

ONTARIO ENERGY BOARD

**ENVIRONMENTAL GUIDELINES FOR THE
LOCATION, CONSTRUCTION
AND OPERATION OF
HYDROCARBON PIPELINES AND FACILITIES
IN ONTARIO**

6th Edition
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Chapter 1: INTRODUCTION

1.1 OVERVIEW

This is the sixth edition of the Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (the “Guidelines”). The previous edition is dated May 2003. The new edition represents the continuing effort of the Ontario Energy Board (the “Board”) to update the planning and information requirements for new hydrocarbon projects, which come before it for approval.

The Guidelines are designed to provide direction to the applicant in the preparation of a project's Environmental Report (the “ER”). The term “environment” in the Guidelines is defined to include natural, social, economic, cultural and built components. The Guidelines are not statutory regulations nor are they a rule or a code issued under the Board’s authority. Nonetheless, the Guidelines represent current knowledge and practice concerning matters that should be considered when making an application for Board approval of hydrocarbon facilities development in Ontario.

The Guidelines inform any party making an application to the Board, how to identify, manage and document environmental impacts. The Guidelines are organized in six Chapters: 1. Introduction; 2. General Planning Principles; 3. Public Consultation; 4. Route and Site Selection; 5. Impact Mitigation; and 6. Implementation and Monitoring.

The background to the Guidelines, the jurisdictional setting, the review process and the projects to which the Guidelines apply and exemptions are set out in Chapter 1. This includes a description of the Ontario Pipeline Coordinating Committee (the “OPCC”), which is comprised of government agencies, that have a role in the review of gas transmission and distribution facilities projects. The stages in the development of an ER are also outlined.

Chapter 2 outlines general planning principles and procedures. It describes the steps to be followed in determining a route or site location for a new facility. This chapter stresses the need for technically sound and consistently applied planning procedures, which are transparent and can be readily understood by all parties. The ER is expected to contain a clear description of the planning process and its results.

Public consultation is addressed in Chapter 3. It emphasizes the importance of identifying those who may be affected by a project and informing them both about the project and how to become involved in the planning process. The types of information that should be conveyed and various options for obtaining public input are discussed. This includes a minimum requirement for a

public consultation program as part of the ER. The total number and type of consultation activities should be determined on a project-by-project basis. In addition, Chapter 3 describes how affected parties can intervene at the Board's hearing and apply for cost recovery. Chapter 4 describes the route and site selection process. Mapping requirements are detailed. Methods of evaluating alternatives are outlined. The types of impacts to be assessed in evaluating alternatives are described. This chapter emphasizes the need to assess all types of environmental impacts (e.g. natural, built, cultural, social, economic) including their cumulative impact.

Impact mitigation is the subject of Chapter 5. It describes mitigation measures to be applied for the reduction and management of construction impacts on the environment. This chapter calls for site specific plans and larger scale mapping for environmentally sensitive areas. It also provides the details to be included in the construction schedule and addresses safety considerations, including contingency plans in the event of accidental spills.

Chapter 6 deals with implementation and monitoring. It refers to the inspection required during construction, to ensure compliance with the commitments made to the Board by the applicant. It makes provision for reporting any changes that are required to construction activities. Chapter 6 calls for monitoring reports to assure the implementation of the applicant's restoration and mitigation efforts. Chapter 6 specifies the content of monitoring reports, including a log of comments from affected landowners during and after construction.

All the references to specific legal and regulatory requirements are current, as of the date issuing of this edition of the Guidelines. As changes to legal and regulatory requirements occur, it is the applicant's responsibility to follow the legal and regulatory requirements in effect at the time the Environmental Report is prepared.

Those who sponsor projects to construct hydrocarbon facilities in the Province of Ontario, and their agents, are expected to comply with these Guidelines as a requisite for the necessary regulatory approvals to undertake such construction. In cases where an applicant considers that strict adherence to the Guidelines will not be practical or in the public interest, the applicant should establish this to the satisfaction of the Board. Any order or directive of the Board takes precedence in the event that the Guidelines conflict or appear to be incompatible with the order.

1.2 APPLICATIONS SUBJECT TO THE GUIDELINES

The Ontario Energy Board is an independent, quasi-judicial tribunal, regulated by the *Ontario Energy Board Act, S.O.1998 c.15 Sch B*, (the “Act”). Under the Act, the Board holds numerous gas and electricity related regulatory responsibilities.

With respect to natural gas, the Board approves natural gas rates, issues gas marketer licenses, approves pipeline construction, approves designation of gas storage facilities, reviews applications for well drilling and provides recommendations to the Minister of Natural Resources. Furthermore, the Board approves municipal franchise agreements and applications for certificates of public convenience and necessity for construction of works to supply gas. The Board also advises the Minister of Energy and Infrastructure and the Minister of Natural Resources, on general matters relating to the natural gas industry. In all its activities, the primary objective of the Board is to ensure that the public interest is served and protected.

The Guidelines are applicable to the facilities that require leave of the Board prior to construction. These include transmission pipelines, distribution, withdrawal/injection or production pipelines, as well as underground storage pool development and ancillary facilities.

Transmission pipelines (including pipelines used for withdrawal and injection in gas storage pool operations) and ancillary facilities require an application to the Board for leave to construct under subsection 90(1) of the Act.

In particular, these Guidelines prescribe environmental analysis and reporting related to gas facilities applications as follows:

- Hydrocarbon pipelines leave to construct applications under sections 90, 91, 95 and 98 of the Act.
- Access onto land applications under s. 98 of the Act.
- Gas storage development applications 36.1, 38, and 40 of the Act.

The Board must be satisfied that the application is in the public interest before it will authorize the development of the facilities. In arriving at its decision, the Board generally considers a number of factors including the need for the project, its economic feasibility and the environmental impacts as described in these Guidelines. Environmental impacts are broadly defined to include impacts on all components of the environment. For copies of the Board’s previous decisions, please contact the Board’s Information Resources Centre or Board’s website.

The Guidelines do not cover distribution system expansions that require only a Certificate of Public Convenience and Necessity or a Franchise Agreement in accordance with sections 8, 9 and 10 of the *Municipal Franchises Act, 1990, c. M 55* (“Municipal Franchises Act”). These

projects shall be planned and assessed in accordance with the environmental screening principles, as directed in the Board's "E.B.O. 188 Natural Gas System Expansion Report", January 30, 1998 (E.B.O. 188).

The Board expects an applicant to comply with these Guidelines before, during and after construction. Applicants are advised that the fact that construction will be located entirely on existing right-of-way ("ROW") may not be sufficient rationale for compliance with these Guidelines, although such projects may be suitable for an exemption application under section 95 of the OEB Act.

1.2.1 Section 90 Leave to Construct Applications

Any person or company planning to construct hydrocarbon transmission facilities within Ontario, must apply to the Board for authorization, pursuant to section 90 (1) and of the Act. Under section 90(1) leave to construct must be obtained if the proposed hydrocarbon pipeline is more than 20 kilometres in length; is projected to cost more than the amount prescribed by the regulations (presently \$2 million); and any part of the proposed hydrocarbon line (i) uses pipe that has a nominal pipe size of 12 inches or more, and (ii) has an operating pressure of 2,000 kilopascals or more.

Any person who has leave to construct from the Board can apply for authority to expropriate land in accordance with section 99 of the Act. The Board may authorize expropriation of land or land rights for pipelines and related facilities, but it cannot determine the compensation for expropriation. The Ontario Municipal Board deals with compensation matters where these are not agreed to between the applicant and affected landowners (section 100 of the Act).

Section 101 applications may be filed by parties who have been granted a leave to construct; or who are exempt from obtaining a leave to construct; or are required by a license condition to expand their distribution or transmission system and, at the same time, cannot reach agreements with municipalities or other utility line owners and operators to cross their utility lines. According to subsection 101(2) the Board's procedures to review the section 101 application follows, with necessary modifications, procedures for expropriation set out in section 99 of the Act.

Certain hydrocarbon pipeline projects do not require approval from the Board. Projects under federal jurisdiction that require approval from the National Energy Board do not require leave to construct from the Ontario Energy Board. A Board order authorizing construction of a transmission line (leave to construct) is not required for the relocation or reconstruction of a

pipeline, unless the size of the line is changed or additional land is required, as set out in section 90(2).

1.2.2 Section 91 Applications

Pursuant to section 91 of the Act, an applicant may seek Board approval for construction of distribution or production pipelines. For example, an application may be made when the pipeline may cause significant environmental effects, such as routing through an environmentally sensitive area, constructing across private land, or routing through heavily populated areas; the Board's review process is more formal and may give the public a greater assurance of "fairness".

Hydrocarbon pipelines may require some ancillary above ground facilities for the movement, storage, regulation and metering functions. Compressor or pumping stations are required to move the hydrocarbons and maintain the desired operating pressure within the pipeline system. Valve stations are usually required at specific intervals for safety, operating and maintenance purposes. Metering and regulator stations are similar to valve stations, but have the capability of measuring and in some cases controlling the flow and pressure of hydrocarbons at a given point for monitoring and sales purposes, to a customer or another pipeline system.

Pursuant to section 91 of the Act, any person or a company may apply to the Board at their discretion, for leave to construct a production line, hydrocarbon distribution line or station. While this option is rarely exercised, applications under section 91 may be filed if a person requires land rights to complete a project.

1.2.3 Entry onto Land Applications

Under subsection 98 (1) of the Act, any person who has leave of the Board or who has been exempted under section 95, may enter onto land to conduct surveys or studies that are necessary for fixing the site of the work. The Board can also grant an interim order under subsection 98 (1.1) authorizing a person to enter on land prior to obtaining leave to construct. Persons seeking entry onto land under subsection 98 (1.1) must have filed an application for leave to construct or for an exemption under section 95 of the Act. A leave to construct application or an exemption application under section 95 must be filed prior to filing a section 98 application. Under this interim order, the Board may allow such persons to undertake surveys and examinations as are necessary for fixing the site of the work. Applications for such an interim order are called "entry onto land applications".

In approving entry onto land applications, the Board may impose conditions which determine the scope and timing of activities that are allowed and set the notification requirements for

landowners prior to entry onto land. The Board may also address mitigation and restoration requirements for entry onto land activities, as well as communication with landowners during and after completion of the entry onto land activities.

1.2.4 Gas Storage Development Applications

Underground gas storage pools are often associated with areas of oil and gas production, and are located primarily in southwestern Ontario. These natural geological formations provide the means of storing large inventories of gas. The development of these pools requires the drilling of storage wells that penetrate a gas-bearing geological structure. The pools are filled with natural gas in the non-heating season and the gas is withdrawn during the heating period. The development of such pools may cause environmental impacts, resulting from the related surface activity such as well drilling, access road construction, pipeline construction and compressor and other station development.

Before gas can be stored in an underground reservoir, the overlying area first must be designated as a gas storage area by the Board, as set by section 36(1) of the Act.

Prior to injecting gas into such a storage reservoir, an applicant must receive authorization of the Board to inject gas into, store gas in and remove gas from the designated storage area, pursuant to section 38(1) of the Act and a permit from the MNR to bore or drill a well, as set out in section 40 of the Act. In granting such approval, the Board may impose conditions of approval that relate to the operation of the storage reservoir. The Board may also impose conditions of approval on a leave to construct for the pipelines required, to connect the injection/withdrawal wells to the compressor unit and upon any necessary drilling permits that are referred to the Board by the Minister of Natural Resources for consideration.

When developing a new gas storage pool, an applicant typically requires the following approvals:

- An Order designating the area containing a gas reservoir as a storage area pursuant to section 36.1(1) of the Act;
- Authority to inject gas into, store gas in, and remove gas from the proposed gas storage pool, pursuant to subsection 38(1) of the Act;

- A favourable report of the Board under subsection 40(1) of the Act, to the Minister of Natural Resources to whom applicant has applied for a license to drill injection/withdrawal wells in the designated gas storage pool; and
- Leave to construct transmission and gathering pipelines within the proposed gas storage pool, pursuant to subsection 90(1) of the Act.

An applicant needs all of the above approvals from the Board, to develop a gas storage pool in Ontario. The ER is typically prepared in accordance with the Guidelines as related to the leave to construct pipelines and well drilling licenses.

1.3 ONTARIO PIPELINE COORDINATING COMMITTEE

The Guidelines recommend a sequence of steps in the preparation of an Environmental Report. The ER becomes part of the pre-filed evidence that applicants file with the Board, when applying for leave to construct. A committee made up of provincial and municipal agencies and other affected and interested parties has been formed, to provide input into the routing or siting and to review the ER. This committee is named the Ontario Pipeline Coordinating Committee (“OPCC”) and is chaired by a member of the staff of the Board. Figure 1 and Figure 2 on pages 11 and 12 outline the “Study Development for the Preparation of an Environmental Report” and “Environmental Report Review by the OPCC”.

The purpose of the OPCC is to coordinate the Ontario government agencies review of facilities projects in Ontario requiring approval from the Board or the NEB, with the goal of minimizing negative impacts. In effect, the OPCC provides a single contact for identifying provincial concerns related to transmission and storage proposals. The OPCC is chaired by a Board staff member and currently includes representation from the following ministries and agencies: Technical Standards and Safety Authority (“TSSA”), Ministry of Environment (“MOE”), Ministry of Agriculture, Food and Rural Affairs (“OMAFRA”), Ministry of Tourism and Culture (“MTC”), Ministry of Municipal Affairs and Housing (“MMAH”), Ministry of Natural Resources (“MNR”), Ministry of Transportation (“MTO”) (the “OPCC representatives”). In addition to the OPCC representatives, affected regional and local municipalities, and conservation authorities are involved in the OPCC review.

The Guidelines have been developed in consultation with representatives of the OPCC. Therefore, the Guidelines are consistent with the mandates of the above ministries and agencies. For clarification of the mandates of the OPCC members or of the OPCC review process,

interested parties are encouraged to contact the Chair of the OPCC at the Board. The Chair of the OPCC coordinates the ER review and ensures OPCC concerns are relayed to the applicant. The OPCC's position on a project's environmental impacts does not preclude any intervenor, or Board staff, from raising environmental concerns at the hearing. The Board will take OPCC and all intervenor recommendations into account, but always has the final decision.

1.3.1 OPCC Review Process

The applicant is expected to consult with OPCC Ministries and other agencies on the constraints mapping and the delineation of the alternatives. When prepared, this information should be forwarded to OPCC representatives. The OPCC always reviews the completed ER, but on some projects individual OPCC representatives or Ministry personnel may choose to review draft documentation of the preferred route or site before the ER is completed.

The constraints map, the ER and any post-construction monitoring reports, should be submitted directly to the local offices of OPCC representatives with a copy of the cover memorandum and reports directed to the OPCC representative. The applicant should contact the OPCC Chair or the representative from each ministry or agency, for the name and address of the local office staff who will review the material. The applicant should ensure that the covering letter accompanying the constraints map, the ER and the post-construction monitoring reports specify that responses are to be forwarded to the OPCC Chair, with a copy to that Ministry's OPCC representative. Forty-two days should be allowed for the OPCC Environmental Report review process.

In the process of the OPCC review, the ER should be submitted to upper and lower tier municipalities, Conservation Authorities, where these exist, and upon request to directly affected landowners or tenured persons, as well as any other affected parties and Aboriginal Peoples. It is recommended that the 42 day review period take place before an application is made to the Board, to allow for a review of the ER and resolution of any concerns prior to the start of the hearing. The applicant must advise all affected parties in writing that those parties can provide comments on the ER to the applicant. Copies of any letters received, should be sent to the OPCC Chair. After the review of the ER is complete, the Chair of the OPCC will advise the applicant in writing of any issues which remain outstanding, following the review of the ER by OPCC representatives.

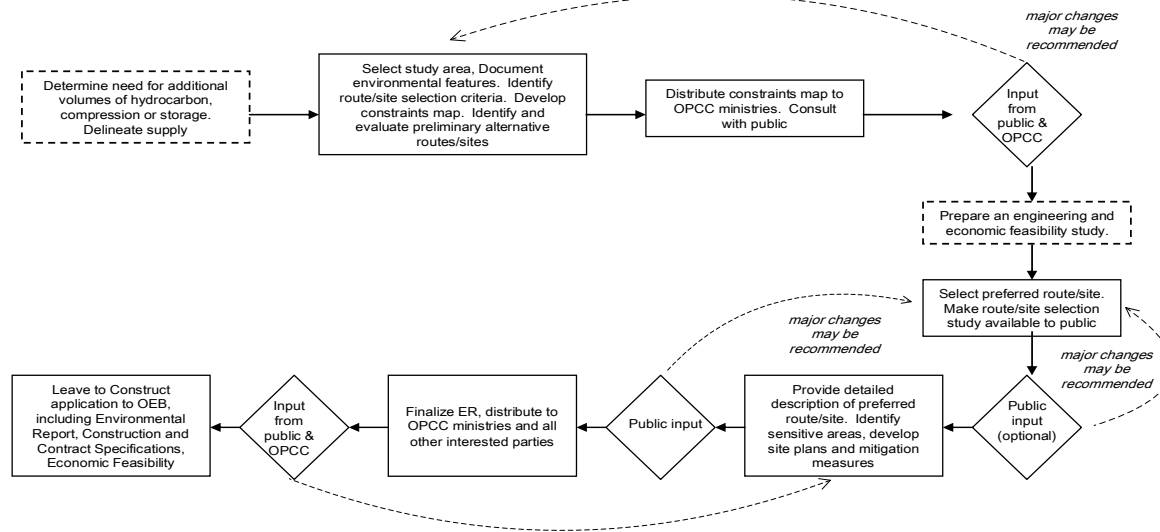
The applicant is expected to file all correspondence from the OPCC as part of the application before the Board. The ER is also to be filed as part of the pre-filed evidence with the application. In its application to the Board for approval, the applicant should also provide the Board with a concise summary (e.g. a summary table) of the concerns raised by OPCC members and the affected parties, during the review of the ER. The summary should indicate how concerns were addressed, whether or not any concerns remain, and the reasons why they remain.

The OPCC ensures that the interests and concerns of the member agencies are brought to the attention of the applicant. The approach is consultative rather than adversarial, and every attempt by the OPCC is made to resolve concerns prior to the Board hearing. If matters cannot be resolved prior to the hearing, the OPCC will assist in presenting provincial concerns to the Board. Board staff with assistance of the OPCC Chair, will also provide procedural assistance to any other involved party, such as a Conservation Authority, the Niagara Escarpment Commission or a non-governmental organization, in bringing its concerns before the Board. If matters are not resolved by the completion of the record and if the issue is within Board's authority, the Board may impose related conditions to its leave to construct and other related approvals.

Pursuant to section 95 of the Act, the Board may exempt a hydrocarbon transmission pipeline and ancillary facilities from a hearing, if it is of the opinion that special circumstances exist which warrant such exemption. The applicant must submit a request for an exemption. The request should include a description of the special circumstances that warrant an exemption. Examples of the special circumstances may be that no additional new land is required and that no environmental impacts are identified. As part of the section 98 application, an ER should be submitted for review by the OPCC, consistent with the required contents of the report as described in these Guidelines. The level of detail in the ER should reflect the environmental issues or concerns encountered on the project.

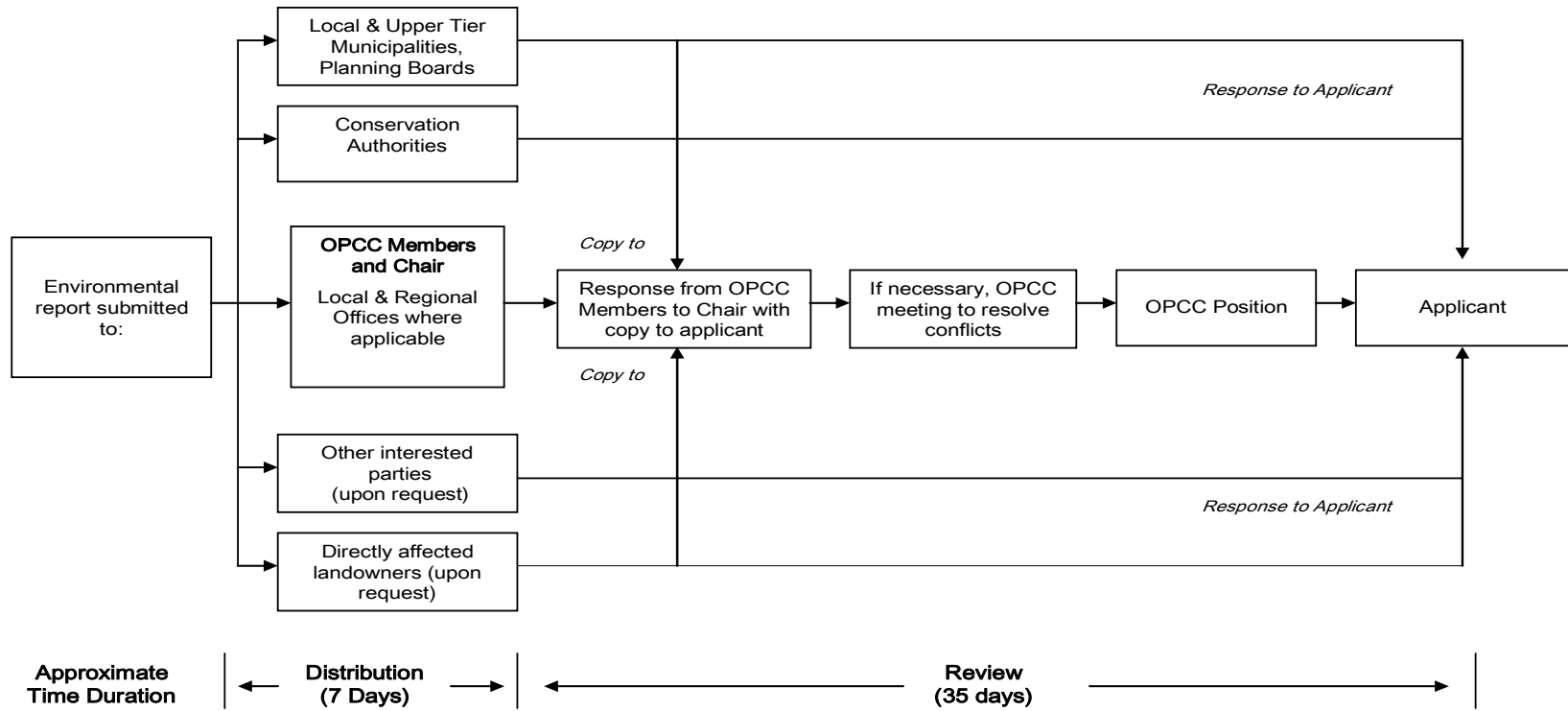
It is expected that exemption applications will be filed only for projects with minor environmental impacts. Nonetheless, all projects, even those applying for exemption are subject to environmental review by the OPCC and the review and time allocated for the review by the OPCC are the same (i.e. 42 days) for all projects.

Figure 1
Study Development for the Preparation of an Environmental Report



NOTE: The information indicated in the dashed boxes are steps which would normally be included in the applicant's supporting evidence but would not be included in the ER documentation

Figure 2
Environmental Report Review by the OPCC



1.4. APPLICATIONS BEFORE THE NATIONAL ENERGY BOARD

The OPCC may also review environmental reports for projects before the National Energy Board (“NEB”) where a large segment of pipeline construction will take place in Ontario. Individual OPCC ministries and agencies may intervene in the NEB proceedings where issues that are within their jurisdiction are identified. Federally regulated companies must meet the environmental planning and filing requirements of the NEB. For additional information on proceedings before the NEB, interested parties should contact the NEB offices directly.

Chapter 2. GENERAL PLANNING PRINCIPLES

The proper selection of a route or site for a new pipeline or a site for a new facility is part of the public interest considerations, when the Board is making its decision in each application before it. The planning principles and procedures that an applicant uses, assist the Board in evaluating whether an application meets the public interest test. Technically sound and consistently applied procedures, which are readily understandable to the applicant, affected parties and the Board, should be the goal in the production of all ERs submitted as evidence.

Chart 1 outlines the major planning steps in choosing a preferred route or site. The ER should contain a description of the planning process that was followed, including the consultative process. The planning process should be traceable, replicable and rational.

Chart 1: Major Steps in Selecting a Preferred Route or Site

- Describe the rationale for study area delineation;
- Establish criteria for identification of alternatives on constraints map;
- Identify all reasonable alternative route or sites based on the consistent application of the criteria;
- Predict potential environmental impacts expected to occur during construction and operation of the project, including cumulative impacts;
- Describe all reasonable mitigation measures and the residual or net impacts which are expected to remain after the mitigation measures have been applied;
- Establish criteria for evaluation of alternatives;
- Evaluate alternatives based on the above criteria;
- Describe the results of alternatives evaluation;
- Select the preferred route or site;
- Describe the rationale in support of the preferred route or site.

Applicants are expected to identify all reasonable alternatives within the study area and to compare their impacts systematically and consistently, using appropriate impact prediction techniques and methods for evaluating alternatives.

Criteria for identifying and evaluating the alternatives should be established at the outset of the study. However, the criteria may evolve as planning progresses. The relative importance and the rationale for each criterion should be described. The ER should note whether each criterion is to be treated as a constraint, or as a comparative criterion. The manner in which the criteria are to be used should be clear and traceable.

The criteria chosen should be used to determine the type of baseline data to be collected. This should help to focus data collection on data relevant to the evaluation and avoid collection of unnecessary background information.

Having good data is an important component of the planning process. In documenting the data sources, the ER should describe the source, scale, precision, vintage, relevance and bias of the data, as well as any data gaps. The data collection should focus on what is needed in order to carry out the planning process in an efficient, effective and comprehensive manner.

The level of detail of the analysis is expected to increase as planning progresses from the comparative evaluation of alternatives, to the analysis of the preferred route or site. For example, the net effects analysis may be relatively generic for the evaluation of alternatives, but more precise and detailed for the preferred route or site. However, the generic evaluation should be sufficiently complete to cover expected individual and cumulative impacts.

Depending on the nature and complexity of the alternatives and their impacts, carrying out the planning process may lead to the selection of one preferred alternative or the elimination of only some of the alternatives. If only some of the alternatives are eliminated, additional information, as well as further refinement of the criteria, may be necessary before adequate differentiation can be made among the remaining alternatives in order to select the preferred one.

Since planning is an iterative process, some of these steps may have to be repeated. Flexibility among alternatives should be maintained as long as possible, before commitments to an alternative are made.

Effective consultation with appropriate federal, provincial and municipal agencies, affected First Nations and Métis Nation and communities, directly and indirectly affected landowners and residents and the general public is extremely important. These stakeholders should be kept fully

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apprised of the project planning process from the outset, so that they have adequate time and information to comment on the project at each step before critical decisions are made.

Chapter 3. PUBLIC CONSULTATION

3.1 AGENCY CONSULTATION

The purpose of agency consultation is to inform and receive input from all government agencies with jurisdiction in the study area. This may include federal, municipal and other provincial agencies, in addition to those participating on the OPCC. The appropriate agency technical representative should be notified in writing of the commencement of the environmental study and the consultation process being followed.

Applicants are strongly encouraged to circulate relevant sections of the draft ER to the appropriate agency field contact for comment, prior to submitting the final draft ER to the OPCC for review. This will help to minimize fundamental concerns being raised at a late stage in the process. A record of agency comments received, the applicant's response, and a description of any issues which remain outstanding, should be summarized in a matrix format and incorporated into the report on the public consultation process accompanying the ER. Wherever practical, outstanding issues should be settled prior to finalization of the ER. The Board expects that applicants will extend all reasonable efforts to resolve the OPCC outstanding issues within the 42 day review time and no later than the day the hearing starts.

3.2 AFFECTED PARTIES

Landowners, whose property will be encroached upon by pipeline, station or well drilling construction, are directly affected by the disturbances created by construction, operation and maintenance of pipelines and related facilities. Consequently, their involvement in the planning of the route or site on their property is essential. Such persons are referred to as "directly affected landowners".

Other landowners whose property lies adjacent to, or close to a proposed pipeline or designated gas storage area, may be affected by proposed construction activities due to noise, dust, and impediment to traffic flows, or the operation of a nearby facility such as a compressor station. In addition, there may be landowners who are restricted from building structures in proximity to certain facilities. Since the intent of the Guidelines is to encourage consultation, these landowners should also be involved in the planning of the route or site adjacent to their property. Such landowners will be referred to as "indirectly affected landowners". The identification of indirectly affected landowners is particularly important in urban settings, where population

densities may be high and a large number of persons could potentially be affected by a facilities project.

Where possible, tenants should be identified and treated in the same manner as either directly affected or indirectly affected landowners, depending upon the location of the property they rent. This should include proprietors of commercial properties and residents in home rental units in areas that may experience construction disturbance.

In areas involving Crown Land, forms of tenure such as trapline licenses, Sustainable Forestry Licenses and permits or leases for commercial uses such as tourism camps, should be noted. For the purposes of these Guidelines, affected tenured persons have the same status as affected landowners. In the Guidelines, references to "landowners" are always meant to include tenured persons where applicable.

3.3 ABORIGINAL PEOPLES CONSULTATION

For the purpose of these Guidelines, and according to section 35(2) of the Constitution Act, 1982, Aboriginal Peoples are defined as to include the Indian, Inuit and Métis¹ peoples. The proposed projects may potentially affect existing or asserted Aboriginal or treaty rights, as well as Métis' Traditional Harvesting Territories, cultural heritage and traditional activities.

Therefore, it is important that the proponent determine, at the very onset of planning, if there is a potential that these parties are affected. The prospective applicants are expected to initiate consultation with any potentially affected Aboriginal Peoples, early in the planning process. The prospective applicants are expected to continue and maintain this communication, until the preferred alternative is selected and the Environmental Report is completed. It is recommended that the prospective applicant keep a record of communication and consultation and file it as pre-filed evidence, together with other materials documenting agency and general consultation conducted during the planning of the project.

The first step is to identify all potentially affected Aboriginal Peoples' groups that will be contacted in respect of the proposed project. It is expected that the prospective applicants gather

¹ There is one Métis People however there are many diverse and distinctive Métis communities in Canada.

information such as Traditional Harvesting Territories, significant portage routes, trapping lines and other areas of concern identified through Métis Traditional Ecological Knowledge Studies or other information sources², First Nations treaty rights, any filed and outstanding claims or litigation concerning Aboriginal treaty rights, treaty land entitlement or Aboriginal title or rights.

The information gathered and recorded in the ER on Aboriginal consultation should include the following:

- i) how the Aboriginal Peoples' groups were identified;
- ii) when contact was first initiated;
- iii) the individuals within the groups who were contacted, and their position in or representative role for the group;
- iv) a listing, including the dates, of any phone calls, meetings and other means that may have been used, to provide information about the project and hear any interests or concerns of Aboriginal Peoples with respect to the project;
- v) written documentation of the notes or minutes, that may have been taken at meetings or from phone calls, or letters received from, or sent to Aboriginal Peoples; and
- vi) a description of the issues or concerns, that have been raised by Aboriginal Peoples in respect of the project and, where applicable, how those issues or concerns will be mitigated or accommodated.

² The recommended starting point for the information gathering on Métis Nation of Ontario ("MNO") is contact with the Lands, Resource and Consultation Office of the MNO in Toronto.

3.4 GENERAL PUBLIC CONSULTATIONS

Soliciting input from the general public is an important component of the route or site selection process. It provides the opportunity for people to become involved in a meaningful way, in influencing decisions on matters which affect them. The applicant is encouraged to consult with interested parties during all stages of the development of the ER where practical, in order to obtain input before decisions are made.

The goal of the public consultation process should be to solicit input from the public, to help the applicant improve public understanding, identify and address issues and provide the public an opportunity to provide meaningful input into the planning process. The applicant's public consultation program should:

- (a) identify those who may be affected and inform those parties of the nature of the undertaking and how they may be affected;
- (b) allow the public to know where, when and how they can be involved in advance of the project; and
- (c) identify how public input is to be taken into account in the planning process and in any decisions made in the course of the process.

The applicant should carry out local public consultation regarding routing and siting decisions, as well as mitigation and monitoring measures for the preferred route or site, once it is chosen.

3.4.1 Public Meetings

Consultation meetings (e.g. seminars, workshops or "open houses") should be held. Efforts should be made after each meeting, to resolve outstanding issues, by holding individual or group meetings as required. The number and frequency of meetings depends on the environmental issues or concerns encountered on the project.

The initial public meeting should take place before choosing the preferred alternative, in order to present a map showing preliminary location alternatives, and to discuss and explain the applicant's planning and approval processes and the role of the public. The meeting should be designed to obtain input on:

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- (a) the study area, including relevant information on the communities and the significant environmental features within them (see Section 4.2.1);
- (b) the proposed preliminary route or site alternatives;
- (c) other potential alternatives;
- (d) proposed constraints and other criteria to be used to evaluate alternative route or sites, their rationale and the relative importance that should be attached to them;
- (e) the evaluation of the net impacts of the preliminary alternatives; and
- (f) additional consultation planned and required.

A second public meeting may be held after the preferred route or site has been chosen, to discuss the evaluation of the alternatives and to explain how public input was used in the planning process to influence decisions.

The meeting should include discussion on:

- (a) public consultation to date;
- (b) the criteria and the method(s) used to evaluate the alternatives and select the preferred one(s);
- (c) potential impacts of the preferred alternative(s), suggested mitigation measures and the resultant net effects; and
- (d) the need for additional consultation.

Depending on the level of stakeholder interest, the consultation suggested for the second meeting may not be needed, until the impact mitigation program is developed as part of the ER. In either case, there should be a consultation prior to finalizing the ER. It should cover the items listed for the second meeting, as well as obtain input on the proposed mitigation and monitoring plans and suggested modifications, if any.

General notices in local newspapers may be used to inform the public of each of the general meetings. Landowners, whose property may be encroached upon in one or more of the identified alternatives, should receive notice of all meetings. Direct notification should also be provided to

any indirectly affected landowners, whose property has been identified as being within a zone of impact, resulting from pipeline construction or operation.

An appendix of the ER should summarize the concerns of all interested parties that have been identified through the consultation process. The appendix should document the date, time and place of each meeting, the concerns that were raised, how they were addressed, why that approach was taken and describe and explain any concerns left unresolved. A matrix, which summarizes this information, is also needed. Individual participants should be advised directly of how their comments were addressed and documentation of this consultation should be provided in the ER.

Once the ER has been completed and is under review by the OPCC and other interested parties, the applicant should remain in contact with members of the OPCC, local government representatives, landowners and other potential intervenors, to try to resolve any outstanding problems.

3.4.2 Landowner Interviews

Landowner interviews are another recommended method of public consultation. Interviews with landowners are a source of information that should be used to "fine-tune" the preferred route or site selection. At the interview, the landowner is shown a map of the proposed route or site on the property and a proposed construction schedule. Directly affected landowners should have an opportunity to discuss route or site alternatives on their property. Existing features or planned modifications to their property may warrant deviation from the originally identified preferred route or site. Any changes in the preferred location resulting from landowner interviews, as well as the rationale for the changes, should be described in the ER.

Landowner interviews should address:

- (a) existing and planned features (e.g. wells, buildings, subsurface drainage tiles, cropping systems, special agricultural enterprises, woodlot management plans);
- (b) environmental features, including features of cultural heritage value;
- (c) siting or routing preference, including mitigation and monitoring measures;
- (d) potential temporary or permanent access to the easement;
- (e) concerns regarding previous pipeline or station construction;

- (f) current farm or business operations, including conservation practices;
- (g) the number of occupants and any particular sensitivities those occupants may have to construction impacts, such as noise and dust; and,
- (h) any potential restrictions on the location of planned buildings or structures.

It is not expected that a proponent will conduct interviews with all indirectly affected landowners, but once identified, they should be invited to all public meetings and otherwise be involved in the preparation of the Environmental Report to a similar extent, as directly affected landowners.

If the application is approved by the Board, a construction schedule should be given to all the directly affected landowners, before the commencement of construction on their property.

3.5 PUBLIC PARTICIPATION AT THE HEARING

After an application is filed, the Board will issue a Notice of Application and direct the applicant on service and publication. The Notice of Application sets the timeline and explains how to become a registered intervenor, an observer or to comment in the Board's proceeding. The Board's web site and Board's *Rules of Practice and Procedure* describe in more detail how parties can participate in the proceedings.

Intervenors may be eligible to recover their cost of participating in the proceedings. The Board determines cost eligibility and amounts. The Board *Rules of Practice and Procedure* and *Direction on Cost Awards* describe cost powers, claims, and assessment guidelines.

CHAPTER 4: ROUTE OR SITE SELECTION

This section of the Guidelines describes the route or site selection requirements including:

- Project description;
- Mapping and description of environment;
- Impact identification and assessment.

4.1 PROJECT DESCRIPTION

In order to properly identify and assess the impacts resulting from a proposed project, a complete description of the project is required. The ER should include a description of:

- (a) the nature, location, size and length of the proposed facilities and any ancillary facilities such as access roads, sewer, power and water lines;
- (b) the nature, location and duration of all related construction activities, including typical equipment used and noise ratings;
- (c) all related land requirements, whether public or private;
- (d) the best available estimate of the construction schedule and the required construction and operational workforce; and
- (e) an indication of the facility appearance and typical operating noise ratings.

4.2 MAPPING AND DESCRIPTION OF ENVIRONMENT

This section includes guidelines for:

- Study area delineation and description;
- Alternatives evaluation;
- Preferred route or site description and considerations.

4.2.1 Study Area

The Environmental Report must include a written description of environmental features within the study area that affect the identification and evaluation of alternatives. General background information which is not relevant to alternative's evaluation, should not be included in this

description. The constraints and alternatives should be described and mapped to a scale of 1:25,000, except for Northern Ontario, where the standard mapping scale 1:50,000 would be appropriate. Northern Ontario is a part of the province of Ontario, which lies north of Lake Huron (including Georgian Bay), the French River and Lake Nipissing.

The level of detail of the information will vary with the study area, its sensitivity, and the type of features found within it. For example, when it is possible to generate an acceptable range of alternatives to be constructed entirely within a road allowance, the description of features may be limited to features which are affected by the proposed route. A more comprehensive inventory may not be required.

In determining the environment to be described, and in identifying and assessing impacts, it should be recognized that the study area used to identify and assess impacts on natural environment, may not always coincide with the study area applicable to the social components of the environment. Social impacts may affect people beyond the immediate area of a pipeline easement. For example, traffic disruptions during construction may affect many travelers or commuters through the affected area; or the economic benefits associated with a project may be felt throughout an entire region, depending upon where the workforce lives. There may also be impacts to natural features that are outside the area being examined for social impacts. For example, a stream crossing may have an effect downstream of the immediate construction or on other watercourses within the watershed.

In general, a social profile of the study area should include an inventory of the existing and historical land uses, a characterization of relevant demographics, a description of the economic base and key commercial activities and community and social services which may be affected by the project. In this sense, profiling sets the limits for the subsequent stages of the analysis.

The study area boundaries should be established, to ensure that all reasonable alternatives and their impacts can be evaluated. In setting the boundaries, it is important to consider the impact type and the zone of impact.

4.2.2 Alternatives Evaluation

A wide range of evaluation methods can be used to evaluate a set of alternatives. Evaluation methods with explicit decision rules are expected. Whatever method is used, the Environmental Report should explain the rationale for the method chosen, how it was applied, the assumptions made, the uncertainty surrounding the conclusions reached, and the steps taken to minimize and understand that uncertainty.

The evaluation method and its application should be transparent. This means that the steps in the process of narrowing down alternatives can be easily traced and the process and its results can be replicated. The documentation of the process in the ER should provide this transparency.

The evaluation of alternatives should involve a discussion of the relative advantages and disadvantages of each alternative. It should explain the trade-offs that were made and provide the reasons why the preferred alternative was chosen over the other alternatives. The rationale provided in the ER for the routing or siting should be evident.

Where construction of a section of pipeline or station may determine the location of future facilities, an evaluation of the system should be undertaken, before the location of a single facility is determined. The information required and its level of detail should be determined on a case by case basis.

4.2.3 Route or Site Description

The ER must include maps or recent air photo mosaics, which illustrate in greater detail the environmental setting of the preferred pipeline route or facility sites. Large-diameter, high-pressure pipelines crossing private lands, should be shown at a scale of 1:10,000 or larger. A larger scale map, photo mosaic or site construction plan in environmentally sensitive areas, should also be prepared.

In some cases, a description of certain environmental features may be unnecessary. For example, a detailed soil survey data may not be required, if the site is in a road allowance and has been previously disturbed.

In addition to the proposed general route or site location and alternatives considered, the list below provides those features and resources which may need to be identified on the maps or photo mosaics, if they are traversed by, or are adjacent to, the preferred route or site:

- (a) existing and proposed compressor, pump, valve and metering stations;
- (b) prime agricultural land and agricultural land use such as croplands (e.g. corn, soybeans, hay), specialty crops (e.g. orchards, vineyards, vegetables), pasture, grazing land, sugar bushes; tile drained land or other environmental improvements;
- (c) farm enterprises/buildings (e.g. greenhouses, livestock facilities such as beef feedlots, dairy farms, poultry barns);

- (d) sensitive landforms and geological features including any mineral deposits, mines and mining claims, identified aggregate resources, oil and gas pools and wells or fields, abandoned oil and gas wells, and current or abandoned mining dumpsites;
- (e) reservoirs, watercourses, (permanent and intermittent streams and rivers) water bodies (ponds, lakes), direction of flow, recharge areas, wetlands, water table (identify sections that may be affected by groundwater seeps), intake and discharge points of water for municipal and private water supplies, location of water crossings, water wells, storm drainage, subsurface tile and municipal drains;
- (f) cultural heritage resources such as cemeteries, registered archeological sites and other resources identified in accordance with current provincial heritage policy;
- (g) topographic information outlining surface contours, geographical distribution of wetland resources, floodplains, organic soils and areas known to be subject to physical hazards such as landslides, mudflows, areas of erosion and slope instability;
- (h) forest resources such as woodlots, sugar bushes, shelter and other protection belts, seed production stands either publicly or privately managed;
- (i) habitat of rare, threatened or endangered plant, fish, wildlife species;
- (j) nationally, provincially, regionally or locally significant floral and faunal areas and other significant wildlife habitat such as deer/moose concentration areas;
- (k) proposed, operating and non-operating landfills;
- (l) potential blasting areas, including water crossings;
- (m) occupied and vacant buildings adjacent to the ROW, which may be affected by construction activities;
- (n) industries (existing or historic) which may have caused contaminated soils along the ROW or contaminated sediments at water crossings;

- (o) for large stream crossings, by other than horizontal directional drilling method, the contour of stream bed and channel (for recreation of configuration during restoration);
- (p) existing and planned linear facilities such as roads, rights-of-way and blind lines;
- (q) existing land uses and land use designations, as set out in municipally adopted and/or provincially approved official plans and zoning bylaws, including registered plans and plan applications;
- (r) fish habitat, as defined by Fisheries Act, including spawning grounds and nursery, rearing, food supply and migration areas;
- (s) Provincial Parks and Ontario Natural Heritage areas; and
- (t) Crown land existing land use designations (i.e. based on “Crown Land Use Policy Atlas” maintained by the MNR.

The decision on the type of background information to collect should be based on the bio-physical characteristics, as well as the socio-economic make-up of the area likely to be affected. The description of the socio-economic environment should include the existing and expected social conditions and any anticipated changes in the area likely to be affected by the alternative route or site.

4.3 IMPACT IDENTIFICATION AND ASSESSMENT

4.3.1 Introduction

The impacts to be assessed for each comparison of alternatives include impacts on the natural, built, social, cultural, and economic components of the environment. There are also interrelationships among these components, which must be taken into account. For example, where an impact on the natural environment in a recreational area is identified, the effect on the people who use that recreational area must also be identified and addressed. Also, cumulative effects that may result from the interaction between the effects of the proposed project and the effects of other developments already in place or planned within or near the study area, are expected to be addressed.

Both positive and negative potential impacts of each alternative must be identified and analyzed, based on an assessment of impacts during construction and the operation of the facilities. Then, all reasonable mitigation and enhancement measures for each potential impact should be described. The analysis concludes with an assessment of the net impacts that remain after the mitigation/enhancement measures have been applied. The level of detail in the information on impacts at this stage will likely be lower than the level recommended in Chapter 5 for the impact management plans, but should be sufficient to provide a consistent basis for comparison and evaluation.

Impact prediction is a two stage process: predicting the effect and then predicting the resultant impact. For example, a high noise level near a pipeline construction site is an effect of construction, while the impact of that noise may be the discomfort of nearby residents. All reasonable efforts should be extended to carry out both stages of impact predictions. When it is not possible to carry out the second, an explanation should be provided.

All reasonable efforts should be made to quantify effects and impacts (e.g. distances, number and duration of occurrences, noise levels, traffic volumes, dust concentrations). At minimum, effects and impacts which can be readily measured should be quantified. Where direct measurement is not reasonable, indicators such as high, medium and low should be used. Where indicators are inappropriate, the analysis should be qualitative and based on consistent descriptions of the expected effects and impacts. The ER should describe how effects and impacts were quantified and the rationale for any indicators and qualitative descriptions used.

All relevant environmental and social impacts resulting from the construction and operation of the project should be described. Relevance may be determined by the significance of the impact, as well as its likelihood. Criteria for determining significance may include: magnitude, geographical extent, duration and frequency, reversibility, level of public concern and ecological context. Criteria for determining likelihood may include the probability of occurrence and the uncertainty in the prediction.

The scope of the analysis is expected to become more refined and site specific, as the planning process proceeds. Initially, the data may be based primarily on secondary sources. Once the alternatives have been identified, more detailed field studies and analyses allow for a more thorough comparison of impacts. The greatest level of detail is expected for the analysis of impacts on the preferred route or site. The data should be mapped to the extent possible.

4.3.2 Land Use Planning and Policies

The ER should describe the impacts of alternatives on land use planning. To identify provincial and municipal land use planning concerns and longer-term issues, the applicant should contact the MTO, MNR, and MMAH representatives on the OPCC, as well as county, regional and local municipal governments and Conservation Authorities. In this way, provincial and municipal land use planning concerns and longer-term land use issues which may affect routing will be identified.

The MTO should be contacted to identify any transportation policies or project plans that may restrict certain facilities from using road allowance along certain classes of highways, bridges and other structures. This information should be considered in the opportunities and constraints mapping. As with all corridor applications that involve encroachment or alteration of MTO land not proposed by MTO, the applicant is required to meet the environmental assessment requirements of MTO, which may include completing either the MTO Class EA process, MEA's Class EA process or another approved EA process to MTO's satisfaction. That requirement must be met to gain a permit. The onus is on the applicant to contact the MTO and get the direction on how to fulfil these requirements.

The MNR, represented by its Land Use and Environmental Planning Section, is a member of the OPCC. The MNR reviews the application and provides comments.

The *Planning Act* R.S.O. 1990, c. P. 13, defines general areas of provincial interest, which is the responsibility of the Minister of Municipal Affairs and Housing. The Minister, either alone or with another Minister(s), can issue specific policy statements which have been approved by Cabinet, on matters of provincial interest. The current Provincial Policy Statement was issued under Section 3 of the *Planning Act* and came into effect on March 1, 2005.³ The Policy Statement provides general principles for coordinated land use planning in Ontario.

The Board, as part of its approval process, is required to be consistent with the Provincial Policy Statement. It is advisable for applicants to include in the ER, a discussion of the relevance to the project of particular provincial policies, such as those on infrastructure, agriculture, mineral resources, natural, cultural heritage and archaeology. The MMAH should be contacted for advice on the statements which have been issued. The appropriate Ministry responsible for the technical substance of each statement can be contacted for assistance on the application of the statement to the project.

³ The 2005 Provincial Policy Statement is currently under review in accordance with a 5-year review schedule.

The relevant municipal and regional official plan(s) should be reviewed with municipal planning and engineering authorities for proper interpretation of these documents. Areas approved for future development or other uses by the plan(s), may eliminate some alternatives. In Northern Ontario, there are official plans which apply to a planning area which cover more than one municipality and may include territory without municipal organization. Where unorganized territory is involved, the planning board acts as the municipal council for land use planning purposes. MNR should be contacted in unorganized territories and areas involving Crown land. Where pipeline facilities affect land in unorganized territory which is part of a planning area, the planning board should be contacted for advice and assistance.

Municipal zoning by-laws should be reviewed to identify those land uses which may have an impact on route or site selection. Also, the Planning Act gives the Minister of Municipal Affairs and Housing, the authority to impose zoning orders which are similar to zoning by-laws passed by municipal councils. Where there is an order in effect, pipeline applicants should give it the same consideration as a zoning by-law in the route or site selection process. The applicant should contact the local planning authority or the MMAH for information on the Minister's zoning orders.

The selection of alternatives may be limited by a plan of subdivision. Applicants should find out if alternatives are affected by a plan of subdivision, which has been submitted for approval. The MMAH has delegated subdivision plans approval authority to most regional/district municipalities, to some counties in southern Ontario, and to towns/cities that are not an administrative part of a county. The applicant should contact the MMAH to identify the subdivision approval authority within a study area.

A further limitation in route or site selection may be that the municipality is conducting a study to amend the official plan in the area of alternatives, the outcome of which, may affect one or more alternatives. Therefore, early contact with municipalities is encouraged.

Other examples of existing land use which may constrain route or site selection include: agricultural uses, utilities, waste disposal sites, transportation facilities, recreation areas, outdoor education areas, wildlife management areas, fish sanctuaries, parks and conservation areas, special protected areas such as prime agricultural lands, wetlands, designated Areas of Natural and Scientific Interest (“ANSI”), cemeteries, burial grounds, heritage sites, locally or provincially designated Environmentally Sensitive Areas (“ESA”), areas on the Oak Ridges Moraine or Niagara Escarpment, occupied and vacant buildings, land tenure, ownership and unregistered forms of tenure (e.g. land use permits).

MTO has policies which restrict certain facilities from using the road allowance along certain classes of highways, bridges and other structures. These constraints should be accounted for in route and site selection.

Examples of proposed land uses to be identified include: approved or exempt undertakings under the Environmental Assessment Act, provincial plans for new or upgraded transportation facilities, National Parks, military lands, railways, Aboriginal reserves, Traditional Harvesting Territories of Métis Nation of Ontario, correctional facilities, landfills, utility corridors and special proposed areas in the Niagara Escarpment Plan or Parkway Belt Plan.

4.3.3 Urban Siting Considerations

In urban areas, reinforcement and expansion of existing pipeline networks present a different set of issues, concerns, and problems to be managed.

Impact of pipeline construction and operation on the different land uses found in the urban environment, needs to be fully considered. All reasonable efforts should be made to locate proposed pipeline facilities adjacent to or on existing utility or transportation corridors. The location requirements of the Fuel Safety Division, Technical Standards and Safety Authority, as presented in its Guidelines for Natural Gas Utilities Locating New Pipeline Facilities and other current safety requirements should be respected.

Relevant municipal departments and agencies such as Engineering, Public Works Departments and Local Electric Distribution Utilities, must be contacted for the precise location of all existing underground utility and service networks and corridors. Consideration should also be given to planned future capital works that may be affected by the proposed pipeline, so that development plans can be coordinated with the host municipality. Each municipality should be contacted for advice on the location of construction activities, such as road resurfacing plans and coordination with them, as well as for their preference for a proposed location and timing of construction.

A detailed land use analysis will provide the applicant with an accurate description of the historic, current and proposed land use, in order to determine possible high impact areas that should be avoided, such as abandoned industrial sites or landfills that may be exposed during the construction process. In urban settings, the protection of trees and other vegetation is of special importance. Vegetation and landscape plans should be developed with the cooperation and consent of municipal authorities. All reasonable efforts should be made, to protect existing trees within technical and practical limits. In both rural and urban settings, where a municipality has bylaws concerning landscape restoration or the protection/replacement of trees or erecting buildings or station structures, the applicant is expected to adhere to the spirit and intent of such

bylaws and to document that adherence in the ER. When a decision has been made to cut trees, the rationale for the decision should be clearly explained in the ER.

In urban settings, issues such as traffic safety, commercial business disruption, proximity to institutions such as schools and hospitals and the impacts on local residents may require increased attention during the routing and site selection stage. Such information should be gathered as part of public consultation and incorporated into the social impact assessment, so that it can be used as part of the routing and siting process.

Where there is a history of industrial land use and evidence of intensive industrial use or environmental concern, the applicant should consider potentially hazardous materials or landfills that may create handling and disposal problems. Contaminated sites should be avoided where practical. If contaminated sites are encountered, MOE District Offices must be contacted by the landowner whose property is contaminated. Procedures for proper soil testing and disposal should be established with the concurrence of the MOE. If proposed facilities are located adjacent to contaminated land, the risk is associated with the following:

- (a) the possibility of encountering plumes of contaminated groundwater, which may have migrated some distance away from the original site of contamination; and
- (b) the possibility that the granular medium surrounding the pipeline could provide a pathway for plume migration at increased rates and to areas that would not otherwise have been affected.

4.3.4 Cultural Heritage Resources

The Ontario Heritage Act provides for conservation, protection and preservation of the heritage of Ontario. Criteria for determining cultural heritage value or interest, is established by the Province through Ontario Regulations 9/06 and 10/06 under the Ontario Heritage Act. The Ministry of Tourism and Culture (MTC) is responsible for the administration of the Ontario Heritage Act and is responsible for determining policies and programs for the conservation of the cultural heritage of Ontario.

Assessment of the impact of proposed project on the cultural heritage resources should inform decisions in the pipeline development planning stage. With regard to cultural heritage resources, pipeline proponents must self-assess and demonstrate appropriate due diligence by:

- (a) recognizing cultural heritage resources that may be affected by pipeline development, identifying significant cultural heritage resources and understanding their cultural heritage value or interest;
- (b) assessing the effects or impacts that could result from proposed pipeline development; and
- (c) protecting cultural heritage resources by appropriate conservation, avoidance and mitigation.

The following table provides brief descriptions of situations found in real property that may have cultural heritage value. It is designed to help proponents know at an early stage, whether any cultural heritage resources may exist on property that could be affected by pipeline projects.

INDICATORS OF CULTURAL HERITAGE VALUE OR INTEREST	IDENTIFIED	POTENTIAL
Property designated under Part IV of the Ontario Heritage Act	Y	
A bridge on Ontario Heritage Bridge List	Y	
Property within a Heritage Conservation District designated under Part V of the Ontario Heritage Act	Y	
Property with a Ontario Heritage Trust or municipal heritage conservation easement	Y	
Property with a provincial or federal plaque	Y	
A National Historic Site	Y	
Property containing a registered archaeological site	Y	
Property with archaeological potential ¹		Y
Property listed on a municipal heritage register or the provincial register		Y
Property adjacent ² to an identified heritage property		Y
Property that has buildings or structures over 40 years old		Y
Property within a Canadian Heritage River watershed		Y
Property associated with a renowned architect or builder		Y
Property containing or adjacent to a burial site or cemetery		Y
Parkland		Y
Land with distinctive landforms or geographic features		Y
Historic transportation corridors (such as navigational canals, rail lines or trails, traditional Métis portage routes etc)		Y
Other human-made alterations to natural landscapes (such as earthworks, plantings, etc.)		Y

¹ Refer to the provincial criteria found in “Conserving A Future For Our Past: Archaeology, Land Use Planning and Development in Ontario, An Educational Primer and Comprehensive Guide for Non-Specialists” Revised 1998, Ministry of Culture

² “Adjacent” includes not only immediately adjoining property, but also the landscape or topography visible from an identified heritage property and the viewsheds that frame the heritage property.

The possible effects or impacts resulting from pipeline development that could affect cultural

heritage resources include:

- (a) Destruction or removal of any – or any part of – significant heritage attributes or features;
- (b) Alteration that is not sympathetic, or is not compatible, with heritage character or appearance;
- (c) Isolation of heritage attributes or features from their surrounding environment, context or a significant relationship;
- (d) Visual intrusions, direct or indirect obstruction of significant views or vistas from, within, or to a built or natural feature;
- (e) Shadows created by new development that alter the appearance or character of a heritage resource;
- (f) A change in physical character, such as when development fills in formerly open spaces, or when significant vegetation is removed; and
- (g) Ground disturbances or land alterations, such as a change in grade, alteration of soil composition or drainage patterns that could adversely affect a cultural heritage resource.

Any pipeline project that may affect a known or potential built heritage resource, cultural heritage landscape, a known archaeological site, or an area of archaeological potential may require further technical heritage studies by qualified persons.

MTC recommends that heritage evaluations and impact assessments be undertaken by qualified persons with relevant, recent experience in work of similar scope in Ontario. For further information, refer to the Ministry of Culture's *Info Sheet #3: Archaeological Resources and Areas of Archaeological Potential* and *Info Sheet#5: Heritage Impact Assessments and Conservation Plans* (part of the Ontario Heritage Tool Kit), which are available on the Ministry's website

http://www.culture.gov.on.ca/english/heritage/Toolkit/Heritage_PPS_infoSheet.pdf

For every project, an archeological assessment in accordance with “Archeological Assessment Technical Guidelines, 1993” must be conducted. The reports and findings of this archeological assessment are filed with the Ministry of Tourism and Culture in compliance with the mandate of this ministry.

Stage I Assessment

A staged approach to heritage resource assessment has proven to be most effective. The preliminary assessment of the heritage potential in the study area must be carried out, prior to the selection of a preferred alternative. This Stage I Assessment may include:

- (a) a preliminary documentary search of the MTC records with the assistance of the Regional Archaeologist, to identify confirmed and suspected sites within the study area;

- (b) terrain analysis of the study area to identify low, medium and high potential areas for the discovery of heritage resources;
- (c) a field examination of the study area, to assist in the identification of significant historical, architectural and heritage resources;
- (d) a more detailed heritage resource assessment, as described in the next section, if existing or potential heritage areas are identified and avoidance of these areas is impossible (although every attempt should be made to avoid them); and
- (e) archaeological work carried out prior to the commencement of an undertaking by an archaeological consultant licensed under the *Heritage Act*, R.S.O. 1990.

Stage II Assessment

A Stage II Heritage Resource Assessment, to identify significant historical, architectural and archaeological features, may be conducted on the preferred route or site, depending on the results of the Stage I Assessment. This may include:

- (a) analysis of existing historical, architectural and archaeological features;
- (b) test excavation of areas of high archaeological potential;
- (c) delineation of site boundaries;
- (d) controlled surface collection; and,
- (e) analysis of data.

The intent of this assessment is to determine the location and extent of heritage sites. It is also to identify the potential impacts of pipeline construction on the site, and finally to determine whether a Stage III Archaeological Salvage is required or whether excavation or monitoring during construction (see Section 5.3) should be carried out. As a cost-saving alternative, a minor deviation of the preferred route may be warranted, to avoid identified archaeological sites. Avoidance is always the preferred mitigation option.

4.3.5 Agricultural Land

The disruption of farmlands by pipelines and related facilities should be minimized. Accordingly, the use of the lowest capability agricultural land is preferred. The applicant should refer to the information on Canada Land Inventory, Agricultural Soil Capability, to rate the capability of the agricultural soils. The rating is available from OMAFRA on 1:50,000 National Topographic System maps.

The Provincial Policy Statement (2005) prescribes protection of prime agricultural land and indicates allowed land uses on such lands.

Pipeline and facilities siting should avoid disruption of prime agricultural lands. Prime agricultural land is defined as being classes 1-4 in the Canadian Land Inventory capability classification and specialty crop lands. Alternate locations on less productive agricultural lands, CLI classes 4-7, are to be identified, all other factors being equal. If these locations are considered unsuitable, the reasons why they were rejected should be outlined.

The Ontario Ministry of Agriculture, Food and Rural Affairs representative on the OPCC should be consulted, as early as possible, when considering alternatives through specialty crop land or prime agricultural areas. Information found in the Agricultural Land Use Systems Maps (1:50,000) and Artificial Drainage Systems Maps (1:50,000) should be verified and augmented by site visits.

Where all the possible alternatives affect prime agricultural lands, priority for avoidance should be given to specialty crop lands followed by class 1-4 soils, in descending order. Consideration should also be given to other priority rating factors such as:

- (a) extent of capital investment in farm buildings, drainage systems, irrigation systems, capital and other improvements;
- (b) the type of existing farm operations; and
- (c) continuity of the agricultural land base.

Pipeline or station construction and operation may impact tilling, crop harvesting and rotations, specialty crops, intensive livestock or poultry operations. These features should be identified and the impacts to them minimized.

If it is essential that the route or site traverse prime agricultural lands, all reasonable efforts to parallel property lines and other rights-of-way should be made. Diagonal field severance should

be avoided. In addition, every attempt must be made to ascertain the location and extent of existing and planned tile drainage systems.

4.3.6 Vegetation and Wildlife Habitat

”Ontario Natural Areas” include a number of types including Areas of Natural and Scientific Interest (“ANSI”), Conservation Reserves, Enhanced Management Area-Intensive Forestry, Provincial Park (various categories), Conservation Reserves, Ontario’s Living Legacy Sites and others. The MNR considers a natural area to be any designated area with natural heritage values. Information on these resources is available from MNR Regional and District or Area offices, and from Natural Heritage Information Center (“NHIC”) website, administered by the MNR. The NHIC maintains natural heritage information for many different natural area types. Once the Ontario Natural Areas are identified in the study area, the local offices of MNR must be consulted as early as possible, to discuss routing or siting alternatives, to avoid impacts on these sensitive resources. As a rule, routing and siting in Ontario Natural Areas should be avoided. The onus is on the applicant to acquire all the permits and to fulfill all the requirements relevant to the Ontario Natural Areas, as required by the MNR.

Forest resources, such as stands of commercial and/or recreational value, should be identified and assessed. The effects of altering wildlife corridors and habitat fragmentation should be considered. Seed production stands of trees should be avoided. Where this is not possible, early consultation with the local MNR office is advisable. Early consultation with the specific Area Foresters, who are aware of the local situation, will minimize impacts on these areas. To avoid clear cutting, the route or site should follow the interface between woodlands and cleared lands.

The route or site should avoid existing deer winter concentration areas (deer yards), moose late winter habitat, provincially and locally significant wetland areas, traditional plant use areas, critical habitat for fur-bearing animals (e.g. dens), moose aquatic feeding areas, known raptor nesting sites and rare, vulnerable and endangered species or locally significant species (e.g. trumpeter swans, great grey owls). Route or sites on Crown Game Preserves, require approval by MNR. Special attention should be paid to assessing impacts on sensitive wildlife and herbaceous species.

4.3.7 Lake and Watercourse Crossings

The impacts of pipeline construction on water bodies are significant considerations in selecting a preferred route or site. A number of characteristics related to watercourses will determine the preferred alternative. To document and justify the preferred crossing locations, the applicant is expected to outline the routing criteria, their relative importance, the net impacts that were

predicted, how criteria were applied and the rationale used to choose the final crossing location. Consideration should be given to watershed or sub-watershed plans where they exist or are being developed. Early contact with Conservation Authorities, where present within a study area, is essential.

The sensitivity of a watercourse must be determined in early consultation with Conservation Authorities, where they exist, and private fish hatchery or put-and-take operators upstream and downstream of the crossing site. Wherever practical, sensitive crossings should be examined on site, with the relevant agencies. Conservation Authorities, on behalf of MNR, are in charge of watercourse protection and only if species at risk are identified, is the MNR to be directly involved. In addition, if there is a disturbance of the waterbed by open cut crossing method, the Department of Fisheries and Oceans has the authority over the crossings and the associated impacts on aquatic habitats. A permit is required from a Conservation Authority under Ontario Regulation 148/06 “Development and Interference with Wetlands and Alterations to Shorelines and Watercourses,” if a proposed route crosses a watercourse, wetland or floodplain.

The number of water crossings should be minimized in selecting the preferred route or site. The headwaters of the watershed should be avoided, as well as groundwater recharge areas and spring sources. Trout lakes, nutrient sensitive lakes and cold water streams and water crossings involving contaminated sediments should be avoided.

Water intakes and discharge points for municipal and private water supplies, which may be affected by watercourse crossing activities, should be identified on the photo mosaics. MOE should be contacted to ensure that Section 33(1) of the *Ontario Water Resources Act*, R.S.O. 1990, as amended, does not apply.

Crossing locations should be chosen to minimize the amount of blasting. Local water well records and geophysical survey data can often provide useful information on subsurface conditions. As well, the sinking of bed cores to the proposed trench depth will provide habitat assessment information, a thorough knowledge of substrate conditions and will ensure that in-stream work is well planned and rapidly executed.

The crossing locations also should be chosen to minimize any impacts on downstream uses, such as water supply intakes, and should avoid fish habitat, such as spawning beds, migration route, nursery and feeding areas. Any Harmful Alteration, Disruption or Destruction of fish habitat (“HADD”) as defined by the *Federal Fisheries Act*, would trigger the approval under the Canadian Environmental Assessment Act and would require authorization from the federal Department of Fisheries and Oceans (“DFO”). MNR local offices should be consulted as to the requirements of the Federal Fisheries Act and the DFO.

In order to minimize bank disturbance, crossing locations that naturally provide a suitable staging area for equipment and materials are desirable to minimize grading and vegetation removal. The composition and contour of the stream bed and channel in terms of their erosion and deposition equilibrium, and their potential for restoration to original equilibrium, should also be considered when selecting an appropriate crossing location.

For liquid-hydrocarbon pipelines, the MNR should be consulted regarding buffer strips between the pipeline right-of-way and watercourses.

4.3.8 Provincial Parks and Conservation Reserves

Where a pipeline is to pass through Crown Land, including the beds of waterways, the applicant must contact the MNR local office. After a preferred route or site is selected, the applicant must apply for a work permit for the use of Crown Land for pipeline installation and operation purposes.

The MNR approval is necessary when it is proposed that a pipeline will pass through any class of Ontario Natural Area, such as Provincial Park or a Conservation Reserve. At Waterway Parks and Provincial Parks located along waterways, site-specific restoration plans may be required to screen the ROW from the waterway. The MNR local office must be consulted, to determine site-specific routing requirements. For Provincial Parks, Ontario Parks Zone office should be contacted.

Areas of important recreational and tourism potential should be avoided, including all known areas used for the purpose of organized outdoor education. Local naturalist clubs and conservation groups are an important information source for locating these areas.

4.3.9 Air Emissions and Noise

Air emissions and their environmental impacts should be compared to all local, provincial and federal regulations, policies and guidelines. In order to assess compliance with *Environmental Protection Act*, R.S.O. 1990, c. E. 19, as amended, Environmental Reports for compressor stations should follow Ontario Regulation 127/01, to include estimates of air emissions and maximum off-site point of impingement concentrations, for any contaminant emitted to the atmosphere from these facilities.

With regard to noise and other air emissions associated with compressor stations, a description of impacts should be provided (with and without mitigation) on adjacent sensitive land uses, during the construction and operation of the facility. This information should be used as a siting constraint or for comparative purposes with alternative sites. A description of expected impacts during the construction and operation of the facility on adjacent land uses should be provided.

4.3.10 Geological Features and Mineral Resources

Existing and planned pits, quarries, aggregate deposits, well sites, mines and mineral deposits (including peat deposits) should be avoided, as well as sites of unusual or significant geological features, such as unique landforms, geological type sections or paleontological or fossil localities. Information and maps concerning mineral resources are available from the MNR and the Ministry of Northern Development and Mines.

4.3.11 Water Wells and Hydrology

A survey of water wells along, and adjacent to, the preferred route or site must be conducted. The MOE Regional Office should be contacted to obtain water well records and relevant associated data. Groundwater hydrology may prove to be sensitive to pipeline excavation and should be described in relation to the wells. Areas where sandpointing may be required should be identified.

Minimum setback requirements for the project and activities, such as drilling, blasting, and excavation should be considered.

Monitoring of the water wells should be carried out where blasting, dewatering or work below the water table is required. If claims of water supply interference arise as a result of construction activity, it is necessary to obtain data on historical and pre-construction water quality and quantity.

Static water levels and depths for wells that are accessible for measurement should be recorded. Well construction details should also be recorded.

Water samples should be collected from the wells after a suitable period of flow. The water should be analyzed for parameters agreed upon with the MOE Regional Office.

Statements should be obtained from homeowners on the adequacy of their supply. The accessibility of the well is the responsibility of the owner. If the owner does not agree to the testing and interviewing, the owner's refusal should be recorded.

De-watering is the removal of impounded water or groundwater from the construction area and can create hydrology concerns. As a result of exposure to various soils and construction materials, such impounded water may have high concentrations of suspended sediment or may be contaminated with high nutrient content and/or toxic substances. If toxic substances are involved, the MOE District Office should be contacted and provided with information on the contaminants, concentrations and the proposed method of handling these materials. Measures should be taken to prevent such water from affecting the water quality of adjacent watercourses.

If the water removed during a dewatering operation is greater than 50,000 litres/day from any groundwater source, a permit to take water must be obtained from the MOE Regional Office.

4.3.12 Safety Considerations

Maps or drawings showing the pipeline's relative position with respect to main buildings intended for human occupancy or assembly should be filed with the application.

New pipelines intended to operate at hoop stress of above 40 % of the specified minimum yield strength ("SMYS"), will have to meet minimum set-back requirements of 20 metres from dwellings intended for human occupancy, and 200 metres from institutions where rapid evacuation is not possible. If this is not practical, a minimum of 5 metres and 90 metres should be maintained, respectively. These guidelines for pipelines above 40% hoop stress are set in the TSSA "Guidelines For Locating New Oil and Gas Pipeline Facilities", August 1998, PI-98/01.

It should be noted that there are no minimum setbacks for new buildings to be developed in the vicinity of existing pipelines operating below 40% "SMYS". As for the development in the vicinity of the existing pipelines operating above 40% SMYS, the same recommendations apply as for new pipelines above 40% SMYS. This is set in the TSSA "Guidelines for Development in the Vicinity of Oil and Gas Pipeline Facilities", August 1998, PI-98/02.

Where the proposed pipeline passes through areas where it may pose a threat to local residents or livestock, consideration should be given to fencing of the right-of-way during construction activities. All such pipelines will require clear, prominent signs so that residents, construction personnel and others working in the area are aware of them.

When constructing in a road allowance or where construction will affect road traffic, site specific traffic safety considerations may be required.

4.3.13 Social Impacts

Social Impact Assessment (“SIA”) is an integral component of environmental analysis. The role of SIA is to ensure that the extent and the distribution of a project's social impacts are considered in an explicit and systematic way.

The SIA should be coordinated effectively with the biophysical assessment of impacts. This is to ensure that all impacts are assessed and trade-offs made in an integrated manner. This is particularly important, when the same potential physical change may cause both a biophysical and a social impact. For example, the biophysical assessment may reveal that the removal of a certain number of hectares of vegetation is insignificant from an environmental point of view, while the SIA may reveal that this removal would cause major disruption to the community. Effective coordination will help to ensure the proper description and inclusion of these impacts in the impact assessment. Coordination is also important to minimize the intrusiveness of the study process on the affected parties. Therefore, when socioeconomic data is required directly from affected parties, it should be collected at the same time as biophysical data is being collected. The reasons for collecting the information should be made clear.

The SIA process involves description of the existing social conditions, predicting the changes that are likely to occur, determining measures to mitigate/enhance the expected changes, and evaluating the net social impacts, together with the other net environmental impacts, in order to make trade-offs when necessary and to select the preferred alternative. The SIA process must be traceable, replicable, carried out at an appropriate level of detail, and fully documented in the ER.

The SIA focuses on the problems and needs of the individuals and communities who are faced with change. The most common social impacts associated with pipeline projects include construction-related noise, dust, traffic disruptions and general disturbance of people's home and business lives during the construction process. This includes impairment of the use and enjoyment of property, the interference with the flow of customer traffic to commercial establishments and with farm-related machinery movement. Noise effects may disturb some livestock operations' productivity or disrupt business operations in the area of construction. Also, pipeline construction is associated with both real and perceived health and safety risks which may affect people's lives and how they feel about their homes and communities. One of the most difficult impacts associated with development projects is the loss of control over personal property and the living environment experienced by affected residents.

The social consequences of implementing each alternative, including the preferred project should be anticipated. This includes determining who will be affected, in what way, for how long, the relative importance of the impact and what can be done to reduce its significance. Public

consultation and education is especially critical at this stage of the process to try to identify, understand and mitigate/enhance the expected impacts.

It is important that an effective dialogue between the applicant and affected parties be maintained throughout the entire planning process, to ensure that decisions are both responsive and responsible. If the public sees that the decision-making process is accountable to their concerns, their sense of apprehension likely will be reduced. Therefore, a good SIA should make the planning and hearing process less contentious.

The level of detail for the SIA will depend on the extent and significance of the expected impacts which either are known or are indicated through the scoping phase of the SIA, as well as public consultation. In rural southern Ontario, the bulk of social impacts in pipeline and station construction are borne by directly affected landowners. In other situations, social impacts may be more difficult to identify and address. In urban areas, the density of the population, and its diversity, often make social impacts more complex and harder to evaluate and manage solely through the public consultation process.

In Northern Ontario, the traditional pattern of land use may be unfamiliar to the applicant, therefore consultants or agents specializing in local social impacts should be retained to identify and address these issues. Special attention should be paid to the diverse cultural groups in these communities, what impact the pipeline or related facility may have on them and specific measures to manage the impacts. Where a proposed facility may affect Aboriginal Peoples' traditional land use areas, the applicant should consult with tribal councils and native communities.

4.3.14 Cumulative Effects

Introduction

Environmental effects can interact and combine with each other over time and space. This combination and interaction of effects is referred to as cumulative effects. In many situations, individual projects produce impacts that are insignificant. However, when these are combined with the impacts of other existing or approved projects, they may become important. Such cumulative effects may include both biophysical and socio-economic effects, and should be identified and discussed in the ER as an integral part of the environmental assessment.

Cumulative impacts may result from pipeline projects which loop existing systems and should be addressed. This may include an examination of areas of known soil erosion, soil compaction or soil productivity problems. It may mean the examination of impacts associated with continued loss of hedgerows and woodlots in the same area. As well, it could mean the increased loss of

enjoyment of property because of disruptions caused by the construction of successive pipelines on a landowner's property. There may also be heightened sensitivities as a result of improper or ineffective practices and mitigation measures in the past.

Positive as well as negative cumulative impacts should be identified. For example, non-productive land can sometimes be used for agricultural purposes with additional tile drainage. Cumulative effects, when identified as part of the assessment process, should be integrated in the appropriate section of the ER (e.g. soil impacts).

Particular attention should be paid to environments of known sensitivity and high eco-value (as defined by provincial policies and public input), to situations where opportunities exist to remedy past negative impacts, and to situations in which a combination of actions may result in identifiable environmental impacts that are different from the impacts of the actions by themselves. Where quantitative assessment of cumulative effects is impossible because of a lack of data or understanding of the ecosystem interactions, a qualitative characterization of the effects should be carried out.

Approach to Cumulative Effects Assessment

The first step in assessing cumulative effects is to define appropriate study area boundaries. It is critical not to restrict the study area to a proposed pipeline easement and temporary work areas. The applicant is required to consider four distinctive cumulative effects pathways when delineating the study area and analyzing and assessing the cumulative effects:

1. additive effects of pipeline construction occurring slowly over time (e.g. erosion of the easement due to inadequate grading);
2. interactive or magnifying effects from pipeline construction (e.g. soil fertility loss and soil drainage degradation due to compaction during construction);
3. additive effects of pipeline construction and other existing and future projects in the area (e.g. additive forest cover losses due to tree clearing for pipeline construction and subdivision development);
4. interaction of pipeline construction with other existing and future projects in the area (e.g. cold stream fish habitat degradation, as an interactive effect of increased erosion and sedimentation due to pipeline stream crossing and floodplain development downstream).

Once the study area is delineated, the information on the current and planned projects in the study area is gathered and analyzed. This information may be obtained from the municipal planning and development departments, official plans, local businesses and other appropriate sources.

Once the potential cumulative effects are predicted and mitigation and restoration measures identified, the applicant should describe any residual effects that cannot be fully mitigated. For the residual effects, a separate strategy to compensate affected parties (e.g. crop loss compensation) or minimize the magnitude of the effects needs to be defined.

The following is a list that encompasses some of the cumulative effects of pipeline construction:

- (a) incremental increase of easement width when adding new parallel pipelines to reinforce the systems;
- (b) additive effects of vegetation removal including riparian vegetation, forest cover, agricultural crops;
- (c) repetitive disturbance of soils including soil compaction, drainage systems damages, loss of soil fertility, crop yield reduction;
- (d) streams and groundwater degradation and effects on water wells;
- (e) residual effects caused by the removal of forest edge and interior, such as reduced species diversity and other habitat alterations.

The ER should include a tabular summary of causes of cumulative effects, a cumulative effects description (e.g. duration, spatial extent), recommended mitigation measures, all residual effects and approaches to deal with residual effects. The locations of the cumulative and residual effects are to be mapped on an appropriate base map.

Chapter 5. IMPACT MITIGATION

5.1 GENERAL MITIGATION TECHNIQUES

Areas of concern along the preferred route or on the preferred site should be listed and described in detail in the Environmental Report. It may be necessary to collect detailed information on these areas of concern, in order to show that they can be protected during the construction and operation of the pipeline or station by standard construction or contract specifications. The appropriate specifications should be reproduced in the ER.

Aerial photo mosaics at a scale of 1:10,000 or larger should be used in conjunction with field surveys to collect environmental data. For environmentally sensitive watercourses, wetlands, significant wildlife habitat and specialty crop lands, more detailed site plans at a scale of at least 1:2,000 should be considered. These site plans should outline workspace requirements, staging areas, methods of erosion control, method of construction, rehabilitation requirements, notification requirements and timing, storm and sanitary water management, landscaping and screening.

The first and most important mitigation technique to be employed is avoidance of the areas by route or site adjustment. If avoidance is not possible, a number of general mitigation techniques are available. These could include scheduling of construction (winter, biological windows, wet soils shutdown), modified construction techniques, the use of specialized equipment, temporary or permanent relocation of the feature or extensive restoration following construction. Appropriate specific techniques should be addressed in the ER.

Standard construction or contract specifications to be used during construction to mitigate negative impacts should be included in the ER. Agency notification requirements and monitoring program descriptions, including sampling should be cited in the ER. Permits required or received for the construction phase of the project must also be described in the ER.

The following sections outline specific mitigation techniques that can be employed during construction to deal with different environmental and social concerns.

5.2 SOCIAL IMPACT MANAGEMENT

Once the net impacts have been identified and assessed for all the alternatives and the preferred alternative has been selected, the ER should describe the social impacts of the preferred alternative in more detail and prescribe specific measures to mitigate any negative impacts. This

is consistent with the increased level of detail expected for the examination of other environmental impacts and proposed mitigation measures for the preferred alternative. Effective public consultation is essential to develop appropriate measures for the mitigation of social impacts. Various mechanisms, such as complaint tracking systems and landowner agreements which set out environmental management commitments by the utility can be used to manage these impacts. In addition, a compensation framework, a decision-making process to resolve issues as they arise, and the applicant's commitments to undertake specific mitigation and monitoring measures in the ER, can help address many of the social impacts.

The ER should document the detailed examination of social impacts for the preferred route or site, the mitigation measures that are proposed and the net impacts which are expected to remain after these measures are applied. Compensation for specific negative impacts should only be discussed after a thorough attempt has been made to mitigate negative impacts.

5.3 CULTURAL HERITAGE RESOURCES-MITIGATION

Mitigation of impacts on cultural resources, such as built resources, registered archeological sites, cemeteries, is best accomplished through avoidance when selecting a preferred route or site.

In cases where it is not possible to avoid an adverse impact on the archaeological resources identified during Stage II Assessment, (see Section 4.3.4.) it will be necessary to carry out a salvage excavation. Stage III archaeological field work must be carried out prior to the commencement of construction on the pipeline segment in question. Consideration should be given to avoiding inclement weather conditions to allow for effective field work.

An archaeological salvage excavation involves the systematic retrieval of artifacts which would otherwise be destroyed, the analysis and curation of those artifacts and the production of a report according to the requirements of the Ontario Heritage Act. The report should thoroughly document what has been removed due to construction.

Above-ground features, such as standing structures should be dealt with by carrying out a detailed recording exercise, which documents the characteristics of the structure prior to removal or destruction. The rationale for removal should be provided.

5.4 EASEMENT PREPARATION

Activities associated with preparation of the easement, include the planning of access, fence bracing, clearing of vegetation, grading and blasting.

During landowner interviews, the applicant should determine whether access to the easement across individual properties is available and whether the landowner is agreeable to the use of such areas during construction. In addition, if the landowner requires access across the easement for farm equipment and/or livestock during construction, this must be provided and noted in the ER and contract documents.

Plans for clearing and rough grading of the easement must accommodate the reasonable requests of the landowner and the procedures of the MNR for Crown Land as prescribed in the approval/permit.

Blasting must be controlled and timed by licensed blasting personnel, to minimize adverse effects on local water wells, buildings, soils, livestock and wildlife. Where there is potential for damage to nearby wells, the applicant should consider retaining a hydrogeologist and blasting specialist, to conduct an evaluation designed to minimize adverse impacts on potentially affected wells. Generally, all water wells within 100 metres of proposed blasting locations should be monitored for quality and quantity prior to construction. The local MOE District Office should be advised of all complaints regarding adverse effects on water wells from blasting and the resolution of such complaints, upon their resolution. Should blasting or construction disrupt water supplies, the applicant should provide an equivalent alternative supply. Blasting in a watercourse requires DFO authorization.

The occupants of all buildings which may be subject to noise and/or vibration due to blasting should be informed by the contractor or his agent prior to the start of the blasting operations, preferably 48 hours in advance. In addition, the contractor or his agent should conduct a pre-blast survey and monitor blasting operations for noise and vibration at all buildings, where the noise and vibration levels are expected to exceed the limits prescribed by applicable municipal by-laws and provincial standards. MOE and affected municipalities should be contacted to acquire current regulations regarding noise control.

All work should be confined to the easement. If it is necessary to work off the easement, temporary working space must be acquired through discussions with the landowner. Traffic on and adjacent to the ROW should be minimized during wet soil conditions. The applicant is

expected to have a policy in place, whereby construction activity on the easement is either reduced or shut down during and after wet weather to avoid damage to soils (see section 5.5.1).

In Fire Districts designated in the *Forest Fires Prevention Act, R.S.O. 1990*, the construction of all permanent and/or temporary roads located off the ROW must be authorized, up to Latitude 54°N, by approval/permit under the Forest Fire Protection Act and/or under the *Public Lands Act, R.S.O.1990*. Any construction road not required after construction is to be closed by the applicant and left in a condition acceptable to the MNR or landowner. The applicant must maintain any access roads necessary for the security of the pipeline.

5.5 AGRICULTURAL LAND

5.5.1 Soils

Stockpiled soil should be located at least 30 metres away from watercourses and protected from erosion. If that distance is not possible, silt fences, earthen berms and plastic sheets should be used to contain and stabilize these soils to prevent loss of soil and the siltation of the watercourse.

To minimize the adverse effect of construction on the agricultural productivity of the land, the applicant, prior to trenching, should remove topsoil along the trench area and under the subsoil storage area, stockpile it separately from subsoil and replace it upon completion of construction.

In areas of highly contrasting soil textures, such as sand overburdens on clay, three soil piles should be considered, one for topsoil and two for subsoil. The topsoil depth and method of stripping should be determined after consultation with the landowner prior to construction.

On well-drained mineral soil, topsoil may be stripped by colour or to a predetermined depth, depending on the wishes of the landowner, to ensure minimal mixing of subsoil and topsoil. However, on some poorly drained soils which contain a high percentage of organic matter, and on organic soils, it may be necessary to strip to a predetermined depth.

All fine stripping of topsoil should be completed within two working days after completing the bulk of the topsoil stripping. This will reduce the chances of exposing the soil to wet weather, which can result in contamination. Inspection is also necessary during excavation and backfilling, to avoid topsoil/subsoil mixing. Upon the request of the landowner, the applicant will remove excess subsoil resulting from construction.

It is the responsibility of the applicant to acquire baseline data (i.e. soil-mapping units and their properties such as horizon depths, organic-matter content, etc.) for the route or site chosen and to propose suitable construction procedures to minimize soil damage. Procedures such as chisel ploughing, para ploughing, sub soiling, stone picking, fertilization, heavy mulching and the use of soil building cover crops, must be carried out wherever needed.

Comprehensive pre-construction investigations are necessary in areas where sensitive materials such as Leda clay are likely to be encountered. Construction techniques and schedules must be modified according to the nature of the sensitive materials found.

The worst impacts of construction occur at high soil moisture levels. Consequently, construction during the driest period of the year is desirable. The applicant is required to establish and implement a wet -weather shutdown policy to minimize adverse impacts of construction on soil productivity. During wet weather conditions, contact with topsoil should be avoided and a total restriction placed on all rubber tired vehicles and equipment traveling on the ROW. If, due to delays, construction must continue under wet soil conditions to meet an in-service date, terms and conditions must be discussed with the landowner. The wet -weather shutdown policy or decision-making process must take into account the nature of the impacts, the concerns of the landowner, agricultural interest groups, the pipeline contractor and the applicant, when determining the need to continue construction under adverse weather conditions.

Upon agreement with the landowner, distribution of the topsoil over the trench may be delayed until the following summer, after all subsidence or settling of the subsoil has taken place and has been leveled down.

5.5.2 Agricultural Drains

If agricultural land that is extensively tile drained cannot be avoided, mitigation plans must be developed and implemented prior to construction. The plans should be designed to maintain proper subsurface drainage during and after pipeline construction.

Consultation with the landowner prior to construction is necessary to determine the location of existing and planned tile drains. If a landowner is not aware of the location or existence of tile drains, OMAFRA may be contacted or a knowledgeable local tile contractor should be consulted, in order to verify the depth and frequency of any installed tiles. The depth of the proposed pipeline should be compatible with existing and planned drainage systems.

Tile drains that are cut during the trenching operation must be flagged and suitably plugged to prevent the entry of foreign material into the drainage system. Plans for maintaining proper

surface and subsurface drainage during the construction which are acceptable to the landowner are required.

Following construction, the applicant must repair or replace any damaged or disrupted tiles. It is recommended that qualified tile drainage consultants and licensed tiling contractors be used for this work. Where the number of tile drains crossing the pipeline trench or their angle of crossing makes individual repair difficult, the installation of headers (sub-mains) should be considered. All open drainage ditches should be restored, utilizing appropriate soil stabilization procedures including, but not limited to, the use of geo-fabrics, wood or straw mulch, hydro seeding and rock or gravel blankets.

5.6 VEGETATION AND WILDLIFE HABITAT

On the pipeline ROW at locations designated by local MNR staff, areas of grasses, ferns, shrubs and other herbaceous species should be maintained for wildlife management purposes, as well as for screening at the banks and edges of watercourses. If vegetation associated with the edge of streams (i.e. riparian vegetation) must be removed, it should be replaced as soon as it is practical, in consultation with MNR and the local Conservation Authority. Where applicable, a compensation plan under the *Fisheries Act, R.S.C. 1991*, as amended, must be prepared before construction begins. DFO may also require a compensation plan if the riparian vegetation disturbance, results in the harmful alteration of fish habitat.

Spraying herbicides over designated nesting sites, headwaters and watercourses is not permitted. The use of herbicides at other locations should be avoided when possible and only undertaken by a licensed applicator. Ecologically sound alternatives to herbicide use should be considered.

Pipeline construction should avoid interference with areas of high scenic value, traditional plant use areas and wildlife corridors. Construction must not interfere with avian nesting periods or rare, threatened or endangered species.

Wetlands must be avoided where possible. Wetlands as defined in the Policy Statement, means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case, the presence of abundant water has caused the formation of hydric soils (soils in which there is an abundance of moisture) and has favoured the dominance of either hydrophytic or water tolerant plants. The four major categories of wetlands are swamps, marshes, bogs and fens. For the purposes of the Policy Statement, lands being used for agricultural purposes, that are periodically "soaked" or "wet", are not considered

to be Wetland. Where a pipeline is constructed through forested wetlands, access and drainage across the trench must be maintained.

Vegetation including trees and shrubs should be protected, especially when requested by landowners or tenants. Every effort should be made to bore under specimen trees where practical. Suitable measures, such as protection of tree roots within the dripline, pruning any damaged branches or roots, protection of trees with earth, gravel fill or fencing, transplanting of vegetation and boring under specimen trees should be used.

A designated maximum slash width through woodlots or forests should be established in consultation with the landowner or MNR prior to clearing. Restricting the width of the working area is often a feasible alternative when passing through valuable woodlots. Merchantable wood must be offered to the landowner, or where possible, used in pipeline construction. The applicant is referred to the *Crown Forest Sustainability Act, R.S.O. 1990*, as amended. Merchantable timber cut during clearing operations, must be cut in standard lengths and piled in locations from which it can be hauled readily, unless other arrangements are made with the owner.

Slash must be chipped or disposed of to the satisfaction of the MNR or landowner. If chipping cannot be used, and disposal is not possible, the slash should be piled for burning at least 10 metres from the edge of any standing timber. In the MNR designated Fire Districts, no burning may take place from April 1 to October 31, except under authority of a burning permit obtained from the MNR, in accordance with the *Forest Fires Prevention Act, R.S.O. 1990*. The applicant should notify the local MOE District Office when open burning is to be undertaken.

On Crown or private land, no disposal of materials (e.g. push-outs) adjacent to the pipeline easement will be permitted, unless approved by the MNR or the landowner.

5.7 WATERCOURSE CROSSINGS

5.7.1 Planning and Preparation

Crossings of lakes and watercourses can cause serious problems of bank erosion, disturbance of cultural heritage resources, siltation, interference with fish and wildlife and impairment of downstream water quality, if not properly planned and executed. Water crossings must be conducted to minimize any increase in downstream siltation and other negative effects on fish and wildlife habitat, water quality or water quantity for downstream uses.

River crossings may be done by either "wet" or "dry" procedures depending on the sensitivity of the water body, its size and flow, and the stability of the bank. All factors should be reviewed and the rationale for selection of a wet or dry crossing must be explained. For sensitive crossings, where topography and soil conditions are suitable, a bored or directionally drilled crossing is the preferred technique. The applicant is required to file a post construction report to demonstrate that the selected technique and site-specific monitoring program minimized adverse impacts (see Section 6.2).

MNR's generic sediment control plans for watercourse crossings should be adhered to. A written plan for wet crossings entitled Sediment Control Plan for Wet Crossings, has been developed along with three plans and drawings for:

- (a) Temporary Vehicle Stream Crossing;
- (b) Pump and Dam Type Crossing;
- (c) Dry Flume Type Crossing.

A site-specific construction plan should be prepared for sensitive water crossings. A scale of 1:5,000 or larger may be necessary for the plan. The site plan should outline:

- (a) alternative crossing procedures where applicable;
- (b) special mitigation techniques;
- (c) time duration of each activity;
- (d) temporary workspace requirements;
- (e) location and size of staging areas;
- (f) method of erosion control;
- (g) the location of any diversions, sediment traps and flumes;
- (h) rehabilitation requirements;
- (i) agency notification requirements;

- (j) storm and sanitary water management;
- (k) spoil disposal locations;
- (l) backfill requirements, landscaping and screening plans;
- (m) the management of equipment exposure to the stream;
- (n) the monitoring program to be implemented before, during and after construction; and
- (o) contingency plans.

Wherever applicable, local MOE and MNR representatives must be notified in advance of all watercourse crossings. Verbal confirmation should be given one day in advance of the scheduled crossing. If there are changes to the originally proposed method of crossing, local MOE and MNR offices should be contacted.

Stream diversions should only be used when no feasible alternatives exist. MNR, MOE, local Conservation Authorities and DFO approval may be required for any planned diversions. Final stream channel clean-up must include removal of any temporary structures, reshaping of the stream to the original or an approved configuration and removal of all construction material and debris.

Construction must be timed to avoid interference with fish migration, spawning or egg incubation. Blasting in or adjacent to watercourse beds must also be restricted during these times. Devices which prevent fish from entering the area of blasting in water bodies can be used at other times. The time sequence of activities from clearing of banks to final restoration must be noted on site plans. Construction operations should avoid recreational lakes or rivers during peak-use periods. If this is not possible, proper warning and lighting must be in place for crossing on recreational watercourses. It is recommended that operators of recreational activities be notified in advance of construction start. The MNR Regional Office should be contacted regarding peak-use periods.

Before any construction at a watercourse crossing begins, all equipment and materials to be used must be on-site and ready for use, to ensure that the crossing time will be minimized. Environment Canada weather reports are to be obtained to avoid unexpected high water flows resulting from regional weather disturbances.

5.7.2 Watercrossing Impact Minimization Measures

To minimize siltation of the water body, earth plugs should be left in the banks until in-stream excavation is to begin. The clearing of vegetation on slopes and banks of the watercourse should be delayed, until just prior to the arrival of pipe and equipment for the crossing.

The bank trench should be excavated and the spoil placed safely away from the bank and protected to avoid unnecessary siltation. A vegetative buffer zone, 3 metres from the water's edge, should be left in place until immediately prior to in-stream excavation. For most inland watercourses, all trench spoils must be placed onshore, unless the appropriate agency (i.e. MNR, MOE) approves in-stream disposal. Highly organic stream bed material should not be returned to the stream; it should be replaced by granular material which should be on site prior to trenching, in order to cover the pipe as soon as it is laid across the watercourse. Gravel backfill should be restricted to the area of stream bed excavation, to avoid creation of an artificial drain from the on-shore trench to the watercourse trench. The applicant should consult with the MNR Regional Office for locations that require granular backfill. Where it has been identified, that the native material is not suitable for backfill, then clean backfill material should be stockpiled on-site in advance of crossing construction, to eliminate delays which would lead to longer in-stream construction time and thereby increase the risk of sedimentation. Aquatic plants uprooted or cut prior to or during trenching operations should be contained and deposited on land to avoid adverse downstream effects.

In-stream construction time should be kept to a minimum. Well-placed sediment and erosion control devices along the banks must be used, to intercept any contaminated surface run-off. All sediment and erosion control devices should be inspected daily, to ensure that they are functioning as designed and they should remain in place until all rehabilitation techniques have been established.

Wherever temporary weirs, coffer dams or diversions are used at water crossings to form settling basins or to facilitate trenching, adequate stream flow must be maintained for downstream water uses. The materials, design and location of these modifications are to be indicated on site plans and approved by the MNR Regional Office. If more than 50,000 litres of water per day are being diverted or stored, then approval is also required from the MOE Regional Office.

To avoid disruption of the bed and the deposition of grease or oil in water, vehicles must not travel along the bed of a watercourse. All in-stream construction activity must be kept to a minimum and specified on the site plan. Forging of any stream cannot take place without permission from the local MNR and Conservation Authority offices.

Mitigation procedures to stabilize the banks, even if temporary, must be instituted within ten days of stream bed back-filling, to protect the banks against surface run-off. The banks should be re-contoured to their original shape, unless otherwise approved. Riparian vegetation should be re-established as soon as possible, after the banks have been stabilized, in accordance with MNR requirements.

5.8 MITIGATION CONSTRUCTION AND OPERATION IMPACTS

A variety of activities associated with pipelines and station construction may have an impact on the surrounding environment. These include such effects as fuel handling, noise, dust, construction waste and general disturbance. The applicant, as part of its efforts to address these impacts, must assign an inspector for major construction projects.

5.8.1 Materials Storage and Waste Disposal

Fuelling and maintenance must be carried out in such a manner and with such precautions, as to avoid contamination of the water table, soil and watercourses. For any areas on the ROW to be used for long term fuel and chemical storage, it is necessary that they be dyked with impermeable material, with sufficient enclosed volume, to hold the tank contents plus 20 percent and located and sloped away from waterways. At the discretion of a qualified inspector, fuelling may be allowed within 30 metres of a waterway, at the discretion of the applicant's inspector, when hoses are equipped with an acceptable non-spilling attachment. Appropriate spill contingency plans should be developed and implemented for fuel and chemical storage.

An Environmental Inspector in conjunction with the applicant's Inspector, should plan and review fuelling sites with the contractor, including procedures for the notification of the appropriate authorities and the interception and clean up of spills as guided by the spills provisions in the *Environmental Protection Act, R.S.O. 1990* ("EPA"). Disposal of such wastes should be in accordance with the requirements of the MOE and MNR.

Waste, including contaminated soil, must be managed in accordance with MOE standards. The EPA and Regulation 347 in particular, require waste to be classified and disposed of appropriately. Waste is to be transported by haulers who have a Certificate of Approval – Waste Management System. Where waste is other than solid non-hazardous, the generator requires a "Generator Registration Number" from the Ministry and has obligations regarding manifesting of waste. When determining the waste category, the proponent must ensure compliance with Schedule 4 of Regulation 347. Ontario Regulation 153/04 which was amended by Ontario Regulation 511/09 and the accompanying *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, provide direction on assessment,

restoration and MOE soil criteria. Questions about this legislation may be directed to the local MOE District office.

The cleaning of equipment in streams and lakes and the emptying of fuel, lubricants and pesticides into watercourses is prohibited under the EPA.

5.8.2 Dust Control

Procedures for controlling the impacts of dust and for minimizing wind erosion should be developed by the applicant. The value of some specialty crops is reduced when dust is deposited on them. The local roads department often has standard specifications for dust control and the appropriate authorities should be consulted to determine application amounts and types of dust retardant. In addition, consideration should be given to the use of water sprayers on bedrock drilling equipment, to minimize dust from these activities.

5.8.3 Noise Control

Noise, resulting from construction and the operation of equipment and motorized vehicles, including stations and storage pool sites, should be controlled in accordance with the current provincial and municipal criteria and regulations. All measurements of the noise levels generated during the construction and operation of the pipeline and of the adjustments to these levels, if required, should follow the MOE Noise Assessment Criteria in Land Use Planning: Requirements, Procedures and Implementation (MOE, 1997).

For noise generated during the operation of the pipeline and the noise generated by compressor and pumping stations, when operated beyond normal working hours, the applicant should ensure that it is within the limits prescribed by the MOE for the type of area where the facilities are located (e.g. rural or urban). Some mitigating measures to reduce the noise resulting from the construction of pipelines and associated facilities, or their operation include the following:

- (a) distance separation between the facility and adjacent noise sensitive land uses;
- (b) favourable topographical features such as berms or other intervening structures;
- (c) devices such as noise barriers, enclosures, silencers and mufflers;
- (d) acoustical treatment of the structural components of the facility;
- (e) modifications to the operation of the facility;

- (f) selection of access route or sites to the construction site in a manner so as to minimize the noise impacts due to truck traffic; and
- (g) restrictions on the hours of construction and the scheduling of noisier operations for less sensitive times of the day.

5.8.4 Construction Specification

In addition to filing the standard construction techniques and procedures that will be used, an outline should be provided, describing how construction crews will be informed, and comply with, recommendations made in the ER. Accordingly, the following should be included in the contract specifications:

- (a) the method for restoring vegetation along the ROW, seeding mixes, application rates and areas to be revegetated;
- (b) site-specific plans of each sensitive watercourse and wetland crossing;
- (c) plans indicating the vegetation to be removed along watercourses, the crossing method and the restoration procedure, locations where fording will be allowed, the sources of water for hydrostatic-testing and the area for discharge of test water;
- (d) a description of all slope-stabilization procedures, including temporary stabilization as required and riverbanks which will be rip-rapped or hydro seeded;
- (e) design drawings, restoration plans or other information, as required, where provincial highways are affected (specific references are available from the MTO);
- (f) a list of the specialized equipment required for specific areas, such as a brush blade or subsoiler;
- (g) any special techniques to be used in the handling and restoration of agricultural soils;
- (h) the methods of handling spills or discharges of pollutants that cause or are likely to cause adverse effects;
- (i) the MOE District Office and Spills Action Centre phone numbers;

- (j) any methods to be used that are a function of the season, such as minimum frost penetration depth before commencement of winter construction, and wet soils shutdown policies; and
- (k) the required approval in writing (permit) by the MOE, MNR and local Conservation Authority.

A proposed construction schedule is required as part of the ER. This should include items such as:

- (a) the project time schedule (season of construction) with reference to periods of fish spawning, avian nesting and fire season;
- (b) a daily time schedule, where noise may be a nuisance to local residents or a specialized land use such as a hospital, school, retirement home or special agricultural operations (e.g. poultry production);
- (c) a daily time schedule, when construction may create any parking, access and/or traffic problems, as well as mitigation measures to be applied to minimize these disturbances;
- (d) project time schedules, with reference to the duration of activities such as topsoil stripping, pipe stringing, in-stream activity, the length of trench to be left open, backfilling and restoration; and
- (e) the scheduling of any heritage resource assessment, mitigation and monitoring.

5.9 SAFETY CONSIDERATIONS

5.9.1 Licensing

Natural gas transmission lines, distribution systems and oil pipeline systems are subject to the *Technical Standards and Safety Authority Act*, S.O. 2000, c. 16, as amended, and a license to operate these systems is required from the Fuels Safety Division of the Technical Standards and Safety Authority.

The applicant should specify to the TSSA the type of hydrocarbon to be carried by the pipeline and the procedures that will be implemented to ensure that the public and the appropriate local authorities, including police and fire departments, are aware of any special hazards. It should be

noted that high-vapour pressure pipelines, which transport liquid products such as propane, butane or similar volatile products, may require the special training of local fire fighters.

Technical information related to class location, design factor, maximum allowable operating pressure, test medium and pressure and specifications for pipes, valves and flanges must be filed with the application, but is not required as part of the ER. The stress level at which the pipeline will operate should be established and documented in the ER.

5.9.2 Spills

A hydrocarbon spills contingency plan must be developed for every liquid hydrocarbon pipeline. The plan and actions should be in accordance to Ontario Regulation 224/07 "Spill Prevention and Contingency Plans".

The spills contingency plan must describe appropriate spills control and damage mitigation on potential pipeline breaks. In addition, the plan must anticipate the "worst case scenario" and contain plans for all landowners downstream or on adjoining properties that could be affected by a spill. The contingency plan must include notification of the MOE's Emergency Spill Response Line, local fire and police departments, municipalities and residents potentially affected by the spill.

Emergency plans in the case of transmission line leaks or breaks must be developed for all hydrocarbon pipelines.

Plans should also be outlined in the ER for the disposal of all waste materials such as lubricating oils, product spills, urethane breakers and paints or additives used in pipeline systems. The chemical composition and toxicity of all such materials must be identified. A plan for special signing and posting of the easement and, if fencing of the right-of-way is planned, a map indicating the proposed locations of the fences should be filed.

In addition to the plans described above, the applicant should develop an emergency/crisis response plan that addresses, among other matters, security threats which could result in physical damage or disruption of the pipeline system. This plan is developed on a corporate level and it is not to be included in the ER.

5.9.3 Hydrostatic Testing

A water-taking permit is required from the MOE Regional Office in advance of any hydrostatic test, for the taking of water from surface or ground sources in excess of 50,000 litres/day. The

applicant for a permit must ensure that the rate of filling the pipeline from surface sources does not interfere with downstream uses or with the natural functions of the stream. A permit may be refused, delayed or proportionately reduced during low-flow stages.

Discharging of water from the pipeline should be done at a rate not exceeding the rate of withdrawal from the source. In addition, an energy dissipator must be installed, to minimize any erosion during discharge. The MOE may require that discharge water be sampled, to ensure that it is substantially the same as the water withdrawn. Other special measures may be required to dispose of poor-quality discharge water, such as the first and last slug of the discharge.

Pumps and heaters should not be located directly adjacent to a watercourse. To prevent soil or water contamination, a retaining berm should be constructed around the equipment and a suitable sized polyethylene sheet installed under the equipment to collect any spills or leaks.

5.10 STATION SITE DEVELOPMENT

Pipelines may require the development of above ground stations, designed for specific functions. Impacts on the surrounding area of these facilities should be addressed in the design of the facilities. The design should also include the protection and security of the site.

Every reasonable effort should be made to screen or soften the visual presence of the above ground station in urban areas, and in high visibility rural areas such as those adjacent to main transportation corridors. The landscaping site plan should include the use of plantings and earthen berms, to make the facility compatible with the surrounding landscape.

Compressor and pumping stations can be a source of noise throughout their operation. It is unavoidable and necessary that natural gas compressors and pipelines are "blown down", i.e. releasing pressure through a venting of gas, in order to allow access to the facility equipment and/or pipeline for replacement and maintenance purposes. Every practical effort should be made to reduce the noise impact created by this procedure, in order to meet the requirements of the municipal noise bylaws.

Site drainage and erosion must be controlled. It is recommended that drainage plans incorporate the use of existing municipal drains, where practical. Drainage should not be allowed directly into a natural watercourse, without flowing through a retention pond in order to reduce sediment discharge during wet weather. Drainage outlets to cultivated or landscaped land are discouraged. Any exposed soil and slopes resulting from construction and subsequent grading and

landscaping, must be protected with erosion prevention material, such as fabrics or hydro seeding, as soon as possible in order to eliminate or reduce soil erosion.

Stations require lighting so that operation and maintenance can take place and to ensure security and public safety. Efforts should be made to reduce unnecessary lighting which may bother surrounding residents.

5.11 STORAGE POOL DEVELOPMENT

The ideal geological site for proposed storage wells development may conflict with other land uses. Therefore, detailed planning must be carried out to ensure that negative impacts are minimized.

In agricultural areas, it is advised that a thorough survey of such factors as the drainage pattern, existence of field tile and cropping pattern, be incorporated into the development process. This requires that the site be properly drained and subsurface drainage maintained throughout the drilling process. In addition, all topsoil must be stripped and stockpiled when requested by the landowner. It should be stockpiled far enough away from drilling equipment, to minimize any contamination. Surface inlets to existing field tile around the well drilling site will maximize drainage potential. Where the landowner is in agreement, a temporary gravel pad or equivalent should be installed before the drilling rigs enter the proposed well site.

Two types of drilling rigs are used, a cable tool rig and a rotary drilling rig. The cable tool rig is the more conventional of the two; it requires a smaller area but takes longer to drill a well than the rotary drilling rig. With both methods exposed, in-ground pits must not be used for the deposition of drilling fluids and cuttings. The preferred technique is the use of flat surface tanks that can be pumped and the fluid disposed of in a proper fashion. If surface tanks are not available, lined pits may be used to minimize the risk of contamination to soil and groundwater.

All additional support equipment must have minimal movement in and out of the well drilling area during wet weather conditions and must follow designated access roads.

There should be either permanent or temporary access roads to proposed well sites in order to withstand the loads of the drilling support equipment and avoid damaging the surrounding agricultural or natural environment. In addition, subsurface and surface drainage must be maintained by the use of side ditches, header tile or other appropriate temporary drainage methods, as recommended by a tile drainage expert in areas where numerous field tiles are encountered. Such mitigation measures must be installed, prior to any drilling equipment

entering the project site. The alignment of the access roads should be designed to minimize their impact on the tilling and cropping practice in any cultivated field. For example, roads should be located to follow the usual lines of farm equipment travel, or headlands in cultivated fields.

Due to geological tolerance and formation location, it may be impossible to avoid negative impact on farmsteads and residences. In these instances every effort must be made to minimize the impact through proper planning and consultation with the directly affected residents. Residents, particularly those in close proximity, should be properly notified of all activities and restricted hours of construction.

5.12 RESTORATION PLANS

The easement must be rehabilitated to the reasonable satisfaction of the landowner and the agencies concerned. Restoration procedures should be implemented promptly during and following construction to limit damage.

To achieve this, it is essential that a restoration plan be developed to rehabilitate the easement. This plan should be included in the ER and put into effect immediately after construction is completed in a particular area. Inclement weather or an approaching wet season may indicate a need for temporary action. A contingency restoration plan should be developed, to mitigate environmental problems during bad weather. For example, it may be advisable to rip-rap river banks and firmly place straw bale barriers in areas where surface run-off could enter the watercourse.

There are well known procedures to alleviate negative construction impacts; these have been proven by experience and documented in standard plans for typical river crossings, highway crossings and other sensitive areas. Standard procedures include, use of hydro-seeding, diversion berms, contouring of slopes, mulching and suitable fertilizer applications. In developing a restoration plan, where there is potential for a major construction problem or where standard construction procedures may not be sufficient, a site specific program should be developed and included for review in the ER.

The landowner must be consulted and any reasonable request regarding rehabilitation of the easement complied with. Planting of soil-building cover crops should be considered. It is possible that arrangements requested by the landowner can result in poor quality restoration and problems in subsequent years, and may not be the preferred approach. On the other hand, the contractor may not be as familiar with the specific limitations associated with the soil type or specified equipment for restoration. It is recommended that a professional agronomist/agrologist

be retained to review the proposed restoration technique and its application with the contractor and the landowner, in order to ensure that optimal results are achieved.

Permanent water service must be restored to landowners who experience any interference or interruption of water supply due to pipeline construction.

Chapter 6. MITIGATION IMPLEMENTATION AND MONITORING

6.1 IMPLEMENTATION

The Board expects that an applicant will adhere to the commitments made in the evidence and to the recommendations made in the ER. When granting a leave to construct, the Board normally imposes standard conditions of approval. These conditions include the requirements to notify the Board of any material changes in construction or restoration procedures, to notify the OPCC Chair of commencement and completion of construction and facilities testing, to file post-construction interim and final monitoring reports with the Board and to apply a landowner complaint tracking system.

Changes or modifications to the approved construction techniques or pipeline alignment should be made in accordance with the Board's Order.

The pipeline construction and restoration of the land must be according to the evidence presented at the relevant hearing. This is a standard condition of approval as part of the Board order approving the project. A representative responsible for ensuring the construction of the pipeline according to the conditions of the Board order must be designated by the applicant. It is expected that an environmental Inspector will be appointed by the applicant for each pipeline construction project. This inspector should be well acquainted with the environmental material filed in support of any project, the notification requirements for various activities and conditions of the Board order.

6.2 MONITORING

To ensure that the construction site is returned to pre-construction conditions as soon as possible, the Board requires that monitoring reports be prepared following construction, to determine the success of the restoration effort. The monitoring reports are required to be filed with the Board as part of standard conditions of approval. The reports are placed on the public record and may be reviewed by any interested party. The reports are designed to provide information on actual impacts related to construction and operation and on success of mitigation measures applied. The monitoring results provide a useful basis for impact prediction and mitigation in future projects.

6.2.1 Monitoring Programs

In some situations, monitoring programs may be required to determine adverse impacts; for example, on sensitive water crossings, soil productivity, directly affected individuals and the community. The

objective of a monitoring program is to establish quantitative data for the assessment of impacts, and to recommend methods of mitigating similar impacts on future projects. The onus is on the applicant to establish monitoring programs that will meet the above objectives to the satisfaction of the governing authority. Consequently, a monitoring program outline should be included with the Environmental Report.

6.2.2 Monitoring Reports

For pipelines, an Interim Monitoring Report and a Final Monitoring Report are normally required as conditions which are included in the Board's order approving the facility. The Interim Monitoring Report is normally required within six months after final tie-ins, while the Final Monitoring Report is to be prepared prior to November 1, after the first full growing season following construction.

For pipelines that are of smaller diameter and length and to be built entirely within existing road rights-of-way, a Post-construction Report is required instead of Interim and Final Monitoring Reports. Post-construction Reports may also be required for storage pool development sites and for station development.

The Post-construction Report should:

- (a) compare the predicted impacts (including cumulative impacts) and mitigation measures with the actual ones;
- (b) discuss the reasons for any deviations which may have occurred;
- (c) describe the success of the restoration;
- (d) identify opportunities for improvement in mitigation for future pipeline projects;
- (e) log landowner complaints with an explanation of any outstanding landowner concerns; and
- (f) detail any instances where the provisions of a local by-law have not been complied with and the reasons for such non-compliance.

The Interim Monitoring Report should:

- (a) describe the predicted impacts (including cumulative impacts) and mitigation measures, compare them with the ones that actually occurred, explaining the reasons for any deviations;

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- (b) outline any changes in the proposed construction, monitoring or restoration procedures that took place during the project, and the reason for the changes;
- (c) discuss the effectiveness of the measures applied and indicate opportunities for improvement in future pipeline projects;
- (d) provide a log of all complaints received during construction and the actions taken in response; and
- (e) include any instances where provisions of any local by-law have not been complied with and the reasons for such non-compliance.

The Final Monitoring Report should:

- (a) describe the condition of the rehabilitated right-of-way and actions taken subsequent to the interim report;
- (b) compare predicted and actual impacts (including cumulative impacts) and mitigation measures, and explain any deviations which occurred;
- (c) report the results of any monitoring programs and analyses such as soil and water sampling, and make recommendations as appropriate;
- (d) discuss the effectiveness of the mitigation measures as well as the monitoring programs and indicate opportunities for improvement in future pipeline projects; and
- (e) provide a breakdown of environmental costs incurred for the project. In particular, items of cost associated with specific measures related to pre-construction, construction or restoration should be described;
- (f) provide a log of all complaints received during construction and the actions taken in response; and
- (g) include any instances where the provisions of any local by-law have not been complied with and the reasons for such non-compliance.

The Final Monitoring Report should address any potential cumulative effects which may arise for pipelines, these may include for example, reduced soil productivity over easements which overlap,

land-use restrictions due to increased easement widths or additional above ground facilities and/or the repeated construction through sensitive areas.

Before, during and after construction, a water quantity and quality survey of wells near the pipeline should be conducted in conjunction with the MOE Regional Office. A procedure must be developed to restore permanent water service to landowners experiencing interference or interruption of water supply.

Upon completion of pipeline construction, "As Constructed" plans must be submitted to MTO for highway crossings.

Following approval of an application by the Board, Board Staff may inspect construction sites to ensure compliance with the conditions of the Board order, with commitments made by the applicant in the application, evidence, and undertakings. The longer-term impacts of construction are assessed through review of monitoring reports as required in the Board orders.

**Appendix A:
Legislation that may be Applicable to Hydrocarbon Facilities Projects in Ontario**

Provincial

Aggregate Resources Act R.S.O. 1990, c. A. 8	
Conservation Authorities Act R.S.O. 1990, c. C. 27	Authorizes establishment of conservation authorities with power to: -own and control land in a watershed (s.21). -regulate construction in a watercourse, swamp, or area susceptible to flooding (s. 28).
Construction Lien Act, R.S.O. 1990, c. C. 30	Revises previous Mechanics' Lien Act. Provides system of liens, trusts and holdbacks to protect financial interests of contractors, sub-contractors, suppliers and workmen on any construction project.
Crown Forest Sustainability Act, 1994 S.O. 1994 c.25	Minister of Natural Resources may issue licences authorizing the cutting of trees on Crown land.
Drainage Act, R.S.O. 1990, c. D. 17	Provides for construction of drainage works. Pipes that are more easily maintained as a result may be charged part of the cost (s. 22).
Employment Standards Act, 2000 S.O. 2000 c.41	Standards for construction and other employees re: hours of work, overtime, vacation pay, etc.
Endangered Species Act, R.S.O. 1990, c. E. 15	Prohibits interference with the habitat of endangered flora or fauna (s. 5). Requires environmental assessments of undertakings by public bodies. This can affect pipes on land or easements owned by public bodies.
Environmental Assessment Act, R.S.O. 1990, c. E. 18	
Environmental Protection Act, R.S.O. 1990, c. E. 19	General prohibition against creation of "adverse effects". Prohibits alteration of a waste disposal site without a Certificate of Approval. Areas defined for protection of public water supply. Requires a Minister of Environment approval for use (e.g. ROW) of any landfill which has been non-operating for 25 years or less. Notification and cleanup requirements and liability of discharges related to spills.
EPA Regulation 347:	Regulates waste management.

EPA Regulation 419/05:	Regulates atmospheric emissions; Certificate of Approval (Air) for construction, alteration, extension or replacement of any plan, structure, equipment, etc. that may result in atmospheric emission of contaminants or altered rate of emissions. Contaminants include: gas, particulate, odour, heat, sound, vibration, etc.
Expropriations Act, R.S.O. 1990, c. E. 26	Provides procedure for expropriating land and determining compensation.
Forest Fires Prevention Act, R.S.O. 1990, c. F. 24	Requires permits to: <ul style="list-style-type: none">- start fires April to October.- clear land.- travel in restricted fire zones. Prohibits smoking in a forest. Applies only to designated fire regions.
Human Rights Code R.S.O.1990, c. H. 19	Prohibits discrimination in employment, etc.
Oil, Gas and Salt Resources Act, R.S.O. 1990 c.p. 12	Applies to hydrocarbon facilities in Ontario. CSA-Z3411-98 is adopted under this Act and applies to gas storage formations.
Labour Relations Act, 1995 S.O. 1990, c. 1 Sch A	General provisions re labour relations, collective bargaining. On pipeline construction, trade unions are not required to prove 55% membership as a condition of a closed shop (s. 46(4)d).
Lakes and Rivers Improvement Act R.S.O. 1990, c. L. 3	Requires approval of Minister of Natural Resources before construction of a dam, diversion work, channelization or any other activity which alters the flow and/or water levels in a lake or river.
Mining Act R.S.O. 1990, c. M. 14	Lieutenant Governor in Council may authorize transmission of energy through mining lands (s. 191).
Municipal Act R.S.O. 1990, c. M. 45	Municipalities may pass bylaws authorizing the construction of pipes on public highways (s. 210 (112)).
Occupational Health and Safety Act R.S.O. 1990, c . O. 1	Establishes standards and procedures for employee safety in construction projects and other workplaces.

Ontario Energy Board Act,
1998 S.O. 1998 c. 15 Sch. B

Requires that the Board issues a leave for constructing a transmission, production, distribution lines or stations (s. 90 and 91). The Board can authorize expropriation (s.99) and use of highways and utility easements (s. 101) for any line.

Ontario Heritage Act R.S.O.
1990, c. O. 18

The Minister of Tourism and Culture is responsible for the administration of the *Ontario Heritage Act* and is responsible for determining policies, priorities and programs for the conservation, protection and preservation of Ontario's heritage, which includes cultural heritage landscapes, built heritage and archaeological resources. Furthermore, under the Ontario Heritage Act, the Minister of Culture is responsible for licensing archaeologists, conducting archaeological fieldwork for proponents under the Planning Act and Environmental Assessment Act. As a term and condition of the license, archaeologists must follow standards and guidelines set out by the Ministry of Tourism and Culture.

Ontario Water Resources Act
R.S.O. 1990, c. O. 40

Prohibits discharge of polluting material. Requires notification to Minister when polluting material is discharged or escapes into water body. Requires a permit for the diversion or storage of water in excess of 50,000 litres per day. Requires a permit when water taking interferes with any public or private interest in any water. Requires approval of industrial sewage works. The approval is required for the establishment, alteration, extension or replacement of new or existing sewage works. As defined in Section 1, "sewage works" means any works for the collection, transmission, treatment and disposal of sewage, or any part of any such works and "sewage" includes drainage, stormwater, commercial wastes and industrial wastes

Pesticides Act, R.S.O. 1990,
c. P. 11

Requires a permit before using a pesticide (s. 7). Provides for control orders and stop orders (s. 20, 21).

Planning Act, R.S.O. 1990, c.
P. 13

Provides for official plans and zoning bylaws to control land use. However, official plans do not control transmission lines approved by the Board. Provides for subdivision control, which also does not apply to gas pipelines.

Provincial Parks Act, R.S.O.
1990, c. P. 34

Regulates use of land in provincial parks (s. 21). Licence of occupation required (Reg. 822).

Public Lands Act R.S.O.
1990, c. P. 43

Minister of Natural Resources may grant easements (s.20) or licences to occupy public lands (s.19). Public lands may also be sold or leased (s.15). In areas without municipal organization, building permits may be required (s.13).

Public Utilities Act R.S.O.
1990, c. P. 52

Requires authorizing bylaw before construction (s.57). Authorizes pipes within buildings (s.21 to 24). Prohibits interference with pipes or meters, or waste of any public utility (s.13). Requires service to any buildings on land lying along the pipe (s.54).

Weed Control Act R.S.O.
1990, c. W.5

Provides for destruction of prescribed "noxious weeds".

Federal Acts

Canada Water Act R.S.C.
1985, C-11

Prohibits deposition of waste in federally regulated waters (e.g. harbours). Provides for federal-provincial agreements.

Fisheries Act, R.S.C.1985, c.
F-14

Stream obstructions may be required to have fishways (s. 20). Prohibits pollution of water inhabited by fish (s. 36) and the harmful alteration, disruption or destruction of fish habitat (s. 35).

National Energy Board Act
R.S.C. 1985, c. N-7

Requires NEB leave to construct interprovincial or international pipelines. Extensive jurisdiction re gas exports, tolls, etc.

Navigable Waters Protection
Act R.S.C. 1985, c. N-22

Requires approval of Minister of Transport to all works in or under navigable waters, except a work which does not interfere with navigation.