National Energy Board



Office national de l'énergie

## DRAFT ENVIRONMENTAL SCREENING REPORT

Pursuant to the Canadian Environmental Assessment Act (CEA Act)

# **Southern Lights Project**





### SCREENING SUMMARY

The Applicants applied for the approval of a number of physical works and activities that would move diluent from Chicago to Edmonton through an existing pipeline, which currently moves crude oil in the opposite direction. To offset the potential loss of crude oil capacity, Enbridge Pipelines Inc. has also applied to construct approximately 288 km of new pipeline and modify existing pumping stations along its existing infrastructure.

The National Energy Board (Board or NEB) is the Federal Environment Assessment Coordinator for the applied-for project (Project). Transport Canada and Indian and Northern Affairs Canada have declared themselves as Responsible Authorities and Environment Canada, Department of Fisheries and Oceans, Natural Resources Canada and Health Canada declared themselves as Federal Authorities who were in the possession of specialist advice. Manitoba Conservation and a number of interested parties also participated in the environmental assessment process.

A number of potential adverse environmental effects of the Project, both bio-physical and socioeconomic, were identified. Issues of public concern mainly focused on reduced soil capability and the potential for water contamination resulting from an accidental product release from the proposed pipeline and the existing pipeline to be reversed.

The NEB has considered information provided by the Applicants, government departments, and the public during its review of the Project. The Board is of the view that, provided all commitments and environmental protection measures made by the Applicants are upheld, and the Board's recommendations are implemented, the proposed Project is not likely to cause significant adverse environmental effects.

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### LIST OF ACRONYMS AND ABBREVIATIONS

AB	Alberta
Alberta Clipper	Enbridge Pipelines Inc.'s proposed Alberta Clipper Expansion Project
AEUB	Alberta Energy and Utilities Board
Applicants	collectively, ESL and EPI
Board or NEB	National Energy Board
CEA Act	Canadian Environmental Assessment Act
DFO	Department of Fisheries and Oceans
DRA	drag reducing agent
EA	environmental assessment
EC	Environment Canada
EPI	Enbridge Pipelines Inc.
ERP	emergency response plan
ESL	Enbridge Southern Lights GP on behalf of Enbridge Southern Lights LP
ESR or Report	Environmental Screening Report
FAs	Federal Authorities as defined in subsection 2(1) of the CEA Act
HC	Health Canada
ha	hectare
km	kilometre
KP	kilometre post
LSr Pipeline	light sour crude oil pipeline
m	metre
mm	millimetre
MPLA	Manitoba Pipeline Landowners Association
MB	Manitoba
MC	Manitoba Conservation
MIT	Manitoba Infrastructure and Transportation
MVA	Meewasin Valley Authority
NEB Act	National Energy Board Act
RAs	Responsible Authorities as defined in subsection 2(1) of the CEA Act
RoW	right of way
SK	Saskatchewan
SAPL	Saskatchewan Association of Pipeline Landowners
SARA	Species at Risk Act
TC	Transport Canada
US	United States

### **1.0 INTRODUCTION**

### **1.1 Project Overview**

Enbridge Pipelines Inc. (EPI) owns and operates the Canadian portion of a mainline system, which currently transports crude oil and petroleum products from Edmonton, Alberta (AB) to the Canada – United States (US) border near Gretna, Manitoba (MB) [Canada/US Border]. This system is comprised of a number of lines including Line 2 and Line 13, all of which extend into the US to reach American and Canadian market locations. Several existing pump stations and valve locations associated with the various lines occur along this right of way (RoW).

The Applicants<sup>1</sup> are proposing to construct and operate the Southern Lights Project (the Project) which, in Canada, would consist of the following three components:

- 1. construction and operation of a light sour crude oil pipeline (LSr Pipeline), including associated infrastructure;
- 2. modifications to infrastructure on Line 2; and
- 3. conversion of the existing Line 13 from crude oil service to diluent service<sup>2</sup> and the subsequent reversal of the flow from south to north

The proposed work also requires the construction and operation of pipelines and facilities in the US; however, those works are beyond the scope of this Project.

### **1.2** Information Sources used in this ESR

This Environmental Screening Report (ESR) is based on information from the following sources:

- Project application (Volume I Application, Volume II Report on Environmental and Socio-Economic Assessment, and Volume III – Environmental Alignment Sheets)
- supplementary filings to the Project application;
- responses to information requests;
- various EPI manuals referenced in the Project application (e.g. Environmental Guidelines for Construction (December 2003), Waste Management Plan (October 2004);

<sup>&</sup>lt;sup>1</sup> The term "Applicants" includes both EPI and Enbridge Southern Lights GP on behalf of Enbridge Southern Lights LP (ESL). Although EPI owns and operates existing pipeline and associated facilities and will be constructing all the new facilities mentioned above, EPI will retain ownership of the Line 13 reversal component of the Project prior to any construction of that component. The term "Applicants" will be used in this report in circumstances where responsibility applies to both parties.

<sup>&</sup>lt;sup>2</sup> Extra heavy oil and bitumen typically require diluent to thin raw production in order to meet specifications for transportation by pipeline. The Project's potential diluent supply sources fall into three broad categories: light hydrocarbon streams recycled from refineries; natural gasoline produced at natural gas liquids fractionators; and imports to North America of natural gasoline.

- submissions from the public and interested parties; and
- evidence submitted at the oral public hearing.

Filed information pertaining to the Project application can be found within 'Regulatory Documents' on the National Energy Board (NEB or Board) website (www.neb-one.gc.ca). For more details on how to obtain documents, please contact the Secretary of the NEB at the address specified in Section 11.0 of this ESR.

### 2.0 RATIONALE FOR THE PROJECT

The reversal and change of service of Line 13 would provide a new diluent transportation service from Chicago, Illinois to Edmonton, AB in order to meet the need for diluent related to the forecasted increase in production of Western Canadian heavy oil and bitumen between 2010 and 2025.

The construction of the proposed LSr Pipeline (additional capacity) and the modifications to Line 2 (increased pumping horsepower for increased throughput) are intended to compensate for the removal of Line 13 from crude oil service.

### 3.0 ENVIRONMENTAL ASSESSMENT PROCESS

An application for a number of approvals to construct and operate the Project, which is comprised of the three components outlined in Section 1.0 of this Report, was submitted to the Board on 9 March 2007 pursuant to section 52 and subsection 58(1) of the NEB Act.

The above-mentioned sections of the NEB Act are identified in the *Canadian Environmental Assessment Act* (CEA Act) *Law List Regulations*, thereby triggering the requirement for the preparation of this ESR.

### 3.1 Government Participation in the Environmental Assessment (EA) Process

The NEB is the Federal Environment Assessment Coordinator for this Project. Upon receipt of a Preliminary Information Package for the Project in November 2006, the NEB issued a federal coordination notification letter (FCN Letter), pursuant to section 5 of the CEA Act's *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* (Federal Coordination Regulations), to identify the potential involvement of federal departments in the EA process. The responses are summarized below:

<b>Responsible Authorities (RAs)</b>	Federal Authorities (FAs) in Possession of Specialist or Expert Information or Knowledge
Transport Canada*(TC)	Environment Canada (EC)
Indian and Northern Affairs Canada	Department of Fisheries and Oceans** (DFO)
	Natural Resources Canada
	Health Canada (HC)

\*Transport Canada advises that it considers itself an RA until it makes the determination as to whether it must issue a permit or license under the *Navigable Waters Protection Act*.

\*\*DFO stated that it will not be commenting on the proposed broad scope of the project and will instead identify a scope of project that meets its responsibilities pursuant to the *Fisheries Act* and CEA Act and that directly relates to effects to fish and fish habitat resulting from construction of the pipeline. DFO stated that it will undertake a screening level assessment pursuant to CEA Act and the scope of project for the purposes of the DFO assessment will be associated with the water body crossings where Authorizations pursuant to the *Fisheries Act* are necessary.

The FCN Letter was also sent to provincial agencies in AB, Saskatchewan (SK) and MB. Saskatchewan Environment and Manitoba Conservation (MC) expressed interest in monitoring or participating in the EA process.

### **3.2** Feedback from the Public Including Government Agencies and First Nations

### **3.2.1** Submissions to the Board

Throughout the course of the EA process, the Board received several submissions pertaining to Project-related EA matters. The areas of primary concern are listed within Section 7.2 of this ESR.

### **3.2.2 Draft Scope of the EA**

In mid-March 2007, the NEB sent a letter to RAs, FAs and interested provincial agencies inviting comments on the draft scope of the EA for the Project. Further, at the end of April 2007 the NEB, pursuant to subsection 18(3) of the CEA Act, conducted a public comment exercise on the scope of the EA including posting of the draft scope on the Canadian Environmental Assessment Registry for public comment.

### 3.2.3 NEB Hearing

Public oral hearings for the Project, pursuant to Hearing Order OH-3-2007, were held on three occasions: 13-14 August in Calgary, AB, 20-21 August in Regina, SK and 29 and 31 October in Calgary.

### 4.0 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The Scope of the Environmental Assessment (Scope) is composed of three parts:

- 1. Scope of the Project;
- 2. Factors to be Considered; and
- 3. Scope of the Factors to be Considered.

The Scope, as determined by the RAs in consultation with the FAs and the public, is included in Appendix 1 of this ESR and provides detailed information on these three parts. Appendix 1 includes a letter which provides the rationale for not making any changes in response to two submissions received from the public.

For this Project, the term "alternative means", as mentioned in Section 2.2 of the Scope, primarily refers to alternative routing options for the LSr Pipeline. These routing options are discussed in Section 9.1 of this ESR. Alternative construction methodologies (*e.g.* at watercourse crossings) are also considered within the context of alternative means.

Section 5.0 of this ESR expands upon the "Scope of the Project" and incorporates any updates and revisions made to the Project by the Applicants since the Scope was determined in June 2007.

### 5.0 DESCRIPTION OF THE PROJECT

Sections 5.1, 5.2 and 5.3 provide information for each Project component throughout the three phases of the Project: construction, operations and abandonment. Map 1 specifies the geographic location of the facilities involved.

	Physical Works and/or Activities
	Pipeline
	<ul> <li>Construction of a 288 kilometre (km) long, 508 millimetre (mm) outside diameter LSr Pipeline between Cromer, MB and the Canada/US Border</li> </ul>
	<ul> <li>Approximately 260 km of the LSr Pipeline would be constructed within or adjacent to EPI's existing RoW in MB</li> </ul>
I Sr Pineline	• The existing RoW, comprised of five pipelines 1, 2, 3, 4 and 13 varies in width; EPI proposes to achieve a consistent RoW width of 36.6 metre (m) after the completion of the LSr Pipeline; 110 km of existing RoW would not require any new permanent land; temporary workspace requirements would be approximately 22 m in width
<ul> <li>Proposed</li> <li>Construction</li> </ul>	<ul> <li>Approximately 28 km of an 18.3 m wide RoW for the LSr Pipeline would be constructed outside of EPI's existing RoW in MB</li> </ul>
date:	• 7.9 km of new RoW would be required east of the Souris River Valley
August/ fall	<ul> <li>Approximately 20 km of new RoW at 10 locations</li> </ul>
2008	<ul> <li>Approximate land area requirements: 377 hectares (ha) of permanent RoW and 697 ha of temporary work space</li> </ul>
	<ul> <li>Temporary workspace may be required at road, rail, foreign line, water crossings, areas where heavy grading is required, shoo-flies/access roads, equipment storage sites, pipe stockpile sites, bone yards, borrow pits and construction office sites</li> </ul>
	<ul> <li>Road and railway crossings would generally be bored</li> </ul>
	• Required activities would include some clearing, topsoil salvage, grading, trenching, backfilling, clean-up and reclamation; blasting may be required where bedrock is encountered
	<ul> <li>Pressure testing using either water or a water-methanol mixture; test water would be disposed of in accordance with applicable regulatory requirements</li> </ul>

### 5.1 Construction Phase

	Physical Works and/or Activities
	• Several crossing methods would be used during watercourse construction such as isolation (e.g., dam and pump, flume), horizontal directional drill, bore and open cut
	<ul> <li>Pipeline would be protected with cathodic protection</li> </ul>
	<ul> <li>12 block valve sites would be installed within the LSr Pipeline RoW</li> </ul>
	• Minimum depth of cover in soil: 0.9 m of subsoil
	Associated Facilities at LSr Pump Stations
	• At each of three existing pump stations*, EPI would install electrically-driven pump units and electrical services buildings, scraper trap facilities and a new drag reducing agent (DRA) injection unit would be installed at Cromer
Line 2 Modifications Proposed Construction date: 2008	<ul> <li>Installation, relocation or recommissioning of DRA injection units at 22 existing pump stations*</li> <li>Pump and motor modifications, replacements and/or installations at 17 existing pump stations *</li> <li>No new lands or RoW are required</li> <li>Hydrostatic testing may be conducted</li> </ul>
Line 13 Reversal Timeframe: July 2009 to June 2010	<ul> <li>Modifications to piping at 16 existing pump stations *</li> <li>Existing pumps would be reversed at all stations except Edmonton where pumps would be idled</li> <li>Installation of DRA injection units at four existing pump stations</li> <li>Installation of delivery metering and connections at three existing pump stations</li> <li>Modifications to four existing scraper traps within existing pumping stations</li> <li>Modifications to six existing check valves along Line 13</li> <li>No new lands or RoW are required</li> <li>Hydrostatic testing may be conducted</li> </ul>

\* See Appendix 1 for the Locations of the Pump Stations

### 5.2 **Operations Phase**

The LSr Pipeline is expected to be in service upon completion of construction and the facilities associated with the Line 2 Modifications are expected to be in service prior to or within that timeframe. Line 13 is expected to be in diluent service by mid-2010. The service life of the Project, as a whole, is anticipated to extend beyond 50 years.

The following outlines information related to the Operations phase of the various components of the Project:

### <u>LSr Pipeline</u>

- Regular aerial and ground line patrols to inspect for environmental monitoring issues, damage to pipe or permanent erosion control structures, RoW encroachments, exposed pipe, erosion/ wash-out areas and sparse vegetation; pipeline markers and signs would also be inspected
- Running regular in-line inspection tools to identify integrity problems
- Maintenance digs, as necessary

### Line 2 Modifications, Line 13 Reversal, and Associated Facilities at LSr pump stations

- Regular inspections of permanent facilities such as pump stations; scraper traps would be inspected at least once per week
- Vegetated areas around permanent facilities would be periodically mowed and gravel may be occasionally added to the sites and on access roads
- There are no process combustion sources associated with the pipeline system and all pumps are driven by electric motors
- New pumps and motors would be in compliance with the requirements of the Alberta Energy and Utilities Board's (AEUB's) Noise Directive 038
- EPI has a groundwater monitoring system at all but eight pumping stations; the Applicants have committed to installing groundwater monitoring systems at the eight remaining stations in the first year after the Project construction is completed

### 5.3 Abandonment Phase

At the end of the service life of the Project, an application pursuant to paragraph 74(1)(d) of the NEB Act would be required for its abandonment, at which time the environmental effects of the proposed abandonment activities would be assessed by the NEB under both the NEB Act and the CEA Act. It is anticipated that many of the effects associated with abandonment would likely be similar to those associated with construction or operation of the Project.



Map 1

### 6.0 DESCRIPTION OF THE ENVIRONMENT

### 6.1 LSr Pipeline Route

The description of the environment is based on information contained in a number of sources including:

- literature reviews;
- field studies performed for the EPI Terrace Phase 1 project, pertaining to soils, wildlife and vegetation, dating back to the 1990s;
- field studies (done mainly in 2006) in areas where:
  - o areas deviated from the Terrace Phase 1 route,
  - o the LSr Pipeline route segments did not form part of Terrace Phase 1 project, and
  - areas of known environmental importance in the vicinity of the LSr Pipeline route based on the results completed for Terrace Phase 1; and
- detailed surveys for a number of disciplines such as soils, wildlife, rare plants, fish, and wetlands, undertaken in 2007 for those areas where there were known knowledge gaps from previous field work.

The spatial extent of the detailed field surveys varied depending on the discipline. For example, wildlife and wildlife habitat surveys were conducted along segments of the proposed pipeline route that traverse native vegetation such as native prairie, bush and bush-pasture greater than 100 m in length, soil surveys were undertaken on previously non-surveyed areas, and weed surveys were performed over virtually the full length of the LSr Pipeline route.

EPI stated that the objectives of its field surveys included: the identification of species or issues; developing a description of habitat; and/or assisting with the development of practical and effective mitigative measures.

As EPI was not able to access all areas for the detailed surveys in 2007, EPI has committed to undertake surveys in 2008 and has stated that it would complete and submit the survey results to the NEB and other appropriate agencies prior to construction. Regarding some surveys such as the late summer rare plant surveys, EPI stated that the results would be submitted to the NEB and appropriate agencies 10 days prior to construction in those areas where the surveys were performed. EPI has conducted a number of late summer rare plant surveys along various segments of the LSr Pipeline route totaling approximately 20 km and has committed to conduct additional surveys in 2008 totaling approximately 10 km.

### Land Use

• Land use along the proposed route consists of 68.4% cultivated land, 11.6% hay land, 9.9% pasture, 4.5% bush and bush/pasture, 5% native prairie and the remaining 0.6% disturbed lands.

 Existing infrastructure and activities in the area include oil and gas activity, roads, rail lines, agriculture, power lines and wind farms. Proposed projects include EPI's Alberta Clipper Expansion (Alberta Clipper), Southern Access and Line 4 Extension projects, TransCanada's Keystone Pipeline Project and various wind generation projects.

### Terrain and Soils

- Flat to rolling terrain; steep slopes are encountered at the valleys associated with some of the watercourse crossings (*e.g.* Deadhorse Creek).
- No bedrock within trench depth was encountered during recent soil surveys.
- The proposed route does not encounter any areas of permafrost or earthquake-prone areas.
- Much of the proposed route traverses clay-textured soils prone to rutting and compaction during wet conditions; coarse-textured soils are also commonly encountered and are prone to trench sloughing and wind erosion.
- Soils on native prairie land are susceptible to rutting and sod/soil pulverization.
- Approximately five percent of the proposed route encounters saline and/or sodic soils.
- Known site of contamination at KP 1154.8; possible other sites that may be contaminated include KP 1245.1 (a landfill site) and other sites along the proposed route where there have been spills and leaks during past farming activities on cultivated and hay lands. (Refer to Section 9.3.1.1, under the heading, "Discovery of existing contaminated soils" for details on this issue.)

### Fish and Fish Habitat

- A total of 26 watercourses would be crossed by the proposed LSr Pipeline. In addition, 12 drainages with undefined channels and limited fisheries value were identified along the proposed route.
- Nine of the moderate and larger watercourses along the route have the potential to support spring spawning sports fish; 23 species were captured during sampling and there are 20 additional species that could be potentially present.
- The Souris River is anticipated to exhibit year-round stream flow; however, many of the other watercourses crossed by the proposed route may be dry, frozen to the bottom or reduced to negligible flows during the winter.

### <u>Aquifers</u>

There are 17 sand and gravel aquifers along the proposed route. The following four aquifers would be crossed by the proposed LSr Pipeline route: Oak Lake (KP 975 to 1034), Assiniboine Delta (KP 1080 to 1110), Winkler (KP1207 to 1219), and an aquifer with a high groundwater table near the Swan Lake Indian Reserve No. 7.

### <u>Wetlands</u>

- The proposed route crosses 83 km of wetland habitat, with 1 km crossing shallow open water and 82 km crossing marsh areas.
- Wetland areas with special conservation status include: the Oak Lake/Plum lakes, Important Bird Area (KP 987.0 to 1004.0); a Game Bird Refuge (KP 984.9 to 990.1); two Ducks Unlimited wetland projects (KP 1052.0 to 1053.7 and KP 1174.3 to 1174.8); two Manitoba Habitat Heritage Corporation (MHHC) Conservation Agreement areas (KP 1052.1 to 1052.9 and KP 1056.2 to 1057.0); and two North American Waterfowl Management Plan designated priority areas (KP 960.0 to 977.1 and KP 1052.0 to 1063.0).

### **Vegetation**

- Most of the lands along the proposed route have been broken or cleared for agricultural purposes; however, remnant native vegetation (ranging from fescue grasslands to trembling aspen and/or bur oak forests) can be found on soils unsuitable for farming or where topographic constraints would restrict farming practices.
- A total of 70 weeds of concern were observed along the segments of the proposed route surveyed in 2007.
- Approximately 131 ha of native vegetation consisting of 59 ha of native prairie and 72 ha of bush and bush-pasture would be disturbed or cleared during construction.

### <u>Air Quality</u>

• The proposed route is located in an area that is relatively undisturbed by industrial and commercial development which contributes to a high baseline air quality.

### Wildlife and Wildlife Habitat

 The ecoregion also provides a major breeding habitat for waterfowl and includes habitat for white-tailed deer, coyote, snowshoe hare, cottontail, red fox, northern pocket gopher, ground squirrel and bird species like sharp-tailed grouse, black-billed magpie, black bear, moose, ruffed grouse, beaver, and rabbit.

### Species at Risk, as listed on Schedule 1 of the Species at Risk Act (SARA)

- Lands in the vicinity of the proposed route may support the preferred habitat for the following 15 species listed on Schedule 1 of SARA: silver chub, hairy prairie clover, western spiderwort, small white lady's slipper, prairie skink, piping plover, grey fox, least bittern, loggerhead shrike, peregrine falcon, Sprague's pipit, Dakota skipper, yellow rail, northern leopard frog, and monarch butterfly.
- Sprague's pipit and monarch butterfly were the only SARA species observed within the footprint of the proposed route during the 2007 surveys; northern leopard frog and peregrine falcon have been previously identified along the proposed route.

 Although maple leaf mussel, which is scheduled to be added to Schedule 1 of SARA, has documented occurrences in the Assiniboine River, it was not present in samples collected from the Souris River at the LSr Pipeline crossing.

# Species of Concern (Species that are listed in SARA, other than on Schedule 1, and other federally/provincially listed species)

- Lands along the proposed route may support the preferred habitat of about 30 wildlife and fish species and approximately 85 vegetation species that are listed in SARA, other than on Schedule 1, or otherwise federally/provincially listed.
- American bittern, black tern, grasshopper sparrow, red-tailed hawk, short-eared owl and Swainson's hawk were species of concern observed within the footprint of the proposed route during 2007 surveys and plains spadefoot toad, red-headed woodpecker, smooth green snake, snapping turtle, merlin, sprey and double-crested cormorant were observed in previous surveys.
- Based on the 2007 surveys, the following vegetative species of concern were observed: golden bean, sand bluestem, Schweinitz's flatsedge, and Nuttall's sunflower. Yellow Indiangrass, an uncommon species but not listed as rare in MB, was also observed. Seneca root was observed in previous surveys.

### Socio-Economic

- Approximately 0.9 km of the proposed route traverses Swan Lake Indian Reserve No. 7 and is used for hay production.
- There are 537 water wells in the quarter sections traversed by the proposed route which are mainly used for domestic and livestock purposes.

### Heritage Resources

- There are 18 previously recorded archaeological sites in the general vicinity of the proposed route including the Thornhill Burial Mounds.
- A number of areas along the proposed route have been identified as having high potential for containing historical resources.

### Current Traditional Land and Resource Use

The proposed LSr Pipeline traverses Treaty No. 1, Treaty No. 2, Treaty No. 4 and Treaty No. 6 lands as well as lands claimed by Dakota First Nations and Métis people as traditional territory.

### 6.2 Pump Stations for all Three Project Components and Six Check Valve Sites on Line 13

The following description is representative of all existing pump stations and the six check valve sites on Line 13 where work would be conducted as part of the Project. All work would be conducted within the confines of each facility.

- Previously disturbed, fenced industrial sites
- Lacking topsoil, vegetation and suitable habitat for wildlife (including for species at risk)
- With the exception of Edmonton, AB, there are no watercourses within any of the station sites
- Other than at Craik and Glenavon, SK, there are no wetlands within 30 m of the station sites
- The pump stations are currently sources of ongoing operational noise; however, noise from pumps and motors comply with AEUB Noise Directive 038

# 7.0 COMMENTS FROM THE PUBLIC RELATED TO ENVIRONMENTAL AND SOCIO-ECONOMIC MATTERS OF THE PROJECT

### 7.1 Project-Related Issues Raised through Consultation Conducted by the Applicant

During the preparation of its Environmental and Socio-Economic Assessment for the Project, the Applicants consulted with a number of sources including the general public, landowner associations and federal, provincial and local government agencies. This information contributed to the identification of potential adverse environmental effects, issues of concern and the development of mitigation measures. The majority of issues and questions raised through the consultation efforts were resolved by the Applicants throughout the course of its application process. Some issues were also raised through submissions directly to the Board and those issues are included in Section 7.2.

### 7.2 Project-Related Issues Raised in Comments Received by the NEB

Several submissions from the public, landowner associations and various levels of government were received by the Board. They outlined a number of potential environmental effects. Those effects were categorized by environmental elements as outlined below.

		<b>Interested Party</b>	
Environmental Element of Interest	Government Agencies (federal, provincial, regional, local)	Public: (Individuals, Landowner associations, conservation groups)	Aboriginal Groups
Wildlife	Х		
Species at Risk	Х		
Wetlands	Х		
Fish and Fish habitat	Х		
Vegetation	Х		
Soils	Х	Х	
Health			
Human Occupancy and Resource Use	Х	Х	
Heritage Resources			Х
Current Traditional Land and Resource Use			Х
Accidents and Malfunctions	Х	Х	
Cumulative Effects		Х	

Information and concerns raised through the submissions have been incorporated within Section 9 of this Report.

### 8.0 THE NEB'S ENVIRONMENTAL ASSESSMENT METHODOLOGY

In assessing the environmental effects of the Project, the NEB used an issue-based approach. Alternative LSr Pipeline routing considerations are discussed in Section 9.1. In its analysis within Section 9.2, the NEB identified interactions expected to occur between the proposed project activities and the surrounding environmental elements. Also included were the consideration of potential accidents and malfunctions that may occur due to the Project and any change to the Project that may be caused by the environment. If there were no expected element/Project interactions, then no further examination was deemed necessary. Similarly, no further examination was deemed necessary for interactions that would result in positive or neutral potential effects. In circumstances where the potential effect was unknown, it was categorized as a potential adverse environmental effect.

Section 9.3.1 provides an analysis for all potential adverse environmental effects that are normally resolved through the use of standard design or mitigation measures. In Section 9.3.2, the Board has identified certain potential adverse environmental effects for detailed analysis based on public concern or the use of non-standard design or mitigation measures. Appendix 3 specifies the ratings for criteria used in evaluating significance.

Section 9.4 provides discussion on inspection while Section 9.5 addresses cumulative effects. Section 9.6 addresses follow-up programs and Section 9.7 lists recommendations for any subsequent regulatory approval of the Project.

### 9.0 ENVIRONMENTAL EFFECTS ANALYSIS

### 9.1 Routing of the LSr Pipeline

Routing of the new LSr Pipeline was influenced by EPI's desire to minimize the amount of new land disturbance, avoid any areas of high environmental sensitivity and maximize operational efficiency.

The proposed LSr Pipeline route parallels the existing EPI pipeline corridor for approximately 90% of its length.

In a letter of comment, EC recommended that the proponent provide an alternate route that would avoid major wetland complexes. Subsequently, EPI stated that it understood that the rerouting request was primarily based on concerns about potential spills as opposed to potential damage caused by construction. Section 9.3.2.2 outlines EPI's mitigation measures to address this issue.

EPI identified a number of route realignments which are areas where the proposed route deviates from the existing EPI corridor, which are discussed below.

### 9.1.1 Souris River Route Realignment

Due to the encroachment on a farm yard within the Souris River area, EPI deviated approximately 7.9 km from its existing corridor.

At this location, EPI identified two route alternatives:

- Route Alternate 1: approximately 7.4 km long, entailing new RoW for approximately 23% of its total length; there is slope instability along a portion of the route; the pipeline would cross a highway using a boring technique at one location.
- Route Alternate 2: approximately 7.9 km long and entails new RoW for its entire length; there are no slope stability issues along the route; the pipeline would cross a highway using a boring technique at two locations.

EPI selected Route Alternate 2 to avoid slope stability issues.

Manitoba Infrastructure and Transportation (MIT), in a letter of comment, stated that it preferred Alternate Route 1 because it minimized the number of highway crossings. MIT noted the following requirements: that provincial road and highway crossings shall be bored; that any disturbance to the RoW shall be repaired and returned to pre-existing conditions; and that erosion controls shall be used where, according to MIT, erosion potential is high. EPI has committed to meet these requirements.

### 9.1.2 Other Route Realignments

Additionally, EPI's proposed route deviates from the existing corridor at 10 locations along approximately 20 km of proposed 288 km route. Reasons for these deviations include avoidance

of wetlands, shelterbelts, burial grounds and/or existing infrastructure. The linear distance of the proposed realignments range from tens of meters to about 300 m.

EPI stated that no potential impacts were identified along the proposed realignments which have not been previously addressed in its application. EPI further stated that the proposed route realignments do not alter the conclusions with respect to the significance of environmental effects.

### 9.1.3 Views of the Board

The Board is of the view that paralleling the existing EPI corridor as much as possible minimizes the potential environmental effects. The Board finds that the proposal to widen an existing pipeline RoW would minimize environmental and socio-economic effects compared to constructing the project on lands previously undisturbed by pipeline activity. Further, pipeline surveillance and maintenance activities can be conducted more efficiently within a common RoW than for two RoWs that are geographically separated.

Regarding the Souris River route realignment, the Board is of the view that EPI's selection of Alternate Route 2 would minimize potential environmental effects due to the elimination of the slope instability noted for Alternate Route 1. Although the Board acknowledges MIT's preference of Alternate Route 1 since it involves only one road crossing, the Board is of the view that EPI's proposed use of standard boring techniques would have little to no effect on the ongoing operation of highways. However, prior to any boring operation, the Board would expect EPI to consult with MIT and work toward resolving outstanding issues that may arise.

Regarding the other route realignments referred to above, the Board is of the view that EPI's proposed routing is appropriate and would likely result in lesser environmental effects as the deviations avoid environmentally sensitive areas as identified by EC, address concerns raised by landowners, and avoid infrastructure such as houses, shelterbelts or oil and gas facilities. The Board notes that that the subsequent NEB detailed route process could also be used to address outstanding routing issues, if necessary.

Any further deviations, changes or alterations to the applied-for route would require an application to the NEB.

# 9.2 Project – Environment Interactions

(The interactions are primarily associated with the LSr Pipeline; however, as indicated, some may also apply to pumping and valve stations)

)iscussed in:	Section 9.3.2			×													
Mitigation <b>E</b>	Section 9.3.1	Х	х	X	x x	x x	1	Х	Х	Х	Х	Х					
	Potential Adverse Environmental Effect	<ul> <li>Terrain instability</li> </ul>	<ul> <li>Soils capability (surface/sub-soil mixing, soil erosion, saline soils, presence of stones in sub- and top soil, pulverization, compaction, wet conditions) on</li> <li>Non-agricultural lands</li> </ul>	<ul> <li>Agricultural lands</li> <li>Discovery of existing contaminated soils</li> </ul>	<ul> <li>Alteration/disturbance of native prairie</li> <li>Alteration of vegetation important to wildlife</li> </ul>	<ul> <li>Introduction/spreading of weeds on the LSr Pipeline RoW</li> </ul>	<ul> <li>Loss of ornamental trees, windbreaks and shelterbelts</li> </ul>	<ul> <li>Alteration of natural drainage patterns</li> </ul>	<ul> <li>Reduction in surface water quality</li> </ul>	<ul> <li>Disruption of water well flows</li> </ul>	<ul> <li>Disruption of springs</li> </ul>	<ul> <li>Fish mortality and the disturbance or alteration of fish habitat, resulting from</li> </ul>	o Disturbance of riparian vegetation	o Alteration of instream habitat	<ul> <li>Increased suspended solid concentrations during instream construction</li> </ul>	o Blockage of fish movements	o Contamination from snills
Type of	Potential Effect(s)	Adv	Adv		Adv			Adv				Adv					
Description of Interaction	(How, When, Where)	<ul> <li>Clearing, grading, excavation and backfilling along the RoW</li> </ul>	<ul> <li>Clearing, grading, excavation and backfilling along the RoW and pump stations</li> <li>Use of construction equipment and vehicles</li> </ul>		<ul> <li>Clearing, grading, excavation and backfilling along the RoW</li> </ul>	<ul> <li>Use of construction equipment and vehicles</li> </ul>		<ul> <li>Clearing, grading and excavation and</li> </ul>	backfilling along the RoW			<ul> <li>Clearing, grading, excavation and backfilling at stream crossings along</li> </ul>	the RoW	<ul> <li>Use of equipment and vehicles during construction and operations</li> </ul>			
Project	Inter- action?	Y	Y		Y			Υ				Y					
Environmental	Element	Terrain stability	Soil and Soil Productivity		Vegetation			Water Quality and	Quantity			Fish and Fish Habitat					
						cal	isyd4-o	Bid									

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	Environmental	Project	Description of Interaction	Type of		Mitigation Di	iscussed in:
	Element	Inter- action?	(How, When, Where)	Potential Effect(s)	Potential Adverse Environmental Effect	Section 9.3.1	Section 9.3.2
Wetla	sbu	Y	<ul> <li>Clearing, grading, excavation and backfilling at stream crossings along the RoW</li> <li>Use of equipment and vehicles during construction and operations</li> </ul>	Adv	<ul> <li>Alteration of wetlands (habitat, hydrologic and/or water quality function)</li> </ul>	x	
Wildl Habit	ife and Wildlife at	Y	<ul> <li>Clearing, grading, excavation and backfilling along the RoW and some pump stations</li> <li>Use of equipment and vehicles during construction and operations</li> </ul>	Adv	<ul> <li>Alteration of wildlife habitat</li> <li>Sensory disturbance and/or displacement of wildlife</li> <li>Mortality due to vehicle/wildlife collisions on access roads and along the RoW</li> <li>Mortality due to the physical disturbance of undiscovered nests, burrows, dens or other localized</li> </ul>	× × × ×	
Speci	es at Risk ral)	Y	<ul> <li>See wildlife, vegetation and fish elements</li> </ul>	Adv	<ul> <li>habitat on the RoW</li> <li>Disturbance, alteration of habitat and /or mortality or destruction to species at risk (wildlife, fish and/or vegetation)</li> </ul>	X	
Speci Statu errito	es of Special s (provincial, prial, local)	Y	<ul> <li>See wildlife, vegetation and fish elements</li> </ul>	Adv	<ul> <li>See wildlife, vegetation and fish elements</li> </ul>	×	
Air Q	uality	¥	<ul> <li>Clearing, grading, excavation and backfilling along the RoW</li> <li>Use of equipment and vehicles during construction and operations</li> <li>Operations at pumping facilities: space heating of buildings; fugitive or process emissions</li> </ul>	Adv	<ul> <li>Vehicle Equipment Emissions</li> <li>Dust</li> <li>Smoke from burning of slash</li> <li>Trace levels of greenhouse gases</li> </ul>	× × × ×	
Hum Reso	an Occupancy/ urce Use	Y	<ul> <li>Clearing, grading, excavation and backfilling along the RoW</li> <li>Use of equipment and vehicles during construction and operations</li> </ul>	Adv	<ul> <li>Disturbance to agricultural and ranching operations</li> <li>Loss of enjoyment of property caused by noise</li> </ul>	x x	
Herit	age Resources	Υ	<ul> <li>Clearing, grading, excavation</li> </ul>	Adv	<ul> <li>Disturbance/destruction of heritage resources</li> </ul>	Х	
Curre Land Use	nt Traditional and Resource	U	<ul> <li>Clearing, grading, excavation and backfilling along the RoW</li> <li>Use of equipment and vehicles during construction</li> </ul>	Adv	<ul> <li>Loss or alteration of traditional sites</li> <li>Disruption or inability to carry on traditional activities</li> </ul>	X	

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		Ductood		Ju om L		Mitigation Di	iscussed in:
	Environmental Element	Inter- action?	Description of Interaction (How, When, Where)	Lype of Potential Effect(s)	Potential Adverse Environmental Effect	Section 9.3.1	Section 9.3.2
	Socio and Cultural Well-being	z					
	Human Health/ Aesthetics	z					
	Accidents/ Malfunctions	Y	<ul> <li>Clearing, grading, excavation and backfilling along the RoW and pump stations</li> </ul>	Adv	<ul> <li>Contamination of wetlands and aquifers caused by an accident or malfunction of the LSr Pipeline during operations</li> </ul>		X
			<ul> <li>Use of equipment and vehicles during construction and operations</li> </ul>		<ul> <li>Contamination of the South Saskatchewan River caused by an accident or malfunction of Line 13</li> </ul>		Х
			<ul> <li>Potential release of hydrocarbons from the LSr Pipeline and Line 13 during</li> </ul>		<ul> <li>Soil contamination from a rupture or leak due to pipeline failure during operations</li> </ul>	x	
			operations		<ul> <li>Water or soil contamination due to spills of hazardous materials during construction</li> </ul>	X	
Other					<ul> <li>Rupture of, or damage to foreign lines, EPI's existing pipelines and cables during construction</li> </ul>	× ×	
)					Effects on fish and fish habitat due to a release of drilling mud during horizontal directional drilling	×	
					<ul> <li>Fire during construction</li> </ul>	1	
	Effects of the	Υ	<ul> <li>Slumping</li> </ul>	Adv	<ul> <li>Delay construction</li> </ul>	X	
	Environment on the Proiect		<ul> <li>Flooding</li> </ul>		<ul> <li>Affect the operations of the Project</li> </ul>	X	
			<ul> <li>Wildfires</li> </ul>		<ul> <li>Damage to infrastructure</li> </ul>		
			<ul> <li>Severe weather</li> </ul>				

Legend: Y (Yes); N (No); U (Uncertain); P (Positive); Ntl (Neutral); Adv (Adverse)

### 9.3 Potential Adverse Environmental Effects

To address potential adverse environmental effects, the Applicants have proposed several mitigation strategies to avoid or minimize the effects of the Project, including avoidance through route selection; scheduling of activities to avoid sensitive periods; developing mitigation measures, including contingency plans, to address site-specific and general issues; inspection during construction to ensure mitigation is implemented and effective; and maintenance activities during the operation of the pipeline system. The reader is referred to the Applicants' application and supporting documentation for details on all the mitigation proposed by the Applicants. These measures have provided the Board with a sufficient basis to assess the potential adverse environmental effects associated with the Project and meet the objective of mitigating potential adverse environmental effects.

As noted in Section 8.0 of this Report, the analysis of potential adverse effects has been categorized into two streams: Section 9.3.1- Analysis of Potential Adverse Environmental Effects to be Mitigated through Standard Measures, and Section 9.3.2 - Detailed Analysis of Potential Environmental Effects. Note that a "Views of the Board" is provided for each of the environmental effects discussed in Section 9.3.2; whereas, the Views presented in Section 9.3.1 encompass the remaining potential adverse environmental effects identified in Section 9.2. Both sections identify recommendations in the event that regulatory approval is granted for the Project.

### Field Surveys

In its application, EPI noted that a number of field surveys would be undertaken in 2007. Subsequently, EPI informed the Board that some of these surveys could not be completed until 2008, including several that would be conducted close to the start of construction.

EPI stated that for any survey reports that are submitted to the NEB after the filing of its Environmental Protection Plan (EPP) which is discussed in Section 9.4, it has mechanisms in place to ensure that updated information from these surveys would be communicated to the appropriate staff in the field. EPI also stated that federal and provincial agencies would be consulted regarding mitigation for any discoveries made during any of the environmental surveys.

EPI stated that while some biophysical field survey reports would be submitted by mid-July, late summer rare plant survey results would not be available until early August. In some instances EPI has requested permission to commence construction as soon as 10 days subsequent to the filing of the site-specific survey reports. EPI stated that it would submit the results of these outstanding studies to the NEB prior to the commencement of the LSr Pipeline construction for these site specific areas.

### Views of the Board

The Board notes that it would be more effective if mitigation measures from the surveys were encompassed in one complete EPP as opposed to having a number of supplementary attachments. The Board also notes that completion and submission of field surveys 10 days prior to construction is not optimal and could affect the quality of the surveys and mitigation strategies due to time constraints. The Board further notes that while EPI intends to undertake and submit a number of biophysical surveys by mid-summer of 2008, it is possible that due to weather or unforeseen circumstances, the surveys may be delayed thereby increasing the number of surveys being submitted 10 days prior to construction in those surveyed areas.

The Board acknowledges that although EPI's contingency plans filed in the application would likely result in effective mitigation for any species discovered, site-specific mitigation would not be known until surveys are completed.

To ensure that appropriate mitigation strategies would be in place and effectively communicated, upon receipt of any survey reports after the filing of the EPP, it is recommended that, as appropriate, meetings with EPI and Board staff take place prior to the commencement of construction within these site-specific areas to discuss its survey findings, proposed mitigative measures and the results of its consultations with other agencies.

### 9.3.1 Analysis of Potential Adverse Environmental Effects to be Mitigated through Standard Measures

### 9.3.1.1 Analysis

The Applicants have identified standard design and mitigation measures for all the potential environmental effects that were categorized in Section 9.2 as fitting into this analysis stream.

The following table provides discussion on the potential adverse environmental effects and associated standard mitigation that have been the subject of comments received by the NEB, for which the NEB required further information from the Applicants, or which involve the Applicants' commitments to other federal and provincial departments or agencies.

Potential Adverse Environmental Effect	Notes
Discovery of existing contaminated soils	<ul> <li>EPI has an existing 'Contaminated Soil Management Procedure' in place which addresses:         <ul> <li>contamination identification;</li> <li>initial response (<i>e.g.</i>, notification of company and government contacts);</li> <li>soil handling and temporary storage;</li> <li>erosion control;</li> <li>soil sampling and testing;</li> <li>disposal; and</li> <li>documentation.</li> </ul> </li> <li>EPI committed to remove and replace contaminated soils encountered during construction with clean soil, in a manner that meets or exceeds the applicable regulatory criteria.</li> </ul>
Introduction/spreading of Weeds on LSr Pipeline RoW	<ul> <li>Leafy spurge is the primary weed of concern by the public, including government agencies.</li> <li>EPI stated that weeds of management concern according to the <i>Manitoba Weeds of Concern Act</i> and <i>Weeds of Concern Regulation</i> were reviewed prior to field reconnaissance.</li> <li>EPI has committed to undertake a weed survey prior to construction and, as outlined in Section 9.3.1.2, the Board recommends that EPI undertake a five-year post-construction monitoring program to monitor various environmental issues including weeds.</li> <li>EPI stated that any problematic areas noted during the post-construction monitoring program period would be controlled (e.g., hand picking, mowing or spraying), as deemed appropriate by EPI, the municipal agricultural weed specialist and landowners.</li> <li>Pursuant to Schedule 4 of the Manitoba Pipeline Landowners Association/Saskatchewan Association of Pipeline Landowners (MPLA/SAPL) – EPI agreement which is explained in more detail in Section 9.3.2, EPI has committed to an additional weed management plan which applies to MPLA/SAPL members' lands affected by the Project.</li> </ul>

Potential Adverse Environmental Effect	Notes
Fish mortality and the	• EPI has identified:
fish habitat	• the locations of crossings;
	• species that are or could be present;
	<ul> <li>vehicle and pipeline crossing techniques; and</li> </ul>
	o mitigation measures.
	<ul> <li>EPI has undertaken 2007 fish surveys and has committed to undertaking further fish surveys in 2008, all of which would be submitted in a report to the NEB, DFO and MC.</li> </ul>
	• EPI stated that it is maintaining ongoing consultations with DFO and Manitoba Water Stewardship regarding: Operational Statements; horizontal directional drilling crossings and DFO authorizations and potential for compensation in the event of a harmful alteration, disruption or destruction of fish habitat; and a final list of proposed watercourse crossings.
	• EPI stated that it would adhere to all approvals, permits and authorizations issued by regulatory authorities and that any alternatives or alterations to crossing requirements specified in approvals, permits and authorizations must be approved prior to the commencement of crossing construction.
Alteration of wetlands (habitat, hydrologic and/or water quality function)	• EPI stated that it is developing a Wetland Characterization and Wetland Compensation Proposal to address temporary loss of wetland function arising from construction of the LSr Pipeline. Upon completion, EPI plans to provide copies of the proposal to EC and applicable provincial agencies for their review. When finalized, the goal is to have one plan in place to address wetland compensation for temporary loss of wetland function that would satisfy all parties.
	<ul> <li>EPI stated that it will form a joint EPI/EC committee to address post- construction monitoring program of wetlands.</li> </ul>
Sensory disturbance and/or mortality of wildlife	<ul> <li>The Applicants stated that it would respect setback distances and timing restrictions other than in circumstances where it has listed criteria to compensate for not meeting those restrictions and would consult with appropriate agencies as required.</li> </ul>

Potential Adverse Environmental Effect	Notes
Disturbance, alteration of habitat and /or mortality or destruction to species at risk (wildlife, fish and/or	• EPI has submitted 2007 surveys and will be submitting 2008 field surveys to appropriate agencies, including a bi-valve study of the Souris River. Although the maple leaf mussel is not yet added to Schedule 1 of SARA, EPI will verify the presence of this species in the Souris River.
vegetation)	• EPI stated that EC is satisfied with the survey protocol regarding the appropriateness of the wildlife and rare plant survey methodology in relation to length of native vegetation and pasture.
	• EPI stated that it anticipates that any discoveries made in the 2008 surveys would be similar to those found in prior surveys; however, in the event of a new discovery, EPI has committed to consult with appropriate federal and provincial agencies to confirm the suitability of proposed mitigation associated with the new discovery.
	• EPI has "species of concern discovery contingency plans" for fish and bivalves, plants and wildlife.
	• EPI stated that any additional information gathered from surveys, including identifying gaps that would be covered by future field surveys, would be incorporated into one document for use by key environmental construction field personnel.
	• EPI stated that there is a program mechanism in place so that any information from field surveys undertaken 10 days prior to construction will be conveyed to the key personnel.
Alteration/disturbance of native prairie	• Full trench and work lane stripping would occur for the majority of the RoW that goes through native prairie to avoid the high potential for rutting and pulverization of the topsoil/sod.
	• For localized areas where the construction RoW would be inaccessible to traffic by rubber-tired vehicles and where no grading is required, stripping would be reduced to blade width.
	• EPI would ensure lands with native vegetation are seeded with native seed mix.
	• EPI would avoid the use of highly invasive species on adjacent non-native prairie lands.
	• EPI stated that reclamation efforts include reducing the total area of disturbance and returning the RoW to as-near preconstruction conditions as feasible within a practical time frame.
Disturbance to agricultural and ranching operations	<ul> <li>Construction is scheduled outside peak agricultural and ranching activity periods.</li> </ul>
	• EPI would provide notification to farmers and compensation for crop loss.
	• In addition, post-construction monitoring may address some of these issues (refer to the Post-construction Monitoring Section 9.3.1.2 following this table).
Loss of enjoyment of property caused by noise	• EPI would ensure compliance with AEUB Noise Directive 038 at all of the pump facilities.
	<ul> <li>The AEUB Noise Directive 038 is designed to maintain acceptable noise levels and to maintain quality of life for residents near energy industry facilities.</li> </ul>

Potential Adverse Environmental Effect	Notes	
Disturbance/destruction of heritage resources	• Should any previously unidentified heritage resources sites be encountered during construction of the Project, activity at that site would be stopped and the Heritage Resource Discovery Contingency Plan would be implemented. The site would be fully documented prior to resumption of construction activity.	
	In addition to this standard mitigation, the Board recommends that EPI file with the Board the results of its archaeological and paleontological investigations and include the recommendations resulting from the archaeological and paleontological investigations, including those related the Thornhill Burial Mounds. Further, the Board recommends that EPI: immediately cease work at the location of the discovery of any previously unidentified archaeological or heritage resources; notify responsible provincial authorities; and resume work only after approval is granted by the responsible provincial authority. (See recommendations 1 and 2 in Section 9.7 of this ESR.)	
Loss or alteration of traditional sites	<ul> <li>EPI has further indicated that its contingency plan, in the event that any Aboriginal interests were identified in the Project area, would consist of meeting with the Aboriginal organization or community that has identified an interest and to work with that community to jointly develop a course of action.</li> </ul>	
	In addition to this standard mitigation, the Board recommends that EPI file with the Board the results of the archaeological and paleontological investigations and include the recommendations resulting from the archaeological and paleontological investigations, including those related to the Thornhill Burial Mounds. Further, the Board recommends that EPI: immediately cease work at the location of the discovery of any previously unidentified archaeological or heritage resources; notify responsible provincial authorities; and resume work only after approval is granted by the responsible provincial authority. (See recommendations 1 and 2 in Section 9.7 of this ESR.)	
Disruption or inability to carry on traditional activities	<ul> <li>No current traditional use of the lands along the proposed LSr Pipeline has been identified. The evidence indicates that EPI did consult with Aboriginal groups to establish whether they required traditional land and resource use studies. EPI has further indicated that its contingency plan, in the event that any Aboriginal interests were identified in the project area, would consist of meeting with the Aboriginal organization or community that has identified an interest and to work with that community to jointly develop a course of action.</li> </ul>	

Legend: Bio-Physical; Socio-Economic; Other

### 9.3.1.2 Post-construction Monitoring

As part of its overall mitigation, EPI has committed to undertaking a two-year post-construction monitoring program. The Board is of the view that this time frame may not be adequate to assess EPI's mitigation for a variety of environmental elements including but not limited to, soil productivity on cultivated lands, weeds, native prairie, and plant species of special concern along the LSr Pipeline. A longer monitoring time frame is required to deal with factors such as variable soil moisture conditions depending on annual climatic factors, variability of soil types

encountered and variability of mitigation employed during construction. Regarding the latter, environmental effects can vary in accordance with the construction techniques or mitigative techniques employed, some of which would not be chosen until the actual time of construction. An extended time frame would also provide a more adequate data set by which to assess the efficacy of EPI's mitigation. Therefore, it is recommended the Applicants undertake a five-year post-construction monitoring program as outlined in Recommendation (3) in Section 9.7. Further, such a program should outline EPI's methodology for assessing the effectiveness of its mitigation.

### 9.3.1.3 Views of the Board

With respect to the potential environmental effects identified in Section 9.2, other than those that are dealt with individually in the following section (9.3.2), the NEB is of the view that if the Applicants:

- effectively implement the standard design and mitigative measures proposed in the application and subsequent submissions; and
- adhere to the commitments made during the oral public hearing and the recommendations outlined in Section 9.7 of the ESR,

these potential adverse environmental effects of the Project are not likely to be significant.

### 9.3.2 Detailed Analysis of Potential Adverse Environmental Effects

### 9.3.2.1 Potential Effects on Agricultural Soils Capability

Background/Issues	EPI outlined several potential adverse effects on agricultural soil capability as indicated in Section 9.2. Any of these effects in isolation or in combination could hinder future crop growth on cultivated agricultural lands if not properly mitigated.
	In its evidence and Information Requests of EPI, MPLA/SAPL raised concerns regarding Project effects on agricultural soils. In particular, MPLA/SAPL submitted that:
	<ul> <li>The baseline soils information being relied on by EPI was not sufficient to adequately ascertain Project effects and mitigation</li> </ul>
	• EPI was inappropriately using the terms "soil capability" and "soil productivity" and that the terms are neither synonymous or proxies for one another.
	<ul> <li>EPI had failed to identify potential effects associated with compaction and trench subsidence.</li> </ul>
	<ul> <li>EPI's proposed mitigation was not adequate, particularly as it related to trench subsidence and compaction.</li> </ul>
	• EPI's proposed post-construction monitoring program was not adequate to assess Project effects on soil capability.
	<ul> <li>EPI's wet soil contingency plan was not adequate as suspension of construction activities was a "last resort" after considering other contingency measures and further, the descriptors used to determine when construction should halt were too subjective.</li> </ul>
	<ul> <li>EPI had not proposed the use of a landowner construction monitor to assist in possible support of landowner concerns in resolving any soils related issues that may arise during construction.</li> </ul>
	<ul> <li>Post-construction monitoring reports from previous EPI and other pipeline construction projects that EPI was relying on as proof of the effectiveness of its proposed soil mitigation measures, were based on little objective data and much subjective observation.</li> </ul>

	<ul> <li>On 19 October, 2007, MPLA/SAPL filed with the Board a Settlement Agreement (Agreement) that they reached with EPI and indicated that they had resolved their issues with EPI. Included within this Agreement were numerous mitigation measures that EPI committed to implement during pipeline construction within its application as well as mitigation measures specific to the Agreement.</li> <li>EPI also responded to questions raised by the Board throughout the proceedings pertaining to soil erosion from stockpiled soil windrows, topsoil stripping and wet weather shutdown criteria</li> </ul>	
Mitigation Measures	Within its application and subsequent submissions, EPI outlined mitigation for alleviating potential effects on soil capability. Much of this mitigation could be considered standard mitigation that is typically employed during large diameter pipeline construction and will not be repeated here. The following is a brief summary of issues pertaining to certain mitigative strategies that were raised by either MPLA/SAPL or the Board during the course of the proceedings.	
	Joint Committee/Independent Construction Monitor/Environmental Inspection	
	EPI stated that it would assign a minimum of one Lead Environmental Inspector per spread while construction activities are under way and that Assistant Environmental Inspectors would be assigned as necessary during key construction activities such as clearing, topsoil stripping, water crossing construction, and topsoil replacement and erosion control during rough clean up. Resource Specialists would also be employed as required during construction at certain environmentally sensitive areas.	
	Pursuant to the Agreement, any issues relating to potential effects on soil productivity would also likely be addressed though the Independent Construction Monitor and the Joint Committee as outlined in the Agreement. For landowners not part of MPLA, EPI committed to looking at having non-MPLA/SAPL landowners represented on the Joint Committee as well. EPI further stated that any issues or concerns raised by non-MPLA/SAPL landowners would be addressed on a per person basis as EPI is made aware of any comments or concerns that those landowners may have.	
	<u>Baseline Soils Information</u> EPI submitted that its soils surveys were adequate to characterize the soils which would be encountered along the proposed pipeline route as soil surveys provide an indication as to factors such as soil types and depths but there can still be substantial variability of these factors between data points. Localized effects related to previous pipeline construction or to natural variability would be at a scale too small to map and would be addressed on site by the Environmental Inspector. Further, EPI stated that post-construction monitoring for previous EPI projects along the proposed route did not indicate any extensive topsoil/subsoil mixing issues and therefore, additional soil surveys were not warranted along the segments of the proposed pipeline route that parallel the existing EPI pipeline corridor.	
	Compaction and Tranch Subsidence	
	According to EPI, once compacted areas have been determined through a comparison of compaction levels on and off RoW, measures for alleviating compaction included but not limited to ripping with a multishank ripper, employing a subsoiler plow, and general cultivation across the RoW.	
	Backfill and compaction procedures would be developed during detailed engineering but EPI stated that it would undertake baseline bulk density testing off RoW prior to backfilling of the trench. The backfilled trench would be compacted to the extent feasible, using suitable equipment along the trenchline during non-frozen conditions. Alternative methods of compaction would be used if approved by EPI's engineer. Pursuant to the Agreement, EPI further committed to subgrade surface bulk density testing on the RoW prior to ditching and after backfilling with a view to restore the RoW ditchline to within 10% of the original subgrade surface baseline measurement. EPI committed to further subsidence mitigation	

	such as regrading, restripping, and importation of topsoil, if necessary.		
	Wet/Thawed Soils Contingency Plan		
EPI's wet/thawed soils contingency plan provides guidance as to when certain pipeline construction activities should be suspended due to wet or thawed soils. One concern th Board noted with the plan was that there was a potential conflict between it and EPI's proposed criteria for progressively increased topsoil stripping widths found elsewhere it application. It was not clear if EPI intended to undertake topsoil stripping operations ev during excessively wet soil conditions. In its response to Board IR 1.24, EPI clarified th topsoil salvage operations would be suspended during excessively wet soil conditions.			
	Pursuant to the Agreement, EPI has committed to three additional provisions to the wet/thawed soils contingency plan on MPLA and SAPL member lands:		
	<ul> <li>consideration of a plasticity of surface soil depth indicator;</li> </ul>		
	<ul> <li>implementation of contingency measures prior to the occurrence of wet/thawed soils indicators if weather conditions are such that excessively wet/thawed soil conditions are likely to occur and</li> </ul>		
	<ul> <li>all heavy traffic is to be suspended in excessively wet/thawed soil conditions where topsoil has been replaced.</li> </ul>		
	Further, according to the Agreement, the independent construction monitor would have input into the decision as to when to suspend activities in conjunction with EPI's Chief Inspector and Environmental Inspector.		
Monitoring	EPI committed to undertaking a two year post-construction monitoring program to address and resolve any issues along the LSr Pipeline RoW.		
Legend: Bio-Physic	cal: Socio-Economic: Other		

### Views of the Board

Regarding the MPLA/SAPL contention that the terms soil productivity and soil capability were being used inappropriately by EPI, the Board notes that although there may be uncertainty associated with these terms and they may have different uses in different contexts. The Board has previously accepted the use of soil productivity as an indicator of soil capability, often measured in terms of equivalent crop growth, in previous post-construction assessments. Additionally, EPI has outlined its proposed post-construction monitoring program for Project effects on soils in its Application and it stated that it would undertake more detailed soil assessments as required.

Within its application and supporting evidence, EPI stated its proposed measures, including contingency plans and its environmental inspection program, for mitigating Project effects on agricultural soils. The Board notes that it will discuss with EPI any outstanding issues that it may have regarding its EPP as outlined in Section 9.4.

The Board does have concerns regarding EPI's proposed two year time frame for postconstruction monitoring and is of the view that two years may not be an adequate time frame for assessing the effectiveness of EPI's mitigation for Project effects on soils. Should the Project be approved, the Board recommends that EPI be required to undertake such monitoring for a period of five years (Recommendation 3). Further, the Board would be assessing EPI's postconstruction monitoring methodology and would discuss any outstanding issues with EPI. The Board is of the view that this monitoring program would be a valuable tool for assessing the potential effects of the Project on soil capability and the success of the mitigation applied. Overall, the Board is satisfied with EPI's proposed mitigation for Project effects on agricultural soils capability and when considered with the Board's Recommendation 3, is of the view that the Project is not likely to cause significant adverse effects on agricultural soils. This conclusion pertains to soils on the lands of both MPLA/SAPL members and non-MPLA/SAPL members due to the sufficiency of mitigation proposed for each group of landowner members.

### Evaluation of Significance

Frequency	Duration	Reversibility	Geographical Extent	Magnitude
Isolated	Short-term	Short to long term	Footprint	Low to medium
Adverse Effect				
Not likely to be signifi	cant			

Refer to Appendix 3 for definitions of the Evaluation of Significance Criteria

### 9.3.2.2 Potential Contamination of Wetlands and Aquifers Caused by an Accident or Malfunction of the LSr Pipeline During Operations

Background/Issues	The proposed LSr Pipeline would cross a number of wetlands and run over a number of aquifers.	
	Concerns were raised by the public, including EC, with respect to the potential water contamination, including drinking water wells, in the event of a rupture or leak during the operational phase of the Project. Areas of primary concern to EC are the Oak Lake/Plum Lake complex, the Glenboro Marsh/Black Slough and the wetland basin at KP 1161. EC recommends the installation of isolation valves on the LSr Pipeline in the above-mentioned locations.	
	EPI assessed the need for a specialized integrity assessment program (SIAP) that would encompass the design, construction and operation phases of the pipeline segments near the Oak Lake, Assiniboine and Winkler aquifers as well as the aquifer near the Swan Lake Indian Reserve No. 7. Upon questioning from the Board, EPI stated that the SIAP would be integrated into EPI's existing integrity management program (IMP). The IMP is a requirement for Board-regulated companies under the <i>Onshore Pipeline Regulations</i> , 1999 (OPR-99).	
Mitigation Measures	To mitigate potential effects on aquifers, pursuant to its existing IMP and its current practices for design and construction, EPI stated that it would undertake an evaluation of the following potential mitigative strategies and select measures appropriate for the proposed LSr Pipeline Project:	
	<ul> <li>increase the minimum depth of cover to 1.5 m to limit the potential for third party damage</li> </ul>	
	<ul> <li>increase the frequency of internal corrosion checks;</li> </ul>	
	<ul> <li>optimize valve location and spacing to limit the amount of product that could be released;</li> </ul>	
	<ul> <li>increase the wall thickness of the pipe; and</li> </ul>	
	<ul> <li>ensure adequate cathodic protection of the pipe.</li> </ul>	
	EPI has committed to conducting a feasibility assessment related to the installation of isolation valves on both sides of the wetland basin at KP 1161, the Demare Slough near KP 1149, the unnamed wetland near KP 1124, the Oak Lake/Plum Lake complex and the	

	Glenboro Marsh/Black Slough complex. EPI stated that the requirements for determining where isolation values should be installed is dependent on the topography of the line and if there are sensitive areas down slope of the pipeline.	
	EPI has a series of programs in place to minimize a potential release, to monitor the pipeline system, and to respond in the event of a release.	
	The LSr Pipeline will be hydrostatically tested prior to operation.	
	As required by the OPR-99, EPI has an emergency response plan (ERP) in place that was developed to be consistent with industry standard publications such as Emergency Planning for Industry (CAN/CSA-Z731). The ERP will have measures in place to promptly and effectively respond to a release of product from the LSr Pipeline. EPI has committed to update its ERP to incorporate the LSr Pipeline.	
	EPI will develop a plan to identify alternate water supplies and commits to provide alternate water sources to affected parties, if warranted, in the event of an accidental release of product that adversely affects an aquifer.	
Monitoring	Included within EPI's IMP and other operational programs are requirements for inline inspections for denting, corrosion and cracking and other forms of monitoring the integrity of the pipeline such as regular fly overs of the RoW.	
Lagande Die Division Serie Formanie Other		

Legend: Bio-Physical; Socio-Economic; Other

### Views of the Board

The Board notes that the magnitude of a rupture or leak caused from an accident or malfunction could be extensive if the product from the pipeline entered sensitive water bodies or groundwater. However, the Board is of the view that EPI's commitment to operating the LSr Pipeline in accordance with the specifications, standards and other information referred to in its application or as otherwise agreed to during the OH-3-2007 proceeding, would minimize the likelihood of a rupture or leak from occurring. Further, EPI has committed to undertaking feasibility studies for the consideration of installing isolation valves adjacent to sensitive water areas, which may help mitigate negative effects in the event of a leak or rupture.

The Board notes that it would continue to monitor EPI's pipeline and facility IMP and other operational programs to ensure that they are adequate, that they are being implemented appropriately and that they are effective.

To further minimize the likelihood of a rupture or leak and ensure public safety, the Board is of the view that, in any authorization that may be granted, EPI should be directed to:

- develop and submit a joining program that includes welding and testing procedures and manuals;
- submit a comprehensive health and safety plan and field pressure testing program; and
- construct and operate the LSr Pipeline in accordance with the information referred to in its application.

Please refer to Recommendations (4), (5) and (6) in Section 9.7 for detailed wording.

Taking into account the programs in place and the proposed recommendations, the Board is of the view that this component of the Project is not likely to cause significant adverse environmental effects as a result of accidents and malfunctions, since the likelihood of occurrence is very low.

### Evaluation of Significance

Frequency	Duration	Reversibility	Geographical Extent	Magnitude
Accidental	Short-term	Short to long term	Footprint to region	High
Adverse Effect				
Not likely to be signifi	cant			

Refer to Appendix 3 for definitions of the Evaluation of Significance Criteria

# 9.3.2.3 Potential Contamination of the South Saskatchewan River Caused by an Accident or Malfunction of Line 13

Background/Issues	Line 13 currently handles crude oil which flows from Edmonton to the Canada/US Border. The proposed reversal would permit diluent to flow from the Canada/US Border to Edmonton.
	A number of concerns were raised by the public, including the Town of Outlook and the Meewasin Valley Authority, with respect to the effects of a spill or leak at the South Saskatchewan River pipeline crossing to the water supply of downstream users ( <i>i.e.</i> local, Saskatoon and the Town of Outlook).
	EPI specified that diluent is a petroleum product. In comparison to typical crude oil, diluent disperses more readily and more is lost to evaporation upon a release.
	The EPI pipeline system in western Canada has for a number of years transported a variety of petroleum products including diluent products such as condensate. The toxicity and potential health effects from exposure to diluent are similar to other petroleum products transported in the EPI pipeline system.
Mitigation Measures	The Applicants stated that EPI's ERP is on file with the NEB. The ERP includes measures to prepare and respond in the event of a spill during pipeline operation.
	The Applicants stated that the ERP remains applicable for Line 13 operating in diluent service.
	The Applicants stated that EPI conducts bi-weekly aerial patrols of the pipeline system to check for any activities or situations that could affect the integrity of the pipelines (such as third party damage or bank erosion).
	The Applicants stated that EPI's control centre remotely monitors and controls the operation of the pipeline system using Supervisory Control and Data Acquisition systems. In the event of a pressure drop on the system indicating the possibility of a release, the operation of the pipeline can be suspended and operations personnel and equipment are deployed to the site.
Monitoring	Included within EPI's IMP and other operational programs are requirements for inline inspections for denting, corrosion and cracking and other forms of monitoring the integrity of the pipeline such as regular fly overs of the RoW.

Legend: Bio-Physical; Socio-Economic; Other

### Views of the Board

As required by OPR-99, EPI has an ERP in place for the existing Line 13 crude oil service. The Board is of the view that the existing measures and monitoring undertaken by EPI would continue to be applicable during the operations for diluent service.

To further ensure public safety and minimize the likelihood of a rupture or leak at the South Saskatchewan River Crossing as well as elsewhere along the line, the Board is of the view that, in any authorization that may be granted, the Applicants be directed to:

- develop and submit a joining program that includes welding and testing procedures and manuals;
- operate Line 13 in accordance with the information referred to in its application;
- prior to placing Line 13 into diluent service, provide an engineering assessment in accordance with the Canadian Standards Association Z662-07, *Oil and Gas Pipeline Systems* which evaluates the pipeline's fitness for purpose, for the proposed reversal of flow;
- in the event that the Board is not satisfied that the engineering assessment demonstrates that Line 13 may safely commence operation in diluent service, ESL may be required to hydrotest all, or portions of Line 13; and
- after placing Line 13 into diluent service, ESL shall submit to the Board a revised engineering assessment to account for actual operating pressure profiles and pressure cycle data gathered since the reversal of flow.

Please refer to Recommendations (4), (6), (7), (8), and (9) in Section 9.7 for detailed wording.

Taking into account the programs in place and the proposed recommendations, the Board is of the view that this component of the Project is not likely to cause significant adverse environmental effects, as a result of accidents and malfunctions since the likelihood of occurrence is very low.

However, the Board recognizes concerns have been expressed about potential contamination of the water supply to downstream users, particularly to the City of Saskatoon and Town of Outlook. The Board is of the view that concerns could be alleviated to a large extent if EPI could demonstrate that its emergency response measures will address potential contamination concerns. Therefore the Board is of the view that an emergency exercise should be undertaken for a potential rupture/leak at the South Saskatchewan River crossing to assess the effectiveness of the ERP to protect downstream water users.

Therefore, in any Order that the Board may issue, the Board is of the view that the Applicants be directed to undertake an ERP exercise at the South Saskatchewan River Crossing. Please refer to Recommendation (10) in Section 9.7 for detailed wording.

### Evaluation of Significance

Frequency	Duration	Reversibility	Geographical Extent	Magnitude
Accidental	Short-term	Short to long term	Footprint to region	High
Adverse Effect				
Not likely to be signifi	cant			

Refer to Appendix 3 for definitions of the Evaluation of Significance Criteria

### 9.4 Inspection

EPI stated that Environmental Inspectors would be assigned to the construction of the LSr Pipeline to ensure that proposed mitigative measures are properly implemented. In addition, EPI stated that appropriate Resource Specialists would be available onsite, when warranted, and would have expertise in the particular issues associated with the spread (*i.e.*, soil scientist, geotechnical engineer, wetland specialist, fisheries biologist, botanist, wildlife biologist, archaeologist, reclamation specialist, *etc.*). Overall, EPI committed to have a suitable number of Environmental Inspectors to provide an appropriate level of inspection. EPI further stated that training programs would be developed for all construction and inspection personnel to ensure that all individuals are aware of the environmental issues and their respective responsibilities.

During the course of the proceedings, the Board raised concerns that inspectors may have difficulty in performing their duties if they have to refer to a number of documents (*i.e.* application, supplementary submissions and manuals) to find mitigation commitments. Therefore, the NEB recommends that EPI consolidate all mitigation measures and commitments into an Environmental Protection Plan (EPP). Refer to Recommendation 11 in Section 9.7 for more details.

The Board also notes that pursuant to the NEB Act, the Board has its own inspection program and Board Environmental Inspectors are tasked with ensuring protection of property and the environment.

### 9.5 Cumulative Effects Assessment

The Applicants' cumulative effects assessment evaluated the adverse residual effects directly associated with the Project in combination with the adverse residual effects arising from other projects and activities that have been or will be carried out in the vicinity of the Southern Lights Project. The reader is referred to the Applicants' application for additional details on its cumulative effects assessment methodology.

### 9.5.1 Other Projects Interacting with the Southern Lights Project

Past, existing, and proposed projects or activities within and adjacent to the proposed corridor include, but are not limited to, oil and gas activity, roads, rail lines, agriculture, power lines, and wind generation projects. The predominant projects that the Applicants noted which could potentially interact with the Southern Lights Project include:

- existing EPI pipelines within the RoW that the LSr Pipeline would parallel;
- EPI's proposed Alberta Clipper Project that would parallel the LSr Pipeline route with a fivemetre separation;
- EPI's proposed Southern Access Project;
- TransCanada Keystone's proposed oil pipeline where it crosses the LSr Pipeline route; and
- proposed wind generation projects in the vicinity of the LSr Pipeline route.

EPI's existing pipelines and its proposed Alberta Clipper Project are the projects most likely to result in direct cumulative environmental effects with the Southern Lights Project. The LSr Pipeline route would follow the same route as the Alberta Clipper pipeline from the Cromer Terminal to the Canada/US border.

### 9.5.2 Potential Cumulative Effects

The Applicants identified potential cumulative residual effects associated with the following elements:

- physical elements such as slope stability, soils, water quality and quantity, air quality including greenhouse gases, and acoustic environment;
- biological elements such as fish and fish habitat, wetlands, vegetation, wildlife and wildlife habitat, and species at risk;
- socio-economic elements such as human occupancy and resource use, heritage resources, traditional land and resource use, human health and infrastructure and services; and
- accidents and malfunctions.

The Applicants stated that its proposed Project-specific environmental protection and mitigative measures are sufficient to address potential cumulative effects and that the cumulative residual environmental and socio-economic effects associated with the construction and operation of the Project are not unlike those routinely encountered during pipeline and associated facility construction in an agricultural setting. However, as discussed in the following paragraphs, the Applicants also proposed to undertake specific mitigative measures to address cumulative effects related to certain bio-physical and socio-economic elements.

### Soil Capability

The Applicants stated that the LSr Pipeline component of the Southern Lights Project would act cumulatively with previous disturbances and the Alberta Clipper Project in that an incremental change in soil capability would occur. Past activities which have affected soil capability are largely attributed to agricultural activities and previous pipeline construction programs. In addition, since the Alberta Clipper Project and the LSr Pipeline would share the same construction RoW, residual effects on soil arising from Alberta Clipper would be expected to act cumulatively with the LSr Pipeline. The Applicants noted that to a lesser extent, the LSr Pipeline may also act cumulatively with the residual effects arising from the construction of the Keystone Pipeline Project but such effects would be limited to the segment where the LSr Pipeline and the Keystone pipeline intersect.

In its original application, the Applicants proposed construction of both the Southern Lights and Alberta Clipper projects to commence in late 2007 and extend until 2009.

In August 2007, the Applicants submitted a revised cumulative effects assessment considering the scenario that construction of the pipeline component of the Alberta Clipper Project from Cromer to the Canada/US border would be undertaken one year after construction of the pipeline component of the Southern Lights Project. The former would generally commence in summer 2009 and the latter in summer 2008.

If constructed on their own, the LSr and Alberta Clipper pipelines would be constructed with a 5 m separation and each would require a 40 m wide construction RoW. However, since the two projects would parallel one another and be constructed within a year of each other, the rights-of-way and temporary workspace would be shared and overlapping. Thus, the total construction RoW width for both pipelines would be 45 m.

To minimize topsoil handling and therefore reduce the potential of topsoil and subsoil mixing, the Applicants proposed to leave the topsoil in rows along the RoW in between the two periods of construction to avoid disturbing the topsoil twice. Measures would be taken to stabilize the topsoil and prevent wind erosion and weed infestation. However, the Applicants also stated that if it was the landowner's preference, it would replace the topsoil at the end of the first construction season and that in either case, landowners would be compensated appropriately. Final clean-up and reclamation of the combined construction RoW would generally be conducted in the late fall 2009.

The Applicants further noted that its proposed soil handling methods would also result in overall decreased disturbance, which in turn would result in reduced effects on other elements such as wildlife and vegetation and the decrease the potential for the spreading of weeds.

### Other Biophysical and Socio-Economic Elements

The Applicants also proposed to install the LSr and Alberta Clipper pipelines simultaneously during construction of the LSr Pipeline component of the Southern Lights Project at certain locations in order to minimize disturbance. These locations include several potentially sensitive watercourse crossings, the Glenboro Marsh / Black Slough wetland complex (KP 1106.9 to KP 1114.5), and within the town of Morden (KP 1195.9 to KP 1197). The Applicants submitted that co-construction of the pipelines through these areas would be likely to result in reduced

cumulative adverse effects on water quality and quantity, fish and fish habitat, wetlands, vegetation and wildlife, including species at risk, and other land uses in the Morden area.

### 9.5.3 Applicants' Conclusion

The Applicants submitted that with the implementation of its proposed mitigative strategies, the potential cumulative adverse residual effects associated with the construction and operation of the Southern Lights Project, including the LSr pipeline and associated facilities, Line 2 modifications, and Line 13 reversal components, on biophysical and socio-economic elements would not be likely to be significant.

### 9.5.4 Views of the Board

The Applicants proposed concurrent construction of the Alberta Clipper and Southern Lights projects at certain locations is likely to result in reduced environmental effects on water quality and quantity, fish and fish habitat, wetlands, vegetation and wildlife, including species at risk, and other land uses in the Morden area. Further, the Applicants soil handling plans to accommodate both projects would lessen potential adverse effects on soil capability. Co-construction of the projects would result in less overall temporal and spatial disturbance on these environmental elements and is the preferred approach should both projects be approved. However, the Board is also of the view that the Applicants' proposed project-specific environmental effects resulting from the projects are not likely to be significant in the event that stripping and topsoil replacement or co-construction of the pipes cannot occur at the same time.

The Board is of the view that, taking into consideration the Applicants' proposed Project-specific mitigation measures, its additional measures proposed to further mitigate cumulative effects, and the recommendations referred to in Section 9. 7, the proposed Project would not likely result in significant adverse cumulative environmental effects in combination with other projects or activities that have been or will be carried out.

### 9.6 Follow-Up Program

The Project and its associated activities are generally routine in nature and the potential adverse environmental effects of the Project are expected to be similar to those of past projects of a similar nature in a similar environment. For this reason, the NEB is of the view that a follow-up program pursuant to the CEA Act would not be appropriate for this Project.

However, it is recommended that the Applicants undertake detailed post-construction monitoring as discussed in sections 9.3.1.2 and 9.3.2.

### 9.7 Recommendations

It is recommended that, in any authorization that the NEB may grant, a condition be included requiring the Applicants to carry out all of the environmental protection and mitigation measures outlined in its application and subsequent submissions. Further, other recommendations include:

- (1) EPI shall:
  - (a) file with the Board, at least 60 days prior to the commencement of construction, the results of the archaeological and paleontological investigations; and
  - (b) include the recommendations resulting from the archaeological and paleontological investigations, including those for the Thornhill Burial Mounds, in the EPP.

If appropriate, EPI may file the results related to the LSr station facilities and the LSr Pipeline excluding the LSr station facilities separately, one prior to the commencement of construction of the LSr station facilities and the other prior to the commencement of the construction of the LSr Pipeline excluding the LSr station facilities.

- (2) EPI shall, in the event that previously unidentified archaeological or heritage resources are discovered:
  - (a) immediately cease work at the location of the discovery and notify responsible provincial authorities; and
  - (b) resume work only after approval is granted by the responsible provincial authority
- (3) On or before the 31 of January of each of the first 5 years following the commencement of the operation of the LSr Pipeline, EPI shall file with the Board, and make available on its website for informational purposes, a post-construction environmental report that:
  - (a) identifies on a map or diagram the location of any environmental issues which arose during construction;
  - (b) discusses the effectiveness of the mitigation applied during construction and the methodology used to assess the effectiveness of mitigation;
  - (c) identifies the current status of the issues identified (including those raised by landowners), and whether those issues are resolved or unresolved; and
  - (d) provides proposed measures and timelines EPI shall implement to address any unresolved concerns.

The report shall address, but not be limited to, issues pertaining to soil productivity on cultivated lands, weeds, reclamation of native prairie, and plant species of special concern.

(4) EPI shall develop joining programs for: the LSr Pipeline (excluding the LSr station facilities); the LSr station facilities; and Line 2. ESL shall develop the joining program for Line 13 Reversal. Both shall file these with the Board at least 60 days prior to commencement of any welding activities to which the programs relate. The joining programs shall include:

- (a) requirements for the qualification of welders;
- (b) requirements for the qualification and duties of welding inspectors;
- (c) the welding techniques and processes EPI/ESL would be using;
- (d) the welding procedure specifications and procedure qualification records;
- (e) the welding procedure specifications for welding on in-service pipelines (where applicable);
- (f) the non-destructive examination (NDE) procedures, and supporting procedure qualification records, which detail the ultrasonic and/or radiographic techniques and processes EPI/ESL would be using, for each welding technique;
- (g) the defect acceptance criteria for each type of weld (i.e. production, tie-in and repair);
- (h) an explanation of how the defect acceptance criteria were determined; and
- (i) any additional information which supports the joining program.
- (5) EPI shall file with the Board the following programs and manuals within the time specified: EPI shall file with the Board the following programs and manuals within the time specified:
  - (a) Comprehensive health and safety plan related to the LSr station facilities at least 60 days prior to construction of the LSr station facilities;
  - (b) Comprehensive health and safety plan related to the LSr Pipeline excluding the LSr station facilities– at least 60 days prior to construction of the LSr pipeline excluding the LSr station facilities; and
  - (c) Field pressure testing program for the LSr Pipeline at least 14 days prior to pressure test.
- (6) EPI shall cause the approved Project to be designed, located, constructed, installed, and operated in accordance with the specifications, standards and other information referred to in its application or as otherwise agreed to during the OH-3-2007 proceeding.
- (7) ESL shall file with the Board for approval, at least 9 months prior to placing Line 13 into diluent service, an engineering assessment (EA) in accordance with the Canadian Standards Association Z662-07, *Oil and Gas Pipeline Systems* which evaluates the pipeline's fitness for purpose, for the proposed reversal of flow. The EA shall account for, but not be limited to:
  - (a) a comparison of excavation findings with associated results from all crack in-line inspections (ILI) performed during current service, and with associated results from the most recent geometry ILIs;
  - (b) a confirmation of the accuracy of the ILI tools, or measures undertaken to mitigate potential inaccuracies;

- (c) the pipeline condition after completion of repairs, including type and dimensions of remaining crack and geometry features;
- (d) a comparison of operation prior to reversal versus future service conditions, including cyclical loading estimates;
- (e) the estimated defect growth and time until failure, once Line 13 is reversed;
- (f) pipe design and material properties (such as toughness) of the various Line 13 portions;
- (g) transient analyses completed on Line 13;
- (h) consequences of failure, with regard to pipe properties described in f); and other potential hazards that may be aggravated by the proposed reversal of Line 13.
- (8) In the event that the Board is not satisfied that the engineering assessment demonstrates that Line 13 may safely commence operation in diluent service, ESL shall be required to hydrotest all, or portions of Line 13. If hydrotesting is required, ESL shall file with the Board for approval its Pressure Testing Program at least four weeks prior to the commencement of pressure testing activities.
- (9) No later than six months after placing Line 13 into diluent service, ESL shall submit to the Board a revised engineering assessment to account for actual operating pressure profiles and pressure cycle data gathered since the reversal of flow. As part of ESL's engineering assessment, estimated defect growth rates and in-line inspection intervals shall be adjusted accordingly.
- (10) Within six (6) months after commencement of operation of Line 13 in diluent service:
  - (a) ESL shall conduct an emergency response exercise at its South Saskatchewan River crossing and relevant downstream control points with the objectives of testing:
    - emergency response procedures, including response times;
    - training of company personnel;
    - communications systems;
    - response equipment;
    - safety procedures; and
    - effectiveness of its liaison and continuing education programs.
  - (b) ESL shall notify the Board, at least thirty (30) days prior to the date of the emergency response exercise, of the following:
    - the date(s) and location(s) of the exercise;
    - the type of exercise;
    - the exercise scenario;
    - the proposed participants in the exercise;
    - the objectives of the exercise; and

- the evaluation criteria.
- (c) ESL shall file with the Board, within sixty (60) days after the emergency response exercise outlined in (a), a final report on the exercise including:
  - the results
  - how objectives were achieved;
  - areas for improvement; and
  - steps to be taken to correct deficiencies.
- (11) EPI shall file with the Board for approval, at least 60 days prior to construction, an updated project-specific Environmental Protection Plan (EPP). The EPP shall describe all environmental protection procedures, and mitigation and monitoring commitments, as set out in EPI's application or as otherwise agreed to during questioning, in its related submissions or through consultations with other government agencies. Construction shall not commence until EPI has received approval of its EPP from the Board. If appropriate, the Applicants may submit two separate EPPs, one for the LSr Pipeline excluding the LSr station facilities and the other for the LSr station facilities.

### **10.0 THE NEB'S CONCLUSION**

The NEB is of the view that with the implementation of the Applicants' environmental protection procedures and mitigation measures and the NEB's recommendations, the proposed Project is not likely to cause significant adverse environmental effects.

### 11.0 NEB CONTACT

Claudine Dutil-Berry Secretary National Energy Board 444 Seventh Avenue S.W. Calgary, Alberta T2P 0X8 Phone: 1-800-899-1265 Facsimile: 1-877-288-8803 secretary@neb-one.gc.ca

### **APPENDIX 1** Scope of the Environmental Assessment (as determined in June 2007)

File OF-Fac-Oil-E242-2007-01 01 6 June 2007

To: Distribution List

### Enbridge Southern Lights Limited Partnership (ESL) and Enbridge Pipelines Inc. (EPI) Proposed Southern Lights Pipeline Project Scope of the Environmental Assessment Pursuant to the *Canadian Environmental Assessment Act*

On 27 April 2007, the National Energy Board (the Board) requested comments from the public on the draft scope of environmental assessment for the proposed Southern Lights Pipeline Project.

The Board received a letter of comment from the Meewasin Valley Authority, which posed the following question in the context of the cumulative effects assessment related to the Project: "Does the phrase "other projects" include all existing pipelines that have been constructed within the RoW, regardless of ownership?" The Board is of the view that the phrase "other projects" in factor (a) of Section 2.2 of the Scope of the Environmental Assessment includes all existing pipelines, regardless of ownership, that may be the source of environmental effects that may potentially interact with the environmental effects of the proposed Southern Lights Pipeline Project. Therefore, the Scope, as drafted, will adequately consider the cumulative environmental effects of accidents and malfunctions that are likely to result from the Southern Lights Pipeline Project in combination with other projects or activities that have been or will be carried out.

The Board also received a letter of comment from the Roseau River Anishinabe First Nation (RRAFN). The RRAFN stated that the Southern Lights Pipeline Project adversely affects the "constitutionally protected s. 35 interests of the RRAFN" and registered its concern that appropriate consultation be carried out. The RRFAN did not, however, provide information on the specific interests adversely impacted by the proposed Project and did not suggest any changes to the draft Scope. As a result, the Board is of the view that it is not necessary to make any changes to the draft Scope based upon the comments of the RRAFN. The Board notes that the CEA Act mandates consideration of any change that the Project may cause in the environment and any impact of such a change on the current use of lands and resources for traditional purposes by Aboriginal peoples. It also requires the consideration of mitigation measures proposed to minimize any such impact. These requirements have been incorporated into the Scope. Furthermore, the impacts of the Project on Aboriginal peoples is also a specific issue in the public hearing process that has been established in respect of the Project.

Accordingly, in response to the comments received, the Board has not made any changes to the draft Scope. The Board also notes that the Board, Transport Canada and Indian and Northern

### Southern Lights Project

Affairs Canada are responsible authorities (RAs) pursuant to the *Canadian Environmental Assessment Act* for the proposed Project and the RAs have determined the scope of the environmental assessment, as attached to this letter.

The Board notes that the RRFAN has been forwarded a copy of the Hearing Order issued in relation to the Southern Lights Pipeline Project, which outlines in detail the various means of participating in the NEB proceeding.

Yours truly,

David Young Acting Secretary

Attachments

### Enbridge Southern Lights Limited Partnership and Enbridge Pipelines Inc. Proposed Southern Lights Pipeline Project Scope of the Environmental Assessment Pursuant to the *Canadian Environmental Assessment Act*

### **1.0 INTRODUCTION**

Enbridge Southern Lights Limited Partnership (ESL) and Enbridge Pipelines Inc. (EPI) are proposing to construct and operate the Southern Lights Pipeline Project (the Project). A Certificate of Public Convenience and Necessity pursuant to section 52 and Orders pursuant to section 58 of the *National Energy Board Act* (NEB Act) to construct and operate the proposed Project would be required and the project would be subject to an environmental screening under the *Canadian Environmental Assessment Act* (CEA Act).

On 14 November 2006, Enbridge filed a Preliminary Information Package with the Board regarding the proposed Project. The intent of the Preliminary Information Package was to initiate the environmental assessment (EA) process pursuant to the CEA Act. The following departments subsequently identified themselves as having responsibilities or an interest under the CEA Act in the EA of the proposed Southern Lights Pipeline Project:

- National Energy Board required to conduct an EA under the CEA Act (Responsible Authority (RA))
- Transport Canada, Navigable Waters RA
- Indian and Northern Affairs Canada RA
- Environment Canada in possession of specialist or expert information or knowledge (Federal Authority (FA))
- Health Canada FA
- Department of Fisheries and Oceans FA
- Natural Resources Canada FA

The Provinces of Manitoba and Saskatchewan also expressed an interest in monitoring and participating in the EA coordination process although Provincial EA legislation is not triggered.

The Canadian portion of the Project would consist of three components. The Project would include conversion of Line 13 from crude oil service to diluent service and reversal of Line 13 to allow flow from the Canada - United States (US) border near Gretna, Manitoba (MB) to Edmonton, Alberta (AB). The Project would also involve construction of approximately 286 km of new 508 mm (NPS 20-inch outside diameter) light sour (LSr) crude oil pipeline from Cromer, MB to the Canada - US border near Gretna, MB. The Project also includes the modification of certain Line 2 pump stations and the addition of drag reducing agent (DRA) injection systems between Edmonton, AB and Canada - US border near Gretna, MB. Approximately 8 km of new right of way (RoW), not contiguous with or alongside existing RoW, would be required for the new pipeline facilities. Construction of the new pipeline facilities would require the crossing of

11 named watercourses, including the Souris and Cypress Rivers. There may also be other related physical works and activities associated with the Project.

The scope of the EA was established in accordance with the CEA Act and the CEA Act *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* which state that the RAs shall establish the scope of the EA after consulting with FAs. The Provinces of Manitoba and Saskatchewan also reviewed the draft scope.

### 2.0 SCOPE OF THE ASSESSMENT

### 2.1 Scope of the Project

The scope of the Project as determined for the purposes of the EA includes the various components of the Project as described by ESL and EPI in their 14 November 2006 Preliminary Information Package and 9 March 2007 Application, submitted to the National Energy Board.

The scope of the Project includes construction, operation, maintenance and foreseeable changes, and where relevant, the abandonment, decommissioning and rehabilitation of sites relating to the entire Project, and specifically, the following physical works and activities:

### Line 13 Reversal

- Enbridge's existing Line 13 would be reversed from the Canada US border near Gretna, MB to Edmonton, AB to allow for a south to north flow. This reversal would allow the redeployment of Line 13 from crude oil service to diluent service. No new diluent pipeline construction would be required in Canada.
- Modifications to 17 existing pump stations on Line 13 in AB, SK and MB. Sixteen of these stations would be modified for reverse flow service and one station in Edmonton, AB would be redeployed.
- The installation of DRA skids within existing station boundaries at 4 existing line 13 pump stations.

### **Light Sour Crude Pipeline**

Construction of approximately 286 km of a new 29,500 M /day (185,000 bbl/day), 508 mm (NPS 20-inch OD) light sour crude oil pipeline from Cromer, MB to the Canada - US border near Gretna, MB The construction in Canada would be in or alongside and contiguous to existing EPI right of way (RoW) for almost its entire length. Approximately 8 km of new non-contiguous RoW would be required. Three new pumping units would be required and each would be located within existing Enbridge pump station boundaries.

### Line 2 Modifications

Modifications to certain of EPI's existing Line 2 pump stations between Edmonton, AB and the Canada – US border near Gretna, MB specifically:

- replacement of 17 Line 2 pumps and motors at existing pump stations.
- The addition or recommissioning of DRA skids within existing station boundaries at 22 existing Line 2 pump stations.

### **Related Undertakings and Activities**

Staging areas, temporary construction workspace, access roads, any required work camps, and equipment laydown areas are also included in the scope of the Project.

It should be noted that any additional modifications or decommissioning/abandonment activities would be subject to future examination under the NEB Act and consequently, under the CEA Act, as appropriate. Therefore, at this time, these activities will be examined in a broad context only.

### **Navigable Watercourse Crossings**

Additionally, for greater clarity, the Scope of the Project includes the crossings of navigable watercourses.

### 2.2 Factors to be Considered

The EA will include a consideration of the following factors listed in paragraphs 16(1)(a) to (d) of the CEA Act:

- (a) the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- (b) the significance of the effects referred to in paragraph (a);
- (c) comments from the public that are received during the environmental assessment process; and
- (d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project.

In addition, pursuant to paragraph 16(1)(e), the EA will consider alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means.

For further clarity, subsection 2(1) of the CEA Act defines 'environmental effect' as:

- a) any change that the project may cause in the environment, including any change that the project may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species as defined in the *Species at Risk Act*;
- b) any effect of any change referred to in paragraph (a) on
  - i. health and socio-economic conditions,
  - ii. physical and cultural heritage,
  - iii. the current use of lands and resources for traditional purposes by aboriginal persons,
  - iv. any structure, site or thing that is of historical, paleontological, or architectural significance; or
- c) any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.

### 2.3 Scope of Factors to be Considered

The EA will consider the potential effects of the proposed Project within spatial and temporal boundaries within which the Project may potentially interact with, and have an effect on components of the environment. These boundaries will vary with the issues and factors considered, and will include:

- construction, operation, decommissioning, site rehabilitation and abandonment or other undertakings that are proposed by the Proponent or that are likely to be carried out in relation to the physical works proposed by the Proponent, including mitigation and habitat replacement measures;
- the natural variation of a population or ecological component;
- the timing of sensitive life cycle phases of wildlife species in relation to the scheduling of the Project;
- the time required for an effect to become evident;
- the time required for a population or ecological component to recover from an effect and return to a pre-effect condition, including the estimated degree of recovery;
- the area affected by the Project; and
- the area within which a population or ecological component functions and within which a Project effect may be felt.

For the purpose of the assessment of the cumulative environmental effects, the consideration of other projects or activities that have been or will be carried out will include those for which formal plans or applications have been made.

### **APPENDIX 2** Locations of Proposed Work/Activities at Existing Pump Stations

Pump Station	Line 2 Modifications	LSr Pipeline	Line 13 Reversal
Edmonton			
Kingman			
Strome			
Hardisty			
Metiskow			
Cactus Lake			
Kerrobert			
Herschel			
Milden			
Loreburn			
Craik			
Bethune			
Regina			
White City			
Odessa			
Glenavon			
Langbank			
Cromer			
Souris			
Glenboro			
St.Leon			
Manitou			
Gretna			

### **APPENDIX 3** Significance Criteria Definition

The table below defines the criteria used by the NEB for evaluating the significance of the effects discussed in Section 9.3.2. These criteria and definitions are largely based on information used by the Applicants. However the NEB added its own criteria, Evaluation of Significance, and included a corresponding definition.

Criteria	Definition
Frequency (how often would the event that caused the effect occur)	Accidental: Occurs rarely over assessment period
	Isolated: Confined to specified period
	Occasional: Occurs intermittently and sporadically over assessment period
	Periodic: Occurs intermittently but repeatedly over the construction and operations period
	Continuous: Occurs continually over the construction and operations period
Duration (period of the event causing the effect)	Immediate: Event duration is limited to less than or equal to two days
	Short-term: Event duration is longer than two days but less than or equal to one year.
	Medium-term: Event duration is longer than one year but less than or equal to ten years
	Long-term: Event duration extends longer than ten years
Geographic Extent	<b>Footprint</b> : The land area disturbed by the Project, construction and reclamation activities, including associated physical works and activities ( <i>i.e.</i> , permanent pipeline RoW, temporary construction workspace, temporary stockpile sites, temporary staging areas, facility sites)
	<b>Local</b> : The area which could potentially be affected by construction and reclamation activities beyond the construction RoW including associated physical works and activities. The local boundary varies with the discipline and issue being considered ( <i>e.g.</i> , for assessment of the effects of noise on wildlife, the area affected by noise ( <i>i.e.</i> , 2 km buffer) from the source is included in this boundary)
	<b>Region</b> : The area extending beyond the local boundary. The boundary for the region also varies with the discipline and the issue being considered ( <i>e.g.</i> , for socio-economic analysis, regional boundaries include large communities that will be used as construction offices or regional municipal district boundaries)
	<b>Province</b> : The area extending beyond regional or administrative boundaries, but confined to Manitoba, Saskatchewan or Alberta ( <i>e.g.</i> , provincial permitting boundaries, etc.)
	Transboundary: The area extending outside Canada
Reversibility	Immediate: Effect is alleviated in less than or equal to two days
	Short-term: Greater than two days and less than or equal to one year to reverse effect
	Medium-term: Greater than one year and less than or equal to ten years to reverse effect
	Long-term: Greater than ten years to reverse effects
	Permanent: Residual effects are irreversible
Magnitude	Negligible: Residual effects are not detectable
	<b>Low</b> : Potential effects are detectable, but well within environmental and/or social standards or tolerance
	<b>Medium</b> : Potential effects are detectable and approaching, but below environmental and/or regulatory standards or tolerance
	High: Potential effects are beyond environmental and/or social standards or tolerance
Evaluation of Significance	" <b>Likely to be significant</b> " would typically involve effects that are: high probability, irreversible, regional in extent or of high magnitude