
- Sensitive areas and/or areas of rare or endangered species/habitats

A comprehensive biophysical inventory can be an important tool for First Nation communities with a wide range of applications. It can provide a community with an understanding of the nature and extent of natural resources associated with their land; and based on this understanding, it can help a community make informed decisions related to development, and the management of natural resource harvesting activities and conservation. Table 4.1 lists these resource features and provides a brief introduction to the type of information that is collected about these resources and its application.

During biophysical inventories it is often useful to collect information on surrounding land use activities and existing development. Especially if maps are used as a way to summarize and present the information that was collected during the inventory. Examples of this type of information include:

- Heritage and traditional sites
- Infrastructure (roads, power lines, pipelines and industrial or municipal developments)
- Land Use information (surface or subsurface leases, registered traplines, wildlife management units, etc.)

Table 4.1 Resource features and their role in natural resource planning and management

Resource	What is it - Why collect it?
<p>Air, climate and weather</p>	<p>What is it? Information in air, climate and weather often includes regular measurements of temperature, precipitation, wind direction and speeds; and in some cases, the levels of certain elements or chemical compounds found suspended in the air.</p> <p>Why collect it? Information on weather and air quality are important for ensuring industrial/municipal compliance with human health guidelines related to air quality, and also in understanding effects related to global warming and climate change.</p>
<p>Surficial geology and landforms</p>	<p>What is it? Information on surficial geology and landforms on the earth’s surface can be used to describe physical surface features such as mountains, drumlins or coulees, as well as providing insight into terrain stability.</p> <p>Why Collect it? Development that has potential to affect unstable slopes or increase risks of surface material moving may cause damage to equipment, property, and other environmental aspects (such as waterways or wildlife habitat). This information can also help identify potential for mineral (placer mining) or aggregate (gravel and sand) resources.</p>

Resource	What is it - Why collect it?
<p>Bedrock geology</p>	<p>What is it?</p> <p>Seismic and drilling programs are often used to describe the bedrock geology of an area; that is, the layers of rock and sand found below the earth's surface. In addition, to learning what bedrock material is present (such as granite or sandstone); these types of studies are used to predict and describes how thick and how deep these layers are from the surface.</p> <p>Why Collect it?</p> <p>This type of information is used during exploration, and development planning to help determine where certain resources (gravel, mineral, water, oil, gas etc.) might be found, and how best to design projects so they conserve these resources and reduce the chances of having a negative effect on groundwater resources.</p>
<p>Hydrogeology (groundwater)</p>	<p>What is it?</p> <p>Information describing groundwater sources may include the depth, direction of groundwater flow, average expected groundwater yield, locations of springs, and spring flow rates. Hydrological inventories may also characterize the chemical composition of groundwater sources.</p> <p>Why Collect it?</p> <p>This information is important for project planning and in preventing project related impacts to groundwater sources. Groundwater is commonly used for industrial projects (oil sand mining, oil and gas wells, aggregate and mining projects). In addition, many people living on Reserves in Alberta depend on groundwater as their primary source of drinking water through wells. Groundwater contamination can destroy the water supply of an entire community.</p>

Resource	What is it - Why collect it?
Soils	<p>What is it?</p> <p>Soils inventories can provide information describing the soil formations found in a particular area including the relative amount of organic matter; soil texture (coarse or fine), and other soil characteristics such as salinity.</p> <p>Why Collect it?</p> <p>Soils information is useful in understanding the agricultural land capability of a site, determining appropriate methods for construction, help decide where projects elements (such as holding ponds or waste transfer sites) should be located; or to help in reclamation planning.</p>
Surface Water	<p>What is it?</p> <p>Surface waters include rivers, streams, lakes, reservoirs, and wetlands. Information about surface waters may include their size (width and depth), the flow rate, descriptions of the stream/river/lake bottom and a wide range of water quality parameters.</p> <p>Why Collect it?</p> <p>Knowing the location and extent of surface water bodies is important for a number of reasons. The most obvious use of this information is to help describe the potential for fresh water sources and fish habitat. Many communities have cultural or spiritual connections with waterways and these features are commonly associated with cultural, (archaeological and traditional) sites. In addition to this, surface water bodies can help specialists predict the characteristics of the surrounding soils and surficial terrain and as a result, avoid flood hazards and unstable areas. Wetlands and bogs provide valuable habitat for certain species of wildlife as do the areas bordering rivers and streams.</p>

Resource	What is it - Why collect it?
<p>Fish and Aquatic Resources</p>	<p>What is it?</p> <p>Fisheries inventories provide lists of the fish and other organisms. "Other organisms" usually means benthic invertebrates; small aquatic insects and worm-type-things that are an important source of fish food.</p> <p>Why Collect it?</p> <p>Fish are an important source of food for many Aboriginal communities and knowing the type and abundance of fish found in a particular water body can help set harvest parameters for non-Aboriginal fishermen as well as help industry and government plan projects so they have the least amount of impact on these populations (for example – timing of stream crossings during pipeline construction). Benthic invertebrates are often used as an "indicator" for water quality and value of fish habitat.</p>
<p>Vegetation</p>	<p>What is it?</p> <p>Vegetation inventories list the dominant species (trees, shrubs, grass and herbaceous species; mosses and lichens) found at a site. These inventories often use other site attributes (such as slope, % cover, stand height, etc.) to classify vegetation communities. Information on sensitive, rare, threatened or endangered species is also collected at certain times of year.</p> <p>Why Collect it?</p> <p>Having a good understanding of the native vegetation species in an area is important for avoiding impacts to traditional users, wildlife and for reclamation planning.</p>

Resource	What is it - Why collect it?
<p>Wildlife</p>	<p>What is it?</p> <p>Wildlife inventories aim to describe the wildlife species that are common in an area and the type of habitat or migration routes they use. The term “wildlife” includes all large carnivores (e.g. bears, wolves, cougars, etc.), ungulates (elk, deer, moose, caribou etc.), small carnivores (wolverines, badgers, etc.), furbearers (marten, beaver, muskrats, or rabbits, etc.), and small mammals (mice, voles and squirrels etc.). It also includes bird species including waterfowl (swans, ducks, geese, and grebes), shore birds (herons, cranes, plovers and sandpipers etc.), gallinaceous species (grouse, ptarmigans, quails, etc.) and songbirds (robins, sparrows, warblers, etc.). Wildlife inventories often use track counts, surveys (aerial, bird song, pellet counts, etc.), live trapping and habitat assessments to predict populations (or relative abundance) of each species.</p> <p>Why Collect it?</p> <p>Information on key wildlife habitat in an area is very important in considering the location and timing of development activities. Wildlife is also an important source of food and income for many Aboriginal people. The health and abundance of wildlife can have a strong impact on people in the area.</p>

Land Use information	What is it - Why collect it?
Heritage or traditional important sites	<p>What is it? Heritage or traditionally important sites commonly include camp sites, ceremonial areas, tool making sites, historical/traditional trails and access routes or other physical locations used in the past.</p> <p>Why Collect it? This information can be used to protect important sites from damage during development.</p>
Infrastructure	<p>What is it? Examples of infrastructure include: locations of houses and cabins, sewage lagoons and landfills, utility lines, roadways existing well sites and pipelines, or railways.</p> <p>Why Collect it? This information can be useful when deciding where a project should be located. Locating projects (such as road ways, electrical transmission lines or pipelines) beside existing similar linear project is cost effective and important for reducing environmental impacts. Knowing the location of a variety of utility lines can be a very important factor in Environmental Health & Safety. NRCAN and INAC have this information for all the Reserves in Canada. This information is also useful for planning social programs; such as emergency evacuation plans or for community development (i.e. new schools).</p>
Trapping - RFMAs	<p>What is it? Since the 1930s trapping has been managed through "Registered Fur Management Areas" (RFMA). A map of these areas is available at the Public lands division of Alberta Sustainable Resource Development (ASRD).</p> <p>Why Collect it? This information can be used to identify individuals that need to be notified and consulted during development planning and that qualify for trapper's compensation. Fur</p>

	<p>harvest data is also collected for each RFMA and can also be requested through Public Lands Division of ASRD. This information can be useful in predicting or understanding changes in wildlife populations.</p>
<p>Hunting – WMUs and special wildlife management zones</p>	<p>What is it?</p> <p>Wildlife Management Units (WMU) are blocks of lands allocated by the province to manage the harvest of wildlife species by non-Aboriginal hunters. Alberta Fish and Wildlife collects information on the harvest levels for several wildlife species. The provincial government has also delineated special management areas for wildlife that require large tracks of sensitive habitat (for example; grizzly bears and caribou). These maps are available from Alberta Fish and Wildlife.</p> <p>Why Collect it?</p> <p>This information can be useful in predicting or understanding changes in wildlife population.</p>

Table 4.1 lists a variety of ways biophysical and land use information can be used; however simply put, it can tell a community what their land base has (in terms of resources) at a particular point in time. This is often termed "baseline information". This information, when combined with social and land use information provides the basis to making environmental use decisions and enables a community to measure changes once development occurs.

**A Hands-On Approach to Monitoring:
A Case Study from the Tribal Chiefs Peacekeepers Conservation Association of
Alberta**

The Tribal Peacekeepers Conservation Association (TPCA) is working towards an integrated planning and management regime for the communities of Heart Lake, Beaver Lake, Cold Lake, Goodfish Lake, Frog Lake, Kehewin Cree First Nations. A key aspect of this approach is the development of a strong foundation of scientific information about the health of the land, water, wildlife, soils and air in the region.

The model proposed by the TPCA is adapted from the Globe Education Model. GLOBE is a hands-on, primary and secondary school-based education and science program that is in operation world-wide. For the First Nation, this kind of monitoring approach will enable them to gather much needed scientific information while at the same time building the capacity of their local Aboriginal communities. For students, the GLOBE model provides the opportunities to learn about the condition of the atmosphere, hydrology, soils, land and wildlife through valid scientific methods of data gathering and analysis. Students may be able to learn through building relationships and sharing their findings with other students from around the world via the World Wide Web.

The communities of Heart Lake, Beaver Lake, Cold Lake, Goodfish Lake, Frog Lake, Kehewin Cree First Nations have experienced a significant degree of social and environmental change in recent decades as a result of oil and gas activity, forestry and agriculture. According to Roger MacDonnel, Executive Direct of the TPCA, "The communities are not against development. The overall goal of the Tribal Chiefs is to build capacity so that they will be able to participate in all levels of regional resource management".

For more information see:

http://www.globe.gov/globe_flash.html

4.2 Sources of Environmental Baseline information

The amount of information described in Table 4.1 may seem overwhelming. The good news is, much of this information has been collected and is available through government agencies, industry or environmental organizations.

Sources of information include, but are not limited to:

Federal Government Agencies:

- Environment Canada (EC);
- Department of Fisheries and Oceans (DFO);
- Natural Resources Canada (NRCan);
- Indian and Northern Affairs Canada (INAC);
- Parks Canada (PC);
- Energy Mines and Resources Canada;
- Health Canada (HC); and,
- Geological Survey of Canada (GSC).

Provincial Government Agencies:

- Alberta Environment;
- Alberta Sustainable Resource and Development (ASRD) ; Resource Data division ;
- Alberta Infrastructure;
- Alberta Energy and Utilities Board (EUB);
- Alberta Geological Survey; and,
- Alberta Agriculture, Food, and Rural Development.

Industrial sectors:

- Forestry Companies;
- Utility Companies;
- Oil and Gas Companies; and,
- Mineral Extraction Companies.

Outside agencies and individuals; for example:

- Ducks Unlimited.

- Trout Unlimited.
- The Nature Conservancy
- Environmental Consultants

Table 4.2 and 4.3 lists some of the sources of information available through government agencies.

Table 4.2 Federal Baseline Information and Responsible Government Authority

Baseline Information	Federal government authority and data source
<p>Administrative boundaries, place names, digital elevation, road networks</p>	<p>NRCan LSD Legal Surveys Division's National Framework Canada Lands Administrative Boundary (CLAB) Level 1 http://sgb.nrcan.gc.ca/index_e.php</p> <p>Geomatics for Sustainable Development of Natural Resources; one stop access to The Atlas of Canada, GeoBase, GeoGratis, Toporama</p> <p>The Atlas of Canada cartographic and geographic information on Canada, including the 1:2 Million Base Dataset and others</p> <p>GeoBase a common, up-to-date and maintained base of quality geospatial data for all of Canada with access to Administrative Boundaries, Canadian Digital Elevation Data (CDED), Landsat 7 Orthoimages, includes road networks</p> <p>GeoGratis http://geogratias.cgdi.gc.ca/clf/en download FREE Canadian spatial data... everything from Landsat, RADARSAT, Earth Observation Data, Atlas Vectors, National Scale Frameworks, CGIS (Canadian Geographic Information Systems), Vector/Tabular Data...Information on climate change, groundwater, natural hazards, aboriginal property rights infrastructure, mineral and energy potential</p> <p>Natural Resources Canada (NRCan) http://www.nrcan-rncan.gc.ca/com/index-eng.php plays a pivotal role in helping shape the important contributions of the natural resources sector to the Canadian economy, society and environment.</p>

<p>Meteorology (weather information: rain, wind speeds & direction, snow fall etc.) Climate change</p>	<p>Environment Canada</p> <p>Environment Canada's general weather information: http://weatheroffice.ec.gc.ca/canada_e.html</p> <p>Meteorological Service of Canada (MSC) is Canada's source for meteorological information. The Service monitors water quantities, provides information and conducts research on climate, atmospheric science, air quality, ice and other environmental issues, making it an important source of expertise in these areas</p> <ul style="list-style-type: none"> • National Climate Archive [http://www.climate.weatheroffice.ec.gc.ca/] • Climate Normals • Envirodat <p>Canadian Information System for the Environment:</p> <p>http://www.cise-scie.ca/english/home.cfm - Contains information on Air, Climate and Water.</p> <p>GeoGratis: http://geogratis.cgdi.gc.ca/clf/en</p> <p>- Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada; information on climate change,</p> <p>NRCan CFS Climate Natural Resources Canada Canadian Forest Service Great Lakes Forest Centre Regional, National and International Climate Modeling</p> <p>CCIS Canadian Climate Impacts and Scenarios data and information generated outside of the CCIS Project Gridded Observed Climatologies for 1961-1990</p>
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Air Quality	<p>Environment Canada http://www.ec.gc.ca/air/introduction_e.html</p> <p>The federal government has a clear responsibility to address these threats to the environment and human health. Once pollutants have entered the environment they cannot always be contained within geographic boundaries. Increasingly, much of the pollution pressure originates far beyond Canada's borders and thus requires international cooperation and the effective advancement of Canada's interests to find a solution.</p> <p>Air Quality - General Information</p> <p>Canadian Information System for the Environment: http://www.environment.alberta.ca/625.html Contains information on Air, Climate and Water.</p>
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**Surficial
geology,
terrain and
Bedrock
geology**

Geological Survey of Canada http://gsc.nrcan.gc.ca/index_e.php

The GSC is Canada's premier agency for geoscientific information and research, with world-class expertise focusing on geoscience surveys, sustainable development of Canada's resources, environmental protection, and technology innovation

- Bedrock geology
- Energy resources
- Geochemistry and geochronology
- Geophysics
- Geoscience surveys, land surveys, and GPS
- Marine geology and oceanography
- Mineralogy and economic geology
- Paleontology

GeoGratis: <http://geogratias.cgdi.gc.ca/>

- Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada. Information on natural hazards mineral and energy potential

The Atlas of Canada: <http://atlas.gc.ca/site/english/index.html> - Contains maps on a variety of variables including geology.

NRCan GSC http://gsc.nrcan.gc.ca/index_e.php Geological Survey of Canada's digital copy of the Surficial Materials of Canada

<p>Soils</p>	<p>NRCAN http://www.nrcan.gc.ca/com/index-eng.php</p> <ul style="list-style-type: none"> • Canada Land Inventory - Land Capability for Agriculture • Canada Land Inventory - Land Capability for Agriculture (searchable) • Canada Land Inventory - Land Capability for Forestry (searchable) <p>PFRA General Soil Maps http://www.agr.gc.ca/pfra/gis/index_e.htm</p> <p>PFRA Generalized Land cover for the Canadian Prairies</p> <p>Canada Land Inventory: http://geogratis.cgdi.gc.ca/CLI/right.html -Contains land capability maps for agriculture throughout Canada. They assign classes of land capability for agriculture throughout Canada. They group mineral soils according to their potential and limitations for mechanized agricultural use.</p> <p>National Land and Water Information Service: http://www.agr.gc.ca/nlwis/exampro_e.htm#two - Contains information on the soil landscapes of Canada. You can choose which soil attribute you would like to map (ex: vegetation class, surface material, drainage class etc.)</p> <p>Agriculture Canada's Prairie Farm Rehabilitation Administration http://www.agr.gc.ca/pfra/gis/index_e.htm - has data for Generalized Landcover and Gross Watershed Boundaries for the Canadian Prairies</p> <p>CanSIS Agriculture Canada's Canadian Soil Information System. The Canadian System of Soil Classification maps use a hierarchical scheme to classify soils. These general maps categorize soil groups into (from general category to specific): orders, great groups, subgroups, families, and series.</p>
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<p>Surface hydrology (streams, rivers, lakes, and wetlands)</p>	<p>Canadian Information System for the Environment: http://www.cise-scie.ca/english/home.cfm - Contains information on Air, Climate and Water.</p> <p>The Atlas of Canada: http://atlas.gc.ca/site/english/index.html - Contains maps on a variety of variables including hydrology.</p> <p>Water Survey of Canada: http://www.msc.ec.gc.ca/wsc/products/hydat/main_e.cfm?cname=hydat_e.cfm</p> <ul style="list-style-type: none"> • download hydrometric information across Canada from the National Water Data Archive • National Water Research Institute: http://www.nwri.ca/publications/keyreports-e.html • Environment Canada's Water Use Data: http://www.ec.gc.ca/eau-water/ • Canadian Hydrographic Service: http://www.chs-shc.gc.ca/index-eng.asp information on tides, currents and water levels • Agriculture and Agri-Food Canada National Land and Water Information Service: http://www.agr.gc.ca/nlwis/main_e.htm is developing a site to access current and local land and water data • PFRA Agriculture Canada's Prairie Farm Rehabilitation Administration has data for Generalized Landcover and Gross Watershed Boundaries for the Canadian Prairies.
<p>Hydrogeology (groundwater)</p>	<p>Federal Groundwater data is difficult to obtain. Most information is held by provincial agencies and municipalities. Health Canada</p> <p>Canadian Information System for the Environment: http://www.cise-scie.ca/english/home.cfm - Contains information on Air, Climate and Water.</p> <p>Environment Canada Groundwater Site: http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=300688DC-1</p> <p>GeoGratis: http://geogratis.cgdi.gc.ca/clf/en</p> <p>Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada. Information on groundwater</p>

<p>Water Quality</p>	<p>Canadian Information System for the Environment: http://www.cise-scie.ca/english/home.cfm - Contains information on Air, Climate and Water.</p> <p>National Water Research Institute: http://www.nwri.ca/publications/keyreports-e.html</p> <p>Indian and Northern Affairs Canada: First Nations Water Management Strategy: http://www.ainc-inac.gc.ca/ai/arp/es/0708/fnwms/fnwms-eng.asp</p> <p>Environment Canada has very little water quality data; it is focused on water quantity.</p> <ul style="list-style-type: none"> • Canada’s national archive for water quantity data • HYDAT CD-ROM - Order or download the database • Archived Hydrometric Data - Query the database on-line
<p>Species at Risk or with Special Conservation Status</p>	<p>Committee On the Status of Endangered Wildlife In Canada (COSEWIC): http://www.cosewic.gc.ca/eng/sct5/index_e.cfm</p> <p>Contains a database of the status and locations of species at risk in Canada.</p> <p>NatureServe: http://www.natureserve.org/ - Contain a database of species in North America with habitat maps.</p> <p>Environment Canada’s Species at Risk page: http://www.sararegistry.gc.ca/default_e.cfm</p> <ul style="list-style-type: none"> - Search for species at risk by name or by map. - Includes information on legislation, recovery, financial support and publications. <p>Wild Species 2000, the General Status of Species in Canada report: http://www.wildspecies.ca/wildspecies2000/en/home_E.html</p> <p>Parks Canada, Species at Risk site: http://www.pc.gc.ca/nature/eep-sar/index_e.asp</p>

Biodiversity	<p>Canadian Information System for the Environment: http://www.cise-scie.ca/english/home.cfm - Contains biodiversity status and reports on trends for a variety of species.</p> <p>Canadian Biodiversity Information Network (CBIN): Canada's node in the International Clearing-house Mechanism (CHM) of the Convention on Biological Diversity. The site, which is coordinated and maintained by the Biodiversity Convention Office of Environment Canada, provides efficient access, through the Search icon, to biodiversity-related information from academia, industry, non-governmental organizations (NGOs), and governments. http://www.cbin.ec.gc.ca/default_e.cfm</p>
Fish and Fish habitat may include Benthic Invertebrates	<p>DFO's Statistical Services: http://www.dfo-mpo.gc.ca/communic/Statistics/main_e.htm - search for aquaculture, commercial and recreational fishing information</p> <p>DFO's Fisheries Regulations for Alberta: http://laws.justice.gc.ca/en/F-14/SOR-98-246/text.html</p> <p>DFO's Policy for the Management of Fish Habitat: http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/policies-politique/index_e.asp</p> <p>DFO's Habitat Conservation and Protection Guidelines: http://www.dfo-mpo.gc.ca/habitat/habitat-eng.htm</p> <p>Environment Canada's Species at Risk page: http://www.sararegistry.gc.ca/default_e.cfm</p> <p>Canadian Science Advisory Secretariat Status Reports: http://www.dfo-mpo.gc.ca/csas/Csas/Home-Accueil_e.htm - search for species, habitat and ecosystem information</p>
Ecological land classification (ELC)	<p>National Ecological Framework GIS datasets for the different layers of the ecological framework http://www.creditvalleycons.com/programsandservices/downloads/ELCwebsite.pdf</p> <p>EcoMAP info and download link for The State of Canada's Ecosystems in Maps http://geogratis.cgdi.gc.ca/Ecosystem/ecosystem.html</p> <p>Atlas of Canada http://atlas.gc.ca/site/english/maps/ has vegetation maps</p>

<p>Forest and vegetation Cover</p>	<p>Canada Land Inventory: http://geogratis.cgdi.gc.ca/CLI/right.html -Contains land capability maps for forestry throughout Canada.</p> <p>The Atlas of Canada: http://atlas.gc.ca/site/english/index.html - Contains maps on a variety of variables including forest fires.</p> <p>NRCAN, Forest Ecosystems of Canada: http://ecosys.cfl.scf.rncan.gc.ca/accueil-home-eng.asp Includes information and interactive maps of various components of forest ecosystems (including disturbances, net primary production, climatic zones).</p> <p>National Land and Water Information Service: http://www.agr.gc.ca/nlwis/exampro_e.htm#two - Includes interactive mapping applications. - Contains the 2000 version of the plant hardiness zones of Canada and maps and information on the soil landscapes of Canada. You can choose which soil attribute you would like to map (ex: vegetation class, surface material, drainage class etc.)</p> <p>NRCan CFS NFI Natural Resources Canada Canadian Forest Service National Forest Inventory</p>
<p>Rare Plants and/or Rare plant communities</p>	<p>See: Species at Risk or with Special Conservation Status</p> <p>http://www.cws-scf.ec.gc.ca/index_e.cfm</p>
<p>Wildlife: Big Game, furbearers</p>	<p>Canada Land Inventory: http://geogratis.cgdi.gc.ca/CLI/right.html -Contains land capability maps for agriculture, forestry, recreation, waterfowl, and ungulates throughout Canada.</p> <p>Environment Canada: Canadian Wildlife Service http://www.cws-scf.ec.gc.ca/index_e.cfm</p> <p>CWS: http://www.cws-scf.ec.gc.ca/theme.cfm?lang=e&category=6 The Canadian Wildlife Service is involved only in regulations that control the hunt of migratory game birds and in fishing regulations within its National Wildlife Areas.</p> <p>Parks Canada</p>

<p>Migratory Birds</p>	<p>Canada Land Inventory: http://geogratis.cgdi.gc.ca/CLI/right.html -Contains land capability maps waterfowl, throughout Canada.</p> <p>National Wildlife Research Centre</p> <p>Important bird Areas in Canada (IBA) http://www.ibacanada.ca/</p> <p>NAWMP</p> <p>Canadian Wildlife Service http://www.cws-scf.ec.gc.ca/birds/status/index_e.cfm</p> <p>Bird Atlas (banding and research)</p>
<p>Roads and infrastructure including Housing on Reserve</p>	<p>GeoGratis: http://geogratis.cgdi.gc.ca/clf/en</p> <p>- Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada. Information on infrastructure,</p> <p>The Atlas of Canada: http://atlas.gc.ca/site/english/index.html - Contains maps on a variety of variables including land, Aboriginal populations, etc.</p> <p>GeoGratis: http://geogratis.cgdi.gc.ca/clf/en</p> <p>- Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada. Information on aboriginal property rights infrastructure.</p>
<p>Pipelines, Well sites, Seismic</p>	<p>NRCAN has Reserve level infrastructure data</p> <p>National Energy Board</p> <p>National Energy Board is an independent federal agency that regulates several aspects of Canada's energy industry. Its purpose is to promote safety, environmental protection and economic efficiency in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development and trade.</p> <p>Construction and Operation Gas Pipelines Map, Oil Pipelines Map Electricity - January 1998 [PDF: 104 KB]</p>

Mineral Surface Leases	<p>GeoGratis: http://geogratias.cgdi.gc.ca/clf/en</p> <ul style="list-style-type: none"> - Contains Landsat, RADARSAT, GIS, vector and tabular data for mapping Canada. Information on mineral and energy potential <p>Map of mineral and metal activities in Aboriginal communities: http://www.icmm.com/page/915/canadas-mineral-and-energy-resource-assessments</p>
Aggregate resources	<p>This information is not digitally available, but can be obtained via the "Alberta First Nations Natural Resources Database" housed at INAC offices in Edmonton.</p>
Parks or Protected Areas	<p>Canada Land Inventory: http://geogratias.cgdi.gc.ca/CLI/right.html -Contains land capability maps for recreation, throughout Canada.</p> <p>Canadian Biosphere Reserves Association: http://www.biospherecanada.ca - Discusses the Biosphere Reserves in Canada.</p> <ul style="list-style-type: none"> - Discusses programs and projects that are underway to protect these reserves. - Gives links to informative readings.

Table 4.3 Provincial Government Authority and data sources for baseline information

Baseline Information	Provincial government authority and data source
Administrative boundaries, place names, digital elevation, road networks	AltaLIS 1:2 Million Base Dataset http://www.altalis.com ABT Lithoprobe Alberta Basement Transect (ABT) project has data for transect lines, township and range, and other data http://www.lithoprobe.ca/transectsWebSites/ab/gis/le_gisdownl.htm
Meteorology (weather information: rain, wind speeds & direction, snow fall etc.) Climate change	AENV Provincial Water Data Reports: http://www.environment.alberta.ca/forecasting/reports/index.html - daily precipitation and reservoir storage data
Air Quality	AENV CASA http://environment.alberta.ca/GSASearch.aspx?sitesearch=environment.alberta.ca&q=air+quality http://www.casahome.org/ - the central repository for air quality data collected in Alberta
Surficial geology, terrain and Bedrock geology	Alberta Geological Survey AGS Alberta Geological Survey http://www.ags.gov.ab.ca/GIS/gis_and_mapping.shtml Information on: Surficial geology deposits, Bedrock, topography, Drift thickness, Structural lineaments, Metallic minerals, Industrial minerals, Kimberlites; also: Drill holes, Oil and gas wells; Hydrogeology (chemistry of wells tested), Sand and Gravel, Sources of CO2

Soils	<p>Alberta Agriculture</p> <p>AGRASID Agricultural Region of Alberta Soil Inventory Database http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/sag3249?opendocument</p> <p>The Alberta Land Inventory was established to provide land capability information for the northern area of the province that was not mapped during the Canada Land Inventory project. Landform and topographic classes were spatially delineated on National Topographic Series (NTS) 1:50 000 base maps.</p> <p>Alberta Soil Information Centre http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/sag6903?opendocument</p> <p>Alberta Soil Quality Benchmark Sites: http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/aesa1981?opendocument</p>
Surface hydrology	<p>AENV</p> <p>Information on: water management, Alberta's river Basins, Water quality and quantity, flood Risk maps, water advisories etc. http://environment.alberta.ca/GSASearch.aspx?sitesearch=environment.alberta.ca&q=water</p> <p>Hydrometric Near Real Time Data: water level information http://scitech.pyr.ec.gc.ca/waterweb/disclaimerB.asp</p> <p>Provincial Water Data Reports: daily precipitation and reservoir storage data http://www.environment.alberta.ca/forecasting/data/precipmaps/precipmaps.html</p> <p>Flood Risk Maps: http://environment.alberta.ca/3823.html</p> <p>Water Supply Outlook: http://www.environment.alberta.ca/forecasting/WaterSupply/index.html</p>
Hydrogeology (groundwater)	<p>AENV</p> <p>Information on: water management and groundwater information http://environment.alberta.ca/GSASearch.aspx?sitesearch=environment.alberta.ca&q=water</p> <p>The Groundwater information system: http://environment.alberta.ca/1301.html</p> <p>Detailed databases with flood plain information, groundwater quality, survey benchmarks and groundwater wells.</p>

Water Quality	<p>AENV Alberta Geological Survey</p> <p>Information on: Hydrogeology (chemistry of wells tested) Surface Water Quality Data: http://www.environment.alberta.ca/2024.html - information available upon request Alberta Surface Water Quality Index: http://www.environment.alberta.ca/1777.html - analysis of surface water quality within the long-term river network using the Water Quality Index The Groundwater Information System: http://environment.alberta.ca/1301.html - groundwater quality information</p>
Species at Risk or with Special Conservation Status	<p>ASRD - Fish and Wildlife Division;</p> <p>Government of Alberta: Species at Risk site: http://www.srd.alberta.ca/ Includes general status reports, detailed status reports, legal designations, recovery and prevention strategies that the province is implementing.</p>
Fish and Fish habitat	<p>ASRD – Fish and Wildlife Division</p> <p>Fisheries Management Area Contacts: information on fish species and population data upon request http://www.srd.alberta.ca/AboutUs/SRDContacts/FisheriesWildlifeManagementAreaContacts.aspx The Water Act Code of Practice Management Area Maps are to be used for determining water body classes and restricted activity periods for activities affecting the bed and banks of water bodies. These can be downloaded from Alberta Environment Water Management web-site: A Fish Conservation Strategy for Alberta: http://www.srd.alberta.ca/ManagingPrograms/FishWildlifeManagement/FisheriesManagement/FishConservationStrategyAlberta.aspx Fish Management Zones: http://www.srd.alberta.ca/FishingHuntingTrapping/FishManagementZones/Default.aspx</p>

Ecological land classification (ELC)	<p>ASRD – Lands and Forest</p> <p>Ecological Land Classification Reports Ecological Land Classification (ELC) studies include ELCs, Integrated Resource Inventories and Biophysical Land Classifications. These studies consist of baseline landscape information for selected project areas within Alberta. The information is an integration of landform, soils, climate, vegetation and site conditions such as drainage.</p> <p>http://www.creditvalleycons.com/programsandservices/downloads/ELCwebsite.pdf</p>
Forest and vegetation Cover	<p>ASRD – Lands and Forest</p> <p>Forest / Vegetation Inventories:</p> <p>The Alberta Ground Cover Classification (AGCC) provides a course level vegetation classification interpreted from remote satellite imagery for tracking landscape level vegetation cover. Coverage is available for most of the province’s green zone. AGCC version 3 is currently available to the public through the Alberta Resource Data Division of ASRD. The classification continues to be refined and updated as more data is acquired and new areas are added to the dataset. Be sure to request the most recent version.</p> <p>The Alberta Vegetation Inventory (AVI) provides detailed vegetation information necessary for forest management planning, wildlife habitat classification and integrated resource management activities.</p> <p>Broad Scale Forest Inventory (Phase 1) The Phase 1 Inventory included all publicly owned forested lands in the province; this does not include Indian Reserves. Through aerial photo interpretation, land was classed according to vegetation cover as productive, potentially productive or non-productive.</p> <p>Historical Wildfire Mapping Data</p> <p>http://www.srd.alberta.ca/MapsFormsPublications/Maps/ResourceDataProductCatalogue/ForestVegetationInventories.aspx</p>

Native Prairie Vegetation Inventory is a quarter-section based dataset which includes Crown ownership and grazing disposition from the Land Status Automated System (LSAS). Native prairie landscapes have been interpreted using 1992-93, 1:30,000, aerial photography to determine percentages covering each quarter-section for six native cover types

<http://www.albertapcf.org/background.html>

Phase 2 Forest Inventory (Detailed Forest Inventory DTI and Quota Reconnaissance Survey QRS) the Detailed Forest Inventory and the Quota Reconnaissance Survey captured the forest cover in polygon form with attributes that described the crown density, height, species composition, site class and maturity class or year of stand establishment. Potentially productive and non-productive lands were also classified. The minimum polygon size was 16 hectares. The Detailed Forest Inventory encompasses the Eastern Slopes Forest Management Units and approximately another 36 Forest Management Units scattered around the Province. There are 403 map sheets with one township per sheet for the Eastern Slopes and 668 mapsheets with 4 townships per sheet for the other Forest Management Units. The Quota Reconnaissance Survey has 139 maps sheets with 4 townships per sheet scattered around the province from Township 45 to 86.

Phase 3 Forest Inventory encompasses most of the Green Area (forested area) and a small portion of the White Area adjacent to the Green Area. Notable **exceptions within the Green Area** include 3 Forest Management Units (A13, F10 and F20) in the northern part of the province, the Cold Lake Air Weapons Range (L9), Patented Land, **Federal Indian Reserves** and Wilderness Areas within the province.

<http://www.srd.alberta.ca/MapsFormsPublications/Maps/ResourceDataProductCatalogue/ForestVegetationInventories.aspx>

Reconnaissance Vegetation Inventory (RVI) a broad vegetation inventory for the Green Area and White Area. The maps depict both forestry and agricultural based vegetation cover types including those native and introduced to the province, as well as height, and density. In some cases non-vegetated areas are included in the inventory. The hardcopy maps are intended for wildlife habitat evaluation. http://gcmd.nasa.gov/records/CANADA-CGDI_Canada_AlbertaRDB_ReconnVegInv.html

Geo-administrative: Forest Land Use Zones 1:1 000 000 Scale Resource Features
Sustainable Resource Development's Insect and Disease Surveys

<http://www.srd.alberta.ca/MapsFormsPublications/Maps/ResourceDataProductCatalogue/Geoadministrative.aspx>

Rare Plants	ANHIC http://www.cd.gov.ab.ca/preserving/parks/anhic/esa.asp
Wildlife: Big Game, furbearers	ASRD – Fish and Wildlife Division
	Wildlife referral maps can be purchased for the following areas: Northwest Boreal Region [NWBR], Northeast Boreal Region [NEBR] Northern East Slopes Region [NESR] Prairie, Bow and Parkland Regions [PBPR] Moose Management areas Caribou management zones
Waterfowl and Game Birds Passerines and non-migratory birds	ASRD – Fish and Wildlife Division
	Wildlife Referral maps
Mineral Surface Leases	AEUB, ASRD
	Access to the provincial spatial referencing system through the Geodetic Surveys Unit at the Director of Surveys: http://www.ramp-alberta.org/resources/resources+references.aspx Photo Distribution has a collection of over 1.3 million aerial photographs covering the entire province of Alberta dating back to 1949. Medium or small scale black & white and colour photography are available for viewing in the Reference Library. Copies of the photography can also be purchased either in hard copies or digital formats. http://www.srd.alberta.ca/MapsFormsPublications/AirPhotoDistributionOffice/Default.aspx
Aggregate resources	ARSD – Public Lands Division
	Alberta Geological Survey http://www.ags.gov.ab.ca/GIS/gis_and_mapping.shtml Information on: Sand and Gravel

<p>Other Land Use Information</p> <p>FMA's</p> <p>WMUs</p> <p>RFMA's</p>	<p>ARSD – Public Lands Division</p> <p>All information related to reservations or notations</p> <p>http://www.srd.alberta.ca/ManagingPrograms/IntegratedLandManagement/documents/AlbertaProvincialDecisionProcessesRelatedtoIntegratedLandManagement-Jan10.pdf</p> <p>http://www.srd.alberta.ca/ManagingPrograms/ForestManagement/ForestTenure/ForestManagementAgreements/Default.aspx</p> <p>http://www.srd.alberta.ca/FishingHuntingTrapping/WildlifeManagementUnits.aspx</p> <p>http://www.srd.alberta.ca/ManagingPrograms/ForestManagement/ForestTenure/ForestManagementPlans/AlbertaPacificForestProducts.aspx</p>
<p>Parks or Protected Areas</p>	<p>Community Development; Alberta Natural Heritage Information Centre (ANHIC) (Environmentally Significant Areas)</p> <p>ARSD (provincial parks, natural areas, wilderness areas, Ecological reserves etc.)</p> <p>Community Development ANHIC Environmentally Significant Areas Alberta Natural Heritage Information Centre's GIS data sets providing information on Environmentally Significant Areas (ESAs) in Alberta http://tpr.alberta.ca/parks/heritageinfocentre/default.aspx</p> <p>Community Development Parks and Protected Areas protected areas and Crown Reservations digital data http://www.tpr.alberta.ca/parks/heritageinfocentre/protectedareas.aspx</p>

4.3 Collecting additional Baseline information

While a huge amount of information is available, it may not always be in a format, or a scale that is useful for making environmental management decision at the Reserve level. For this reason, communities may be faced with collecting more detailed information about a particular area. The method to collect additional information will vary depending on the type of information your community is interested in compiling. A list of useful references including provincially recognized field protocols are listed below. In most cases, collecting additional biophysical information has four main phases:

1. Review of existing maps, air photos and published reports.
2. Consultation with knowledgeable people (community members, government agencies, environmental consultants).
3. Field reconnaissance and additional data collection.
4. Data compilation and map production.

Collection of this information, when done on First Nations land, is most effective when there is significant consultation with and participation from the local community. This is described in greater detail in Sections 4.0 (Local and Traditional Knowledge -- TEK) and 3.0 (Engaging Community).

4.3.1 Field Protocols and other useful references

The following section lists

General information

This site is focused on B.C., but has some links to federal information sources:

http://www.bcfn.org/isp/networking_topic.htm

ELC and Vegetation Classification

Canadian Forest Service and Alberta Land and Forest Service. 1994. Ecological Land survey Site Description Manual. Prepared pursuant to the Canada-Alberta Partnership Agreement in Forestry.

Nesby, Richard. 1997. Alberta Vegetation Inventory standards Manual. 2.1 Prepared of Alberta Environmental Protection Resource Data Division.

Strong, W.L., K.R. Leggat. 1992. Ecoregions of Alberta. Prepared for Alberta Forestry Lands and Wildlife. Land Information Services Division, Resource Information Branch.

Environment Canada. 1989. Ecoclimatic Regions of Canada. Ecological Land Classification Series No. 23 Written and compiled by the Ecoregion Working Group Canada Committee on Ecological Land Classification.

Wetlands

Vitt, D.H., Halsey, L., and M. N. Thormann. Peatland Inventory of Alberta. Phase 1: Overview of Peatland Resources in the Natural Regions and subregions of the Province. Prepared for the Alberta Peat Task Force.

Halsey and Vitt 1996 Alberta Wetland Inventory (AWI) Version 1.0 Prepared for Alberta Environmental Protection Resource Data Division.

Riparian Health Assessment

Cows and Fish Alberta Riparian Habitat Management Society
<http://www.cowsandfish.org/health.html> Procedures to assess riparian health for small streams, large rivers and lakes, wetlands and sloughs

Soils

Soil Characterization Protocols: a step by step guide.
<http://ltpwww.gsfc.nasa.gov/globe/pvg/chartoc.htm>

B.C. Ministry of Agriculture, Food and Fisheries. Soil Sampling Fact sheet:
<http://www.agf.gov.bc.ca/resmgmt/publist/600series/611100-1.pdf>

Wildlife

Alberta Environment/Alberta Sustainable Resource Development. The general Status of Alberta Wild Species. For most up-to-date information, visit the website at:
www.gov.ab.ca/env/fw/status/index.html

B.C. Resource Inventory Committee (known as RIC) have a series of publications outlining protocols for how to inventory a range of wildlife species (small mammals, aquatic furbearers (such as beaver, and muskrats), carnivores etc. <http://gov.bc.ca/risc/pubs/>

Stream Classification

D.L. Rosgen

http://www.wildlandhydrology.com/html/..%5Cassets%5CCCLASS_OF_NATURAL_RIVERS_300.PDF Standard method for stream classification

Water Quality Sampling

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/ambient/index.htm>

Procedures to sample water quality of effluents, small streams, large rivers and lakes.

Hydrometric Measurements

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/hydro/index.htm>

Procedures to conduct hydrometric surveys on small streams and large rivers using gauging stations and monitoring equipment

Biological Sampling (except fish)

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/freshwaterbio/index.htm>

Procedures to sample bacteria, algae, macrophytes and benthic invertebrates in streams and lakes

Fish Sampling (B.C. protocols)

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/fishcol/index.htm>

Procedures to sample fish

Fish Habitat Sampling (B.C. protocols)

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/recon/index.htm>

Procedures to sample and assess fish habitat

Automated Water Quality Monitoring

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/waterqual/index.htm>

Procedures to collect water quality information on small streams and large rivers using automated monitoring equipment

Sediment Sampling

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/lake-stream/index.htm>

Procedures to sample sediments in streams and lakes

Designing Water Quality Sampling Programs

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/design/index.htm>

Guidelines to design water quality monitoring programs

Interpreting Water Quality Data

British Columbia Ministry of Sustainable Resource Management Resource Information Standards Committee

<http://srmwww.gov.bc.ca/risc/pubs/aquatic/interp/index.htm>

Guidelines to interpret water quality data

Rapid Bioassessment of Aquatic Habitat and Organisms

United States Environmental Protection Agency

<http://www.epa.gov/bioindicators/html/rbps.html>

<http://www.epa.gov/owowwtr1/monitoring/rbp/index.html>

Rapid bioassessment protocols for aquatic habitat, algae, macrophytes, benthic invertebrates and fish in streams

Fish Inventory Assessment (Golder's Protocols)

Golder Associates Ltd.

<http://www.teckcominco.com/articles/tr-ecorisk/workplans/2004/2004-aquaticwp.pdf>

Procedures to inventory fish

Fish Health Assessment (Golder's Protocols)

Golder Associates Ltd.

<http://www.teckcominco.com/articles/tr-ecorisk/workplans/2004/2004-aquaticwp.pdf>

Procedures for fish health assessment

Stream Habitat Assessment

United States Department of Agriculture

<http://www.stream.fs.fed.us/publications/PDFs/RM245E.PDF>

Procedures for stream habitat assessment, streamflows and channel assessment

Sediment Sampling

http://www.stream.fs.fed.us/publications/PDFs/rmrs_gtr74.pdf

http://www.fs.fed.us/rm/pubs/rmrs_gtr74.html

Procedures for sampling sediment in streams

Species at Risk

Federal

Environment Canada
Canadian Wildlife Service
(780)951-8700 or 1-800-263-0595

www.speciesatrisk.gc.ca

www.sararegistry.gc.ca

Agriculture and Agri-food Canada
Prairie Farm Rehabilitation Administration
306-780-3914
www.agri.gc.ca/pfra/biodiversity/species_e.htm

Fisheries and Oceans Canada
204-984-2416
www.dfo-mpo.gc.ca/csas/species-especies/index_e.htm

Parks Canada Agency
204-984-2416
www.pc.gc.ca/nature/eep-sar

Provincial Government

Alberta Sustainable Resource development
Fish and Wildlife Division
780-427-5185
www3.gov.ab.ca/srd/fw/riskspecies

4.4 Issues and Challenges

Centralized provincial data

Several years ago, the provincial government privatized data. As a result, there is no single source of data in the province, but rather several private companies (for example QC data or Evergreen Consultants) that act as repositories for digital spatial data. This data must be purchased and it can be quite costly.

Industries (such as forest companies or oil and gas exploration companies) also have very current, comprehensive data sets. For example; Alberta Pacific Forest Industries Inc. has the most current Alberta Vegetation Inventory (AVI) data for NE Alberta. Similarly, the Alberta Oil Sands Environmental Research Project (AOSERP) was responsible for compiling soils information for the region and is considered the standard data set for environmental investigations in NE Alberta. Some information (such as the locations of seismic programs) is considered proprietary and may not be

made publicly available for up to 2 years. Depending on the relationship between Bands and a particular company, arrangements may be made to share data, but more often, it must be purchased.

In the last couple of years, provincially funded initiatives are using private consultants, universities and other organizations (such as Alberta Research Council) to improve digital environmental data sets. Examples include the Alberta Biodiversity Monitoring Program and "AIM" – Alberta Integrated Management Program. In addition to this, the Resource Data Division of ASRD has been allocating time and resources to centralize provincial data sets.

Because there are so many sources of data in the province; and different areas of the province have different kinds and amounts of information, First Nation communities may find it useful to hire an experienced person that can give them direction on the best approach to compiling data for their area of interest.

Format and scale

Federal and provincial inventory programs may not produce data that is of a scale/resolution that is useful for local decision making. For example; the Alberta Biodiversity Monitoring program is collecting data on a township scale; that is, one sampling in location per township. While this information will be excellent for strategic level planning at a provincial scale, this single data point will not provide environmental planners with enough information on biodiversity to determine local effects on biodiversity for a project that may have a footprint impacting several sections of land. In many cases, industry or environmental consultants that have done studies on behalf of industry are the best sources for high resolution data that is useful at a local level.

Some First Nations are considering setting standards by which biophysical information about their Reserve must be collected. They are also creating policies requiring Industry and other proponents of development to collect environmental information in these standard formats and then provide digital copies of this information to the Band.

Keeping data current

As development and human populations increase, so too does their footprint on the environment. Natural events, such as fires, landslides or flood events can also change the structure and function of ecosystems. Keeping track of changes on the landscape and keeping maps and databases current is a time-consuming, never ending task. It usually requires skilled personal, familiar with both the information stored in a communities information

management system (Section 6.0), but also the technology used (computers and software programs) to develop and store the information. Finding appropriate people to undertake this task, along with securing sufficient Band resources (in terms of money, time and people) is a common challenge. Building relationships with industry can be an effective way to keep data up to date for a Nations area of interest.

Fuel Storage

5.0 FUEL STORAGE

Alberta First Nations face increasing land use pressures caused by many different kinds of development and land use activities. As a result, leaders, environmental managers and community members must determine if and how the demands for economic development while addressing the wider issues of protecting the health and environment of the reserve. With this in mind it is critical to understand that fuel storage while allowing for the continued economic development and other activities to continue on reserve still poses a serious threat to the health of a reserve.

5.1 What is the current situation?

Ottawa targets leaky fuel tanks on reserves

Last Updated: Thursday, May 31, 2007 | 9:46 AM CT

"The federal government wants to clean up thousands of fuel storage tanks that it claims are leaking — or are at risk of leaking — into the environment.

New regulations published in the Canada Gazette, the government's official newspaper that is found online, are expected to become law later this year. The regulations will cover many of the tanks found on First Nations reserves that hold gasoline or home heating fuel. It'll be up to the owner to make the fixes. While fixing a single tank can be an expensive proposition, the government says it will be cheaper to do it now than do nothing and clean up a damaged environment later.

Among the reserves that have grappled with a leaky tank is Poundmaker, near North Battleford. Five years ago, people on the reserve noticed their drinking water smelled and tasted like gasoline. They discovered an underground storage tank was leaking into their water source. The cleanup cost was \$1 million. A year later, at the First Nations community of Lac La Ronge, workers doing some excavation hit a rock, generating a spark and igniting a flash fire.

It turned out the soil was soaked with gasoline from a leaky tank. That cleanup cost \$850,000.

Ottawa is proposing new rules that would result in the removal or repair of an estimated 8,000 tanks across Canada. The total cost to make the changes is \$176 million.

Fuel leaks are considered a major source of environmental problems on reserves, according to René Drolet, an Environment Canada special projects manager.

"On federal lands and aboriginal lands, two-thirds of the known contaminated sites are contaminated by petroleum products..." Drolet said.

Affected parties, who have been told about the new rules, have four years to comply."

Fuel storage on reserve lands is not formally regulated. Technical Guidelines and Codes of practice along with the National Fire Code are currently the status quo for fuel storage tanks on reserve lands. The Canadian Environmental Protection Act (CEPA) currently provides regulations designed to encourage owner and operators of fuel storage tanks in excess of 4000 liters to register them with INAC if they are on reserve lands. Registration of fuel storage tanks provides an overview of the facilities that are located on reserve but does not help to ensure compliance or conformance with technical guidelines, meaningful legislation or best management practices. Changes therefore, to the CEPA regulations as they pertain to fuel storage are currently in the approval process and may be in force by 2008.

These new changes to the CEPA regulations will identify the need for the owner operator to register their tanks with Environment Canada rather than INAC. In addition the proposed new regulations will apply to above ground tanks over 2500 liters and other tanks over 230 l thus reducing the size of tank that qualifies for registration. These regulations are being prepared in order to improve environmental protection requirements for tank owners and operators as well as fuel providers to help ensure compliance with best management practices and promote environmental management. Additional initiatives will include how and when to take a tank out of service, leak detection, specific compliance requirements with the Canadian Council for Ministers of the Environment (CCME) *Codes of Practice for Petroleum and Allied Petroleum Products on Federal lands*, emergency plans, operation and maintenance requirements, installation requirements, reporting and withdrawal from service requirements.

5.2 What are some terms related to fuel storage facilities?

The following terms are related to fuel storage and fuel storage facilities. You should be aware of these definitions as it relates to this topic.

Aboveground storage tank means a storage tank with all the storage tank volume above grade (i.e. more than 90% is above surface grade).

Aboveground storage tank system means one or more commonly connected aboveground storage tanks including all connected piping, both aboveground and underground, pumps, dispensing, and product transfer

apparatus, dyking, overfill protection devices, and associated spill containment and collection apparatus.

Cathodic protection or **cathodically protected** means a method of reducing or preventing corrosion of a metal surface by making that surface the cathode of an electrochemical cell.

Leak means any loss of liquid *petroleum* or *allied petroleum products* because of a defect in a *storage tank system*.

Leak detection means a device or method that is capable of detecting *leaks* in a *storage tank system*.

Liner means a material used as the outer barrier of a *secondary containment system*, but does not include the outer wall of double-wall *pipng* or *storage tanks*.

Line-leak detector means a device used in pressure *pipng* systems to detect a *leak* in the *pipng*.

Spill means any loss of liquid *petroleum* or *allied petroleum product* from a *storage tank system* that is not attributable to a *leak* in the *storage tank system*.

Spill containment device means a container fitted to the inlet of a *storage tank* or to the suction coupling of a used *oil storage tank* that helps prevent *spills* from entering the environment.

Storage tank means a closed container for the storage of *petroleum* or *allied petroleum products* with a capacity of more than 230 L that is designed to be installed in a fixed location.

Storage tank system means a system for the storage and dispensing of *petroleum* or *allied petroleum product* and is not limited to *storage tanks*, associated *pipng*, *vents*, pumps, and dispensing equipment.

Underground storage tank means a *storage tank* with all of the *storage tank* volume below grade and the primary tank or double-wall completely surrounded by or in intimate contact with backfill.

Underground storage tank system means one or more commonly connected *underground storage tank(s)*, including all underground and aboveground connections, *pipng*, pumps, and dispensers.

5.3 What are the standards for building and managing fuel storage facilities?

The “Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products” (hereafter referred to as “the Code”) is published by the Canadian Council of Ministers of the Environment (CCME) through its National Task Force on Storage Tanks.

The Code comprises a model set of technical requirements designed to protect the environment by preventing product releases from aboveground and underground storage tank systems. The Code was written in a form suitable for adoption by legislative authorities in Canada.

The membership of the National Task Force was representative of provincial, territorial, and federal agencies which have the authority to regulate storage tank systems containing petroleum and allied petroleum products.

The Code was developed with the voluntary assistance of many industry experts who have contributed to the work of the National Task Force on Storage Tanks. The National Task Force was assisted in its work by the staff of the CCME Secretariat.

5.4 What are the ways you can ensure Environmental Protection for Fuel Storage and why is it important?

As a fuel storage tank operator or owner or administrator you have responsibilities related to fuel storage on reserve lands. Understanding the corrosion protection on your tank system is of course less important than understanding whether or not you have protection. It is much more prudent to ensure you have an emergency plan for workers on site should an emergency occur in the form of a release, fire, leak or other event. In addition an operations plan should exist to guide fuel reconciliation program and promote diligent record keeping. Simple activities such as daily tank dips should be undertaken to support reconciliation of fuel purchased verses fuel sold or used. This is considered a basic management function for any fuel facility in the business of purchasing or using fuel.

5.5 How can I learn more?

For more information on fuel storage tanks you can review the following. Canada Gazette Part 1, Volume 141 number 14 dated Saturday April 7, 2007 Regulatory Impact Statement page 829, and proposed regulations page 851

- Public Works and Government Services web-site (some of the references are out of date but the risks and management issues are very current.) http://www.pwgsc.gc.ca/si/inac/content/fuel_storage_docs-e.html
- Canadian Environmental Assessment Act (CEAA) – for conducting environmental assessments on federal lands.
- Canadian Environmental Protection Act – Fuel Storage Tank System Registration on Federal lands
- National Fire Code

5.6 What Does this Mean to My Community?

Fuel storage continues to be one of the most potentially environmentally harmful and yet required activities on reserves in Canada. By complying with and maintaining the aforementioned standards and protection measures communities can continue to protect the precious water and soils resources on their reserves. This is not just a set of rules and conditions, instead, consider them as very important because ultimately they have the ability to save lives.

5.7 Issues and Challenges

5.7.1 Groundwater Quality

Poor management of underground fuel storage tanks from improper installation, management, location or transfer techniques can lead to environmental degradation from hydrocarbons in groundwater. Primary constituents of gasoline include Benzene, Toluene Ethylbenzene and Xylene (BTEX). Benzene as a known carcinogen, is the primary contaminant and as little as one teaspoon of Benzene in water can render an Olympic sized swimming pool undrinkable.

It is well documented that underground tanks can corrode over time causing the release of hydrocarbons that may come into contact with groundwater supplies for smaller communities that use water wells. Many communities may be unaware that they have leaking underground tanks. Single wall underground tanks that lack cathodic protection present the greatest risk to the environment and ground water sources.

Solution: If you have older tanks in the community they may need to be removed, taken from service or have a regular leak test to ensure they are not leaking.

5.7.2 Surface Water Quality

Surface water contamination can occur from spills due to poor fuel handling practices at both aboveground and underground tanks. When filling fuel storage tanks or dispensing fuel, spills can occur. Spills can also occur during the storage and collection of waste oil.

Solution: Spill containment areas can be as simple as a concrete pad with a sump drain where spills can collect. This is currently a requirement in the National Fire Code.

The following list highlights the environmental requirements for fuel storage facilities.

1. Gas stations and fuelling facilities on reserve lands are required to have an environmental impact assessment completed prior to construction or project initiation.
2. Only certified fuel tanks should be installed by a certified installer to ensure the fuel tanks meet with the proposed Canadian Environmental Protection Act (CEPA) regulations, National Fire Code and CCME Technical Guidelines.
3. Currently fuel storage tanks must be registered with INAC but when proposed changes to the CEPA regulations come into force they will need to be registered with Environment Canada. In some cases your fuel provider may want you to have your tank registered with the Province's Petroleum Tank Management Association of Alberta (PTMAA).

Waste Management

6.0 WASTE MANAGEMENT

Solid waste on reserve lands falls under the Jurisdiction of the Indian Act, Indian Waste Disposal Regulations. According to regulations landfills on reserve are required to have a permit from INAC. Under the Regulations, a permit from the Minister is required to:

- operate a garbage dump on a Reserve;
- use any land on a Reserve for disposal or storage of waste;
- burn waste on a Reserve. Permits are to be renewed annually

A permit cannot be obtained without an environmental impact assessment. The environmental assessment ensures the site is properly sited and meets criterion outlined in the DIAND Code of Practice for Waste Management Facilities (Environmental Services, Public Works and Government Services Canada). This code prescribes technical standards (best practices) for landfill facilities on Reserves. The code applies to landfills that accept 10,000 tonnes of waste per year or less, and those that do not accept hazardous waste and are not located in a sensitive area such as a wetlands, gully's, ravine's or buried valley. The latter cases require specific permit conditions. Most First Nation communities in Alberta do not even generate 2000 tonnes of waste per year.

The DIAND Code provides guidance on the siting and design, operating parameters, monitoring, corrective action, reclamation, closure and post-closure care, record-keeping and reporting requirements for landfills on reserve.

There are currently very few sites on reserve in Alberta that have a permit to operate, are engineered or have an operations plan.

6.1 What are types of waste storage facilities?

The following are the type of waste storage systems and facilities you should be familiar with:

- **landfill:** a site for receiving and burying solid waste
- **sanitary landfill:** a landfill which is divided into cells that are filled in sequence, and in which the waste is compacted and covered regularly with soil after filling; usually is equipped with lining to prevent escape of liquids.
- **transfer station:** a temporary storage area where waste is stored safely before being transported to its final disposal site; waste "screening" may or may not take place here.

- **solid waste stream:** the types and quantities of waste composing solid waste (paper plastics, glass, metals, domestic waste, yard waste, etc.)
- **municipal solid waste:** the solid waste that is typically generated by residential and commercial facilities in urban areas or small communities.

6.2 Considerations in Waste Management Facilities

The following are key considerations in the location and operation of waste management facilities:

Siting: Locating of the proposed waste management facility is a crucial factor in avoiding problems in the future. A number of important factors, such as proximity to human communities, surface water, ground water resources, land use and so forth, must be taken into account. A perfect site location is rare, and most often some compromises need to be made in order to identify an "optimal" site.

Design: Proper design of the site, including earthworks, liner materials, arrangement of cells and many other factors, need to be taken into account in order to avoid future problems with surface and ground water contamination, noise and odour, traffic and other problems mentioned above

Operational: Effective operation of the waste management site is obviously a key factor in avoiding adverse effects. This includes things such as compacting and covering the waste, screening the waste, providing security to the site, and preventing fires. These procedures are outlined in a later chapter.

Decommissioning: At the end of the operational life of the waste management facility, it is important to ensure that the buried wastes do not pose a risk to surrounding ground water, surface water or land, through seepage or leakage. Other problems to be avoided include erosion through slope failure or failure of vegetation, fire and odour through exposure of buried wastes, and so forth. Appropriate contouring and re-vegetation should be done in accordance with the land use option that is selected.

Waste Minimization: As the amount of waste that needs to be disposed decreases, the need for landfill space will decrease accordingly, along with the associated potential problems such as noise, dust, pollution and odour.

6.3 What are the Key Issues associated with Waste Storage

6.3.1 Health and Safety Issues

There are a number of health and safety issues associated with operating a landfill, waste transfer or other related waste management facility. Some key examples are given below.

Traffic

Traffic flow (congestion) and safety may be affected by the numbers of waste management vehicles (trucks and other equipment) entering and exiting the site. In designing a new facility, it is wise to take into account the existing traffic levels and patterns, for example, the locations of schools and the timing of daily or weekly heavy periods (rush-hour).

Dust and smoke

Dust and smoke may be generated by the operation of the waste management vehicles entering or exiting the site; and by machinery (e.g., bulldozers, graders) operating at the site. This may affect not only the site workers, but residents, schools, businesses etc. in the vicinity of the site.

Fires

In the case of fires at the disposal site (intentional or otherwise), harmful smoke or fumes may be generated, producing offensive odours or even a health risk to neighbouring communities. Fires may also spread to surrounding lands, particularly if there is not a sufficient buffer strip separating treed or grassed areas.

Pests and Diseases

The spread of pests and diseases from waste disposal or transfer sites may pose a risk for site staff or surrounding communities, if poor management practices exist. Typical pests at waste management facilities include:

- rodents (rats, mice, etc.);
- birds (gulls, etc.);
- insects (food and breeding sites); and
- dogs and cats.

Some of the above pests are capable of spreading disease to other animals and humans.

6.3.2 Environmental Issues

Some of the environmental issues associated with waste management facilities include the following:

Air Quality

Air quality may be adversely affected by smoke produced from vehicles, either those of trucks bringing in the waste, or those operating at the site. Dust may also be raised as a result of these activities on unpaved routes or tracks.

Surface Water Quality

Surface water, including streams, lakes, wetlands, etc. could be affected by water that falls onto the waste site in the form of rain or snow, contacts the waste itself, and then flows off the site into adjoining watercourses. This is called "contact water", and it can result in the movement of contaminant substances from the waste to surrounding watersheds, causing pollution. Spills and leaks from machinery or containers at the landfill could also contribute to pollution, if proper practices are not followed.

Water can also be affected when erosion of excavated surfaces occurs during landfill development or operation (grading, filling, covering, etc.). Erosion results in soil particles being carried in runoff water to surrounding watercourses. This causes the water to appear muddy, and can have very serious effects on fish and other aquatic organisms, as well as degrade its value for human use.

Ground Water Quality

Ground water can be polluted when water that enters a landfill site through rainfall or otherwise, percolates downward through the waste, and enters ground water aquifers below the site. If this is allowed to happen, contaminants from the waste will enter the ground water and lower its quality for drinking, domestic, irrigation, livestock watering, or other use. The water that percolates down through the landfill in this way is called "leachate". Ground water can also be affected where there are a lot of spills and leaks from machinery or containers, if the spilled material is not attended to.

Land Use

Conflicts in land use may occur where a landfill or waste transfer station is located in the vicinity of a residential or commercial area, or where there are land uses that are incompatible with waste management activities (i.e., wildlife refuge, recreational area, etc.).

6.4 How can I learn more?

For more information on solid waste management check out these useful websites.

http://www.pwgsc.gc.ca/si/inac/content/docs_technical_solid_waste_toc-e.html

<http://www.ec.gc.ca/>

<http://www.ccme.ca/ourwork/waste.html>

Canadian Environmental Protection Act (CEPA)

6.5 What Does this Mean to My Community?

Waste Storage becomes a complex topic when addressing the needs of a community. While an essential part of the life it has seen less than ideal prioritization and funding by all levels of government. Past mismanagement or underfunding has created some serious long term liabilities for the government and for communities. The first and best choice of a community is to not have a landfill and to use transfer stations and other ways of waste storage. This is because most landfills have historically been underfunded and are typically difficult to run with these limited funds.

If your community insists on having a landfill the aforementioned code of practice for landfills on reserve prescribes technical standards (best practices) for these facilities Reserves. The code applies to landfills that accept up to 10,000 tonnes of waste per year or less, and that does not accept hazardous waste and are not located in a sensitive area such as a wetlands, gully, ravine or buried valley. The latter case requires specific permit conditions. Refer to these Codes to provide guidance on the siting and design, operating parameters, monitoring, corrective action, reclamation, closure and post-closure care, record-keeping and reporting requirements for landfills.

6.6 Issues and Solutions

6.6.1 *Particulates*

Burning garbage liberates particulates and releases toxins into the air. Burning garbage in the waste disposal pit is still a common practice primarily because people want to make more room for waste without digging a new pit. The toxins from burning are created because an open fire burns at low temperatures and causes incomplete combustion of

various substances such as Styrofoam, rubber, plastic and other harmful substances.

Solution -Don't burn wastes in the garbage pit! Separate untreated wood so it can be disposed of separately.

6.6.2 Ozone Depleting Substances

Old fridges, freezers and air conditioners contain Freon, CFC's or in older units halocarbons. These substances are known to deplete the ozone layer of the earth's atmosphere and as such are regulated under the Canadian Environmental Protection Act (CEPA), Ozone Depleting Substances Regulations. Regulations state that it is against the law to knowingly release Ozone depleting substances into the atmosphere.

Solution - Don't throw fridges and freezers into the pit. Set them aside for removal of Freon by a certified company or person.

6.6.3 Groundwater contamination

Dumpsites can contaminate your drinking water. As garbage is exposed to rain and snow, toxic chemicals can be released or "leached" out of the waste contaminating the water and moving deeper into the ground into drinking water wells or migrating laterally into surface water bodies.

Solution - The best way to prevent contamination of the groundwater is to ensure the site was located properly with consideration given to the type of soil in place. A suitable clay would be capable of compaction density of 10^{-6} and provides appropriate retention of leachates.

6.6.4 Groundwater monitoring

INAC funded the installation of groundwater monitoring wells at many landfill sites on reserve in Alberta. Some of the sites are closed or no longer in use however the monitoring wells should be protected over the long term. Groundwater contamination generally begins several years after the closure of a waste site that was not properly sited or engineered. Groundwater monitoring is therefore usually undertaken on a bi-annual basis or less frequently in order to monitor potential contamination.

6.6.5 Prevent Groundwater Contamination

Avoid throwing out unacceptable wastes such as the following items:

- **Aerosols**
- **Paint**
- **Waste oils**
- **Batteries**
- **Cleaning solvents**

- ***Pesticides - Herbicides***

Basically anything that has a symbol for corrosive, poisonous, explosive or flammable could be considered hazardous wastes and should not be placed into regular garbage. Set it safely aside until a community hazardous waste roundup can be organized.

6.6.6 Waste Reduction

There are many things that the community can do on their own to reduce the amount of waste going to the landfill. The most economical and beneficial way to reduce waste is to compost organic materials in your own back yard. Composting greatly reduces the amount and weight of garbage going to the landfill and can therefore reduce disposal costs to the Administration. Composting also creates a nice soil that can be used on your household plants and gardens.

Collecting old clothes and toys and sharing them with a local second-hand store or charity is also an excellent way to reduce wastes through re-use. Second hand stores are currently very trendy and always environmentally fashionable.

Information Management



7.0 INFORMATION MANAGEMENT SYSTEMS

Information is an important part of successful environmental management. Whether based on science or traditional knowledge – communities are faced with the time consuming tasks of organizing and storing information so that it is accessible and useful for decision-makers and protected for future generations.

First Nations in Alberta and elsewhere historically relied on oral traditions to record, organize and share information. Elders were at the core of this traditional system of information management and were key to ensuring

What is Information?

Any knowledge that has been recorded as a permanent record. A permanent record is useful if the First Nation is interested in sharing or using the information in formal resource management processes such as treaty negotiations, land use planning, or environmental assessment.

that the right information; as well as spiritual guidance, was given to individual community members at the right time. Today, technology including written records, mapping, audio and video recording offer additional opportunities for First

Nations' to record and organize needed information from within the community as well as from other communities, governments, industry and non-governmental organizations.

There are many different kinds of information that may be useful for a community to meet their environmental management goals. Some examples of information may include:

- Knowledge of the locations and characteristics of key wildlife habitat or migration routes (possibly hunting or trapping areas);
- A community Land Use Plan;
- A series of videos about community elders and their history;
- Maps showing access routes to important harvesting areas; or
- Tape recordings of stories that relay relationships between people, animals and their surroundings.

In the past, most reports and maps that were created could only be accessed on paper. In the last decade however, a great deal more information is recorded and is available in digital format, or on computer. Other common methods of recording information include:

- Video recordings;
- Tape recordings;
- CD recordings;
- Photos;
- Drawings; and,
- Physical resources such as artefacts.

7.1 What is an Information Management System?

An Information Management System is any method used to store, and organizes information so that it can later be retrieved. Storing and organizing information requires consideration of many different questions:

- What kind of information is needed to meet our environmental management goals?
- What kind of tools does the community need to effectively store and organize and access/share information?
- Who has this information now? How can we get it? Is it in the proper format? Are there copyright or property laws associated with the use of this information?
- Who needs the information now? Who may need it in the future?
- Where will the information be stored? Where will we store the backup copy?
- Is our approach to storing and organizing information helping us make good environmental management decisions?

7.1.1 *What kind of information is needed to meet our environmental management goals?*

The environmental management goals of a community will be influenced by their physical location, community vision in terms of resources use, and the authority the community has to make environmental management decisions. For example, communities located in the great plains of southern Alberta might be much more interested in recording information related to soil conservation and weather trends (such as precipitation levels and /or the first frost) for agricultural purposes than a community situated in the boreal forest. Similarly; for communities located in the boreal forest, knowledge about forest cover for timber harvesting or caribou migrations for subsistence hunting may be very important; while these aspects may not

even be considered on the prairies. Depending on the goals of the community and the type/number of people that need to use the information collected, will dictate how this information should be stored and organized.

What kind of tools will help you share and use this information in your community?

There are many different kinds of tools that can help you organize and use information for environmental management decision-making. If the band doesn't already have one, developing an office space and filing system for organizing written, audio, video or other materials is an important first step. Having an area in your office or elsewhere in the community where you can display maps and/or information of interest to the community is also very important.

Computer equipment including printers, scanners and software are also very useful tools for organizing information. Ensuring that individuals using the equipment are well-trained on how to use these tools will ensure that the information management system is efficient and cost effective.

Geographic Information Systems (GIS) systems are another useful and increasingly popular tool for organizing spatial or geographic information. GIS systems allow large amounts of information (or "data") to be stored, sorted and geo-referenced. In other words, information stored in a GIS system can be linked to physical locations on the land and if needed, mapped. A number of First Nations in Alberta and elsewhere have developed and adapted software such as ArcView 31 and AskSam to help them organize and interpret information that has been collected on paper maps, by GPS or data from satellites.

Some examples of geographic information that is available from other First Nations, government departments, universities or non-governmental organizations include:

Topographical and Hydrological Basemaps

- Base maps of many areas of Alberta are available at 1:20000 or 1:50000 scale and are useful for showing basic topography (i.e. heights of land), hydrology (i.e. lakes, river) and human use areas (e.g. roads and towns).

Alberta Vegetation Inventory (AVI):

- The information is based on 1:20 000 scale aerial photography and provides detailed vegetation information necessary for forest

management planning, wildlife habitat classification and integrated environmental management activities. Crown Vegetation Inventory activities occur on crown land not managed under a Forest Management Agreement (FMA).

Landsat 7 Imagery

- These are photographs taken from satellite that describe the surface features such as vegetation, heights of land (mountains) and other landscape features.

Satellite Tagging or Collaring Data

- Some First Nations, government departments and/or universities have data from tags or collars

Section 5.0 (Baseline information) also lists some sources of commonly collected baseline information.

7.1.2 Who has this information now? How can we get it? Is it in the proper format? Are there copyright or property laws associated with the use of this information?

Once communities have identified who has the information they need, the next step is to determine what format or form the information is available in, and the format in which it would be most useful. In some cases, a printed copy of a map or report may be all that is necessary for the community. If you are currently operating a GIS system or plan to do so in the near future, ask if the information is also available to the community as a digital or electronic file that is compatible with the Band's computer software.

In some cases, there may be copyright or sensitivities associated with the use or publication of information. For example, the locations of sensitive cultural sites are rarely shared as public information. Some elders' oral histories that have been recorded on video may also be very sensitive. Knowing what information may be sensitive and developing Consent and Release forms for the use of this information is key to ensuring that your information management system meets the needs of your community.

7.1.3 Who needs the information now? Who may need it in the future?

Part of a successful information management system is ensuring that the information is accessible to the community, particularly to environmental management decision-makers. It may be useful to arrange meetings with

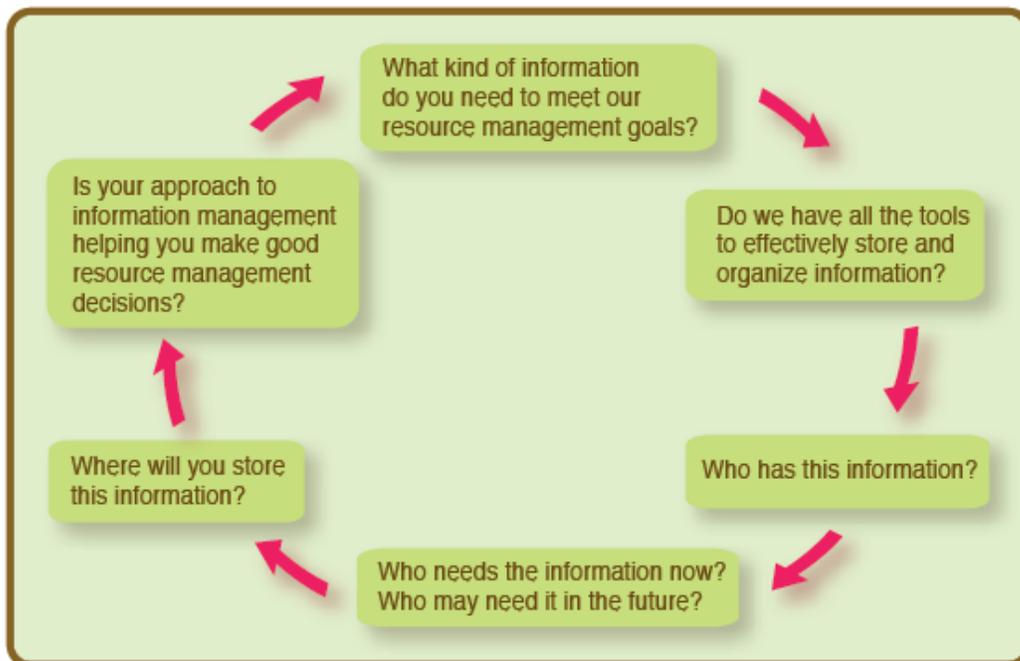
Advisory groups, Committees or key environmental people in the community who may be interested in the information being gathered. They may also be helpful in finding additional information. An open-door policy to access environmental information (whether it be through posting maps distributing reports or other methods of making materials available) will help ensure that the information management system that is developed meets the needs of the community.

7.1.4 Where will you store this information? Where will we store the backup copy?

Storing the information so that is accessible is important however, it is also important to ensure that information is not lost. In some offices, materials have tendency to “grow legs and walk away”. It is therefore a good idea to store sensitive and very valuable copies of reports, maps, photos, videos or artefacts in locked cabinets or showcases. In the case of digital materials, you should make back up files and store these extra copies in another building.

7.1.5 Is our approach to storing and organizing information helping us make good environmental management decisions?

A final step in the process of developing an information management system is an evaluation of how the system is working. Taking stock of the aspects of your information management system are working and where you need additional information, training or support from other organizations is important.



7.2 How will having an Information Management System benefit the community?

Having a system to store, organize and readily access natural resource information can benefit a community in a number of ways. Perhaps the most important benefit is it will help your community make informed decisions. A fully integrated information management system can enable and encourage decision makers to consider a range of factors in combination rather than in isolation. When decisions makers have a single source of retrieving information, it makes it easier for them to be aware of the different kinds of information that is available and understand how the information might be applied. When information is integrated (different types of information are compiled in a single location) it can help a community decide where gaps exist in their information base, and thus where more investigation/research may be required. A central integrated system can save money by eliminating unnecessary gathering of information that has already been collected and recorded and it can help prevent information that has been collected from getting lost.

7.3 Issues and Challenges

Finding a system that works for your community

There are many different kinds of technologies and information management systems available from government, universities and from within the community. With so many options, often the biggest challenge a community faces is in identifying a system that meets the needs of the community. Being realistic in considering what a community wants an information system to do; how various people in the community want to access the information; and, how much money and time a community can invest in setting up and maintaining a system is very important.

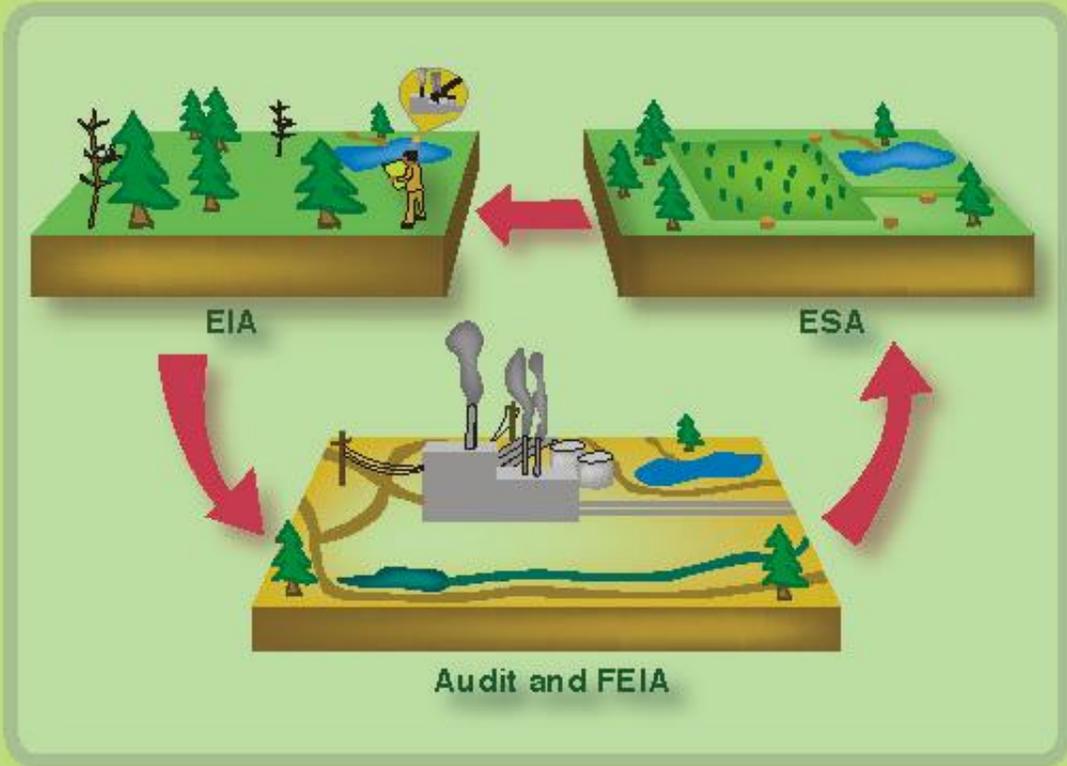
While state of the art GIS and other digitally based systems are powerful tools, they also require computer systems, and software applications that require a significant investment in terms of money (they are expensive) and people. People intending to operate and maintain GIS systems require specialized training and need to stay committed to ensuring their training; and the GIS system itself, is up-to-date. Without this commitment, it will be very difficult to add new information into the system, especially if the information is generated outside of the community.

In some cases, a simpler information management system may be more accessible and user friendly, but still meets the needs of the community. For example; a community may not be interested (at this point in time) in

building their own maps, or altering them for different purposes, but still want to have access to maps that summarize land use information. For these communities a centralized map library with a master list of what maps are available may be a much more appropriate information management system than a GIS system that only one person can access.

Many First Nations in Alberta want to have their own internal mapping and GIS capabilities to store and organize large amounts of information; however, very few do. Those that do have GIS systems and similar technology have found them underutilized or difficult to keep current. Some communities have capabilities to build maps, but can't print them. In many cases this deficiency is tied to a lack of training (creating an inability to effectively undertake this task) and a lack of funds to set these systems up. Technical support from a regional organization (i.e. TSAG) would be useful for helping communities identify appropriate systems for their communities and in helping communities understand the steps that are needed to establish and then later maintain various types of information systems.

Environmental Management



8.0 ENVIRONMENTAL MANAGEMENT

8.1 Environmental Management Tools

8.1.1 Introduction

Development projects affect the environment and communities in different ways. The need for an assessment depends on when the project is going to be developed, the size of the project, and the scope of the potential impacts.

8.1.2 What are the main Environmental Management Tools?

The following are four key environmental processes or tools that can be used in environmental management decision making.

Environmental Assessments are a planning and predictive tool. They document baseline environmental conditions to help plan for resource development and management initiatives. They provide an organized, orderly way of considering, evaluating, reducing; and if possible, avoiding possible negative impacts a proposed development might have on the environment.

Environmental Site Assessments are an impact evaluation tool. They are a tool to assist in the determination of the condition of the land at a particular site at a single point in time. Environmental Site Assessments are commonly used to identify potential risks and liabilities associated with a site. For example, an environmental site assessment can be used to determine how or if a site is or has been affected by soil or groundwater contamination.

Environmental Audits are a compliance evaluation tool. They can be conducted at any time during a development project or business operation as they are used to evaluate compliance with regulatory requirements or conformance with internal directives.

Follow-up Assessments are an adaptive management tool. Follow-up assessments are studies to evaluate the environmental effects of projects after completion and usually involve long-term monitoring programs. These types of studies can be used to evaluate the accuracy of EIA predictions and if necessary revise mitigation plans of project operations to eliminate or reduce future environmental effects. Note that in certain situations federal departments under the *Canadian Environmental Assessment Act* (the Act) may require a follow-up program.

Proposed resource development projects on Reserve lands, or within the traditional territories of First Nations, may need to go through an environment assessment (EA) process (also often referred to as an environmental impact assessment) to ensure that they are both socially and environmentally sustainable. EA is the main tool for evaluating resource development projects before they are approved. In general terms, environmental assessment is a process of identifying, evaluating, reducing and, if possible, avoiding negative effects that a development may have on the environment. It can help communities:

- Plan and have local projects approved (e.g. sewage treatment plants on Reserve or ecotourism resorts);
- Learn more about and influence the planning and management of development projects being proposed by industry or government;
- Check that existing development projects are not adversely affecting the environment; and,
- Learn more about previously developed projects and how past environmental impacts might be reversed or minimized.

Environmental assessment processes are legally defined under the *Canadian Environmental Assessment Act (CEAA)* and the *Environmental Protection and Enhancement Act (EPEA)*. You can find more information about this legislation from the Canadian Environmental Assessment Agency www.ceaa-acee.gc.ca and the Government of Alberta at <http://www3.gov.ab.ca/env/protenf/approvals/factsheets/enhanact.html>

In Alberta, there are a variety of provincial and federal agencies involved in the implementation of this legislation; for example:

Provincial:

- Alberta Environment www3.gov.ab.ca/env/
- Alberta Energy Resource Conservation Board (ERCB) www.ercb.ca
- Alberta Utilities Commission (AUC) www.auc.ab.ca
- Alberta Natural Resources Conservation Board (NRCB) <http://www.nrcb.gov.ab.ca>
- Alberta Sustainable Resources Development (ASRD) <http://www3.gov.ab.ca/srd/>
- Culture and Community Spirit <http://culture.alberta.ca/>

Federal:

- Canadian Environmental Assessment Agency (CEAA) <http://www.ceaa.gc.ca/default.asp?Lang=En&n=D75FB358-1>

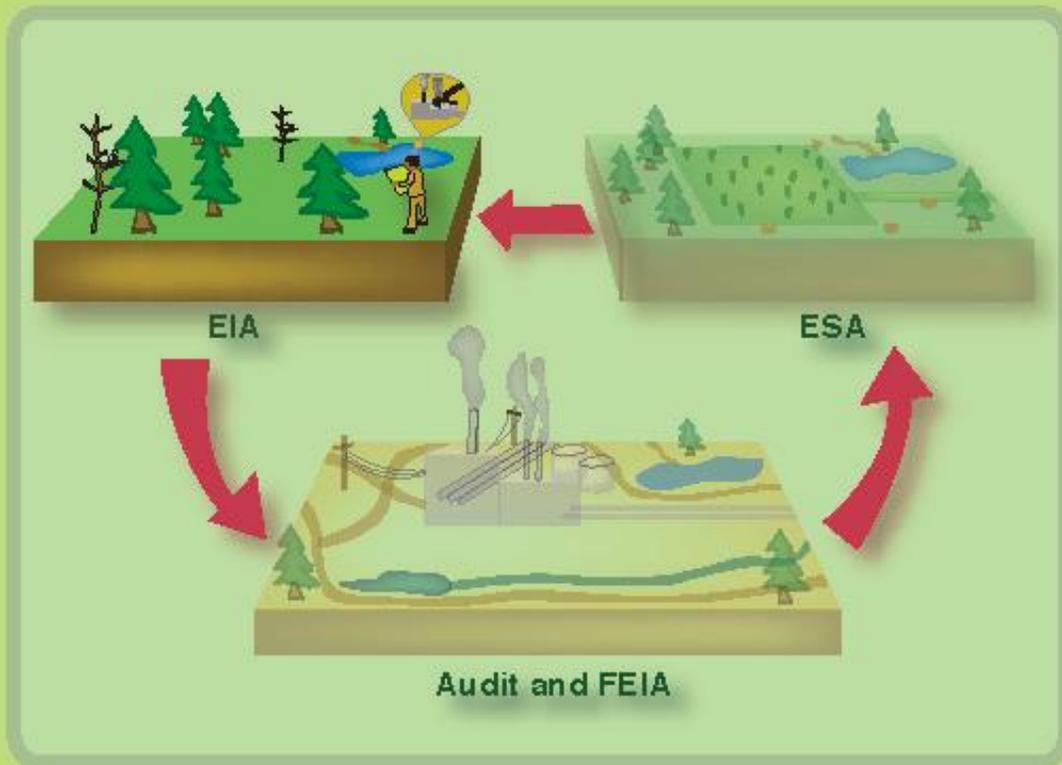
- Indian and Northern Affairs (INAC) <http://www.ainc-inac.gc.ca/enr/en/index-eng.asp>
- Parks Canada Agency (PC) <http://www.parkscanada.ca/>
- Public Works and Government Services Canada (PWGSC) <http://www.pwgsc.gc.ca/text/index-e.html>
- National Energy Board (NEB) - <http://www.neb-one.gc.ca>
- Fisheries and Oceans Canada (DFO) http://www.dfo-mpo.gc.ca/home-accueil_e.htm
- Transport Canada (TC) - <http://www.tc.gc.ca/eng/tc-main.htm>
- Environment Canada (EC) - <http://www.ec.gc.ca/>
- Health Canada (HC) - <http://www.hc-sc.gc.ca/>

The subsequent sections will provide you with information about the following questions:

- What is an Environment Assessment (EA) and why is it important?
- What is an Environment Site Assessment and why it is important?
- What is an Environmental Audit and why is it important?
- What is a Follow-up Assessment and why is it important?

In addition, these sections provide a list of references that will help you find more information.

Environmental Impact Assessment



8.2 Environmental Assessment

8.2.1 What is Environment Assessment?

The Canadian Environmental Assessment Agency (the Agency) explains that “in general, environmental assessment (EA) is a process to predict the environmental effects of proposed initiatives before they are carried out. An EA:

- identifies possible environmental effects;
- proposes measures to mitigate adverse effects; and
- predicts whether there will be significant adverse environmental effects, even after the mitigation is implemented” (<http://www.ceaa-acee.gc.ca>, Frequently Asked Questions).

An EA may be required prior to any decision to allow a project or development to occur. EA is a planning tool to assist in minimizing or avoiding adverse environmental effects before they occur. It is good practice to undertake an EA even if it is not legally required. EAs provide a process to systematically consider and incorporate environmental effects into decision making.

When a First Nation is seeking to develop a project such as an on Reserve sewage treatment facility, the First Nation would be defined as the project “proponent”. As such, the Guidelines for Proponents that are available on the Agency’s website

Proponent: the company, agency, individual or organization wanting to develop a project

http://www.ceaa-acee.gc.ca/012/001/5-0_e.htm would be a useful tool. In addition to these guidelines, Appendix 1 also can provide direction on the kind of information that is required when conducting an EA.

Provincial guidance for undertaking an EA off Reserve (within traditional territories) can be found at <http://environment.alberta.ca/2824.html> and <http://www.environment.alberta.ca/1274.html>

First Nations may seek to influence the planning and management of a project proposed by industry or government (e.g. gas well or irrigation dam). There are a variety of ways to accomplish this including contacting the proponent and/or the provincial or federal department involved or, in certain situations, claiming “intervener” status.

The steps associated with claiming intervener status and the roles and responsibilities of being an intervener can be different depending on the kind

of project and the department or agency that is administrating the process. It is therefore important to contact the federal or provincial government department or agency involved in the EA to learn more about gaining intervener status.

Examples of ways to participate in EA processes include:

- Provide comments on the provincial proposed Environmental Impact Assessment (EIA) Terms of Reference for the project of interest and the resulting Application and EIA report;
- During provincial Board or Commission hearing processes, individuals or First Nations may file a claim to become an “intervener”; And
- Provide Traditional Ecological Knowledge into the federal environmental assessment process.

Information describing how to become involved in the federal or provincial EA processes; including how to obtain funding for your involvement can be found at the following links http://www.ceaa-acee.gc.ca/011/index_e.htm. and <http://www.eub.gov.ab.ca/BBS/public/EnerFAQs/EnerFAQs2.htm>

Please note that federal funding is only available in selection situations.

Opportunities for involvement in the federal and provincial EA processes are also described in this guide in Sections 8.7 and 8.8, respectively.

Whether as a proponent or an intervener, having a basic understanding of the EA process will help your community have meaningful input into the planning and approval of a proposed development.

8.2.2 When is Environmental Assessment used?

As environmental assessment (EA) is a planning tool to determine the effects of a project. An EA should be implemented each time a project is proposed.

Provincially, an environmental assessment is required when a project is listed on the mandatory list of the *Environmental Assessment (Mandatory and Exempted) Activities Regulation* of the *Alberta Environmental Enhancement and Protection Act*. If the project is not listed on this regulation, an EA may be required at the discretion of the Director.

The criteria for triggering an EA under the *Environmental Protection and Enhancement Act* can be found in:

- *Mandatory and Exempted Activities Regulations* (AR111/93): http://www.qp.gov.ab.ca/documents/Regs/1993_111.cfm?frm_isbn=0773287426

Federal EA processes may be required by law when projects are proposed on Federal lands (including Reserve lands), receive federal funding, have a federal department as a proponent, or require a permit or authorization listed on the Law List Regulation under the *Canadian Environmental Assessment Act* (the Act).

The criteria for triggering an EA under *CEAA* are found under Section 5 of the Act, and in the associated regulations:

- *Inclusion List Regulation*: http://www.ceaa-acee.gc.ca/013/incllist_e.htm
- *Law List Regulation*: http://www.ceaa-acee.gc.ca/013/lawlist_e.htm
- *Exclusion List Regulations, 2007*: http://www.ceaa.gc.ca/013/act_e.htm#Exclusion
- *Comprehensive Study List Regulation*: http://www.ceaa.gc.ca/013/act_e.htm#CompStudy

When a project is proposed on federal lands, the federal government automatically becomes involved (unless the proposed project is on the *Exclusion List Regulation*). Once a federal department has a responsibility to undertake an environmental assessment under the Act, that department becomes a responsible authority (RA). There may be more than one RA. Federal departments that do not have a responsibility to undertake an EA under the Act may be requested or may offer to provide expertise to the RA during the EA. These federal departments are referred to as federal authorities (FA).

For example, if a proposed project is likely to affect fish or fish habitat, then Fisheries and Oceans Canada (DFO) may be required to issue a Section 35(2) *Fisheries Act* Authorization. This is on the *Law List Regulation* and DFO would need to undertake an environmental assessment under the Act prior to issuing an Authorization for the harmful alteration, disruption or destruction of fish habitat

Indian Reserves are considered federal lands and are subject to federal legislation. Indian and Northern Affairs Canada (INAC) is often considered a "responsible authority" for Indian Lands. In other words, they hold responsibility for making decisions on whether or not to allow a project to proceed and

INAC is the "responsible authority (RA)" for Indian lands.

judiciously exercise this in conjunction with the communities. As such, INAC can be used as a resource when determining if an EA is required for a proposed development, and in determining the scope of an EA. As a responsible authority, INAC may, on behalf of any First Nation, get advice from other "expert departments" within the federal government (such as DFO, PWGSC, EC, HC) when needed.

Development planned for lands off Reserve, may still influence First Nation communities, Reserve lands or traditional territories. On provincial lands, Alberta Sustainable Resource Development (ASRD), Alberta Environment (AENV) or the Energy Resources Conservation Board (ERCB) / Natural Resources Conservation Board (NRCB) / Alberta Utilities Commission (AUC), are the often provincial regulators. AENV will determine if an EA under the *Environmental Protection and Enhancement Act* is required.

8.2.3 What does this mean to my Community?

Environmental impact assessments can offer many benefits including considering environmental effects and mitigation measures early in the project planning cycle.

- *Planning tool:* EA's are an effective tool in project planning as they allow the identification and mitigation of adverse impacts to the environment before they happen.
- *Issues considered:* The EA process ensures that all the concerns/issues are taken into account early in the project planning stages.
- *Public information/input:* The EA process gives the public an opportunity to know about the project, and to express its concerns within a structured process. This increases government and industry accountability.
- *Communication:* The EA process allows different levels of government and industry to work together at an early stage, avoiding costly duplication and overlap.
- *Prevention:* Conducting a good EA is ultimately more cost-effective than re-building or cleaning up the mess from a poorly planned project.

In summary, EAs help ensure that environmental concerns are addressed at an early stage, and that projects are designed with environmental sustainability in mind.

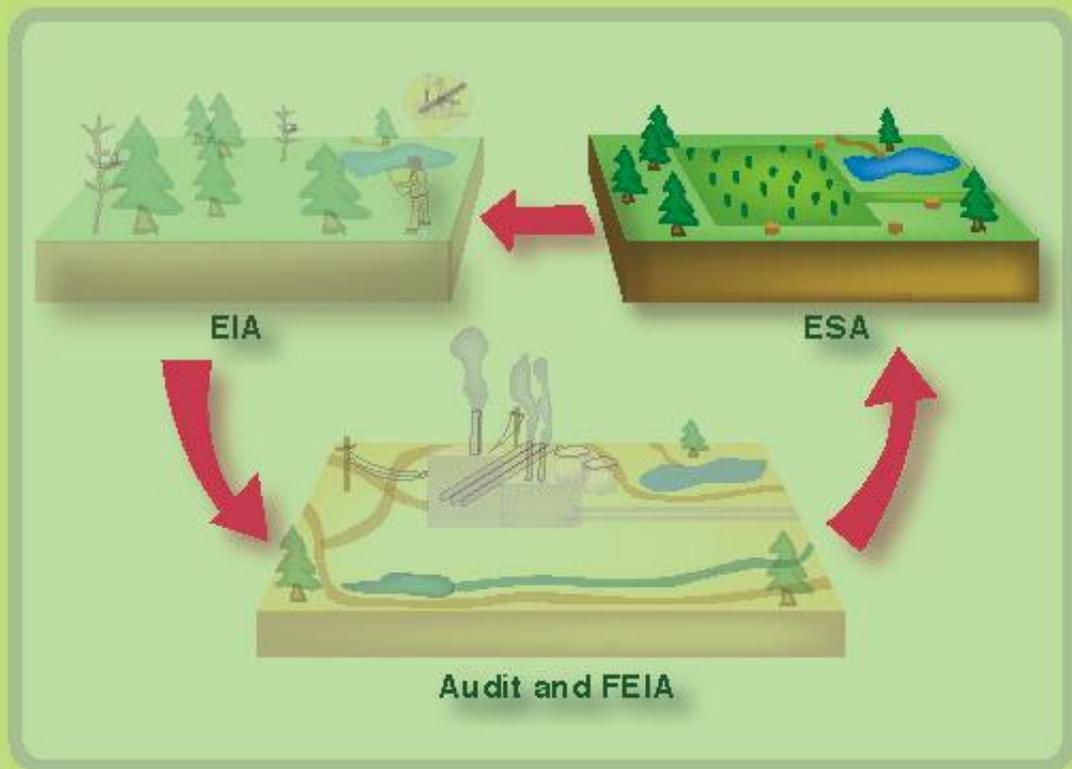
EA improves project, program, and policy design by considering alternatives to the project and alternative means of carrying out the project, as well as methods of mitigating any potentially adverse effects. The EA process also

offers many diverse stakeholders the opportunity to participate in community development.

8.2.4 How can I learn more about EAs?

- INAC EA Procedural Guide (2008) and the related Proponent Guide are available from INAC staff in the Alberta region.
- INAC's "Series One Environmental Learning Regime (ELR)" training materials have been tested and will be modified for more suitable delivery to First Nations and Tribal Councils. The ELR contains detailed information on EA, ESA, Audits and Legislation.
- Treaty Nations Environmental Assessment Manual for Projects on Indian Lands. 1995. Prepared by Acres International Limited and Focus Groups from Treaty 6, Treaty 7 and Treaty 8. Prepared for Indian and Northern Affairs Canada (INAC).
- Environmental Assessment Training Workshop Work Book. 1999. Alberta Treaty Nations Environmental Secretariat (ATNES). Sponsored by (INAC).
- www.ceaa-acee.gc.ca (for information on the *Canadian Environmental Assessment Act* and related regulations)
- www.inac-frenchlink.ca
- Environment Canada's Environmental Assessment Guides (<http://www.cws-scf.ec.gc.ca>):
 - Environmental Assessment Guidelines for Forest Habitat of Migratory Birds
 - Migratory Birds Environmental Assessment Guideline
 - Wetland Environmental Assessment Guideline
 - Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada

Environmental Site Assessment



8.3 Environmental Site Assessment (ESA)

8.3.1 What is an Environmental Site Assessment?

Environmental Site Assessment (ESA) is a historical review of a parcel of land used to evaluate the potential for environmental contamination to exist on or around the site. ESA is a tool to assist in the determination of the condition of the land at a particular site at a single point in time. They may occur prior to a land transaction occurring. ESAs may be conducted to evaluate the current environmental conditions and identify possible contamination or to reduce the potential to purchase a contaminated site without the buyer's knowledge.

The Canadian Standard Association outlines minimum requirements for ESAs in the guiding document: CSA Standard Z768-01. CSA Standard Z768-01 states that ESA should provide an in-depth understanding of:

- the site history;
- a range of possibilities with respect to contamination; and
- quantitative data describing existing contamination.

The information collected during an investigation is correlated back to the property's first usage, before usage, or to the extent that historical information allows. Since neighbouring properties have potential to affect the property being assessed, they may also need to be considered during a site assessment.

There are three phases of ESAs:

- **Phase 1:** is conducted to identify the potential for contamination to exist. It involves research of historical air photos and documents, interviews and a site visit.
- **Phase 2:** occurs if it is determined that there is potential for contamination to exist at a site. It involves an intrusive investigation to obtain water (surface and/or groundwater), soil or air samples. Samples are sent to a laboratory for analysis to determine the type and sometimes the extent of contamination at the site.
- **Phase 3:** delineates the extent of contamination at a site and may include the development and implementation of an appropriate remediation plan. During the course of remediation, confirmatory samples (of soil, water and sometimes air quality) are taken and submitted to a laboratory to ensure the site is "clean".

8.3.2 What does this mean to my Community?

Prior to a land transaction an ESA is normally conducted to determine the environmental condition of a particular site. ESA's provide information that can be used to identify potential risks and liabilities associated with a subject site in the form of contamination. An ESA is normally required before leasing or designating land on reserve for a particular use. If an ESA reveals that a site does not have the potential for contamination then a community can issue a lease or land tenure verifying that the site is not contaminated and they have a right to include in the Terms and Conditions of a lease agreement that the site must be returned in the same condition that it was initially given.

If an addition to Reserve is being pursued by a community it is also a requirement of INAC, through policy, to ensure that an ESA is completed prior to the addition commencing.

Phase 2 and Phase 3 ESA's are often completed on sites where there is known or suspected contamination. For instance a fuel storage tank site that has an old underground tank or a leaking aboveground fuel storage tank will require a Phase 2 ESA immediately.

Contaminated sites identified on Reserve are managed in accordance with the contaminated sites management policy and Indian and Inuit Affairs Program Contaminated Sites Management Program http://www.federalcontaminatedsites.gc.ca/publications/action_agir/action_agir-eng.pdf and <http://www.federalcontaminatedsites.gc.ca/index-eng.aspx>.

8.3.3 How can I learn more about ESAs?

The best reference is CSA Standard Z768-01 and should be used when conducting an ESA. Due to the potential liability and high level of knowledge/skill required to undertake an ESA it is important to seek experienced assistance. Companies that perform ESA's hold errors and omissions insurance and have extensive experience in ESA investigation and report preparation.

Additional training on ESA's can be accessed through INAC Environmental Learning Regime (ELR) for First Nations. Contact TSAG for more information.

8.4 Environmental Audits

8.4.1 What is an Environmental Audit?

Environmental audits can be conducted at any time during a development project or business operation as they are used to evaluate compliance with regulatory requirements or conformance with internal directives. Environmental audits should follow the Canadian Standard Association CSA Z751 of Environmental Auditing: Principles and General Practices, and CSA Z773 in case of Environmental Compliance Auditing.

8.4.2 Why are Audits Important?

Audits can be used for the renewal of permits, and when projects reach certain thresholds. Land tenure issued to an existing facility, for instance, may incorporate environmental Terms and Conditions based on an environmental assessment and they can be later evaluated in the form of an audit. Environmental clauses may include the requirement to submit periodic environmental monitoring reports or annual audits.

Environmental Audits can be self administered, undertaken by a third party or by a regulatory body. In any case, audits should be undertaken by qualified individuals who are not directly employed as regular staff by the site operator as per the CSA. Self administered audits are a way of measuring compliance of existing operations with federal legislation, best practices and internal policies. When a regulatory audit is conducted, typically instances of non-compliance identified must be corrected within 30 working days or prior to the renewal of permits.

The process for conducting an Environmental Audits requires the following steps:

1. Identify any past Terms and Conditions that may have been applied to the operation and review for relevance.
2. Based upon the review of Terms and Conditions, create a Terms of Reference for the Audit.
3. Provide the party responsible for the audit with the Terms of Reference.
4. Obtain a copy of the completed audit report and include with the compliance/conformance file.
5. Audit findings will be used to take corrective actions, if needed, and as input for environmental management decision making.

Siksika Nation Species at Risk Study

Siksika Nation, located east of the city of Calgary, Alberta, is part of the Blackfoot Confederacy, which also consists of the Piikani, Kainaiwa of southern Alberta and the Blackfeet Nation south of the border. Siksika in our language means "Blackfoot". The Nation has a total population of approximately 6000 members.

About 25% of Siksika Nation's Lands have been developed (agricultural, urban or oil and gas development), leaving the remainder of the habitat relatively undisturbed. Lands are located within the range of five threatened and endangered species identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed under the *Species at Risk Act* (SARA):

- Burrowing Owl
- Sprague's Pipit
- Loggerhead Shrike
- Swift Fox
- Piping Plover

These wildlife species act as an umbrella species; protection of these species and their habitat also provides protection for numerous other prairies species that inhabit similar habitats and which have been identified by COSEWIC as species of special concern (i.e., Swift Fox, Ferruginous Hawk, Common Nighthawk, Long-billed Curlew, Yellow Rail, McCown's Longspur, Short-eared Owl, Peregrine Falcon, Monarch, Western Toad and Northern Leopard Frog).

Siksika Environment initiated a project to document local Species at Risk and their critical habitat, and raise awareness within the community regarding SAR. The project was conducted by the Siksika Environment Department (which is a subsidiary of Siksika Land Management), who are:

- Lars Duck Chief (SARA Project Coordinator)
- Colin Spring Chief (Environment Coordinator)
- Mory Ayoungman (SARA Project Assistant).

The overall purpose of this project is to raise awareness within the community regarding Species At Risk (SAR) and develop recommendations for future recovery efforts. To accomplish this, the project had two objectives:

- 1) Document SAR populations and critical habitat within the lands of the Siksika Nation
- 2) Promote SAR-related capacity building within the community

The methods used to achieve the first objective (SAR database) included: interviews with Siksika Elders to collect Traditional History; literature review of previous studies, reports, environmental assessments conducted on Siksika land; and Spring-Summer field surveys (e.g. breeding bird surveys, habitat assessments). These three methods were lead by employees of Siksika Environment with the assistance of Siksika Summer Students (Catlin Big Snake and Marty Woods).

The community was informed about the project and about local SAR initiatives and encouraged to participate as volunteers. The project included TEK collection, a literature review as well as field surveys. The long-term goal of this project is to develop a current database of SAR populations and critical habitat, as well as a list of recommendations for future SAR recovery initiatives.

This past fiscal year, Siksika was fortunate to obtain funding from Environment Canada through Aboriginal Funds for Species at Risk (AFSAR) to proceed with the project. With the funding in place, we were able to search for listed Species at Risk (COSEWIC and SARA) within Siksika Lands. Our main goal was to create and maintain a Species at Risk Database/Inventory for the Nation. With the funding, we were able to obtain specific training on how to identify wildlife in the field. With this training we were able to design datasheets that can be utilized for the field studies. Also, the funding was essential for our field studies, as we were able to purchase the equipment required to proceed with our project. One main purchase was a geographic information system (GIS) Station which would hold the database for the data that was being collected out in the field.

This past summer was very exciting, as we (Siksika Environment Department) embarked on a field study to confirm and educate about Species at Risk in Siksika.

We were able to confirm the presence of seven out of our 15 target species for the project. These species are:

- Loggerhead Shrike
- Burrowing Owl
- Peregrine Falcon
- Sprague's Pipit
- Long Billed Curlew
- Northern Leopard Frog
- Swift Fox

We are now in the midst of having these habitats protected within the Nation. As well as presenting to our youth through School Presentations to create awareness. This project has paved the way for our Land Management & Environment Department to continue with maintaining and building our Database/Inventory of these species of concern. We give thanks to Environment Canada, Technical Services Advisory Group (TSAG) & Kainai Environment Department for their help in obtaining the funding and capacity building for Siksika.



*Photos by Lars Duck Chief & Mory Ayoungman 2009

8.5 Follow-up Assessment

8.5.1 What is a Follow-up Assessment?

A follow-up assessment is a study to evaluate the environmental effects of a project after its completion and may involve long-term monitoring programs. These types of studies can be used to evaluate the accuracy of EA predictions and if necessary revise mitigation plans of project operations to eliminate or reduce future environmental effects.

Follow-up assessment is carried out after a project has been constructed to determine the effect that project is having, or has had, on the environment. EAs are a predictive process and are designed to provide differing degrees of speculation on what impacts "might" occur; follow-up assessments can be used to test if the predictions made in the EA were accurate. Although not legislated under *CEAA*, in certain situations federal departments under the *Canadian Environmental Assessment Act* (the *Act*) may require a follow-up program.

Follow-up assessment is used as a tool to determine how accurate those predictions were, how effective mitigations are in preventing impacts and to allow for adaptive management of impacts.

A follow-up assessment may also consider how a past activity, that may or may not have been predicted in an EA, affected the environment. A follow-up assessment may provide information to learn about the effects that particular projects and technologies have on the environment, and may be used to help determine appropriate mitigation or enhancement for the negative impacts that a project has caused. Follow-up assessments include monitoring, auditing, and applying corrective measures. In general, the objectives of a follow-up assessment are to:

- Guarantee that Terms and Conditions of project approval are implemented;
- Confirm environmental compliance and performance measurements;
- Deal with any unanticipated changes and situations;
- Adjust mitigation and management plans; and
- Learn from and contribute information gained from the follow-up assessment experience as a means of improving the EA process and its role in project planning and development.

The process for conducting a complete follow-up assessment includes the following steps:

1. Collect historical information on file related to the region and the project.
2. Review the original EA, ESA, Audits, and other related environmental information as available.
3. With the available information, describe the environmental characteristics and state of the region prior to the implementation of the project.
4. Collect information and create a current baseline of the environmental condition of the region.
5. Define changes between original and current conditions.
6. Determine direct and indirect effects of the project, and those produced by other events including natural causes.
7. Apply adaptive management, to further mitigate the direct and indirect effects of the project, where needed.

8.5.2 How do you undertake a Follow-up Assessment and why is it important?

A follow-up assessment is necessary to build a quality control function into the EA process after a project has started. The scope of the follow-up assessment will depend on the scope of the pre-decision assessment. This includes the predicted potential significance of the impacts, uncertainties about predictions, and outcomes.

Depending on the selected approach, follow-up may include:

- Inspection and surveillance to ensure Terms and Conditions are implemented;
- Monitoring effects and compliance requirements to ensure standards are met and impacts are within predicted levels;
- Impact management to address unanticipated changes and adjust mitigation measures and environmental management plans accordingly; and
- Audit and measurement of the evaluation process to examine the accuracy of predictions, the success of mitigation measures, and overall levels of environmental and EIA performance.

8.6 Issues and Challenges to Environmental Management Tools

Internal Capacity

Environmental management tools are extremely useful in assisting a community to make confident decisions related to sustainable environmental management. As these processes may be complex, this guide has introduced a range of environmental management tools:

- Environmental Assessment (EA)
 - Federal EA Types
 - Screenings (including Class Screenings)
 - Comprehensive Studies
 - Mediation and Panel Reviews
 - Provincial EA
- Environmental Site Assessment (ESA)
- Environmental Audits
- Follow-up Assessment

Each of these processes is governed by various forms of legislation or guidance documents originating from more than one government agency. To effectively conduct an EA that meets regulatory requirements, the people undertaking the assessment may require a range of skills and backgrounds (regulatory, scientific, economic and socio-cultural).

Several First Nation communities in Alberta have created on Reserve environmental companies and are exploring opportunities to build a team of environmental technicians. Often the Land Administration staff are responsible for the entire suite of environmental services, including the application of environmental management tools. Additional investments of resources including money and human resources may be required.

Training

Some Federal Agencies offer information sessions and courses about Federal Acts, regulations and EA. To undertake some of the tasks associated with an EA requires specific and sometimes very technical skills. Community members may or may not be required to obtain more advanced training off Reserve, with or without accreditation. Longer training programs are available through a number of institutes or technical providers. Please contact TSAG for the most up to date information. It should be taken into consideration some First Nation students are not comfortable living away from their communities and homes and this may prevent completion of post-secondary programs.

Equipment

Many of the environmental studies that are carried out for environmental assessment (all types of EAs, ESAs, Audits and Follow-up Assessments) require various types of technical equipment (for example: specialized sampling and or monitoring equipment etc.). This requires a significant investment.

Follow-up Assessment Issues and Challenges

An initial challenge to conducting a follow-up assessment is to gather the information (i.e. past documents) to recreate the environmental and social characteristics of a region previous to the implementation of a project. An additional challenge is that the original information may be in a different format, making it difficult to compare and draw a complete picture. Another challenge is to determine a) what effects were caused by a project, b) what effects were the cumulative results of different projects undertaken in a region, and c) what effects are caused by natural events. It is possible to determine the sources of the environmental effects by using models, observation, and monitoring in order to conduct a follow-up assessment.

Conducting a follow-up assessment is a challenging task, because it is necessary to recreate the environmental and social characteristics of a region previous to the implementation of a project, which, in many situations, has been operating for many years. Recreating that baseline information may be difficult because the necessary information may not be available or data may have been gathered using different methods, making it difficult to compare and draw a complete picture. Another challenge is to determine what effects were actually caused by a project, what effects were the cumulative results of different projects undertaken in a region, and what effects are simply caused by natural events. It is possible to determine the sources of the environmental effects by using models, observation, and monitoring.

Summary of Environmental Management Tools

Environmental Site Assessments			Audits	Environmental Assessments	Follow-up Assessment
Is the site contaminated?			Does the existing project comply and conform (respect) all laws, regulations and guidelines for 'best practice'?	What kind of environment effects will result from a proposed project?	How has an existing project affected the environment?
Phase 1	Phase 2	Phase 3			
Is the site contaminated? Where might the contamination come from?	Is there contamination and what kind of contamination is it?	How can the site be cleaned up and the contamination removed?	An audit can be carried out by the project owner, another individual or agency including a regulatory authority	<p>Under the federal CEAA process an environmental assessment may develop an:</p> <ul style="list-style-type: none"> • Environmental Assessment Screening report • Comprehensive Assessment • Mediation • Panel Review <p>Under the provincial Alberta EPEA process an Environmental Impact Assessment Report is produced, This may be subject to a public hearing (that can include a joint federal-provincial hearing).</p>	<p>A follow-up environmental assessment includes the following steps:</p> <p>Re-creation of Baseline Information</p> <p>Determine current environmental state</p> <p>Establish differences in environmental state</p> <p>Determine effects caused by project</p>

Environmental Site Assessments			Audits	Environmental Assessments	Follow-up Assessment
Report that identifies the need for Phase 2 or verifies if the site appears uncontaminated	Report that confirms and characterizes (possibly delineates) contamination and recommends Phase 3 or verifies there is no contamination evident.	Remediation Plan Developed or Implemented (Phase 4 or a separate step is often required for implementation of the remediation plan)	Report card on Compliance Environmental Protection Plans See Management Tools Mitigation Plans	Mitigation Plan Impact significance Environmental Protection Plans	Follow-up assessment Report Corrective measures Indemnification Program
Based on Past and Current Activities/Incidents			Based on present to protect the future	Predicts future	Based on past to protect the future

8.7 Overview of the Canadian Environmental Assessment Act (CEAA)

The following section was kindly contributed by the British Columbia First Nation's Environmental Assessment Technical Working Group (FNEATWG) from their First Nation's Environmental Assessment Toolkit (FNEATWG 2009).

This section provides an overview of the environmental assessment requirements of the Canadian *Environmental Assessment Act (CEAA)*. *CEAA* applies to all projects for which the federal government has a decision-making role, either as proponent, funder, land administrator or regulator.

Your First Nation is most likely to encounter the federal EA process when projects proposed to take place on reserve land are assessed under the *CEAA*, but you may also have an interest in participating or be asked to participate in *CEAA* assessments of projects or activities proposed in your traditional territory.

8.7.1 What is CEAA?

In Alberta, there are two regulatory environmental assessment (EA) processes, the federal EA process as set out in the *Canadian Environmental Assessment Act (CEAA)*, and the provincial EA process as set out in the *Alberta Environmental Protection and Enhancement Act (EPEA)*. There are situations where proposed projects are subject to both *CEAA* and *EPEA*, and are assessed jointly. A more general overview of the EA process, and the features that are common to most EAs, can be found in Section 8.0 of this guide.

What is the Canadian Environmental Assessment Act (CEAA)?

CEAA is the legal basis for the federal EA process. *CEAA* sets out the responsibilities for the environmental assessment of projects where federal government decision-making is involved.

A number of regulations have been established under the *CEAA*. Four are essential to the function of the *Act*. Others apply in special circumstances.

The four essential regulations are the:

- *Inclusion List Regulations*. Specifies projects that are not physical works that are subject to *CEAA*. An example of a physical activity that is not a physical work is ocean dumping or low-level flying.

- *Law List Regulations*. Sets out the regulatory triggers of *CEAA*. For example, an authorization to disrupt fish habitat required under the *Fisheries Act* is a law list trigger.
- *Exclusion List Regulations*. Specifies the types of projects that do not require an assessment under *CEAA*. These are small projects not likely to cause significant impacts, such as housing renovations.
- *Comprehensive Study List Regulations* describes those projects for which a more detailed assessment is mandatory. These tend to be large projects that are likely to have significant adverse environmental effects.

CEAA first came into force in 1995. Since then, it has undergone one Five Year Review, which included extensive public and First Nations' consultation. Following the review, *CEAA* was amended by Bill C-9, which received Royal Assent on June 11, 2003, and came into force on October 30, 2003. A further Parliamentary Review is scheduled for 2010.

What are the Purposes of *CEAA*?

The purposes of *CEAA* (Section 4[1]) are to:

- Ensure that the environmental effects of projects are reviewed in a careful and precautionary manner before federal authorities take action in connection with them so that projects do not cause significant adverse environmental effects,
- Encourage federal authorities to take actions that promote sustainable development,
- Promote cooperation and coordinated action between federal and provincial governments on environmental assessments,
- Promote communication and coordination between federal authorities and Aboriginal peoples ,

***CEAA* and Sustainable Development**

CEAA is expressly directed at promoting sustainable development. *CEAA* defines sustainable development as, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Canadian Environmental Assessment Agency has an evolving sustainable development strategy that acknowledges the inter-relationships between society, environment and economy and the importance of balancing these in decision-making. The goal of the strategy is to further sustainable development by improving the federal environmental assessment process and better addressing the environmental aspects of decision-making. Information about the sustainable development strategy can be found at http://www.ceaa-acee.gc.ca/017/0011/index_e.htm.

- Ensure that development in Canada or on federal lands does not cause significant adverse environmental effects in areas surrounding the project (including other countries), and
- Ensure that there is an opportunity for public participation in the environmental assessment process.

What is the Canadian Environmental Assessment Agency?

The Canadian Environmental Assessment Agency (the Agency) is an independent federal government agency that administers the federal environmental assessment process. It is accountable to parliament through the Minister of the Environment.

Key responsibilities of the Agency include:

- Coordinating screenings that are also subject to the assessment process of another jurisdiction and all comprehensive studies
- Promoting, monitoring and facilitating compliance with the *Act* and its regulations
- Providing training, guidance and research related to environmental assessment
- Maintaining responsibility for the Quality Assurance Program (that includes mechanisms to monitor compliance with the *Act* and the quality of assessments) for assessments conducted under the *Act* and its regulations
- Assisting parties in building consensus and resolving disputes
- Providing advice to the Minister of the Environment in the exercise of the minister's responsibilities
- Encouraging public participation
- Providing administration and advisory support for review panels, mediations, comprehensive studies and class screenings
- Promoting strategic environmental assessment

What is the role of the Minister of the Environment?

The Minister of the Environment is the minister responsible for the implementation of *CEAA*.

The minister's responsibilities include:

- Establishing a review by a mediator or a panel at any stage of a screening, under certain circumstances and in consultation with a federal authority
- Deciding early on in a comprehensive study whether the project should be referred to a mediator or review panel

- Requiring further information or action to address public concerns following a comprehensive study
- Issuing an environmental assessment decision statement following a comprehensive study which may include requirements for mitigation measures or a follow-up program
- Appointing the mediator or panel members and, in consultation with the federal authority responsible for the project, establishing its terms of reference
- Appointing a mediator or review panel where a project may cause significant adverse environmental effects that cross onto federal lands or occur across provincial boundaries or international borders

What is the Role of the Major Projects Management Office?

A federal Major Projects Management Office (MPMO) was announced by the federal Minister of Natural Resources on October 1, 2007 and opened on March 12, 2008. The role of the MPMO in the federal EA process is to provide overarching project management and accountability for major resource projects in the federal regulatory review process. Its goal is to improve the efficiency and effectiveness of Canada's regulatory system by improving the management and performance of the federal environmental assessment and regulatory process for major resource projects.

A Major Resource Project is defined as "a large resource project, which is subject to a comprehensive study, a panel review or a large or complex multi-jurisdictional screening, as defined under the *Canadian Environmental Assessment Act*." Major resource projects "North of 60" are not within the MPMO mandate.

Canada's regulatory system includes "the environmental assessment (EA) process (the project planning phase); subsequent permitting, licensing and authorizations which allow physical work to be initiated or operations to commence, and compliance monitoring and enforcement throughout the life-cycle of a project." Thus, the MPMO mandate extends beyond the environmental assessment process for major resource projects.

Through its Early Aboriginal Engagement Guide, the MPMO is encouraging proponents to consider signing formal agreements or protocols as a means to incorporate traditional knowledge and optimize the benefits of the prospective project. The MPMO points out to proponents that although engagement agreements or protocols may require additional time and resources, they can contribute significant value by ensuring that all parties understand the proposed engagement process on a basis of good faith.

The MPMO has created timelines for both the environmental assessment phase of a project, and the subsequent regulatory/permitting phase. These timelines will be set out in Project Agreements, to be signed by all the involved federal departments and agencies. The Project Agreements also set out the roles and responsibilities of federal departments in relation to Aboriginal consultation duties. For examples of existing Project Agreements and associated timelines, see <http://www.mpmo-bggp.gc.ca/project-projet/index-eng.php>.

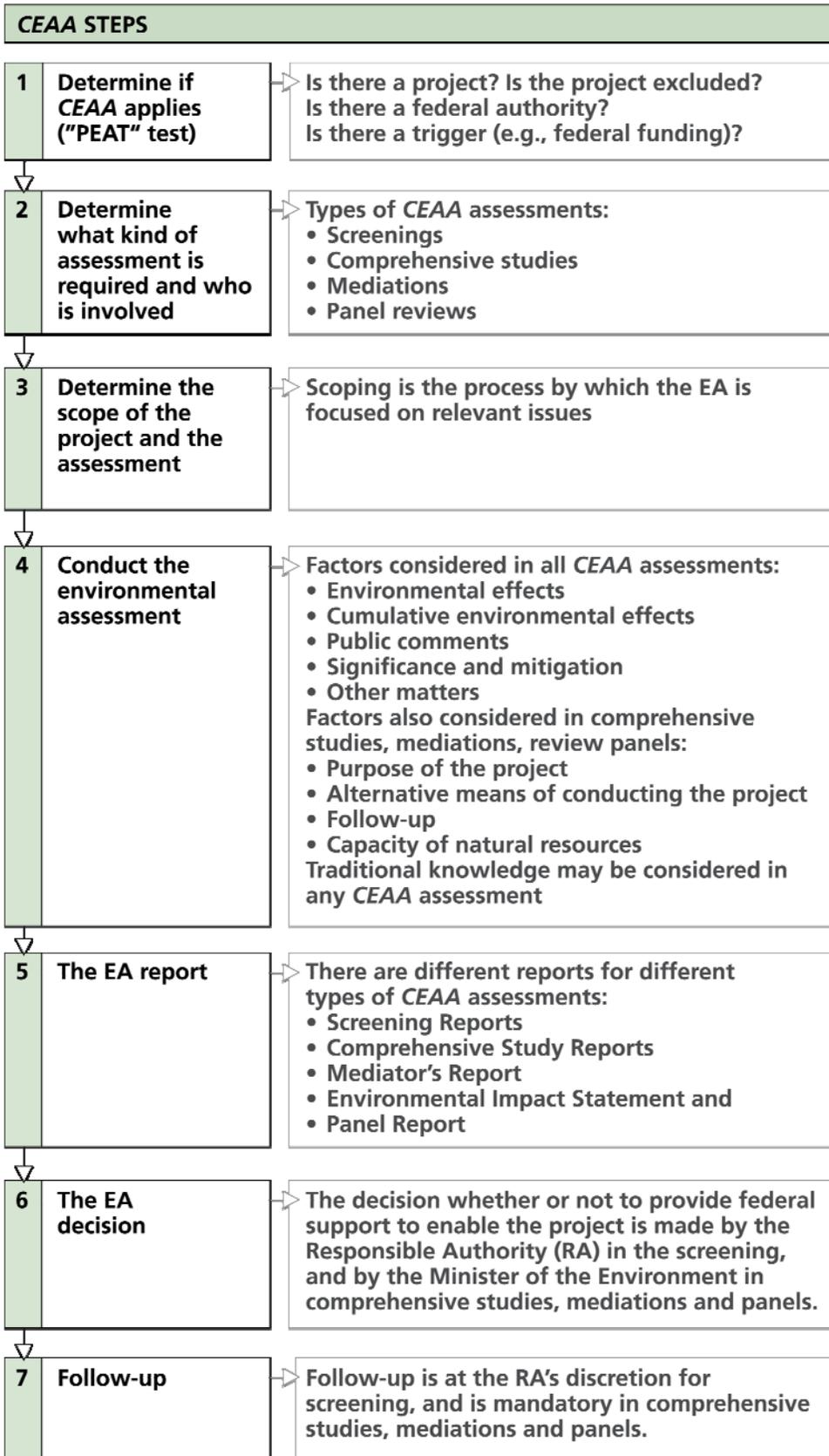
Further information on the Major Projects Management Office is available at <http://www.mpmo.gc.ca/index-eng.php>.

8.7.2 What are the steps in a Canadian Environmental Assessment Act Assessment?

There are a number of steps common to all CEAA assessments. These include the following:

- Step 1 – determine whether CEAA applies
- Step 2 – determine the type of assessment that is to be conducted
- Step 3 – determine the scope of the project and the assessment
- Step 4 – conduct the environmental assessment
- Step 5 – the environmental assessment report
- Step 6 – the environmental assessment decision
- Step 7 – follow-up

Each of these steps is discussed in more detail below and shown in the flow chart on the following page. See also Section 8.2 for “How and Why” of an EA.



Step 1 – Determine Whether CEAA applies

CEAA does not apply to every project. Determining whether or not CEAA applies requires asking four questions that are commonly called the “PEAT” test. These are summarized in a diagram below.

Is there a Project?

The first step is to determine if there is a project, as defined by CEAA. Under CEAA, a project is either an undertaking in relation to a physical work, or an undertaking not relating to a physical work that is included in the regulations.

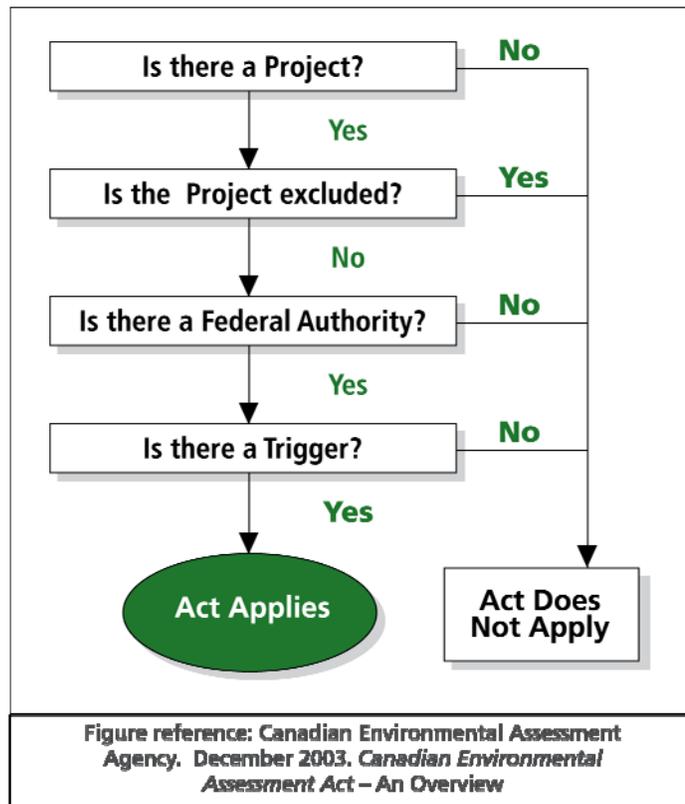
Physical works are projects that are constructed and have a fixed location. Any undertaking in relation to a physical work could be a project for the purposes of CEAA; that is, construction of a new structure or operation, modification, decommissioning or abandonment of an existing structure.

An undertaking not relating to a physical work refers to projects that may not be constructed or have fixed locations, but nonetheless may have adverse environmental effects. Examples of projects that are physical activities include low-level military flying and ocean dumping. The

Inclusion List Regulations describe those activities that are not physical works, but are still projects for the purposes of CEAA.

Is the Project Excluded?

The *Exclusion List Regulations*, 2007 specify which projects may be exempted from CEAA. Excluded projects are those that are likely to have insignificant effects, such as renovations or additions to a house. A project may also be excluded if it is necessary for reasons of national security or in response to national emergencies.



The *Exclusion List Regulations*, 2007 were amended in March and May 2009 to facilitate federal "Building Canada Plan" funding programs that were implemented in response to the global economic recession. The amendments exclude from assessment classes of projects that have been shown to have insignificant environmental effects based on completed environmental assessments and the experience of Responsible Authorities dealing with these projects. Examples include a variety of municipal and community buildings, bus and rapid transit systems, streets, roads and bridges, repair and upgrading of existing infrastructure, social housing projects and new water supply systems. The regulations will be in effect until March 2011 and will be reviewed in the context of the regular five-year review of *CEAA*.

The March 2009 regulations and detailed Regulatory Impact Analysis Statement are available at <http://canadagazette.gc.ca/rp-pr/p2/2009/2009-03-19-x2/html/sor-dors88-eng.html>. The May 2009 amendment (SOR/2009-131) and Regulatory Impact Analysis Statement is available at <http://canadagazette.gc.ca/rp-pr/p2/2009/2009-05-13/pdf/q2-14310.pdf>.

In further response to the global economic recession, new *Infrastructure Projects Environmental Assessment Adaptation Regulations* were enacted in March 2009. These regulations "adapt" existing provisions in *CEAA* to facilitate federal "Building Canada Plan" funding programs by enabling the federal Minister of the Environment, under certain conditions, to allow a provincial environmental assessment to be substituted for a federal assessment. The federal minister retains decision-making authority and must be satisfied that the provincial process is equivalent in matters such as significance of adverse environmental effects, public participation, access to documents and final reporting.

What are the responsibilities of the Responsible Authority (RA)?

The responsible authority must ensure that an environmental assessment of the project is conducted as early as possible in the planning stages of the project and before the responsible authority makes any decisions or undertakes any action that would allow the project to proceed.

If there are two or more responsible authorities for a project, *CEAA* requires them to try to work together and to carry out their responsibilities in a coordinated manner that eliminates unnecessary duplication. To achieve this, one of them may be designated as the lead responsible authority for the project and assume primary responsibility for ensuring that the environmental assessment complies with *CEAA*.

The new regulations and a Regulatory Impact Analysis Statement are available at <http://canadagazette.gc.ca/rp-pr/p2/2009/2009-03-19->

x2/html/sor-dors89-eng.html. These regulations were amended in May 2009 (SOR/2009-132) to relate to the Exclusion List Regulation, 2007 and those amendments. The May amendments and Regulatory Impact Analysis Statement are also available at <http://canadagazette.gc.ca/rp-pr/p2/2009/2009-05-13/pdf/g2-14310.pdf>.

The amendments will be in effect until March 2011 and will be reviewed in the context of the regular five-year review of *CEAA*.

Is there a Federal Authority?

If it is determined that there is a project that is not excluded, the next step is to determine whether a federal authority is involved.

The *Act* specifies what a federal authority is and what it is not. Under the *Act*, a federal authority is: a federal minister, an agency of the federal government, any federal department or agency, or any other body prescribed in the *Act*. A federal authority is not: a territorial government, a band Council under the *Indian Act*, a Harbour Commission, or a Crown Corporation.

Is there a Section 5(1) Trigger?

The final step is to determine whether or not Section 5(1) of *CEAA* has been “triggered”. *CEAA* is triggered whenever a federal authority has a specified decision-making responsibility in relation to a project. There are four possible triggers.

CEAA is triggered if a federal authority:

- Proposes a project;
- Provides financial assistance to a proponent to enable a project to be carried out;
- Sells, leases or otherwise transfers control or administration of federal land to enable a project to be carried out; or
- Provides a licence, permit or an approval that is listed in the *Law List Regulations* that enables a project to be carried out.

Other Possible Reasons for Carrying out a Federal EA – the Transboundary Provisions

If a project does not involve any of the “triggers” of the *Act*, an environmental assessment under the *Act* may still be possible. In other words, even if *CEAA* has not been triggered, under Sections 46 to 54 of *CEAA*, the Minister of the Environment may refer a project to a mediator or panel under special circumstances set out in the transboundary provisions of *CEAA* (for more information on panel reviews, see Step 2 below).

For instance, if the Minister of the Environment receives a formal petition from an individual or interested party requesting a project be referred to a mediator or review panel, and if the minister considers that the project has the potential to cause significant adverse transboundary environmental effects between non-federal and federal lands, or across provincial or international boundaries, then the minister has the authority to require an assessment of the transboundary effects in some circumstances.

Some of the transboundary provisions relate specifically to First Nation lands. Section 48(1) of *CEAA* establishes that if *CEAA* is not otherwise triggered, and if the minister is of the opinion that the project may cause significant adverse environmental effects on (among other things) Reserve lands, treaty settlement lands or lands that are included under Self-Government Agreements, or other lands in which First Nations have interests, the Minister of the Environment may refer the project to a mediator or a panel.

If your First Nation is concerned that a project not subject to *CEAA* will have significant adverse environmental effects either on your reserve lands or your treaty settlement lands, you could write to the minister and seek to have a panel review conducted under *CEAA*.

Step 2 – Determine the Type of Assessment to be conducted

Once it has been determined that the *Act* applies, the next step in the *CEAA* process is to determine what level of assessment will be required.

There are four types of assessments that may be conducted under *CEAA*, depending on the scale, complexity, and potential environmental effects of the proposed project. This is because *CEAA* applies to very small projects (e.g. stream crossings or culverts) and to very large projects (e.g. mines or port developments), the *Act* aims to ensure that the appropriate level of effort is applied to the environmental assessment of a project.

Types of *CEAA* assessments are:

- Screenings (including model class and replacement class screenings)
- Comprehensive studies
- Mediation
- Review panels

Presented below is a general overview of the different kinds of assessments conducted under *CEAA*. The various factors that are to be considered in all *CEAA* assessments, and the additional factors that must be considered in

comprehensive studies, mediations and panels, are discussed in Step 4 – Conduct the Environmental Assessment.

Screenings

Screenings are conducted for projects where the environmental effects are well understood and mitigation measures to prevent or minimize effects are well known and reliable. Almost all (99%) of environmental assessments conducted under *CEAA* are screening level environmental assessments.

Typically, projects undergoing a screening will be relatively simple and straightforward. Examples of projects that might undergo a screening would be construction of a new bridge or installation of a culvert.

Screenings are carried out by a wide variety of officials across the country (e.g. Fisheries and Oceans Canada, Parks Canada, Coast Guard) and for a wide variety of projects. Therefore, there is some variation in the way they are done.

Class Screenings

A class screening is a special type of screening that can help streamline the environmental assessment of certain types of projects. These types of projects are not likely to cause significant adverse environmental effects, providing that the design standards and mitigation measures described in the class screening report are applied. There are two types of class screenings provided for in *CEAA*: model class screenings and replacement class screenings.

A model class screening provides a generic assessment of all projects within a class and within a specified location. For example, Model Class Screening for Routine Fish Habitat Restoration and Enhancement Projects in British Columbia and Yukon. The responsible authority uses information contained in a model class screening report, but also prepares an individual screening report for the project containing location-specific or project-specific information.

A replacement class screening provides a generic assessment of all projects within a class, but location-specific or project-specific information is not needed. The RA does not need to prepare a project-specific screening report, but must ensure that the design standards and mitigation measures are implemented.

A few are listed below:

- *Model Class Screening Report for Routine Projects in the Town of Banff and Proximate Outlying Areas*

- *Model Class Screening Report for the Importation of European Honeybees*
- *Model Class Screening Report for Routine Fish Habitat Restoration and Enhancement Projects in British Columbia and Yukon*

Comprehensive Studies

Although the vast majority of proposed projects covered by the *Act* require a screening, some projects are required to have additional factors considered in the assessment of their environmental effects. These projects are included on the Comprehensive Study List. The Comprehensive Study List is established by regulation and is intended to deal with projects that are likely to result in significant adverse environmental effects. These projects usually are large scale, complex and environmentally sensitive, and frequently generate significant concern for First Nations and other communities.

Examples of proposed projects on the Comprehensive Study List include:

- Large mining projects
- Large industrial plants such as pulp and paper mills
- Major electrical generation projects
- Large oil and gas developments
- Major pipelines

Early on in a comprehensive study, the Minister of the Environment has to decide whether the project should continue to be assessed as a comprehensive study or whether it should be referred to a mediator or review panel. If the minister decides that the project should continue as a comprehensive study, the project can no longer be referred to a mediator or review panel.

Before making this decision, the minister must provide the public and First Nations an opportunity to comment on the ability of a comprehensive study to address issues relating to the project. As part of this public consultation process, the responsible authority must ensure the public and First Nations are provided an opportunity to comment on the scope of the project, the factors to be considered and the scope of those factors. The responsible authority must also ensure the public and First Nations are provided with an opportunity to participate in the environmental assessment of the project. A final opportunity to comment on the comprehensive study report is also provided before the minister makes a decision on the project.

Mediations

Mediation is a voluntary process of negotiation, where an impartial mediator helps interested parties resolve their differences. Under *CEAA*, the Minister

of the Environment can appoint a mediator if the environmental effects of a project are uncertain or potentially significant – or if First Nation or public concern warrants it. The minister will consult with the responsible authority and the parties to determine if mediation is a suitable course of action. Mediation can be used independently or in combination with panel reviews to address specific issues.

Mediation is intended to be a non-adversarial, collaborative approach to solving problems and generating agreements. It may be an appropriate process for resolving issues when all of the interested parties have been identified and are willing to participate, and a consensus appears possible. Groups or individuals having a direct interest or being directly affected by a proposed project would be involved in mediation. To date, a formal mediation has not taken place under CEAA.

Panel Reviews

A panel review is a review conducted by an impartial panel of experts. A panel review can only be established by the Minister of the Environment. The Minister of the Environment may refer a project to a review panel when:

"it is uncertain whether the project is likely to cause significant adverse environmental effects; or the project is likely to cause significant adverse environmental effects and it is uncertain whether these effects are justified in the circumstances; or public concerns warrant it."

The panel solicits input from a wide variety of groups and individuals and involves many opportunities for public input. A panel review includes public hearings where the proponent, government regulators, First Nations, the public and other interested parties can present their evidence, concerns and information.

The Minister of the Environment may refer any project undergoing a screening to a panel review at any time, whether or not the screening has been started. As noted in the discussion of the comprehensive study, once the minister decides that a comprehensive study is the appropriate means of undertaking an environmental assessment for a project on the Comprehensive Study List, the project cannot later be referred to a panel review. If your First Nation is particularly concerned about the possibility that a proposed project may cause significant adverse environmental effects, you may wish to press the minister to refer the project directly to a panel review.

Step 3 – Determine the Scope of the Project and Scope of the Assessment

Once it has been determined that CEAA applies, and what kind of assessment process will be followed, the next step is to determine the “scope” of the project and the environmental assessment.

Scoping is the process by which the environmental assessment is focused on the relevant issues for the proposed project. There are three basic parts to scoping.

The first establishes the scope of the project. In other words, which physical works and activities related to the project will be considered in the environmental assessment? For example, if the project is a pulp mill, the scope of the project would include other aspects such as the construction of any access roads to the mill. The scope of the project is, at the minimum, the project as proposed by the proponent. The scope of the project is determined by the Minister of the Environment for a mediation or review panel. (<http://www.CEAA-acee.gc.ca/default.asp?lang=En&n=C3BD5DA2-1>)

A cumulative environmental effect is an effect on the environment, after mitigation measures are applied, which results from effects of a project when combined with those of other past, existing and imminent projects and activities. These may occur over a certain period of time and distance.

The second part of scoping sets out the factors that will be considered in an environmental assessment. These are set out in the Act, and are discussed in more detail in the section below called, Factors to be considered in a CEAA Assessment. In general, the factors that will be required in a CEAA assessment will depend on the type of assessment being conducted. Factors that may be considered would include such things as environmental effects, mitigation, significance and follow-up.

The third part of scoping establishes the scope of the factors that are to be considered. In other words, if one of the factors to be considered is a cumulative effects assessment (CEA), the scoping process would set out which other projects may be considered in the CEA. Or, the scope of factors to be considered might specify which wildlife species will be included in the environmental assessment. The scope of the factors to be considered is determined by the responsible authority for screenings and comprehensive studies, and by the Minister of the Environment for a mediation or review panel stage.

First Nations' Involvement in Scoping

In a screening, the responsible authority has the discretion to determine if public (including First Nation) participation is "appropriate". If public participation is determined to be "appropriate", the RA will provide the public with an opportunity to examine and comment on – among other things – the scope of the project and the assessment. This information will be available on the Canadian Environmental Assessment Registry (http://www.CEAA-acee.gc.ca/050/index_e.cfm) or through the RA.

In comprehensive studies, mediations and panels, public - including First Nation - consultation is required in determining the scope of the project, the factors, and the scope of the factors to be considered.

Whether or not public input into the scoping exercise is sought by the RA, your First Nation may contact the RA or the minister at any time and ask for input into scoping. In addition, you may provide the RA with any comments you may have on the project's scope, and whether it adequately addresses those factors that your First Nation considers relevant.

See also the Canadian Environmental Assessment Agency's website for Agency guidance on scoping (http://www.CEAA-acee.gc.ca/012/016/index_e.htm).

Step 4 – Conduct the Environmental Assessment

All environmental assessments, whether they are screenings, comprehensive studies, mediations, or panels, must consider a number of factors. The factors for each of these types of assessments are set out in Section 16(1) and 16(2) of *CEAA* for screenings, comprehensive studies, mediations and panels.

Factors to be Considered in all *CEAA* Assessments

Every EA conducted under *CEAA* – whether it is a screening, comprehensive study, mediation or panel review – must include a consideration of the following factors:

- The environmental effects of the project, including the environmental effects of accidents and malfunctions
- The cumulative environmental effects of the project
- Public comments
- The significance of any environmental effects
- Mitigation measures
- Any other matter that the RA (in a screening or comprehensive study), or the minister (in a mediation or panel) considers relevant

Environmental Effects

All environmental assessments done under *CEAA* must consider the environmental effects of the project.

Under *CEAA*, “environmental effect” is defined as any change that the project may cause in the environment. This is known as a direct effect. For example, a direct environmental effect may include impacts on water quality or wildlife populations, in particular a listed-wildlife species, its critical habitat or its residences as set out in the *Species at Risk Act*.

In addition, an EA must include a consideration of indirect effects of a project.

In other words, the EA must include a consideration of a change in the environment caused by the project and the effect of any such change on:

- Health conditions
- Socio-economic conditions
- Physical and cultural heritage
- The current use of lands and resources for traditional purposes by Aboriginal persons
- Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance

Finally, an EA must also include a consideration of any change to the project that may be caused by the environment, whether any such change occurs within or outside Canada.

It is important to bear in mind that under *CEAA*, the socio-economic effects of a project may or may not be considered in a *CEAA* assessment. If a socio-economic effect such as job loss is caused by a change in the environment, such as loss of fish habitat, which is in turn caused by the project, then the socio-economic effect is an environmental effect within the meaning of the *Act*. If the socio-economic effect is not caused by a change in the environment, but by something else related to the project, such as an influx of outside workers to the area, then the socio-economic effect is not an environmental effect within the definition of *CEAA* and its consideration is not mandatory in the EA.

If your First Nation decides to participate in an EA under *CEAA* it is important to provide your view on the potential environmental effects of the project during the scoping process and during the conduct of the actual environmental assessment analysis. Despite the fact that *CEAA* is concerned only with direct impacts to the environment, and indirect impacts on such things as socio-economic conditions, you should still inform the proponent or

the RA of your concerns. In other words, just because *CEAA* does not require that an environmental effect that you are concerned with be considered, does not preclude this effect from being included if concern is high enough. This is especially true in panel reviews, where the Terms of Reference may be very broad indeed. If you express your concerns early, there is a greater chance they will be included in the assessment.

Note that you should provide information to *CEAA* and the RA's if you believe there may be an impact on your Reserve or traditional lands. The more that the Crown knows about your concerns, the better equipped they will be to avoid affecting your rights.

Cumulative Effects

Under *CEAA*, environmental assessments must consider the cumulative environmental effects that are likely to result from the project in combination with other projects or activities. That means that the environmental effects of other projects and activities that are likely to interact with the environmental effects of the project in question should be included in the assessment. For example, if the construction of a bridge affects the water quality in the river it crosses, then other stressors or impacts on the same water quality parameters, such as those from a nearby mill could be included in the cumulative effects assessment.

Under *CEAA*, the significance of any cumulative effects must also be considered.

The process for conducting a cumulative effects assessment is set out in more detail the Agency's website for guidance on the consideration on cumulative environmental effects in *CEAA* assessments (http://www.CEAA-acee.gc.ca/013/0001/0008/guide1_e.htm#Reference_Guide)

Significance

Deciding whether a project is likely to cause significant adverse environmental effects is central to the concept and practice of environmental assessment. Whatever adverse environmental effects are addressed and whatever methods are used, the focus of environmental assessment always narrows down to a decision about whether the project is likely to cause significant adverse environmental effects.

The central test in *CEAA* is therefore whether a project is likely to cause significant adverse environmental effects. This determination is an objective test, which means that all decisions about significance must be supported by findings based on the requirements set out in the *Act*.

“Significance” is not defined in *CEAA*, but should be determined based on the following criteria:

- Magnitude of the adverse effect
- Geographic extent of the adverse effect
- Duration and frequency of the adverse effect
- Reversibility of the adverse effect
- Ecological context

When an RA or the minister makes a determination of whether or not significant adverse environmental effects are likely, it involves a three-step process:

- Deciding whether the environmental effects are adverse;
- Deciding whether the adverse environmental effects are significant; and
- Deciding whether the significant adverse environmental effects are likely.

When your First Nation is participating in a *CEAA* process it is important to be aware of the approach that was taken in determining significance. It is also important to put forward your community’s interpretation of significance, especially for environmental effects of concern. Refer to the Canadian Environmental Assessment Agency’s website for Agency guidance on the determination of significance (http://www.CEAA-cee.gc.ca/013/0001/0008/guide3_e.htm#Reference%20Guide).

Mitigation

Every environmental assessment conducted under *CEAA* must consider technically and economically feasible measures that would mitigate any adverse environmental effects of the project.

According to *CEAA*, mitigation is the elimination, reduction or control of adverse environmental effects of a project and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

In addition, if the responsible authority provides federal support to a project and the project proceeds, it is required under *CEAA* to ensure that all appropriate mitigation measures are implemented. Furthermore, responsible authorities may also have powers other than those given under *CEAA*, such as permitting powers, the holdback provisions of funding arrangements and contractual arrangements, to ensure that mitigation measures are implemented.

Some methods that may be used by responsible authorities to ensure implementation of appropriate mitigation measures are:

- Compliance statements
- Conditions of approval in contract with project proponent
- Performance bonds by proponent
- Site visits

If your First Nation is participating in a *CEAA* review, examine the mitigation measures proposed and provide your comments on their acceptability.

Factors to be considered in Comprehensive Studies, Mediations and Panels

In addition to those factors listed above, Section 16(2) of *CEAA* establishes that every comprehensive study, mediation or panel review must also include a consideration of the following:

- The purpose of the project
- Alternative means of carrying out the project
- The need for, and the requirements of, any follow-up programs
- The capacity of renewable resources that are likely to be significantly affected by the project.

While not required for screenings RA's may also consider the above, especially for large or complex projects that are undergoing a screening.

The following describes the specific interpretation and application of these factors as part of *CEAA*.

The Purpose of the Project

"Purpose of" the project is essentially a statement by the proponent about what is to be achieved by carrying out the project. For example, "the purpose of a specific power generation project is to generate 500 mega watts of electricity". The purpose is generally stated from the perspective of the proponent and provides the context for the project.

In addition to the purpose of the project, the RA is strongly encouraged to consider the "need for", or fundamental rationale for the project (*CEAA* Section 16 [1e]). In the example of a power generation project, the "need for" might be "to provide power for consumers in Calgary or Edmonton".

For further information, see Canadian Environmental Assessment Agency's Operational Policy Statement, Addressing "Need for", "Purpose of", "Alternatives to" and "Alternative Means" under the *Canadian Environmental*

Assessment Act, (http://www.CEAA-acee.gc.ca/013/0002/addressing_e.htm).

Alternative Means to Carrying out the Project

Alternative means to carrying out the project is a description of the technically different or economically feasible ways that the project could be carried out. Examples of alternative means might include alternative routes for a pipeline or locations for a tailings pond. Alternative means also includes different ways of implementing the project or different mitigation measures. For example, a mine could be developed using open-pit or underground mining methods or an oil refinery could be developed using either of two types of technology.

The technical and economic feasibility of the alternative means must be assessed and compared against criteria set out prior to the evaluation. The environmental effects of the alternative means also need to be assessed and taken into account in the decision.

If your First Nation is providing input to the scoping of a *CEAA* review, note which alternative means are expected to be examined and the criteria being used to evaluate them. Provide your comments on the appropriateness of the criteria and the alternatives that are being evaluated; describe other alternatives if necessary.

For additional information see *CEAA's* Operational Policy Statement (http://www.CEAA-acee.gc.ca/013/0002/addressing_e.htm).

Follow-up

The purpose of follow-up under *CEAA* is to verify the accuracy of the environmental assessment and to determine the effectiveness of mitigation measures. For proposed projects that have been assessed and approved through a comprehensive study, mediation or review panel, the responsible authority must design the program and ensure the implementation of the program. For screenings, the responsible authority must determine if a follow-up program is appropriate under the circumstances and, if so, design it and ensure it is implemented.

Follow-up programs may be appropriate in screenings where:

- The project involves a new or unproven technology
- The project involves new or unproven mitigation measures
- An otherwise familiar or routine project is proposed for a new or unfamiliar environmental setting

- The assessment's analysis was based on a new assessment technique or model, or there is otherwise some uncertainty about the conclusions
- Changes in project scheduling could result in environmental effects

There are no formal requirements for the public or First Nation's involvement in follow-up and monitoring programs. However, you may be able to negotiate an agreement with the RA and/or proponent to be involved in the review and design of a follow-up program. See CEAA's Operational Policy Statement on Follow-up Programs at http://www.CEAA-acee.gc.ca/013/0002/ops_ppd_e.htm for more information on participating in follow-up and monitoring programs.

The Capacity of Renewable Resources

The potential effect of the project on the capacity of renewable resources to meet present and future needs is an important factor to assess. Therefore, potential for both short-term and long-term effects must be addressed. Examples of the capacity of renewable resources would be long-term forest productivity, and the sustainability of fisheries and wildlife populations.

The assessment of capacity of renewable resources would likely overlap with many of the concerns your First Nation might have about effects to the land. Therefore, pay close attention to the assessment of the capacity of renewable resources to determine if the resources of particular interest to your First Nation are being properly assessed.

Traditional Ecological Knowledge

In addition to the factors that must be considered in all CEAA assessments, and those additional factors that must be considered in comprehensive studies, mediations or panel reviews, CEAA also gives the RA the discretion to consider Aboriginal traditional knowledge (ATK) [also referred to as traditional ecological knowledge (TEK)] in any environmental assessment. Section 16.1 of CEAA states that

"Community knowledge and Aboriginal traditional knowledge may be considered in conducting an environmental assessment."

This means that the inclusion of your TEK in a CEAA assessment is not mandatory. The RA may contact your First Nation seeking to include your TEK in a CEAA assessment. However, your

The Canadian Environmental Assessment Agency has developed interim principles for considering Aboriginal TK in environmental assessments conducted under CEAA for EA practitioners. These are available on the Agency's website, at http://www.ceaa-acee.gc.ca/012/atk_e.htm

First Nation has the discretion to decide if this would be appropriate. In other words, inclusion of your First Nations' TEK in a federal environmental assessment is not mandatory and requires your consent.

Alternatively, your First Nation may decide it is interested in having its TEK considered in a federal environmental assessment of a project. If that is the case, you can contact the RA and request that your TEK be considered in the assessment. In addition, you can include TEK in any submission that you make within the environmental assessment process, at any time.

Further information on including TEK in environmental assessments *CEAA's* Interim Principles is available at <http://www.CEAA-acee.gc.ca/default.asp?lang=En&n=4A795E76-1>.

Step 5 – The EA Report

Reports are required for all types of *CEAA* assessments. However, the reporting requirements differ, as do the requirements for public input and review of the reports. Under the March 2009 federal Infrastructure Projects Environmental Assessment Adaptation Regulations, a provincial environmental assessment report prepared for a project under consideration for federal funding may be used by the federal authority to make decisions, provided the substitution of the process was approved by the Minister of the Environment.

The Screening Report

Following the completion of a screening, the RA or the proponent prepares a screening report that addresses all of the factors identified during the scoping exercise.

The screening report may or may not be made available for formal public comment. Under *CEAA*, the RA has the discretion to determine if formal public comment on the screening report is required. If the RA determines that formal public comment is appropriate, the RA determines how this public input will be sought. However, the screening report can be obtained directly from the RA, whether there is a formal public comment period or not.

It is worthwhile for your First Nation to provide your comments on the screening report, whether or not a formal public comment period is conducted. You should contact the RA for a copy of the screening report.

The Comprehensive Study Report

In a comprehensive study, the findings of the study are compiled into a comprehensive study report. The matters that must be covered in the

comprehensive study report are set out in Section 21(2) of *CEAA* and include:

- The scope of the project, the factors to be considered in the assessment, and the scope of those factors
- Public concerns about the project
- The project's potential to cause significant adverse environmental effects
- The ability of the comprehensive study to address issues relating to the project, and
- A recommendation to the minister whether to continue the comprehensive study or refer the project to a mediator or review panel

The factors to be considered in a comprehensive study (Step 4 in this section) may relate directly to your First Nation's interests (e.g. current use of lands and resources by Aboriginal people, cultural heritage). Therefore, consider becoming involved in the aspects of the comprehensive study that relate directly to your interests. This would involve negotiating study agreements with the responsible authority and/or the proponent, such as, for traditional use or traditional ecological knowledge studies.

Comprehensive study reports are available for formal public comment. It is key for your First Nation to provide written comments on the comprehensive study report. Prior to making a decision on the project, the Minister of the Environment must take into consideration any public comments received during the formal public comment period.

For more information about comprehensive studies, see the Agency's Comprehensive Study Process Guide at: http://www.CEAA-acee.gc.ca/013/0001/0003/comps_e.htm.

The Panel Report

In a panel review, the proponent of the project is required to prepare an environmental impact statement (EIS). The EIS is prepared at the request of, and according to guidelines drafted by, an environmental assessment panel. The guidelines may include requirements for the proponent to collect information. The EIS is available for public comment.

As with a comprehensive study, consider negotiating your First Nation's involvement in the EIS studies of interest to your community. As well, conduct a detailed review of the EIS. It's a good idea to provide written comments on the EIS as well as to provide an oral submission to the panel (see Public Participation in Panels in Section 8.8.3).

Step 6 – The Environmental Assessment Decision

The EA Decision in Screenings

Following the completion of a screening, the responsible authority must determine the significance of the adverse environmental effects of the project. This determination governs whether the responsible authority can take action that will enable the project to proceed.

If the project is not likely to cause significant adverse environmental effects, following the application of mitigation, the RA can enable the project to proceed. For example, if there are no significant adverse environmental effects associated with a bridge crossing, Transport Canada may issue a permit under the *Navigable Waters Protection Act*.

If the screening has identified that further review is necessary, the responsible authority must ask the Minister of the Environment to refer the project to a mediator or a review panel.

Further review is necessary when:

- It is uncertain whether the project is likely to cause significant adverse environmental effects
- The project is likely to cause significant adverse environmental effects and it is uncertain whether these effects are justified in the circumstances
- Public concerns warrant it

Note that the responsible authority cannot take any action that enables the project to proceed, if, after taking into account any appropriate mitigation measures, the project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances.

The EA Decision in Comprehensive Studies

Following the completion of a comprehensive study, the Minister of the Environment issues an environmental assessment decision statement. This decision statement includes the minister's opinion about the significance of the adverse environmental effects of the project and sets out any mitigation measures or follow-up program the minister considers appropriate.

The Minister of the Environment also has the power to request additional information or require that public concerns be addressed before issuing the environmental assessment decision statement. Once the environmental assessment decision statement is issued, the minister refers the project back to the responsible authority for action.

If the minister's decision statement indicates that significant adverse environmental effects are not likely, following the application of mitigation measures, the RA can take an action that enables the project to proceed. For example, Industry Canada can provide funding to the project.

If the minister's decision statement determines that significant adverse effects are likely, even after the application of mitigation, and if these effects are justifiable (e.g. there is significant public support for the project or the economic benefits outweigh the environmental effects), the RA may recommend that the project proceed. However, the RA must have Cabinet approval before a project can be allowed to proceed if there are justifiable significant adverse environmental effects.

As with a screening, a project will not be enabled to proceed if, following mitigation, significant adverse environmental effects are determined to be likely, and if these effects cannot be justified in the circumstances.

The EA Decision in Panels and Mediations

Once a review panel has completed the public hearings and its analysis, or mediation is concluded, the review panel or mediator must prepare an environmental assessment report that summarizes the rationale, conclusions and recommendations and includes a summary of comments received from the public. This report is submitted to the responsible authority and the Minister of the Environment who then makes it public.

The responsible authority must take the review panel's report into consideration before making any decision with regard to the project. If, following mitigation, significant adverse environmental effects are not likely or if significant adverse environmental effects are likely, but are justifiable in the circumstances, the RA may make a decision to enable the project to proceed.

However, whatever course of action the RA takes, it must have the approval of Cabinet. If, on the other hand, significant adverse effects are likely – following the application of mitigation measures – and these effects are not justifiable in the circumstances, the RA may not make any decision that will enable the project to proceed.

Step 7 - Follow-up

For screening assessments under *CEAA*, the RA determines whether follow-up is necessary. If the RA determines that follow-up is required, the RA must design the follow-up program and ensure its implementation. The RA must also post a notice on the Canadian Environmental Assessment Registry

(CEAR) stating whether or not a follow-up program is considered appropriate for the screening of a project.

For comprehensive studies, mediations and panels, follow-up is mandatory. The RA must design a follow-up program and ensure its implementation. Relevant material about the follow-up program must also be placed on the *CEAA* website.

8.7.3 What is Public Participation in CEAA Assessments?

The public participation requirements of *CEAA* differ depending on the type of assessment that is being conducted.

The following different requirements are discussed:

- Public participation in screenings
- Public participation in comprehensive studies
- Public participation in mediations
- Public participation in panel reviews

In addition, the public registry requirements of *CEAA* are described under the heading, Canadian Environmental Assessment Registry, in this section. The *CEAA* requirements for “public participation” also apply to your First Nation. There are also specific provisions under *CEAA* that relate directly to First Nations and First Nation involvement. These are discussed in Section 8.8.4 (First Nation Interests in *CEAA* Assessments). If your First Nation is concerned about a project undergoing an environmental assessment under *CEAA*, it is important to inform the RA or the minister of your interests in the assessment as early as possible, and to negotiate your participation. For general information on public participation, see the Agency’s site at: http://www.CEAA-acee.gc.ca/012/019/index_e.htm.

Public Participation in Screenings

Public involvement in a screening is at the discretion of the responsible authority and depends on factors such as the nature of the project, its environmental setting and public concerns.

If the responsible authority decides to solicit public comment as part of the screening, this input will be taken into consideration when the responsible authority decides the next step in the environmental assessment process. Where the responsible authority has determined that public participation is appropriate, it must provide an opportunity for the public to examine and comment on the screening report. If the screening report is made available for comment, it is worthwhile for your First Nation to provide written comments. The Ministerial Guidelines for public participation in screenings

are available at http://www.CEAA-acee.gc.ca/013/006/ministerial_guideline_e.htm

There are no statutory duties for the RA to consult with First Nations regarding a screening. However, there are common law duties for the RA to consult with First Nations if the proposed project could potentially affect First Nations' Aboriginal rights or title or treaty rights.

CEAA's Participant Funding Program

CEAA's Participant Funding Program can provide funding for individuals, non-profit organizations and Aboriginal groups to participate in comprehensive study reviews, review panels and mediation. Funding recipients must demonstrate that they meet at least one of the following criteria:

- have a direct, local interest in the project, such as living or owning property in the project area
- have community knowledge or Aboriginal traditional knowledge relevant to the environmental assessment
- plan to provide expert information relevant to the anticipated environmental effects of the project

The Aboriginal Funding Envelope also may provide funding to Aboriginal groups involved in consultation relating to Panel Review processes and MPMO Comprehensive Studies.

An independent committee reviews funding proposals. The committee will give higher priority to expenses associated with:

- supporting the participation of local parties
- the provision of value-added expertise by other parties

Based on the committee's recommendations the president of the Canadian Environmental Assessment Agency decides on funding allocation. For more information see: <http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=E33AE9FB-1>.

Public Participation in Comprehensive Studies

Under CEAA, the responsible authority must provide opportunities for public participation throughout the comprehensive study. The public (including First Nations) has an opportunity to participate in the comprehensive study before the Minister of the Environment makes a decision on whether the project should proceed as a comprehensive study or be referred to a mediator or review panel. This public input must be taken into account by the Minister of

the Environment when issuing the environmental assessment decision statement.

The public also has an opportunity to review the comprehensive study report before any decisions are made on the project. Funding is available to assist the public to participate in a comprehensive study.

Comprehensive studies are required for the types of projects (e.g. mines, pulp mills) that may generate significant concerns for your First Nation. It is worthwhile to participate in the formal opportunities for public comment by submitting written submissions.

Public Participation in Mediations

Individuals and organizations having a direct interest in or who are directly affected by a proposed project would be involved in the mediation. A public information program, in which the general public is kept informed of the progress of talks, would form part of the mediation process.

If mediation does not successfully resolve the issues under negotiation, the minister can order its conclusion. The mediator will provide the Minister of the Environment and the responsible authority with a report of the results of the mediation.

Funding is available to assist the public in participating in an assessment by mediation.

If a proposed project where your First Nation is potentially directly affected is being referred to mediation, your First Nation would likely be asked to be involved. If not, it is important to inform the minister of your community's interest in being involved in the mediation.

Public Participation in Panels

In environmental assessments by review panels, members of the public may participate in scoping meetings to identify issues that need to be addressed. There are also opportunities later in the process to appear before the review panel in public hearings to present evidence, concerns and recommendations.

Note that participant funding is available to assist the public in participating in an assessment by a review panel.

In addition to the requirement for public participation opportunities, the Agency has prepared procedures for a panel review stating that:

- The process does not limit Aboriginal rights

- Aboriginal participation in panel reviews may require review panels to develop different procedures, which take into account Aboriginal culture and values

If your First Nation feels that a proposed project undergoing a panel review could potentially affect your interests, consider attending the public scoping meeting to ensure your issues get incorporated into the scoping. Alternatively, contact the Agency or panel's secretariat to identify a means to have a submission put before the panel regarding the scope of the assessment. It is a good idea to prepare written submissions.

Presenting your First Nation's interests and concerns at the public hearing can be a very effective way of communicating and participating in the process. The results of the hearing form the basis of the panel's report to the minister; so, involvement in the public hearings is key to effective representation. Since the procedures for a panel review include consideration of Aboriginal culture and values, there is an opportunity to adapt the process, if needed, to accommodate your First Nation's interests. If the panel is satisfied that release of information provided by First Nations would result in specific harm to the environment (e.g. desecration of a sacred site), the panel can protect that information.

Consider including traditional ecological knowledge in your presentations to the panel as this can be a very effective forum for communicating your First Nation's understanding of the land and the potential impacts from the project.

The Canadian Environmental Assessment Registry

The Agency maintains the Canadian Environmental Assessment Registry (the Registry) to provide public access to information about proposed projects undergoing environmental assessment under *CEAA*. The Registry includes a website where important information about all projects under review is available at http://www.CEAA-acee.gc.ca/050/index_e.cfm.

Typical information posted on the website includes:

- The type of review and its status
- The project name, location, basic description and proponent contact information
- The responsible authority's contact information
- Notices relating to follow-up programs
- Screening reports (if an opportunity for public review has been determined by the RA)
- Comprehensive study reports

The responsible authority also keeps a paper project file of all records related to the environmental assessment.

The project file includes:

- Copies of all information posted to the Registry website
- Reports related to the EA
- Public comments
- Records related to design and need for follow-up programs
- Records related to mitigation measures

Copies of information in the project file are available on request from the RA. In some cases, records or parts of records may not be included in the project file to comply with the *Access to Information Act* and the *Privacy Act*.

8.7.4 What are First Nations Interests in Canadian Environmental Assessment Act Assessments?

Duty to Consult

When a federal environmental assessment is triggered, there are many reasons that you may be invited to participate in it, including having the potential impacts from the project on your traditional land uses considered, sharing your traditional ecological knowledge, or you may be the proponent of a project. Also, if your Aboriginal rights and title or treaty rights could possibly be affected, the RA's may have a legal duty to consult you about their contemplated conduct and, if appropriate, accommodate your concerns. The Canadian Environmental Assessment Agency is usually responsible for integrating Aboriginal consultation into the environmental assessments it coordinates under the Major Projects Management Office (MPMO) initiative unless the National Energy Board (NEB) is involved in the project, in which case it would lead the Aboriginal consultations.

The mechanism for integrating Aboriginal consultation into the MPMO process is through formal Aboriginal consultation and engagement work plans that will be incorporated into the overall Project Agreements that are negotiated with the other federal Parties to a particular major resource project. The MPMO will also be responsible for maintaining the official record of Aboriginal - Crown consultation for the Government of Canada.

For more information on the Crown's position on the duty to consult, please refer to the *Interim Guidelines for Federal Officials to Fulfill the Legal Duty to Consult*: <http://www.ainc-inac.gc.ca/ai/mr/is/acp/intgui-eng.asp>.

Federal EA on Reserve

First Nations considering developing their Reserve lands, will need to consider whether or not their project would require an environmental assessment under *CEAA*. If federal funding is used, or a permit is required under the *Indian Act*, or its regulations, *CEAA* is automatically triggered. So most projects on Reserve trigger a *CEAA* assessment.

The federal government, primarily, but not exclusively, Indian and Northern Affairs Canada (INAC), has a responsibility for screening many on-Reserve projects across Canada each year because First Nations Reserve lands are considered federal lands under *CEAA*.

Some examples of projects that would require an environmental assessment are:

- Designating, leasing or permitting reserve lands for economic development
- Development of a community centre or other capital project with funding through INAC
- A new housing project with INAC funding
- A new solid waste landfill or transfer station
- A timber harvesting operation
- Sand and gravel extraction
- Exploration for oil and gas
- Explorations for minerals

It is important that the need for EA and the requirements of the EA process be considered within the overall design of the project as early in the project planning stages as possible. Each federal department that may be involved under *CEAA* has guidelines and expertise available to communities to assist in completing any environmental assessment that is required.

Often, projects on Reserve have more than one trigger. Proponents should be aware that for each project planned only one environmental assessment is required. Again, federal departments can assist proponents in ensuring that any review requirements are coordinated between departments. A listing of these federal departments can be obtained from the Canadian Environmental Assessment Agency or through the Regional Environmental Manager, Indian and Northern Affairs Canada.

As with any form of EA, it is important to consult with your community.

Opportunities for the Development of First Nation EA Processes

Your First Nation may develop an informal EA regime at any time. In addition, your First Nation may develop a more formal EA process either through treaty negotiations, self-government processes, regulations under Section 59(1) of *CEAA*, or through the *First Nations Land Management Act*.

8.7.5 Summary of Canadian Environmental Assessment Act Assessments

CEAA applies to projects where the federal government has decision-making authority, whether as a proponent, land manager, source of funding or regulator. There are four main types of *CEAA* assessments: screenings, comprehensive studies, mediations and panel reviews. Almost all assessments conducted under *CEAA* are screening level assessments (See Section 8.8.2).

Screenings, including class screenings, apply to projects where the environmental effects are well understood and effective mitigation measures are known. Comprehensive studies are required for large, complex projects that are listed in the *Comprehensive Study List Regulation*. Both screenings and comprehensive studies are undertaken by the Responsible Authority.

In contrast, mediations and review panels, which are established by the Minister of the Environment, are independent bodies that undertake the assessment and then provide recommendations to the Minister and the Responsible Authority. Where the adverse environmental effects of a project are uncertain, likely to be significant or where there is significant public concern, a mediator or a review panel may be appointed by the Minister of the Environment to conduct the EA.

There are six steps to all *CEAA* assessments: determine if *CEAA* applies, determine the type of assessment, determine the scope of the project and the scope of the assessment, conduct the environmental assessment, the EA report, and the EA decision. A seventh step, follow-up, may be required for screenings and is mandatory for comprehensive studies, mediations and panels.

Factors to be considered during the conduct of all *CEAA* assessments include: environmental effects, cumulative effects, significance, and mitigation measures. Comprehensive studies, mediations and panel reviews also require the following to be assessed: the purpose of the project, alternative means to carry out the project; the need for, and requirements of, any follow-up programs; and the capacity of renewable resources that are likely to be significantly affected by the project. In addition, Section 16.1 of *CEAA* gives the RA the discretion to consider Aboriginal traditional

knowledge (ATK) [also known as traditional ecological knowledge (TEK)] in any environmental assessment. Note that TEK can only be considered with the consent of your First Nation.

Opportunities for public participation (includes First Nations) depend on the type of assessment. Funding for participation is available for comprehensive studies, mediations and panel reviews. Public participation in screening assessments is at the discretion of the responsible authority. Comprehensive studies have opportunities for participation in scoping of the assessment, assessing project impacts and reviewing the comprehensive study report. Mediations include directly affected parties and provide updates to the public. Panel reviews involve the most potential for direct input and include public scoping meetings, an opportunity to review the environmental impact statement and public hearings where presentations from First Nations and the public are welcomed.

In addition to the requirements for public participation that First Nations can access, the federal government also has a duty to consult with First Nations about any decisions that might affect Aboriginal rights and title and treaty rights. If a project occurs on Reserve, it may be subject to CEAA. Keep in mind that at any time, your First Nation may decide to develop an "internal" EA decision making process or policy.

8.7.6 Canadian Environmental Assessment Process Additional Information

General Information about CEAA

CEAA website at <http://www.CEAA-acee.gc.ca> and <http://www.CEAA-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1>.

The Canadian Environmental Assessment Agency maintains an updated website at <http://www.CEAA-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1> with links to many of the materials referenced in this Toolkit as well as other resources. The links include information in the following areas:

- Overviews of the *Canadian Environmental Assessment Act* and how to determine when it applies
- Types of Environmental Assessment, including Class Screenings, a Comprehensive Study Process Guide and Procedures for an Assessment by a Review Panel
- Federal Coordination including procedures and identifying "who's involved"
- Public Participation, including a Public Participation Guide, a Guide to Participant Funding, a Guide to the Registry and Guidelines for Assessing Public Participation in Screenings

- Procedural Guides for, among other things, incorporating climate change considerations, addressing cumulative effects, determining significant adverse effects, heritage resources, scoping, and project description in British Columbia
- Cabinet Directives on implementing *CEAA* and strategic environmental assessment
- Operational Policy Statements for adaptive management measures, cumulative effects, addressing "Need for", "Purpose of" "Alternatives to" and "Alternative Means" under *CEAA*, follow-up programs and preparing project descriptions
- Guides to biodiversity and Aboriginal Traditional Knowledge

Sustainable Development

The sustainable Canadian Environmental Assessment Agency's sustainable development strategy can be found at http://www.CEAA-acee.gc.ca/017/0011/index_e.htm.

Aboriginal Group's Submissions during *CEAA* 5-year review

Aboriginal groups made a number of submissions about the ways in which *CEAA* could be strengthened to better serve the needs of First Nations and these can be found at http://www.acee-CEAA.gc.ca/013/001/0002/0004/0004/process_e.htm.

Environmental Assessment Agreements between *CEAA* and other jurisdictions http://www.CEAA-acee.gc.ca/013/agreements_e.htm#3.

8.7.7 Canadian Environmental Assessment Process Checklist

Participating in a Screening

Have you done the following:

- Checked the *CEAA* registry to find out as much information as you can about the project you are interested in
- Contacted the responsible authority to indicate your interest in participating in the screening review
- Informed the responsible authority if you think the project is likely to infringe on your First Nation's Aboriginal rights and/or title and/or treaty rights
- Regularly checked the *CEAA* Registry for information updates
- Provided written comments on the scope of the project and the assessment
- Reviewed and provided written comments on the screening report

Participating in a Comprehensive Study

Have you done the following:

- Checked the *CEAA* registry to find out as much information as you can about the project you are interested in
- Contacted the responsible authority to indicate your interest in participating in the comprehensive study review
- Informed the responsible authority if you think the project is likely to infringe on your First Nation's Aboriginal rights and/or title and/or treaty rights
- Applied for participant funding
- Regularly checked the *CEAA* Registry for information updates
- Provided written comments on:
 - The scope of the project
 - Factors to be considered in the comprehensive study
 - The scope of the factors to be considered in the comprehensive study
- Negotiated study agreements with the RA or the proponent for aspects of the comprehensive study that are of interest to your First Nation (e.g. traditional land use and traditional ecological knowledge studies)
- Participated in aspects of the comprehensive study that are of interest or concern to your First Nation
- Reviewed and provided written comments on the comprehensive study report

Participating in a Panel review

Have you done the following:

- Contacted the Canadian Environmental Assessment Agency or the executive secretary of the panel to indicate your interest in participating in the panel review
- Informed the Canadian Environmental Assessment Agency or the executive secretary of the panel if you think the project is likely to infringe on your First Nation's Aboriginal rights and/or title and/or treaty rights
- Applied for participant funding
- Negotiated a participation agreement with the Canadian Environmental Assessment Agency or the executive secretary of the panel
- Regularly checked the *CEAA* Registry for information updates

Scoping

- Participated in public scoping meetings to ensure that your issue and concerns are incorporated in the scoping and/or
- Contacted the Canadian Environmental Assessment Agency or the executive secretary of the panel to request a meeting between your First Nation and the review panel to make submissions on the scoping
- Provided your written comments on the scoping to the review panel Environmental Impact Statement (EIS)
- Negotiated participation in aspects of the EIS that are of interest and concern to your First Nation
- Participated in the EIS
- Provided written comments on the EIS

Public Hearing

Participated in and presented your First Nation's interests and concerns at the public hearing. Consider the following:

- Presenting oral submissions
- Providing a written submission to the panel that summarizes your oral submission
- Including TEK, if appropriate
- Taking steps to protect your TEK or any other sensitive information

Participating in a Mediation

If a proposed project in your First Nation's traditional territory is being referred to a *CEAA* mediation, have you:

- Informed the Minister of the Environment in writing of your First Nation's interest in being involved in the mediation and if you think the project is likely to infringe on your First Nation's Aboriginal rights and/or title and/or treaty rights
- Applied for funding to participate in the mediation
- Participated in the mediation
- Provided your written comments on the mediation report

Participating in and/or Commenting on the Scope of any *CEAA* Assessment

Opportunities for comment on the scope of a *CEAA* assessment are discretionary in screenings and mandatory in comprehensive studies, mediations and panels. Therefore, if you would like to comment on the scope of any *CEAA* assessment in a screening, you should contact the RA.

When reviewing the scope of a *CEAA* assessment, here are some factors to keep in mind:

- Has the scope of the project been clearly defined, and do you agree?
- Have the factors to be considered been clearly identified, and do they meet the requirements of the *Act*?

These factors are considered in all *CEAA* assessments:

- Environmental effects
- Cumulative environmental effects
- Public comments
- Mitigation measures
- Other factors

These factors are considered in comprehensive studies, mediations and review panels:

- The purpose of the project
- Alternative means to carrying out the project
- The need for and requirements of any follow-up program
- The capacity of renewable resources that are likely to be affected by the project
- Have the scope of the factors to be considered been set out clearly, and do you agree? For instance, are there any species that are not listed that are of concern to your First Nation?
- Have any requirements for First Nation consultation or participation been set out in the scoping document, and are they sufficient?

Traditional Ecological Knowledge

- Have you considered including TEK in the EA?

The inclusion of traditional ecological knowledge in a *CEAA* assessment is at the discretion of the responsible authority. Therefore, if your First Nation would like its TEK considered, you must inform the RA in writing.

8.7.8 Bibliography

First Nations Environmental Assessment Toolkit. "First Nations Environmental Assessment Toolkit." 2009.

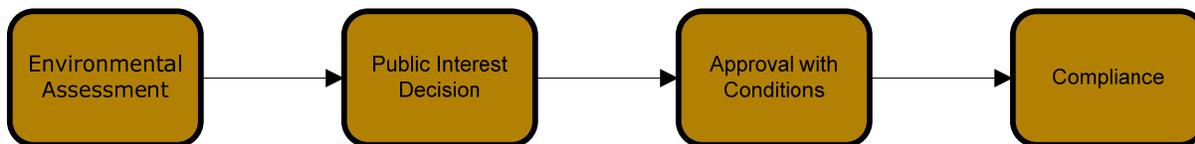
8.8 Alberta Environmental Assessment Process

The following section was kindly contributed by Alberta Environment and is verbatim from Alberta's Environmental Assessment Process (EA Guide 2008-1; Alberta Environment 2008).

8.8.1 Introduction

In Alberta, laws are in place to regulate industrial activities to protect the environment and human health. Alberta Environment is responsible for two major Acts which accomplish this, the *Environmental Protection and Enhancement Act (EPEA)* and the *Water Act*. Under these Acts, many activities must obtain formal approval before they can begin operation. Depending on the complexity or potential consequences of the project, another regulatory process is in place to gather additional information to scrutinize a project. This is the Environmental Assessment process.

There are environmental assessments conducted in Alberta which do not fall under the responsibility of Alberta Environment and are not mandated by EPEA. The Government of Canada, municipalities, corporations and lending institutions also undertake environmental assessment processes under their own laws and authority and for a variety of purposes.



Environmental Assessment is the first step in a regulatory process that:

- Examines a project to determine what the environmental, social, economic and health implications may be;
- Decides whether it is in the public interest to let the project go ahead;
- Gives formal approval to the project and sets specific conditions under which the project can operate; and
- Follows up to ensure that the project is operating within the approval conditions.

When the Government of Canada requires an environmental assessment on a project in Alberta that is also subject to EPEA, the two governments cooperate wherever possible to minimize overlap. They follow the process set out in a bilateral agreement *The Canada– Alberta Agreement for Environmental Assessment Cooperation*.

8.8.2 The Purpose of Environmental Assessment

Alberta's Environmental Assessment process has three basic goals:

- Gather Information – the process ensures that enough information is provided by the project proponent to inform the public and the government agencies about the proponent's understanding of the consequences of their project.
- Public involvement – the process provides an opportunity for people who may be affected by a proposed activity to express any concerns and provide advice to proponents and government agencies.
- Support sustainable development – the information provided during the process allows early consideration of the project's place in the overall plan for the province's environment and economy.

8.8.3 The Stages of the Environmental Assessment Process

Is an EIA required?

The Environmental Assessment process is shown in the diagram at the end of this guide. It begins when the proponent, another government department, local authority or other person informs Alberta Environment about a new project. Staff decides if the project requires an approval under EPEA or the *Water Act*.

Alberta Environment staff will also determine if an Environmental Impact Assessment (EIA) report will be required based on the *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, which contains two lists; activities for which an EIA report is mandatory; and activities which are exempt from requiring an EIA report.¹

Activities that are not specifically listed in the Regulation are called discretionary. The Environmental Assessment process may be triggered for those types of activities through three mechanisms:

- Another Alberta Environment Director, usually the Approvals Director², refers the project to the Environmental Assessment Director³ for consideration;

¹ The Minister may require an EIA report even if the activity appears on the exempted list.

² An Alberta Environment employee appointed by Ministerial Order to make decisions under Part 2, Division 2 of the *Environmental Protection and Enhancement Act*.

³ An Alberta Environment employee appointed by Ministerial Order to make decisions under Part 2, Division 1 of the *Environmental Protection and Enhancement Act*.

- The proponent requests the Environmental Assessment Director make a decision on the need for an Environmental Impact Assessment; or
- The Environmental Assessment Director decides that an Environmental Impact Assessment may be required.

Proponents may be required to submit a Disclosure Document to facilitate review of discretionary projects. Following this review the Director may decide that:

- An EIA report is not required, and the proponent can apply for any approvals that may be required from Alberta Environment, or
- More information is needed to determine if an EIA report is required through the preparation of a Screening Report.

To prepare a Screening Report, the Director seeks comments from the public, and from other government agencies on the merits of the project and the need for an EIA report. The minimum period for public comment is 30 days. The Screening Report considers the complexity of the project, the nature of technology involved, the sensitivity of the location, the presence of other similar activities, public interest and any other factors the Director considers significant. When completed, the Screening Report is made available to the public and the Director advises the proponent and the public whether an EIA report is required.

Preparing an EIA

To outline their view of what should be in the EIA report, the proponent prepares Proposed Terms of Reference (PTOR) and provides them to the public and to Alberta Environment for review. Although EPEA sets out general requirements for information to be included in the EIA report, the Environmental Assessment Director considers input received from the public and from other government agencies and issues the Final Terms of Reference (FTOR) that sets the scope for the EIA report. These Final Terms of Reference are also made available to the public.

Most EIA reports will include:

- a detailed description of the project;
- the location and environmental setting for the project, and baseline environmental, social and culture information;
- the potential positive and negative environmental, health, social, economic and cultural effects of the proposed activity;
- plans to mitigate potential adverse effects and to respond to emergencies;
- information on public and First Nations consultation; and

- an assessment of cumulative effects.⁴

More detailed information on the preparation of EIA reports is available in further Guides from Alberta Environment.

Once completed, the EIA report is submitted to the Environmental Assessment Director for review. For most large energy or resource development projects, the EIA report is part of the application submitted to the Energy Resources Conservation Board (ERCB), the Alberta Utilities Commission (AUC) or the Natural Resources Conservation Board (NRCB).

Technical Review

The purpose of the EIA report is to provide information about the project that can be used in the public interest decision and in the approvals process, should the project proceed to that point. The EIA report is reviewed by Alberta Environment and other provincial agencies. This task is assigned to a multi-disciplinary, integrated team of experts from various government agencies and departments. Depending upon the nature and location of the project, federal agencies may also participate in the evaluation of the EIA report.

The purpose of the review is to identify any project-related uncertainties or risks and determine if the information provided by the proponent meets the requirements of the Terms of Reference. If the information provided is either unclear or insufficient to meet these objectives, the Review Team may ask the proponent for additional information. These questions are called Supplemental Information Requests (SIRs).

When the Review Team is satisfied that they understand the nature of the proposed activity and the proponent's description of potential effects and mitigation, they will inform the Environmental Assessment Director. The Director takes this information and makes a determination that the EIA report is complete and then formally refers the report to the Board or the Minister to become part of the Public Interest Decision process.

Public Interest Decision and Regulatory Approvals

These next steps in the regulation of activities in Alberta occur after the Environmental Assessment process. Once a project has been through an environmental assessment, ***it does not mean that project has been approved*** or that it can commence operation. It has simply met the

⁴ See ERCB/NRCB/AENV Information Letter *Cumulative Effects Assessment in Environmental Impact Assessment Reports under the Alberta Environmental Protection and Enhancement Act*.

information requirements necessary to move onto the next phase. Information about these steps may be obtained from the ERCB, the AUC, the NRCB, or the Approvals Section of Alberta Environment.



8.8.4 Bibliography

Alberta Environment. Alberta's Environmental Assessment Process. EA Guide 2008-1. Alberta Environment. Edmonton: Government of Alberta, 2008.

Land Use Plans



9.0 LAND USE PLANS

Alberta First Nations face increasing land use pressures caused by many different kinds of development and land use activities. As a result, leaders, environmental managers and community members must determine if and how the demands for forestry, mining, tourism, oil and gas, agriculture, recreation, settlement and other land uses can be met. At the same time, many First Nations seek to balance the level of industrial development with environmental protection, social development and cultural preservation.

Land use: the ways people interact with the land and the environment. This can include consumptive use (hunting, oil and gas activity, forestry) and non-consumptive use (camping, off-road vehicle use, canoeing) cultural or spiritual use.

Some land uses take place with minimal impact on the environment and communities. In other cases, land use activities are in conflict with one another. Developers, First Nations and other user groups can end up competing for the same resources. One way to avoid land use conflicts is to identify what land uses should and should not take place in areas before they are proposed. A community can do this through development of a Land Use Plan. More about addressing land use conflicts is discussed in Section 10 (Integrated Resource Management).

9.1 What is a Land Use Plan?

A Land Use Plan formalizes a community's future vision for land and resources into one document (a report, map or poster). It also outlines the steps that will be followed to achieve that vision. It aims to balance opportunities for economic development with the wise use and management of land and protection of natural resources.

A Land Use Plan must be tailored to the needs and expectations of the community. Development of a good Land Use Plan requires the involvement of people (stakeholders) representing a wide range of interests and values. An open, community-based planning process helps to ensure that the final plan reflects the community's underlying interests and vision for the use and management of land and resources.

Land Use Plans may also be referred to as Community Plans, Comprehensive community Plans and Land/Resource Plans

Because Land Use Plans are developed in consultation with the community, they ensure that environmental management decisions take into account the needs of communities, the economy and the environment (the three legs of the sustainable development stool).

A Land Use Plan can be a powerful tool for determining how land is to be used while ensuring natural resources are well managed to benefit both present and future generations. Once the needs and interests of the community are identified, a plan can be developed that clearly outlines the types of activity and/or development that can occur within specific areas or environmental settings. These "rules" for development are often presented in the form of "bylaws" that are developed and enforced by the local government.

Bylaw: a locally enforced rule put in place to ensure activities occur in a way that is acceptable to the community.

A Land Use Plan can be formalized to include maps and a report that describes environmental management objectives, strategies and zoning bylaws; or, simpler poster plans may be created that can display desired land use patterns and development restrictions. Having a Land Use Plan can help to provide some level of certainty and clarity for environmental management decisions in a way that can meet the community's goals and visions.

9.2 What Kind of Information is in a Land Use Plan?

A Land Use Plan generally provides the following information:

- Broad land use zones defined on a map;
- Objectives that guide management of natural resources in each zone;
- Strategies for achieving the objectives; and,
- A socio-economic and environmental assessment that evaluates the plan
- The mechanism to change or update the plan in order to allow for responses to the changing interests or goals of a community.

During various phases of the planning process a community will:

- Set goals and objectives
- Gather and analyze information
- Identify problems/issues
- Identify and evaluate alternatives and

- Select a course of action

The planning process encourages increased communication and cooperation among local governments and the community they represent. This leads to greater knowledge, understanding and agreement about the social, economic and environmental implications of land and resource use decisions. Using the knowledge and experience of the entire community, local governments and environmental managers can develop strategies and make recommendations that minimize land use conflicts.

9.2.1 Land Use Zones

The most common method for implementing a land use plan is zoning. Land Use Zones specify areas within the community/planning area where certain land uses are allowed. Each zone has associated rules regulating the kind of uses permitted in each area, and the location, type and guiding characteristics for the types of development that may occur on the land. Land Use Zones are usually distinguished from one another on a map by using different colours (themes) representing each type of Zone. The scale of these maps typically ranges from 1:10,000 to 1:100,000.

Zoning can:

- Protect unique, historic, culturally important and fragile land
- Prevent or minimize the loss of forest, recreational, and agricultural lands;
- Maintain open space and community character;
- Protect individual property owners from future harmful or undesirable uses of adjacent land; and,
- Assist community economic growth by helping to Reserve adequate and desirable sites for industrial, commercial, and recreational uses.

In developing Land Use Zones, site circumstances (such as topography or water bodies), adjacent land uses, local land use history, and a variety of other factors may be considered. Some examples of zoning categories (or land use designations) may include: agricultural, low density residential, environmental protection areas, commercial, institutional or public service facilities, cultural preservation etc.

Comprehensive Community Plans

Some communities take land use planning to a higher level. This next step is often referred to as a "Comprehensive Community Plan", or a "Community Master Plan", These Plans include not only a Land Use Plan, but plans for

providing adequate housing, utilities, transportation, public facilities, civic buildings, community appearance and any special features. They develop plans and strategies to reach a balance between environmental stewardship, environmental management, standard of living, cultural and traditional values and socio-economic conditions. A Comprehensive Master Plan is an overall guide to community development and problem solving. It is a basic framework against which individuals and organizations can measure plans, programs, and ideas (Government of Canada 2004).

9.3 What is a Land Use Plan used for, How will it benefit my community?

Land Use Planning can be a powerful tool for communities wanting to ensure that their vision for the land and resources is respected by other communities, governments as well as industry. Good Land use planning processes help communities find balanced solutions to social, economic and environmental needs.

First Nations land use planning processes can also provide communities (as well as government and industry) with “certainty” about the kinds of resource activities that can and cannot take place in an area. This kind of certainty can save time and money for communities and others who may be interested in development on First Nations lands. This, in turn, promotes investment opportunities and economic growth, while creating jobs in the community.

Land Use Plans can also be used as a reference point when communities are asked to evaluate resource use proposals, such as forest development plans. By referencing land use plans, project proponents can better determine whether their proposal meets the objectives of the plan.

Where First Nations identify protected areas, parks or others areas of natural or heritage conservation, land use planning can help protect the environment, along with a community’s own natural and cultural diversity.

The process of developing a Land use Plan can help a community guide growth and development by:

- Outlining goals related to a community’s physical, economic and social development
- Identify opportunities and plans for community projects

- Providing valuable information for funding proposals or proposing economic development initiatives to/with other First Nations, governments or industry.
- Providing the basis for land and environmental management decisions

Some Land Use Plans include economic transition strategies to address the evolving needs of a community. Development of an economic action plan can stimulate a variety of programs and projects.

Developing a Land Use plan can also help a community find solutions to existing problems and anticipate future problems related to resource development by:

- Acting as a communications tool within the community and with external partners and stakeholders
- Outline how a community wants to protect property values, allocate of resources etc.
- Providing a basis for decision making in the community;
- Help ensure that chief and council are accountable and transparent to community members and,
- Support, negotiations on aboriginal self-government and treaties.

The planning process generally fosters better relationships between the people and organization that work together to find a common goal. As a vision of land use is developed, the coordination and delivery of services between governments, crown corporations and the private sector are improved. A community driven Land Use Plan can lead to increased knowledge about the environmental values held within Aboriginal communities. This is especially important to resource industries which remain the backbone of Alberta's economy, including the forestry, subsurface (mining, oil and gas), tourism and agricultural sectors and the government agencies that regulate their activities.

A Land Use Plan can be used as an instrument to assist in the allocation of land resources and prevent wasteful public and private expenditures.

9.4 How can I learn more?

Government of Canada 2004. Experiences in First Nation, Inuit and northern communities. Comprehensive community planning. Sharing the story. www.pwgsc.gc.ca/rps/inac also available by calling 1-800-567-9604, 2003, ISBN 0-662-34694-7

First Nation Community Planning Workbook, Cities & Environment Unit, Dalhousie University, 2003, ISBN 0-7703-2992-6, Call 902-494-3926

Information Matrix: A Guide to First Nations Community Planning Information, Call 902-494-3926

A Vision of the Future: Public Involvement in Community Planning Call 902-494-3926

Stepping Forward Series, Mount Allison University, Sackville, NB (This was adopted for community planning in the North)

Development Wheel, Canadian Association of Native Development Officers headquartered in Alberta,

9.5 Issues and Challenges

Finding a common vision

Because various community interests are involved in the strategic planning process, achieving consensus among competing interests is a major challenge in the land use planning process. Compromise is required to develop a shared, long-term vision. This can become even more complicated when dealing with stakeholders from outside a community.

Planning tables may benefit by including representatives from the business sector; environmental and recreational groups; other interest groups; provincial government resource agencies; municipal and local governments. If there is an approved regional land use plan, any sub-regional or community based land use plan should conform to its guiding principals.

The key challenge facing a land use planning process is to spend the time up front ensuring that what is created is useful, relevant, and sensitive to the stakeholders involved in creating and using it. Many land use plans exist provincially that have not been implemented or utilized and are collecting dust.

Political issues surround the formal "zoning" of common land where history, families, or internal conflict hinder this process. In order to be successful, the scope and scale of the planning process needs to be appropriate for the community. It is best to create the land use plan in phases that allow for stakeholder understanding and support to grow as the process continues.

Lack of participation

Some communities may find it difficult to convince certain groups (elders, traditionalists, political activists etc.) within the community to participate in the planning process at all. Reasons may range from lack of capacity to participate, to fundamental concerns about the process itself. Despite this challenge, efforts should be made to engage all interests in order to build the best plan possible.

First Nations involved in treaty negotiations may find it difficult to be involved in a land use planning process. This could be related to the fact that significant community resources (in terms of time, money and man-power) are tied up in this process. The other fear is that their involvement could affect these negotiations; although this is generally considered unlikely.

Implementation and Enforcement

The value of a Land Use Plan is lost if it does not play a central role in the decision making process. This means that community leaders must be aware of and support the land use plan itself. Leaders must refer to the plan before granting approvals to local businesses seeking approval and/or funding.

A plan is just a plan if there is no way to enforce the concepts and initiatives within it. For this reason, having bylaws included as part of a land use plan is very important. Bylaws provide the means for informed band administrators to control and ensure appropriate use of land and resources once a development has occurred.

Keeping it current

After a Land Use Plan is adopted it should be reviewed every three to five years to remain current, assess its effectiveness, determine shortcomings, and develop amendments where and when necessary. Plans may be revised because of a new community need, major new environmental or social issue, a policy requirement, or a new land use proposal. Ensuring the capacity and interest for completing this assessment must be championed at the band management level, regardless of changes in local governments and band administrations.

Environmental Monitoring



10.0 ENVIRONMENTAL MONITORING

Monitoring is an important tool for environmental management. By monitoring the changes that take place in an ecosystem or valued natural resource, First Nations can gain a better understanding about the health of their environment and how it is changing. Some of the most common kinds of environmental monitoring in Alberta include:

- Temperature and precipitation monitoring;
- Water quality and quantity monitoring;
- Wildlife monitoring;
- Monitoring for contaminants; or
- Air quality monitoring.

10.1 What is monitoring?

There are many different kinds of monitoring; however, it is generally defined as an ongoing process of information gathering around one or more "indicators" or "aspect" of environmental change. There are many different reasons that communities, companies and governments develop monitoring programs. Monitoring programs that have been established for research purposes focus on questions such as: Is the moose population declining in our region? Is the sediment in our lake increasing? Is our wetland restoration project attracting more ducks and geese to this area?

Other kinds of monitoring programs have been established as a result of environmental assessment processes and are aimed at confirming predictions made by the proponent of a resource development project. For example, companies involved in shooting seismic around a community, may be required to monitor the impacts of their operations on ground water quality especially if their operations are close to a community's drinking water supply. Forestry companies sending haul trucks through a National Park may be required to monitor sightings of elk, deer or other wildlife.

Some kinds of monitoring are required under federal or provincial legislation. For example, the Department of Fisheries and Oceans and Alberta Sustainable Resource Development, ensure that compliance monitoring is conducted to ensure that companies and individuals are obeying regulations related to the protection of fish and fish habitat. Environment Canada and Alberta Environment require oil and gas companies to conduct air quality monitoring to demonstrate their compliance with Canadian air quality

guidelines and regional policies. There are many other examples of compliance monitoring in Alberta.

Most monitoring programs focus on quantitative indicators or changes in the environment that can be easily measured in a specific time and place. Some examples of quantitative indicators include:

- Number of wildlife sightings in a specific area;
- Centimetres of change in the water levels in a valued stream or lake;
- TSS (total suspended sediment) down stream of a cut block;
- PPM (parts per million) of a contaminant in the air;
- Mg / L (milligrams per litre) of a contaminant in the water;
- PPM (parts per million) of a contaminant in the organ of a fish or human hair; or,
- Sq. feet of habitat restored.

Some monitoring programs also require the gathering of more qualitative information from local communities. In such cases, community members may be asked to recall how many moose they harvested in a 3 month period or to share their perception or personal opinion about a particular issue. Some examples include:

- How many whitefish did you harvest from this lake in the last week?
- What percentage of your groceries do you buy in your local community store?
- How would you describe your quality of life?
- Are you concerned about the human health impacts of the sour gas wells in your region?

10.2 How is a monitoring program developed?

Most monitoring programs involve five interrelated activities:

1. Program design
2. Ongoing data gathering;
3. Analysis and interpretation;
4. Data organization and storage; and,
5. Reporting.

10.2.1 Monitoring Program Design

There are some key questions that need to be considered before designing a monitoring program. In answering these questions, a community will also be able to identify opportunities for involvement. A general set of guiding questions are provided here, that have been adapted from the Canadian Community Monitoring Network (CCMN) <http://www.ccmn.ca/english/intro.html>. Other sources of information on program design can be found in section 9.5.

In general terms, before designing a monitoring program the community needs to resolve the following questions:

- What kind of information is needed to make decisions?
- What monitoring is already taking place (locally and regionally)
- Who are the key groups and networks that could be involved?
- What are the best ways to engage each different group?
- Is the community interested in monitoring?

Once these questions are answered, a community can work to understand how they might become more involved in local and regional monitoring programs. For example:

- Are the benefits of monitoring commonly understood in the community?
- What are motivations and expectations driving community members who want to participate?
- What kinds of skills and expertise are available locally that could contribute to a monitoring program?
- What resources, training and equipment are needed for the community to actively participate?
- Who are the potential champions of this type of initiative?
- What are the common community values and goals (what do they want to get out of a monitoring program)?

It can be very beneficial for First Nations to seek partnerships and resources that may provide technical guidance, support community involvement, and communication early in the design process. Questions to consider include:

- What partnerships can be created or expanded?
- What data management systems are required?
- What communication mechanisms are needed to deliver ecological information?

- What sources of in-kind contributions and financial support are available?

Information gathering & delivery is an important element of producing good results. Questions to ask include:

- Is monitoring data turned into useful information?
- When will information be delivered?
- How should the results of monitoring be communicated?
- In what ways can decision-makers use the new information?
- How can monitoring continue in the future?

Taking the time to carefully plan a monitoring program will ensure that it is:

- Relevant to the community and other stakeholders;
- Collecting information that is useable;
- Understandable to the audience requiring the information;
- Integrated and accountable to a course of action.

10.2.2 Ongoing Data Gathering

The activity of information gathering is the centre piece of any monitoring program. It usually takes place on an ongoing basis, once per week, or at key times during the life cycle of a fish, or construction and operation of a resource development project. Information gathering usually takes place for a set time period of time: over several months, one year, five years, the life span of an industrial project, or until a regulatory body/community determine.

Information gathering may involve one or more of the following tasks:

- Recording observations (e.g. documentation of wildlife sightings around seismic lines),
- Sampling (e.g. taking water samples)
- Interviewing (e.g. surveying hunters during moose hunting season)

The gathering of data for many monitoring programs does not require special expertise. With only a small amount of training, individuals can participate in gathering water quality data, observations about wildlife and many other kinds of information. Many First Nations people are considered to be very valuable in data gathering for many kinds of environmental monitoring because of their close connection to the land and resources.

Other monitoring programs may require specific skills and knowledge that is not common in the community. In such cases, technical environmental

people may have to be involved in the data gathering process. The data gathering required by regulatory authorities (i.e. for compliance monitoring) may also be undertaken by special authorities due to the legal and financial implications of non-compliance for industry and other resource developers.

Developing Social and Environmental Monitoring Capacity in the Piikani First Nation: The Piikani Social and Environmental Monitoring Certificate Program.

The Oldman River Dam is located on the Oldman River approximately 10 km (6 miles) upstream of the western boundary of the Piikani Reserve. The Oldman River valley is a spiritual, cultural, and community centre for the Piikani First Nation. The operations of Dam have directly and indirectly affected the cultural and economic activities of the Piikani First Nation in the valley.

To address a number of issues identified by the Piikani Nation, including the social and environmental effects of the Oldman River Dam on the Piikani Reserve, the Federal Government, the Province of Alberta and the Piikani Nation are working together to conduct a comprehensive Follow-up Environmental Impact Assessment (FEIA) of the Oldman River Dam. After completion of the studies, a complete mitigation and monitoring program will be developed.

In this context, the Piikani Nation created Piikani Environmental Services Inc. (PES) to manage the FEIA and other environmental and social related issues on and near Reserve lands. As the FEIA started to be developed, PES identified a lack of capacity within the Piikani Nation to fully participate in the social and environmental studies being conducted.

Taking advantage of the energy generated by the FEIA, the *Piikani Social and Environmental Monitoring Certificate Program* was created. Fifteen members of the community were selected to undertake a nine month training program which covers all major topics being addressed by the FEIA; including:

- EIA
- Wildlife biology
- Habitat Management
- Water Quality
- Fish biology/Sampling
- Vegetation mapping
- Hydrogeology
- Community Survey
- Traditional Land Use
- Decision making circles
- Historical resources
- Map and Air photo interpretation
- GIS
- Technical Writing

The training program uses a combination of formal western scientific academic education provided by a community collage, practical instruction provided by professional environmental and social consultants, and traditional methodologies and knowledge provided by the Piikani cultural centre and Piikani elders. Through this training, Piikani members will be in a better position to address and identify important environmental issues using a strong traditional and western scientific knowledge base to develop sustainable solutions.

The short term objective of the program is to develop the knowledge and skill base of the Piikani Nation to participate in the FEIA, implement the recommendations coming out of the FEIA, and a long term monitoring program. With the education and training provided through the certificate program, and the experience that participants will gain during the development of the FEIA, PES will be able to provide high quality environmental and social consulting services to the Piikani Nation and throughout southern Alberta to corporate and government clients.

10.2.3 Analysis and Interpretation

Analysis and interpretation is a process of making sense of the data gathered. Analysis can be as simple as summing up the total number of elk sighted in one month or may involve highly technical equipment such as that involved in the analysis of contaminants in fish tissue samples.

Sometimes there is a second stage of interpretation that involves a peer review or analysis of information by experts. In some cases these experts are local community members or elders who hold valuable knowledge about a region or the health of a resource. For example, if the number of moose sighted around the community has declined in the last three years, elders may be asked to provide their perspective on whether this is a natural change in moose abundance and distribution or whether there are other problems in the environment that may have impacted this valued resource. In other cases, experts from a university or technical agency may be asked to provide their opinion about a change that has taken place in the environment. For example, where there has been a small increase in a contaminant in whitefish samples taken from a local lake, experts who are very knowledgeable about this contaminant may be asked about the significance of this increase and its potential health effects on people that eat these fish.

10.2.4 Data Organization and Storage

Monitoring involves the systematic gathering and interpretation of data over a relatively long period of time. Finding appropriate ways of organizing and storing all of this data is therefore very important. Some kinds of data can be easily stored and organized on a computer database. Other kinds of data related to water or tissue samples may need to be stored in a special facility.

Due to legal implications, data from compliance monitoring or that associated with regulatory requirements may need to be more carefully housed than other kinds of monitoring data.

10.2.5 Reporting

Reporting is an aspect of monitoring that is often not considered. Sharing information about changes in the population of valued species, water quality or health of country food is arguably the most important stage of monitoring, particularly for communities that are closely connected to the land. There are many different ways in which monitoring results might be reported. If results are generated once a week, or once a month, as is the case with some water quality monitoring, reporting might be done through a

website or weekly report to the Band Manager or other local resource person. In other cases, results may be shared through newsletter or annual report. Many First Nations may prefer a workshop setting or meeting in the community where local members can ask questions and learn more about the monitoring program from technical environmental people.

10.3 How will monitoring benefit my community

Monitoring environmental changes can give a community the information it needs to effectively participate in local regional decision making processes related to environmental management. It can also provide the data ("proof") that many western thinkers need before they change existing policies or practices. Monitoring can also help a community understand the implications their decisions have on the existing and future generations. By increasing community involvement in monitoring programs (i.e. developing community based monitoring-CBM) it allows for the complex aspects of social, economic and environmental considerations to be addressed in decision making.

10.4 Issues and Challenges

Many communities are interested in monitoring the environment for a variety of reasons. Understanding the way an industrial activity affects the water, air, wildlife, vegetation and other cultural resources is very important to First Nations people and necessary information that will help them make informed decisions. Through participation in monitoring programs, communities can influence what gets monitored, where monitoring programs should focus and how programs should be designed and implemented.

In many parts of Alberta, it is common for industry, government or consultants to invite community members out into the field with them while an environmental specialist collects samples. While this is one way a community can become somewhat involved in a monitoring program, that participation is less meaningful that it should be. Even though many communities recognize this, they often struggle to identify the means to become effective participants in monitoring programs.

Internal capacity

A common roadblock identified by communities is that they lack the necessary skills and training to carry out monitoring. This may be true when communities consider participation in monitoring programs based on Western Science techniques and methodologies. The field component of many environmental monitoring programs requires some technical ability, but these skills can usually be learned through training and practical hands-on experience. Organizations like TSAG and several government programs

have focused on training in the past, but these programs are often short (2 or 3 days) and do not provide for guidance once these skill need to be applied.

An often over-looked skill set inherent to First Nations is the local and Traditional Ecological Knowledge (TEK) held within Aboriginal communities. This body of knowledge is extremely valuable in ensuring monitoring programs are designed to address environmental issues and values from a First Nations perspective. Through generations of living with the land, many First Nations have a holistic understanding of ecological systems and practical experience in reading and understanding the signs of ecological change. It can be difficult for the younger generations to make a connection between their Elders traditional teachings and western science concepts. While training in TEK can only come from inside the community; Aboriginal communities may benefit from initiatives that help them become more aware of what other First Nations are doing to integrate TEK and monitoring.

TEK and Western Science

Government and industry are beginning to recognize the value of this Traditional Ecological Knowledge, but look to First Nations for methods to incorporate TEK in a meaningful way. There are communities in Alberta and other parts of Canada and the world working at building environmental monitoring programs based on TEK and other forms of local knowledge. These programs (often referred to as "Community Based Monitoring Programs") demonstrate that by involving community members in a meaningful way, monitoring programs can address issues related to traditional and cultural resources, traditional ways of life, build relationships with regional stakeholders (government, industry, environmental organizations), alleviate feelings of exclusion and distrust and ensure environmental management decisions are sustainable.

Equipment

Some types of monitoring require delicate monitoring equipment that can be both expensive and difficult to maintain (for example air quality monitoring stations). If a community is unable to invest in these high tech monitoring approaches, there are other ways that a community can become involved in environmental monitoring programs. There are many opportunities for youth and other members of the community to become involved, for example in the sampling, interviewing or information gathering process.

10.5 How can I learn more?

Canadian Community Monitoring Network (CCMN)
<http://www.ccmn.ca/english/intro.html>

Improving Local Decision Making through Community Based Monitoring:
Toward a Canadian Community Monitoring Network
<http://www.ccmn.ca/english/library/ccmn.pdf>

Organizing Community Based Ecosystem Monitoring In Canada
<http://www.ccmn.ca/english/library/whitelaw/intro.html>, by Graham S. Whitelaw

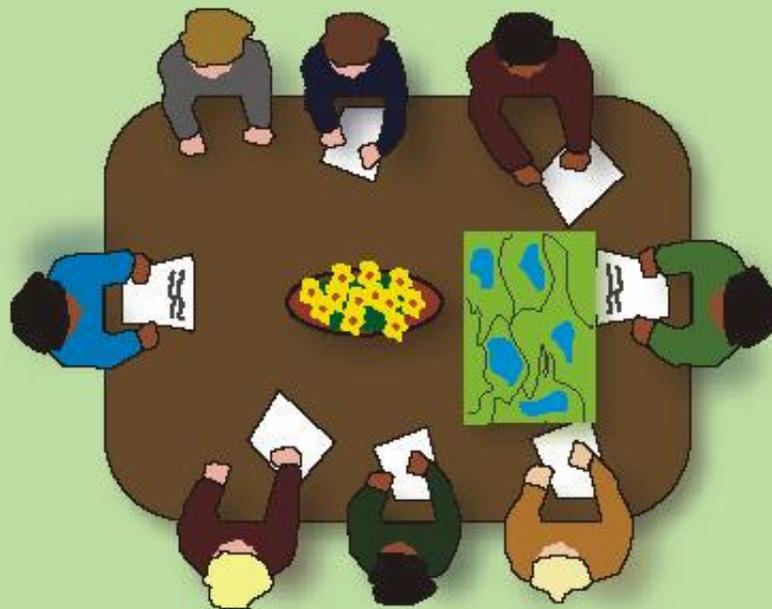
Linking Community Based Ecosystem Monitoring to Local Decision Making
and Policy Development on Sustainability: Voluntary Sector Initiative (VSI)
Project. <http://www.ccmn.ca/english/library/vsi/intro.html>

Canadian Community Monitoring Network Bridge Funding Opportunities:
Regional, Provincial & National Sources
http://www.ccmn.ca/english/library/bridge_funding/bridge_funding_summ.html
Prepared by Rebecca M. Pollock

Ecological Monitoring and Assessment Network (EMAN) Recommended
Monitoring Protocols <http://www.eman-rese.ca/eman/>

Naturewatch: www.naturewatch.ca

Integrated Resource Planning and Management



11.0 INTEGRATED RESOURCE MANAGEMENT

Aboriginal people have long understood that the natural environment is complex and “everything is connected”. Decisions we make about using one resource affects something else. The extraordinary rate of industrial activity in Alberta is increasing the occurrence of overlapping and/or conflicting land use. For example, oil and gas companies are cutting down the trees the forestry company wanted to harvest. Forest companies are changing the habitat for the wildlife species that the hunter wanted to harvest to feed his family. Industrial resource users and their governing agencies now realize that today’s level of resource use requires an increased level of coordination if development is going to be sustainable.

In order for the government to meet its’ mandate of ensuring sustainable resource development; and obligations to protect Aboriginal and treaty rights, it has become necessary for regulatory bodies to work together with First Nations, industry and other interested stakeholders (ENGOs) to find innovative and cooperative approaches to managing regional resources. The concept of “Integrated Resource Management” has been proposed as a solution to land use conflicts.

11.1 What is Integrated Resource Management?

Integrated Resource Management (IRM) is the coordination of resource use such that it will have the smallest and softest human footprint on the landscape, while creating economic efficiencies and cost savings to industry partners and other proponents of development. It is based on the premise that activities are interrelated and recognizes that to maintain functioning ecosystems, coordination at the landscape level is required. Source: AENV. A guide to Integrated Resource Management Terminology http://www3.gov.ab.ca/env/irm/irm_toolkit.htm.

Integrated Resource Management: The management of two or more resources in the same general area and period of time involving a process of setting planning and management goals, objectives, strategies and policies in a cooperative framework among all resource users (Dunster and Dunster 1996)

Integrated Resource Management recognizes that land can be used for multiple purposes, and that tradeoffs or choices must be made with respect to economic, social and environmental benefits. The main elements of an Integrated Resource Planning and Management approach include:

- Multi-resource user consideration and coordination at the regulatory level.
- Multistakeholder processes involving various levels of government, Aboriginal people, industrial sectors and other interested stakeholders (ENGOS and concerned citizens) in the planning stage.
- An ecosystem approach,
- Including TEK and science to make decisions

11.1.1 Ecosystem Approach

First Nations in Alberta face many complex resource management problems. Some of these issues, such as water and sewer treatment or forest fire management happen on-Reserve; many other issues of concern to First Nations are on traditional lands that are off Reserve. Although there is a tendency to focus on the jurisdictional (government defined) boundaries, the most sustainable resource management decisions are those that also take into consideration natural ecosystem boundaries such as a watershed, terrestrial ecozones, or valued wildlife habitat. The traditional territories of First Nations may also be considered a natural ecosystem boundary because of the knowledge and connection they have had to environments and resources.

The ecosystem approach is often described as consistent with many First Nations perspectives on the environment, in that it is holistic and integrated. An ecosystem approach to resource management decision-making would not only take into consideration the effects of a project in a specific area or on a particular resource but would also ask questions such as - How will this resource development activity affect the ecosystem as whole?

Taking an ecosystem approach ensures that all aspects of a resource management problem are addressed, not just those that fall under the jurisdiction of one government department or another. However, this kind of approach can be complicated and time consuming. If for example, there is concern about the downstream effects of an oil and gas project on the traditional lands and Reserve lands, a First Nation may have to ask questions of:

- the oil and gas company;
- the Energy and Utilities Board who issue the permits;
- the Alberta Government Department of Sustainable Resource Development who have jurisdiction over the downstream effects on provincial lands; and,

- the Department of Indian and Northern Affairs who have responsibility for Reserve lands.

There are many different definitions and resources available for First Nations seeking to develop an ecosystem approach to environmental management in their communities. Sources of information on IRM are listed in 9.2

11.1.2 Multi-resource user consideration

Industrial activity and natural resource harvesting activities vary in the type and scale of impact they have on the environment. In Alberta, the provincial government often allocates multiple resources (through surface and subsurface leases) to a range of users on the same land base, while at the same time regulating these uses separately (MacKendrick, et al 2001). For example, oil and gas companies make project applications to the Alberta Energy and Utility Board (AEUB) and forest companies submit Forest Management Plans the Alberta Sustainable Resource Development (ASRD). The AEUB may grant a petroleum company the rights to develop a gas well in an area, even though the ASRD had given the rights to the trees in that same area to a forest company. Having both these activities in the same area can cause resource use conflicts, increase cumulative environmental effects and ultimately affect Aboriginal treaty rights.

Cumulative Environmental Effects: the combined environmental effects that several resource use activities have when they occur in the same general area at the same time.

It is now acknowledged that the decisions one governing agency makes, affects the ability of another agency to make an informed decision. In 1999, the Alberta government committed to sustainable resource development was formalized with its policy "Alberta's Commitment to Sustainable Resource and Environmental Management". Through various Integrated Resource Management initiatives, provincial government agencies are trying to work together to guide industrial applicants through a coordinated process intended to reduce the overall impact of industrial activity, and incorporate a range of ecological, social and economic values into the approvals process.

Working Together – A Co-management Arrangement from Little Red River Cree Nation (LRRCN) and Tallcree First Nation

The traditional territory of the Little Red River Cree Nation and Tallcree First Nation is located in the northern boreal forest of north-western Alberta. Large scale Forestry operations have had a significant impact on sustainability of this region, as well as, the well-being of their communities.

Over the last decade, the First Nations have been working to regain control over their traditional territory. They want to protect the environment, create long-term employment, preserve important cultural sites, and become economically self-sufficient by developing a sustainable forest-based economy. In 1995, the two First Nations signed a Cooperative Management Agreement (CMA) with High Level Forest Products, a private company, and the provincial and federal governments.

The co-management arrangement is a sharing of power over forest management among the First Nations, government and industry. Presently, LRRCN and Tall Cree have lands designated as a Forest Management Area (FMA) which allows them tenure over coniferous timber within three forest areas, and control of deciduous stands. This allows LRRCN and Tall Cree to control the pace of forest development to protect the environment and ensure that cultural sites are preserved. LRRCN and Tall Cree First Nation representatives sit as the majority on the Forest Management Planning Board that is responsible for developing guidelines for the use of forest resources in the area. The Board is currently developing a Forest Management Plan based on the principles of sustainable development and traditional land use practices. The LRRCN/Tall Cree CMA recognizes the First Nations' tenure over coniferous timber within certain forest areas in the region.

This large project requires the cooperation and involvement of Elders, and provides a practical model for First Nation involvement in sustainable forest management elsewhere in Canada. Preliminary results demonstrate that cooperative management is working. The First Nations have regained a degree of control over their traditional lands; the extensive inventory of traditional and scientific knowledge that has been gathered will assist in future plans for sustainable development; jobs and training have been created for First Nations; and First Nations have formed new, productive partnerships with public and private sector groups.

Adapted from Indian and Northern Affairs Canada - Little Red River Cree Nation - Tall Cree First Nation Co-Management Agreement: *Working Towards Self-Sufficiency*
http://www.ainc-inac.gc.ca/pr/pub/ep/envir3_e.html

11.1.3 Multi-stakeholder processes

The involvement of various groups in the planning and policy development stage for natural resource developments is the most important aspect of Integrated Resource Management. IRM is based on (AENV 1999):

- Cooperation
- Communication
- Coordination
- Consideration of all values, and
- Consultation before action.

This process is most effective if representatives from government, First Nations, industry and other interested stakeholders participate in the process. Stakeholders must work together to set and prioritize goals for managing regional resources in a way that can meet the needs of all users. It should be noted, however that First Nations are different than other stakeholders. Their right to harvest natural resources is protected under the Canadian constitution.

Stakeholder: An individual, organization, or group that is directly affected by a development project or a policy decision.

First Nations have a significant role in Integrated Resource Management initiatives. They bring a unique perspective to the planning table based on generations of living close to the land. Their understanding of ecosystems (Mother Earth) and views on sustainability and conservation provide a valuable contribution in helping the government, industry and environmental managers:

- Understand Aboriginal values as they relate to the environment and the role natural resources play in the daily life, culture and spiritual well being of a community;
- Develop a vision, set goals and identify the needs of First Nation communities as they relate to Treaty Rights;
- Appraise the current state of the environment in a region in terms of existing impacts and long term sustainability of multi-resource harvesting activities;
- Identify issues and areas of concern that need to be addressed. They can help prioritize these issues;

- Help to analyze the environmental, economic and social implications of resource management initiatives; and,
- Make policy recommendations.

Recognizing indigenous peoples' harmonious relationship with nature, indigenous sustainable development models, development strategies, and cultural values must be respected as distinct and vital sources of knowledge." (The Kari-Oca Declaration and Indigenous Peoples' Earth Charter:

<http://www.dialoguebetweenations.com/IR/english/KariOcaKimberley/KOCharter.html>). By participating in Integrated Resource Planning and Management processes, First Nations can influence the way development occurs in their traditional territories and ensure that social, cultural and economic factors along with environmental protection and enhancement are considered from a First Nations perspective.

Industry Relations Corporations (IRCs) in the Oilsands Region

With an unprecedented rate of industrial development in NE Alberta has come an increased occurrence of overlapping and/or conflicting land use. In order for the government to meet its' mandate of ensuring sustainable resource development; and obligations to protect Aboriginal and treaty rights, it has become necessary for regulatory bodies to work together with First Nations, industry and other interested stakeholders (ENGOS) to find innovative and cooperative approaches to managing regional resources.

In 1999 a Regional Sustainable Development Strategy was drafted for the Athabasca Oil Sands Region. This documents calls for regional stakeholders to work together to set and prioritize goals for managing regional resources in a way that can meet the needs of all users. Since then, representatives from government, industry, First Nations and environmental organizations have formed a series of multi-stakeholder task groups to scope, design and implement regional research projects, monitoring programs, and policy related to resource management and development planning. For example:

- CEMA (Cumulative Effects Monitoring Association): www.cemaonline.ca ,
- TEEM (Terrestrial Environmental Effects Monitoring Program): <http://www.wbea.org/html/land/landmont.html>
- RAMP (Regional Aquatics Monitoring Program): <http://www.ramp-alberta.org/>, and
- And a host of others that are listed on the CEMA web site.

The Athabasca Chipewyan First Nation, Mikisew Cree First Nation, Fort McKay First Nation, Fort McMurray First Nation and the Chipewyan Prairie First Nation have all formed "Industry Relation Corporations" (IRCs) as the primary means of participating in these initiatives and other regional development approval processes (such as EIAs and permit applications).

IRCs have been formed as individual First Nation corporations that act as the first point of contact for oil sand companies, forestry managers, conventional oil and gas producers, municipalities, and provincial government agencies and other industrial users that are proposing development projects within the traditional territories of these five First Nations. IRCs have taken on the responsibility to:

- Represent their community on regional committees and build community relationships with industry and government;
- Act as a liaison to facilitate information sharing and consultation efforts between industry/government, and the community;
- Provide community input/perspective on development proposals and permit applications;
- Negotiate environmental and social benefit agreements with industry; and,
- Coordinate trapper compensation settlements.

As representatives of their communities, IRCs report to Chief and Council; and in some cases, an Elders Council or Trappers council. However, an important aspect of IRCs is that they are a-political. IRCs typically hire a director and a couple of lead people that take responsibility for Environmental Issues, Social Issues and Economic development. The salaries of IRC staff are paid by industry and government. The funding formula that determines how much each of these groups contributes towards an IRC is based on a number of factors such as how close a community is to a development, the stage each company's project is in, how big it's going to be, etc. Not all IRCs are funded equally.

11.1.4 TEK and Western knowledge

Integrated management not only means taking into consideration the ecosystem and the interconnections between activities and people, but also the interconnections between cultures and knowledge systems.

In many decision-making processes, there is a tendency to rely only on scientific information that might be made available from government or other organizations; however, this kind of information may be limited. By incorporating local and traditional knowledge leaders can become “strong like two people”, as described by a Dene elder, and ensure their decisions reflect the best knowledge available.

As the holders of significant local and traditional knowledge about ecosystems and specific resource management issues, First Nations in Alberta have particularly important role and responsibility with respect to integrated management. Due to the short term nature of many federal and provincial resource management programs, First Nations historical understanding of the land and how it has changed over time is particularly important in integrated management. It provides leaders and others with a ‘big picture’ view that is critical in making good resource management decisions.

11.2 How can I find out more?

Government of Alberta: <http://www3.gov.ab.ca/env/irm/index.html>

Alberta Government. 1999. Alberta’s Commitment to Sustainable Resource and Environmental Management
<http://www3.gov.ab.ca/srd/info/sustainable.pdf>

Sustainable Forest Management Network: Publications about Integrated Resource Management: http://sfm-1.biology.ualberta.ca/english/pubs/en_pubsirm.htm

Secwepemc (Shuswap) Interests in Land Use and Resources Management:
<http://www.secwepemc.org/sntc2.html>

The Aboriginal Mapping Network: Enhancing Tribal Integrated Resource Management Plans by Integrating Traditional Knowledge with Geographic Information System Technology
<http://www.nativemaps.org/abstracts/resource.html>

Saskatchewan First Nation Integrated Resource Management Program
<http://www.gov.sk.ca/newsrel/releases/1996/07/16-356.html>

Innovation Alberta; Ideas on Integrated Resource Management
<http://www.innovationalberta.com/theme.php?themeid=1>

MacKendrick, N., Fluet, C., Davidson D., Krogman, N. and M. Ross. 2001.
Integrated Resource Management in Alberta's Boreal Forest: Opportunities
and Constraints. Prepared for the Sustainable Forest Management Network
2001 - 22.

12.0 SUMMARY OF ISSUES AND CHALLENGES

The following section summarizes the issues and challenges that were identified during the project consultation process. Specific issues and challenges have been organized to refer to the specific environmental management tools found elsewhere in the guide.

Several cross cutting themes have been identified. These include:

- Defining the role for First Nation communities in environmental management
- Internal capacity (personnel, time, money and equipment)
- Environmental training resources
- Integration of TEK and Western Science

Defining Roles

First Nations and Government have expressed the need to have clearly defined policies outlining roles and responsibilities related to environmental management on both reserve lands and within traditional territories.

Building capacity

The need to build capacity at the community level not only includes the core technical and administrative skills of staff, but also ensuring the appropriate number of people are employed so they can effectively do their jobs. Too often band staffs are tasked with “wearing too many hats”. Associated with this capacity is the need for appropriate fiscal resources that can enable administrators to hire the appropriate number of people, and provide them with the necessary tools to conduct their work (salaries, computers, desks, office space, operating budgets etc.).

Environmental Training

More and more communities feel they need to understand and adapt to western science methods of addressing development and environmental management. In order to participate effectively, communities need to be able to speak the same language as government and industry. Training is consistently identified as a necessary tool to bridge gaps between First Nation and western approaches to land use management.

Integration of Western Science and TEK.

Many communities continue to struggle to find effective ways of ensuring local and traditional knowledge are appropriately considered at the policy, planning, implementation and monitoring stages of resource development and conservation.

Local and Traditional Ecological Knowledge are increasingly recognized as being credible and reliable information, that can enhance, complement and validate western science research and monitoring.

12.1 Engaging the Community

Setting Expectations

It is very important that community engagement programs are clear in describing what the Nation is asking from its members, and what the Nation is going to do with this information. If the Nation is only interested in informing the membership about a proposed resource management initiative, but undertake a process of “consultation”, community members may end up frustrated that their ideas were not actively considered in the final resource plan.

For these reasons, it is important that programs wanting input from individuals in the community develop a plan for how to get this input early in the planning process.

Variety of interest groups

It is important to make sure that a variety of stakeholders groups within the Nation participate in the engagement program and that small but vocal special interests groups do not manipulate the process. To help avoid this problem, the Nation should actively seek out the participation of a variety of groups.

These interest groups may have a wide range of capacity (literacy levels, familiarity with environmental issues, understanding of regulatory processes etc.) to effectively participate in the process. For example, it can be difficult for an elder to become fully engaged in discussions related to “acidification effects on the terrestrial environment through cat ion transfers” when the concept is new and perceived as extremely foreign and technical. For these reasons, adequately describing the issues at hand and providing adequate background information to participants before asking for their input is an extremely important step.

Resources

It is important that the Nation does not announce a complex and far-reaching engagement process, if it does not have the resource to implement the program. By not being able to implement the program they have publicly announced, the Nation may lose trust among its membership and appear to be uncommitted to real engagement.

Feedback

If community members spend the time and energy to share their ideas on environmental management issues, it is important that the Nation reflect back to them how their ideas were incorporated (or not) into the final plan. If the membership does not feel as though they have been listened to, then they will be less likely to accept the environmental management decision and less likely to participate in future engagement programs.

12.2 Local and Traditional Ecological Knowledge (TEK)

Information for Environmental Management Systems

Those interested in incorporating TEK into environmental management decisions may consider it at many different levels. At a very basic level, TEK can be considered simply as data and information that can be documented and included in a variety of environmental management contexts such as land use planning and environmental assessment. To many First Nations, TEK is more than just data, it is a system of values, beliefs and practices distinct from conventional environmental management. For example, forestry companies may ask communities to create data points on maps to represent cultural sites that should be avoided during clear cutting. In most cases, the value of these sites is much greater than can be described on a map through data points. It may not be possible to separate a cultural site from the surrounding ecological attributes of the area (a healthy river, a diversity of wildlife or habitats, sacred or traditionally significant vegetation or a series of trails), that may be affected by forest industry activities. Despite this challenge, there is no doubt that the traditional holistic views of ecosystems are crucial to sustainable integrated resource management. First Nations, governments, academics and industry continue to discover effective ways to integrate TEK into environmental management.

Loss of Traditional Knowledge

There is growing concern about the loss of traditional knowledge in many parts of the world including Alberta, Canada. The past five hundred years of western development, has significantly eroded the social, cultural and ecological well-being of many communities. As elders' who lived their life on

the land have passed away, and fewer community members are engaged in hunting, trapping, and gathering activities, there is growing concern about the future of TEK. As a result, communities are anxious to document and preserve many aspects of their traditional way of life as a legacy for future generations. For other communities, traditional knowledge is not being lost. They do not perceive it as tied to historical practices, but as a process of living and adapting to new opportunities and changed environments. For these communities, the fact that fewer people are trapping, hunting and gathering does not mean that their TEK is deteriorated; it means it is evolving.

Intellectual Property Rights

Intellectual property rights and traditional knowledge has been an issue of concern in many parts of the world. Organizations such as the World Indigenous Peoples Organization (WIPO) and the Assembly of First Nations have developed policies and principles on how to respect and protect TEK particularly as it relates to medicinal plants, valued cultural landscapes or heritage sites. Individual First Nations and communities in Canada, such as the Gwich'in Social and Cultural Institute, have also developed specific policies and processes which may be a model for other communities in Alberta seeking to protect and respect their knowledge for future generations.

12.3 Environmental Baseline Information

Centralized provincial data.

Several years ago, the provincial government privatized data. As a result, there is not a single source of data in the province. Several private companies (for example QC data or Evergreen Consultants) act as repositories for digital spatial data. This data must be purchased and it can be quite costly.

Industries (such as forest companies or oil and gas exploration companies) also have very current, comprehensive data sets. For example; Alberta Pacific Forest Industries Inc. has the most current AVI data for NE Alberta. Similarly, the Alberta Oil Sands Environmental Research Project (AOSERP) was responsible for compiling soils information for the region and is considered the standard data set for environmental investigations in NE Alberta. However; industry collects this data for specific reasons. Some information (such as the locations of seismic programs) is considered proprietary and may not be made publicly available for up to 2 years. Depending on the relationship between Bands and a particular company, arrangements may be made to share data, but more often, it must be purchased.

In the last couple of years, provincially funded initiatives are using private consultants, universities and other organizations (such as Alberta Research Council) to improve digital environmental data sets. Examples include the Alberta Biodiversity Monitoring Program and "AIM" – Alberta Integrated Management Program. In addition to this, the Resource Data Division of ASRD has been allocating time and resources to centralize provincial data sets.

Because of there are so many sources of data in the province; and different areas of the province have different kinds and amounts of information, First Nation communities may find it useful to hire an experienced person that can give them direction on the best approach to compiling data for their area of interest.

Format and scale

Federal and provincial inventory programs may not produce data that is of a scale/resolution that is useful for local decision making. For example; the Alberta Biodiversity Monitoring program is collecting data on a township scale; that is, one sampling location per township. While this information will be excellent for strategic level planning at a provincial scale, this single data point will not provide environmental planners with enough information on biodiversity to determine local effects on biodiversity for a project that may have a footprint impacting several sections of land. In many cases, industry or environmental consultants that have done studies on behalf of industry are the best sources for high resolution data that is useful at a local level.

Some First Nations are considering setting standards by which biophysical information about their Reserve must be collected. They are also creating policies requiring Industry and other proponents of development to collect environmental information in these standard formats and then provide digital copies of this information to the Band.

Keeping data current

As development and human populations increase, so too does their footprint on the environment. Natural events, such as fires, landslides or flood events can also change the structure and function of ecosystems. Keeping track of changes on the landscape and keeping maps and databases current is a time-consuming, never ending task. It usually requires skilled personal, familiar with both the information stored in a communities information management system (Section 6.0), but also the technology used (computers and software programs) to develop and store the information. Finding appropriate people to undertake this task, along with securing sufficient Band resources (in terms of money, time and people) is a common

challenge. Building relationships with industry can be an effective way to keep data up to date for a Nations area of interest.

12.4 Information Management Systems

Finding a system that works for your community

There are many different kinds of technologies and information management systems available from government, universities and from within the community. With so many options, often the biggest challenge a community faces is in identifying a system that meets the needs of the community. Being realistic in considering what a community wants an information system to do; how various people in the community want to access the information; and, how much money and time a community can invest in setting up and maintaining a system is very important.

While state of the art GIS and other digitally based systems are powerful tools, they also require computer systems, and software applications that require a significant investment in terms of money (they are expensive) and people. People intending to operate and maintain GIS systems require specialized training and need to stay committed to ensuring their training; and the GIS system itself, is up-to-date. Without this commitment, it will be very difficult to add new information into the system, especially if the information is generated outside of the community.

In some cases, a simpler information management system may be more accessible and user friendly; but still meet the needs of the community. For example; a community may not be interested (at this point in time) in building their own maps, or altering them for different purposes, but still want to have access to maps that summarize land use information. For these communities a centralized map library with a master list of what maps are available may be a much more appropriate information management system than a GIS system that only one person can access.

Many First Nations in Alberta want to have their own internal mapping and GIS capabilities to store and organize large amounts of information; however, very few do. Those that do have GIS systems and similar technology have found them underutilized or difficult to keep current. Some communities have capabilities to build maps, but can't print them. In many cases this deficiency is tied to a lack of training (creating an inability to effectively undertake this task) and a lack of funds to set these systems up. Technical support from a regional organization (i.e. TSAG) would be useful for helping communities identify appropriate systems for their communities

and in helping communities understand the steps that are needed to establish and then later maintain various types of information systems.

12.5 Environmental Assessment

Internal capacity

Environmental Assessment tools are extremely useful in helping a community feel confident that the decisions they are making related to environmental management are sustainable. However, these processes can also be somewhat complex. This manual introduces a range of Environmental Assessment tools:

- Environmental Assessment (EA)
 - Environmental Screenings
 - Comprehensive Studies
 - Mediation and Panel Reviews
 - Model Class Screenings
- Environmental Site Assessment (ESA)
- Audits
- Follow-up Environmental Impact Assessment (FEIA)

Each of these processes is governed by various forms of legislation originating from more than one government agency. To effectively conduct an EA that meets regulatory requirements, the people carrying out the assessment need to have a range of skills and backgrounds (regulatory, scientific, economic and socio-cultural).

While there are several First Nation communities in Alberta creating environmental companies on Reserve; and exploring opportunities to build a team of environmental technicians, this is not the norm. Land Administration staff of two or three are often responsible for the entire suite of environmental services. It can be very difficult for a Band Administration to invest money and human resource power to build effective environmental capacity.

Training

Past training programs offered by federal government agencies have provided some level of information in the community, but most of the individuals that were involved in this project felt that short training programs (under 3 days) were inadequate to equip band staff with the skills to carry out assessments independently. Longer training programs; that include

practical experience in carrying out these processes, would be more effective.

To undertake some of the tasks associated with an EA requires a level of skill that is not usually achieved through short training courses. Community members are often forced to leave the Reserve and move to a larger center to obtain more advanced accreditation. The fiscal complexities many First Nation students face when living away from their communities prohibit them from completing post secondary programs.

Equipment

Many of the environmental studies that are carried out for environmental Assessment (All types of EIAs, ESAs, Audits and FEIAs) require various types of technical equipment (for example; powerful computers and software capabilities, specialized sampling and or monitoring equipment etc.). This requires a significant investment that may not be possible for a community.

FEIA Issues and Challenges

Conducting an FEIA is a challenging task, because it is necessary to recreate the environmental and social characteristics of a region previous to the implementation of a project, which, in many occasions, has been operating for many years. Recreating that baseline information often is difficult because the necessary information may not be available or data could have been gathered using different methods, making it difficult to compare and draw a complete picture. Another challenge is to determine what effects were actually caused by a project, what effects were the cumulative results of different projects undertaken in a region, and what effects are simply caused by natural events. Sometimes it is possible to determine the sources of the environmental effects by using models, observation, and monitoring in order to conduct an FEIA.

12.6 Land Use Planning

Finding a common vision

Because various community interests are involved in the strategic planning process, achieving consensus among competing interests is a major challenge in the land use planning process. Compromise is required to develop a shared, long-term vision. This can become even more complicated when dealing with stakeholders from outside a community.

Planning tables may benefit by including representatives from the business sector; environmental and recreational groups; other interest groups; provincial government resource agencies; municipal and local governments.

If there is an approved regional land use plan, any sub-regional or community based land use plan should conform to its guiding principals.

The key challenge facing a land use planning process is to spend the time up front ensuring that what is created is useful, relevant, and sensitive to the stakeholders involved in creating and using it. Many land use plans exist provincially that have not been implemented or utilized and are collecting dust.

Political issues surround the formal “zoning” of common land where history, families, or internal conflict hinder this process. In order to be successful, the scope and scale of the planning process needs to be appropriate for the community. It is best to create the land use plan in phases that allow for stakeholder understanding and support to grow as the process continues.

Lack of participation

Some communities may find it difficult to convince certain groups (elders, traditionalists, political activists etc.) within the community to participate in the planning process at all. Reasons may range from lack of capacity to participate, to fundamental concerns about the process itself. Despite this challenge, efforts should be made to engage all interests in order to build the best plan possible.

First Nations involved in treaty negotiations may find it difficult to be involved in a land use planning process. This could be related to the fact that significant community resources (in terms of time, money and man-power) are tied up in this process. The other fear is that their involvement could affect these negotiations; although this is generally considered unlikely.

Implementation and Enforcement

The value of a Land Use Plan is lost if it does not play a central role in the decision making process. This means that community leaders must be aware of and support the land use plan itself. Leaders must refer to the plan before granting approvals to local businesses seeking approval and/or funding.

A plan is just a plan if there is no way to enforce the concepts and initiatives within it. For this reason, having bylaws included as part of a land use plan is very important. Bylaws provide the means for informed band administrators to control and ensure appropriate use of land and resources once a development has occurred.

Keeping it current

After a Land Use Plan is adopted it should be reviewed every three to five years to remain current, assess its effectiveness, determine shortcomings, and develop amendments where and when necessary. Plans may be revised because of a new community need, major new environmental or social issue, a policy requirement, or a new land use proposal. Ensuring the capacity and interest for completing this assessment must be championed at the band management level, regardless of changes in local governments and band administrations.

12.7 Environmental Monitoring

Monitoring Issues and Challenges

Many communities are interested in monitoring the environment for a variety of reasons. Understanding the way an industrial activity affects the water, air, wildlife, vegetation and other cultural resources is very important to First Nations people and necessary information that will help them make informed decisions. Through participation in monitoring programs, communities can influence what gets monitored, where monitoring programs should focus and how programs should be designed and implemented.

In many parts of Alberta, it is common for industry, government or consultants to invite community members out into the field with them while an environmental specialist collects samples. While this is one way a community can become somewhat involved in a monitoring program, that participation is less meaningful that it should be. Even though many communities recognize this, they often struggle to identify the means to become effective participants in monitoring programs.

Internal capacity

A common roadblock identified by communities is that they lack the necessary skills and training to carry out monitoring. This may be true when communities consider participation in monitoring programs based on Western Science techniques and methodologies. The field component of many environmental monitoring programs requires some technical ability, but these skills can usually be learned through training and practical hands-on experience. Organizations like TSAG and several government programs have focused on training in the past, but these programs are often short (2 or 3 days) and do not provide for guidance once these skill need to be applied.

TEK and Western Science

An often over-looked skill set inherent to First Nations is the local and Traditional Ecological Knowledge (TEK) held within Aboriginal communities. This body of knowledge is extremely valuable in ensuring monitoring programs are designed to address environmental issues and values from a First Nations perspective. Through generations of living with the land, many First Nations have a holistic understanding of ecological systems and practical experience in reading and understanding the signs of ecological change. It can be difficult for the younger generations to make a connection between their Elders traditional teachings and western science concepts. While training in TEK can only come from inside the community; Aboriginal communities may benefit from initiatives that help them become more aware of what other First Nations are doing to integrate TEK and monitoring.

Government and industry are beginning to recognize the value of this Traditional Ecological Knowledge, but look to First Nations for methods to incorporate TEK in a meaningful way. There are communities in Alberta and other parts of Canada and the world working at building environmental monitoring programs based on TEK and other forms of local knowledge. These programs (often referred to as "Community Based Monitoring Programs") demonstrate that by involving community members in a meaningful way, monitoring programs can address issues related to traditional and cultural resources, traditional ways of life, build relationships with regional stakeholders (government, industry, environmental organizations), alleviate feelings of exclusion and distrust and ensure resource management decisions are sustainable.

Equipment

Some types of monitoring require delicate monitoring equipment that can be both expensive and difficult to maintain (for example air quality monitoring stations). If a community is unable to invest in these high tech monitoring approaches, there are other ways that a community can become involved in environmental monitoring programs. There are many opportunities for youth and other members of the community to become involved, for example in the sampling, interviewing or information gathering process.