

TRANSCANADA PIPELINES LIMITED ENERGY EAST PIPELINE
PROJECT

Assessment of Impacts on the Natural Environment

Ontario Energy Board

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 P.O. Box 2319
 2300 Yonge St. (27th floor)
 Toronto, Ontario
 M4P 1E4
 Contact person: Laurie Klein
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DNV GL Oil and Gas
 Compliance Solutions
 Det Norske Veritas (Canada) Ltd.
 Suite 150, 2618 Hopewell Place NE
 Calgary, AB
 T1Y 7J7
 Tel: 403 250 9041

Task and objective:

Assist and inform the Ontario government in formulating a position on the Energy East application.

Prepared by:


 Dean Mutrie
 Senior Environmental Consultant

Verified by:


 Erin Doerffer
 Engineer

Approved by:


 Jake Abes
 President

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Reference to part of this report which may lead to misinterpretation is not permissible.

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EXECUTIVE SUMMARY

On October 30, 2014, TransCanada PipeLines Limited (TransCanada) filed an application with the National Energy Board (NEB) for approvals needed to construct and operate the Energy East Pipeline (the Project). On January 30, 2015, TransCanada filed Supplemental Report No. 1 with the NEB. The Project is a 4,500 kilometer pipeline system designed to transport 175,000 m³/d (1.1 million barrels per day) of crude oil from receipt points in Alberta and Saskatchewan to delivery points in Quebec and New Brunswick. Within the Province of Ontario, the Project will comprise the conversion to oil service of 1,928 km of an existing buried natural gas pipeline across northern and eastern Ontario, and the construction of 106 km of new buried pipeline in eastern Ontario. All of the pipe within Ontario will have an outside diameter of 1,067 mm (NPS 42). The Project area in north-west and north-central Ontario is sparsely populated forested Crown land with small communities dispersed along the Trans Canada Highway. Population density increases further east as the land use transitions to agriculture and urbanization in the Ottawa and St. Lawrence River valleys.


On November 12, 2013, the Ontario Minister of Energy sent a letter to the Chair and Chief Executive Officer of the Ontario Energy Board (OEB) instructing the OEB to submit a report that considers the implications of the impacts of the Energy East Project on Ontario and the six principles adopted by the Government of Ontario including that “pipelines must meet the highest available technical standards for public safety and environmental protection” and that “pipelines must have world leading contingency planning and emergency response programs”. The objective of the OEB’s report is to assist and inform the Ontario government in formulating a position on the Application.

DNV GL was retained by the OEB to review the Application and provide advice with respect to impacts on pipeline safety and the natural environment in Ontario. As part of the work, DNV GL attended: two rounds of consultation with the public from Kenora to Cornwall; meetings with First Nations and Métis people from Kenora to Akwasasne; and meetings with stakeholders in Ottawa. The Round One meetings took place from January to April, 2014 while the Round Two meetings took place in January and February, 2015.

This document reports on DNV GL’s technical assessment of impacts of the Energy East Project on the natural environment in Ontario. A separate report by DNV GL addresses public safety (DNV GL 2015).

DNV GL makes several general comments about the Application including:

- the Application appropriately addresses many environmental items typically addressed in major pipeline projects;
- the Application is not yet finalized;
- it is premature to comment on the Application’s conclusion that the Project is not likely to cause significant adverse effects in Ontario after appropriate mitigation measures are implemented, although this conclusion is consistent with other interprovincial oil pipelines recently certificated in Canada;
- it is premature to assess whether the Project has “world leading contingency planning” because emergency response plans are not yet available;
- the scope of the assessment of the converted pipeline is limited; and

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- the Application does not distinguish between routing an oil pipeline versus a gas pipeline - no evidence is presented suggesting that the route of the converted gas pipeline in Ontario is appropriate for an oil pipeline.

DNV GL concludes that some aspects of the Application are not consistent with the highest available technical standards for environmental protection including:

- incomplete mapping of surface water intakes;
- intermittent mapping of potential oil spill trajectories; and
- lack of consideration of alternative pipeline routes to avoid impacts to surface water resources, endangered species habitats and wetlands.

DNV GL observes that previous pipeline conversions in Canada have not been located in a project area which encounters hundreds of pristine water crossings in a wilderness or high profile urban setting. DNV GL concludes that there is a risk that the route of the Energy East pipeline will be fixed without adequately considering reroutes to avoid oil spills or lessen potential effects.

DNV GL makes a number of recommendations for consideration by the OEB and Ontario Minister of Energy including:

- full bore rupture modeling of potential oil spill pathways or trajectories and mapping of Highly Sensitive Receptors (HSRs) on the entire pipeline route in Ontario;
- rerouting the pipeline where the existing route is too close to HSRs, wetlands or endangered species habitat or justifying why rerouting is not necessary;
- studying a potential alternative pipeline route beside an existing railway and rerouting the pipeline or justify why rerouting is not necessary;
- preparing a Rideau River/Canal Trenchless Crossing Environmental Protection Plan;
- preparing detailed Park Protection Plans for the numerous Provincial Parks, Conservation Reserves and Conservation Areas crossed by the Project; and
- demonstrating how environmental effects of Project associated power lines will be minimized through route selection and environmental protection planning.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
1 INTRODUCTION.....	1
1.1 Background	1
1.2 Scope of Work	1
1.3 Methodology	2
1.4 Limitations	3
1.5 Outline of Report	3
2 ENVIRONMENTAL ISSUES RAISED BY ONTARIO PUBLIC, FIRST NATIONS AND MÉTIS COMMUNITIES	4
2.1 Impacts on Water	4
2.2 Impacts on Rideau River and Canal	4
2.3 Impacts on Fish and Wildlife	5
2.4 Impacts on Parks and Natural Areas	5
2.5 Impacts on Agricultural Resources	5
2.6 Traditional Land and Resource Use	5
3 TECHNICAL ASSESSMENT OF ENERGY EAST APPLICATION	6
3.1 General Comments	6
3.2 Water	7
3.3 Impacts on Rideau River and Canal	9
3.4 Impacts on Fish and Wildlife	10
3.5 Impacts on Parks and Natural Areas	10
3.6 Impacts on Agricultural Resources	11
3.7 Traditional Land and Resource Use	11
4 CONCLUSIONS AND RECOMMENDATIONS.....	12
4.1 Water	12
4.2 Rideau River and Canal	13
4.3 Fish and Wildlife	13
4.4 Parks and Natural Areas	13
4.5 Agricultural Resources	13
4.6 Traditional Land and Resource Use	13
4.7 Power Lines	14
5 REFERENCES.....	15



List of Acronyms and Abbreviations

<i>CEAA</i>	<i>Canadian Environmental Assessment Act</i>
ESA	Environmental and Socio-Economic Assessment
HDD	Horizontal Directional Drilling
HSRs	Highly Sensitive Receptors
km	kilometer
NEB	National Energy Board
NGP	Northern Gateway Project
NPS	Nominal Pipe Size
OEB	Ontario Energy Board
PDA	Project Development Area
<i>SARA</i>	<i>Species at Risk Act</i>
the Application	Energy East Application and Supplemental Report No. 1
the Project	Energy East Pipeline Project
TLRU	Traditional Land and Resource Use
TransCanada	TransCanada PipeLines Limited
VC	Valued Component

1 INTRODUCTION

1.1 Background

On October 30, 2014, TransCanada PipeLines Limited (TransCanada) filed an application with the National Energy Board (NEB) for approvals needed to construct and operate the Energy East Pipeline (the Project). On January 30, 2015, TransCanada filed Supplemental Report No. 1 with the NEB. These materials are collectively referred to here as the Application and are available for viewing at www.neb.gc.ca/energy_east.

Based on the Application, the Project is a 4,500 kilometer (km) pipeline system designed to transport 175,000 m³/d (1.1 million barrels per day) of crude oil from receipt points in Alberta and Saskatchewan to delivery points in Quebec and New Brunswick. Within the Province of Ontario, the Project will comprise the conversion to oil service of 1,928 km of an existing buried natural gas pipeline across northern and eastern Ontario, and the construction of 106 km of new buried pipeline in eastern Ontario. All of the pipe within Ontario will have an outside diameter of 1,067 mm (NPS 42).


The Project area in north-west and north-central Ontario is sparsely populated forested Crown land with small communities dispersed along the Trans Canada Highway. Population density increases further east as the land use transitions to agricultural and urban in the Ottawa and St. Lawrence River valleys. From west to east, major Ontario drainage basins traversed by the proposed pipeline include: the Nelson River Basin; the Hudson Bay Basin, including James Bay; and the Great Lakes – St. Lawrence Basin including Lake Superior, Georgian Bay and the St. Lawrence River. Specific waterbodies crossed or close to the pipeline route include: the Lake of the Woods; Eagle Lake; Wabigoon Lake; Lac de Mille Lacs; Black Sturgeon River; Nipigon River; Lake Nipigon; Long Lake; numerous rivers flowing north to James Bay including the Missinaibi, Opatatika, Kapuskasing, Groundhog and Mattagami; Lake Temiskaming; Lake Temagami; Lake Nipissing; Trout Lake; numerous tributaries to the Ottawa River including the Mattawa, Madawaska, Mississippi, Rideau and South Nation rivers; and tributaries to the St. Lawrence River.

The Energy East Application consists of 30,000 pages contained within 20 volumes and 68 binders and is based on preliminary engineering design supported by initial results from field investigations, engagement and consultation programs. Supplemental Report No. 1 consists of several thousand pages including: a project update and errata; Technical Data Reports for numerous environmental and socio-economic disciplines; revised foldout maps; and an updated engagement volume.

1.2 Scope of Work

On November 12, 2013, the Ontario Minister of Energy sent a letter to the Chair and Chief Executive Officer of the Ontario Energy Board (OEB) instructing the OEB to submit a report that considers the implications of the impacts of the Energy East Project on Ontario and the six principles adopted by the Government of Ontario including that “pipelines must meet the highest available technical standards for public safety and environmental protection” and that “pipelines must have world leading contingency planning and emergency response programs”. The objective of the OEB’s report is to assist and inform the Ontario government in formulating a position on the Application. The full text of the Minister’s letter can be viewed at the OEB’s Energy East website at www.ontarioenergyboard.ca/oebenergyeast.

DNV GL was retained by the OEB to review the Application and provide advice with respect to impacts on pipeline safety and the natural environment in Ontario. As part of the work, DNV GL attended: two rounds



of consultation with the public from Kenora to Cornwall; meetings with First Nations and Métis people from Kenora to Akwasasne; and meetings with stakeholders in Ottawa. The Round One meetings took place from January to April, 2014 while the Round Two meetings took place in January and February, 2015. Summaries of discussions can be found at the OEB's website cited above.

This document reports on DNV GL's technical assessment of impacts of the Energy East Project on the natural environment in Ontario. A separate report by DNV GL addresses public safety (DNV GL 2015).

TransCanada's Eastern Mainline Project is outside DNV GL's scope of work.

1.3 Methodology

Several thousand pages of text within Application volumes relevant to environmental effects in Ontario were reviewed including:

- Volumes 1, 4, 5, 7, 11 and 12;
- Environmental and Socio-Economic Assessment (ESA) Volumes 1, 2 (Part C1 and C2), 3 (Part C1 and C2), 5, 6, 7 and 8; and
- Supplemental Report No. 1 materials including Project Update and Errata, Appendix Volume 1 – Foldout Maps, Appendix Volume 3 – Terrestrial ESA Update, Appendix Volume 5 – Technical Data Reports Part B Project Wide and Ontario and Appendix Volume 5 – Technical Data Reports Part E – Soils.

The review was guided by:

- The six principles stated in the Minister's letter;
- The Part One and Part Two¹ Public Consultation Reports by Swerhun Inc. (2014);
- The Part One and Part Two¹ First Nations and Métis Report by Counsel Public Affairs (2014);
- The background environmental considerations report posted on the OEB website (TERA Environmental Consultants 2014); and
- The NEB Filing Manual (NEB 2014), the NEB's "List of Issues" for the TransCanada Energy East Pipeline Project (NEB 2015), and the *Canadian Environmental Assessment Act 2012 (CEAA 2012)*.

In determining what represents "the highest available technical standards" or "world leading contingency planning", DNV GL relied upon professional judgment and experience including a review of conditions imposed on other recent NEB-regulated oil pipeline projects. For convenience, the term "the highest available technical standard for environmental protection" in this report is sometimes abbreviated to "the highest level of environmental protection".

¹ The Part Two reports will be published on the OEB website once complete.



1.4 Limitations

This assessment is based on the content of the Application as of January 31, 2015. The right-of-way of the converted and new pipeline was not viewed by aerial or ground reconnaissance and no independent verification of data sources was made.

1.5 Outline of Report

Section 2 summarizes the major environmental issues raised by the Ontario public, First Nations and Métis communities during the two rounds of consultation and meetings in 2014 and 2015. Section 3 provides DNV GL's assessment of how the environmental issues identified in Section 2 were addressed in the Energy East Application. Section 4 provides DNV GL's concluding statements and recommendations for consideration by the OEB and Ontario Minister of Energy. Section 5 lists references cited in the text.

2 ENVIRONMENTAL ISSUES RAISED BY ONTARIO PUBLIC, FIRST NATIONS AND MÉTIS COMMUNITIES

A number of environmental issues and concerns relating to the Energy East Application were raised by the general public, First Nations and Métis communities during the two rounds of consultation and meetings. A brief summary follows while more detail is available in reports by Swerhun Inc. (2014) and Counsel Public Affairs (2014) posted on the OEB's website.

2.1 Impacts on Water

The prime issue raised universally across Ontario was concern about impacts of a potential oil spill on water - water for drinking, fish and wildlife habitat, recreation, transportation and other purposes. For First Nations and Métis people, water is life and there is a strong spiritual connection and need to protect the water as part of "Mother Earth".

A number of individuals indicated that their homes or communities drew ground water from wells near the Project and there was concern about possible impacts on their drinking water supplies, particularly in the event of a small undetectable leak. In south-eastern Ontario, there was specific concern about the Oxford-Marsh Aquifer and the Nepean Aquifer in the Ottawa area.

Many people raised concerns about what might happen to their particular watershed if a spill were to take place like the 2010 event in Marshall, Michigan where it took over 17 hours to shut down the pipeline and the oil travelled more than 60 km down Talmadge Creek and the Kalamazoo River (National Transportation Safety Board 2012). Others noted that, given the fast currents in many rivers crossed by the pipeline route, spill response activities could not be mobilized quickly enough to prevent spilled oil from reaching sensitive waterbodies downstream. Residents of the City of North Bay were particularly concerned about a potential spill into creeks leading to Trout Lake, the source of the City's drinking water. People dwelling in permanent and seasonal residences along the shoreline of Trout Lake who draw drinking water directly from the Lake also expressed concern. There were specific concerns about the close proximity (within 5 km) of the converted pipeline to Lake Nipigon and the Mattawa/Ottawa Rivers where the pipeline route runs parallel to those waterbodies for approximately 25 km and 175 km, respectively. One First Nations community located at the mouth of a river flowing into James Bay expressed concern about spills into that river from the pipeline located more than 250 km upstream. They were particularly concerned because there are no all-weather roads to facilitate rapid oil spill response.

On the new pipeline portion, one First Nations community which draws drinking water from the St. Lawrence River noted the proposed pipeline route parallels the St. Lawrence in close proximity for 40 km and suggested that an alternative pipeline route be chosen further away from the River.

With respect to placement of mainline block valves, a common view expressed was that every watercourse is significant and worthy of protection by valves to minimize the amount of oil released in the event of a spill.

2.2 Impacts on Rideau River and Canal

In south-eastern Ontario, there were concerns raised over the proposed crossing of the Rideau River and Canal for multiple reasons including effects of a potential oil spill on a drinking water source and the waterway as a recreational and navigational asset. The River is designated as a Canadian Heritage River and the Canal is part of a UNESCO World Heritage Site and National Historic Site.



2.3 Impacts on Fish and Wildlife

Concerns were expressed across Ontario about the potential impacts on fish and wildlife and related habitat in general, and specifically what would happen in the event of a spill.

2.4 Impacts on Parks and Natural Areas

Concerns were expressed across Ontario about the potential oil spill impacts on parks and natural areas including provincial parks, conservation reserves, conservation areas, wetlands and other environmentally sensitive areas.

2.5 Impacts on Agricultural Resources

In southeastern Ontario, concerns were raised about potential effects of spills on agricultural lands.

2.6 Traditional Land and Resource Use

A topic raised at several meetings with First Nations and Métis communities was the importance of gathering Traditional Land and Resource Use (TLRU) information to contribute to final routing, siting and Project design.

3 TECHNICAL ASSESSMENT OF ENERGY EAST APPLICATION

3.1 General Comments

DNV GL finds that the Energy East Application appropriately addresses many of the items set out in the NEB Filing Manual and that there is no need to review those items here. Rather, the focus of this report is on the environmental issues raised at public, First Nation and Métis meetings.


At time of writing, the NEB has not ruled on completeness of the Application or issued a hearing order setting down milestones for Project review. Further, TransCanada has not finalized its Application – Appendix 1-1 of “Supplemental Report No. 1 – Project Update and Errata” lists the contents of Supplemental Reports No. 2 through No. 5 proposed to be filed in March 2015, June 2015, September 2015 and June 2016, respectively. Some of the information not yet filed includes description and environmental assessment of Project components such as temporary ancillary construction facilities away from the right-of-way such as construction camps, pipe stockpile sites and work storage sites. Site-specific environmental mitigation information has also not yet been filed, including detailed environmental alignment sheets and updated environmental protection plans. In addition, a great deal more technical material will be generated during the NEB hearing process including multiple rounds of Information Requests by the NEB and registered interveners and corresponding responses by TransCanada. Finally, TransCanada commits to file details of Highly Sensitive Receptors, final valve locations and emergency response plans prior to commencing pipeline operations. DNV GL assumes that TransCanada will make timely filings of all the supplementary information it has committed to.

In its Application, TransCanada concludes that, with a minor exception concerning woodland caribou discussed below, the Project is not likely to cause significant adverse environmental effects in Ontario after appropriate mitigation measures are implemented. Given the limitations described above, DNV GL believes that it is premature to comment on this conclusion except to say that it is consistent with other interprovincial oil pipelines recently certificated in Canada.

Where the information is available, DNV GL makes comments about whether Energy East meets the “highest available technical standards for environmental protection”. Suggested further measures are provided in Section 4, where appropriate.

DNV GL observes that it is premature to assess whether Energy East has “world leading contingency planning” because the emergency response plans are not currently available. Environmental contingency plans for the construction phase of the Project as described in ESA Volume 8 appear to be on the path towards world leading status once Project-specific information is added as committed to. This material is expected to be included in Supplemental Report No. 2.

DNV GL finds that the scope of the pipeline conversion in Ontario is narrowly limited to the footprint of 28 new pump stations each approximately 9 hectares in size, 140 km of permanent access roads, 17 minor pipeline realignments, two new trenchless river crossings (Madawaska and Rideau) and pipeline operations and maintenance activities under normal conditions. There is no evidence filed about the hundreds of waterbodies crossed or in proximity to the converted pipeline, despite the possibility that potential integrity digs or oil spills could occur at any location along the pipeline route (see Section 4). In addition, over 125 km of new power lines are required to serve the new pump stations and an undetermined length of new



power lines are required to serve remotely-controlled mainline block valves but TransCanada defers permitting responsibility of power lines to others (see Section 4).

DNV GL notes that the Application presents no evidence indicating that the route of the original gas pipeline was located with consideration of its appropriateness for transmission of oil. For example, there is no evidence that avoidance of close parallels to sensitive waterbodies such as Lake Nipigon, Trout Lake or the Mattawa/Ottawa river system was considered. Ten route selection criteria for new pipeline construction are listed on page 4-4 of ESA Volume 1 but do not distinguish between the routing of an oil pipeline versus a gas pipeline. DNV GL notes that the Report of the Joint Review Panel for the Enbridge Northern Gateway Project (NGP) states: “The Panel is of the view that pipeline routing is key to avoiding pipeline spills or lessening potential effects in the event of a spill” (Enbridge NGP Joint Review Panel 2013; p. 144). Finally, DNV GL notes that TransCanada is seeking an exemption from the NEB’s detailed route process for activities and works required to convert the TransCanada Mainline to oil service, construction of pump stations on the converted segments in Ontario, and temporary facilities needed for pipeline and facility construction (see Section 4).

3.2 Water

3.2.1 Groundwater Resources


The Enbridge Northern Gateway Panel stated that groundwater can take years to decades to recover if oil reaches it (Enbridge NGP Joint Review Panel 2013; p. 63). DNV GL finds that TransCanada’s Application appropriately recognizes groundwater resources as a valued component (VC) because of their use for domestic, agricultural or industrial purposes. TransCanada conducts a comprehensive review of provincial records of licensed groundwater users and the Application includes maps of over 25,000 registered water wells within 5 km of the converted and new sections of the pipeline. Mitigation measures are proposed, including monitoring of nearby water wells during construction or blasting, and a commitment is made to provide alternative sources of drinking water in the event of a spill.

TransCanada’s ESA Volume 6 identifies 11 representative “Sites of Interest” across Canada and models the probability and the effects of an oil spill at those 11 locations which are used as “surrogates” for the rest of the pipeline route. One of the Sites of Interest is “Aquifers in the Mississippi-Rideau Source Protection Area” (see Figure 4-9 in ESA Volume 6) where 55.6 km of converted pipeline route crosses or is within 1.6 km of private well clusters. Following an analysis, TransCanada states that the probability of a spill from the pipeline near these well clusters is very low and the majority of petroleum hydrocarbon plumes are 100 m or less.

Despite the comprehensive treatment of groundwater resources in TransCanada’s Application, DNV GL comments that elevated public concern about impacts in the Oxford-Marsh, Nepean and other aquifers will persist and will undoubtedly be the subject of further discussion and information filed through the NEB hearing process.

3.2.2 Surface Water Resources

The Enbridge Northern Gateway Panel stated that spills into surface waters can affect drinking water and other water uses for weeks to months (Enbridge NGP Joint Review Panel 2013; p. 63). In its Application, TransCanada makes a general statement recognizing surface water resources as a VC because the Project could affect downstream water users. There is a commitment in the Application that TransCanada will




provide alternative sources of drinking water in the event of a spill. DNV GL notes that the practicality of this commitment was frequently questioned by the Ontario public who asked, for example, what TransCanada would realistically do in the event of a spill into a tributary of the Ottawa River upstream of the City of Ottawa's water intake.

DNV GL finds that TransCanada's Application presents little evidence of downstream surface water use, partly because the area studied only extends 300 to 1000 m from the proposed pipeline route and partly because provincial records of licensed water users are not accessed. Only one Ontario municipal water intake is mapped - the City of North Bay intake at Trout Lake. Trout Lake is one of the 11 "Sites of Interest" mentioned earlier and the North Bay intake is mapped on Figures 4-3 and 4-4 in ESA Volume 6 as part of the spill modeling where the pathway or trajectory of potential worst case (full bore rupture) unmitigated spills is mapped against time. TransCanada concludes that "no effects to the water quality at the North Bay intake are expected". DNV GL notes that this conclusion was challenged by many attendees of the consultation meetings in North Bay and that the Energy East Pipeline has recently been recognized as a threat to North Bay's water source by the Province of Ontario (Ontario Ministry of the Environment and Climate Change 2015; North Bay Nugget 2015). DNV GL finds that intermittent mapping of oil spill trajectories and use of a small sample of locations as surrogates is not consistent with the highest available standard of environmental protection, which is to conduct this modeling on every kilometer of the oil pipeline route as was done on the TransMountain Expansion Project and Enbridge Northern Gateway Project in Alberta and British Columbia (see Section 4).

From the two rounds of consultation and meetings, DNV GL understands that many other communities, towns and cities have surface water intakes downstream of the proposed route, including the City of Ottawa (Ottawa River), City of Cornwall (St. Lawrence River) and the First Nations community of Akwasasne (two intakes in the St. Lawrence River). DNV GL notes that these intakes are not mapped in the Application. Licensed private water intakes, such as those at Trout Lake, are also not mapped. Likewise, surface springs are not mapped. DNV GL concludes that incomplete water intake mapping does not represent the highest available technical standard of environmental protection (see Section 4). In Volume 4, Appendix 4-5 of the Application, a methodology for identifying "Highly Sensitive Receptor" (HSR) data applicable to Energy East valve siting is outlined but no maps or tables of specific HSRs are included. The HSR data is proposed to be mapped for a considerable distance downstream from the proposed pipeline route to correspond to the zone of influence from a worst case spill. Appendix 4-5 defines HSRs as "those areas where a pipeline spill could result in significant impacts to local economies, public health or special status species" and goes on to state that "HSRs include populated areas, commercially navigable waterways, municipal water intakes, ecologically sensitive areas and operator-defined HSRs". DNV GL believes that the proposed HSR methodology is the highest available standard of environmental protection (see Section 4).

3.2.3 Routing

DNV GL notes that TransCanada does not propose any alternative pipeline routes to mitigate impacts to surface water resources in the event of a spill. Apart from committing that the converted gas pipeline will be fit for oil service and that emergency response plans will be in place prior to Project commissioning, DNV GL finds that TransCanada presents no evidence suggesting that the route of the converted gas pipeline in Ontario is appropriate for an oil pipeline (see Section 4). The appropriateness of the general route is Issue No. 9 on the NEB List of Issues cited earlier.



Referring to Figure B-1 in Supplemental Report No. 1 – Appendix Volume 3 – Terrestrial ESA Update as a base map, DNV GL observes that a Canadian Pacific Railway right-of-way is shown intersecting the “Conversion Pipeline” approximately 5 km south of “Winchester Swamp” and intersecting the “New Pipeline” immediately south of the label “Delisle River”. DNV GL submits that paralleling the existing railway right-of-way is a potential alternative route worthy of study. Based on a preliminary analysis of the ten routing criteria discussed in Section 3.1, this alternative route appears to be superior to the proposed route with respect to:

- Minimizing length (the railway route is shorter);
- Minimizing watercourse and major river crossings; and
- Avoidance of sensitive environmental features (the railway route appears to cross one provincially significant wetland area compared to 6; 18% of the proposed route crosses wetlands and the proposed route encounters 30 western chorus frog breeding wetlands – there is no comparable data for the railway route).

Although proximity to sensitive watercourses was not an identified routing criterion, the proposed route is within 5 km of the St. Lawrence River for 40 km whereas the railway route is located between 13 and 27 km away from the St. Lawrence River for its entire length (see Section 4).


3.2.4 Canadian Heritage Rivers

In its Application, TransCanada recognizes that the converted pipeline segment crosses the Rideau River, a Canadian Heritage River. Also on the converted pipeline segment, DNV GL notes that the Missinaibi River and Mattawa River are designated as Canadian Heritage Rivers, but are not recognized as such in the Application (see Section 4).

3.3 Impacts on Rideau River and Canal

TransCanada’s existing gas pipeline route crosses the Rideau River and Canal system near Kemptville, ON approximately 37 km upstream of its confluence with the Ottawa River in the City of Ottawa. In its Application, TransCanada recognizes the Rideau River as a Canadian Heritage River and the Rideau Canal as a National Historic Park and UNESCO World Heritage Site. TransCanada also identifies the Rideau River and Canal as one of the 11 “Sites of Interest” (ESA Volume 6, Figure 4-5) and performs a similar spill modeling analysis as described earlier. TransCanada concludes that effects on recreational activities and aquatic resources in the Rideau system are not anticipated and suggests that any oil spills would be contained within Long Reach through use of the existing lock-and-dam system. DNV GL notes that this conclusion was challenged at Round Two consultation meetings in Kanata and Ottawa.

In recognition of the Rideau’s high profile, TransCanada proposes a trenchless crossing method using horizontal directional drilling (HDD) technology where the waterway and adjacent banks will be undisturbed as the pipeline is installed underneath. DNV GL notes that HDD is considered to be the highest level of environmental protection for water crossings because there is no in-stream disturbance. Potential issues can occur during HDD including loss of drilling mud (also known as ‘fracking out’). TransCanada recognizes this contingency and has included a generic Project “Directional Drilling Procedures and Instream Drilling Mud Release Contingency Plan” and proposes to make it more site-specific in Supplemental Report No. 2. The Contingency Plan discusses: emergency response equipment and procedures; water quality monitoring; plans for potential continuance of drilling; and use of a detailed alternate crossing method if the HDD



installation is unsuccessful. TransCanada reports that preliminary geotechnical drilling suggests that the HDD method at the Rideau River is feasible but identifies the contingency crossing method as open-cut in the event the HDD method is unsuccessful (see Section 4).

3.4 Impacts on Fish and Wildlife

TransCanada's Application does not identify or describe fish and wildlife resources associated with hundreds of watercourses crossed by the route of the converted pipeline segment, which is not consistent with the highest level of environmental protection (see Section 4).


On the 106 km new pipeline segment in eastern Ontario, TransCanada identifies over 100 water crossings including Hosaic Creek, Hoople Creek, Raisin River, Beaudette River, Rivière Delisle and Rigaud River. TransCanada proposes six watercourses to be crossed using trenchless technology, 59 to be crossed using the isolation method (if flowing at time of construction), 20 to be open-cut (if dry or frozen at time of construction) and the remainder to have no visible channel and of no further interest. At a high level, DNV GL finds that this proposal appears to be consistent with the highest level of environmental protection. This also appears to be the case with the proposed use of HDD at the Madawaska and Rideau Rivers.

In its Application, TransCanada reports on fish and wildlife field studies and concludes that no significant effects are anticipated except for the potential for cumulative effects on woodland caribou at two pump stations (Smooth Rock Falls and Potter) in the Kesagami Range. Woodland Caribou are listed under the *Species at Risk Act (SARA)*. During the two rounds of consultation and meetings, DNV GL notes that there were suggestions made that woodland caribou no longer occupy this portion of their historic range and are now only encountered further north of the pipeline route. Nevertheless, TransCanada proposes offset measures consistent with the Woodland Caribou Recovery Program to compensate for habitat loss, which constitutes the highest level of environmental protection.

Supplemental Report No. 1 includes Technical Data Reports on the entire Ontario portion and western chorus frog surveys along the new pipeline segment in eastern Ontario. Western chorus frogs are a *SARA* listed species. A total of 30 western chorus frog breeding wetlands were identified along the proposed pipeline route. DNV GL notes that TransCanada commits to implement mitigation consistent with the July 3, 2014 proposed recovery strategy for this species in Ontario, which represents the highest level of environmental protection. However, DNV GL also notes that no information about rerouting to avoid western chorus frog breeding wetlands is provided (see Section 4).

3.5 Impacts on Parks and Natural Areas

The converted pipeline segment crosses eight Provincial Parks (Aaron, Amable Du Fond, Winnange Lake, Black Sturgeon River, Missinaibi River, Nagagamisis River, Mattawa River, Grant's Creek), four Conservation Reserves (Nipigon Palisades, Nipigon River, Hawkins Property, McLaren Forest) and four Conservation Areas. No special mitigation is proposed in the Application (see Section 4). TransCanada's Supplemental Report No. 1 states that three provincial parks are encountered in the Project Development Area (PDA) of new pump stations or access roads including Black Sturgeon River, Grant's Creek and Winnange Lake. In addition, the Nipigon Palisades Conservation Reserve slightly overlaps the PDA of the Nipigon pump station and the Baxter Creek Conservation Area (part of the Rideau Valley Conservation Authority) falls within the PDA of the Rideau River crossing (see Section 4).



Supplemental Report No. 1 also states that 18% of the land cover crossed by the 106 km long new pipeline segment in eastern Ontario is categorized as “wetland”, including six Wetlands of Provincial Significance. DNV GL finds no indication that wetlands were avoided in selecting the proposed route, which is inconsistent with the NEB Filing Manual and the highest level of environmental protection (see Section 4).

Although TransCanada commits to file site-specific environmental protection information, DNV GL observes that there are no detailed protection plans proposed for parks, conservation reserves, conservation areas, wetlands or other environmentally sensitive areas (see Section 4).

3.6 Impacts on Agricultural Resources

TransCanada’s Supplemental Report No. 1 provides considerable detailed mapping of soil types, topsoil depths and agricultural land use. As stated previously, Emergency Response Plans describing protection measures in the event of an overland spill are not yet prepared. However, TransCanada commits to provide this information prior to pipeline commissioning (see Section 4).

3.7 Traditional Land and Resource Use

In its Application, TransCanada reports on the progress of agreements with 56 Ontario First Nations or Métis communities regarding preparation of TLRU studies. To date, none of the studies have been completed. TransCanada states that, as TLRU studies are completed, study information will be reviewed against the ESA in order to verify assessment conclusions regarding Project effects on TLRU. Summaries of the studies and related discussions will be incorporated into supplemental reports and provided to the NEB in 2015 (see Section 4).

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Water

DNV GL observes that previous gas-to-oil conversion projects in Canada (e.g. conversion of TransCanada's Line 1 from Empress, AB to Regina, SK as part of the Keystone Project in the last decade) have not been located in a project area which encounters hundreds of pristine water crossings in a wilderness or a high profile urban setting. Furthermore, DNV GL observes that TransCanada has requested an exemption from the detailed route process but provides no evidence supporting the acceptability of the general route of the converted pipeline for transporting oil. Rather, TransCanada relies on general commitments to make the pipeline fit to carry oil and to prepare emergency response plans post-certification. DNV GL concludes that, at that point in the process, there is a risk that the route of the Energy East pipeline will be fixed and there will be no opportunity to avoid spills or lessen potential effects in the event of a spill through rerouting as the Gateway Panel noted earlier. That same Panel also found it prudent to adopt the "precautionary approach".

With this in mind, DNV GL recommends the following:

1. *Conduct full bore rupture modeling (also known as spill trajectory or spill pathway mapping) on every kilometer of pipeline route in Ontario to identify the zone of influence from potential worst case spills. This spill path mapping would be similar to ESA Volume 6 Figures 4-3 and 4-4 referred to earlier regarding Trout Lake.*
2. *Advance the implementation of the Highly Sensitive Receptor methodology outlined in Volume 4, Appendix 4-5, including mapping of all municipal, domestic and industrial licensed surface water intakes, ground water intakes, springs and ecologically sensitive areas within the zone of influence identified by the modeling as above. Overlay the HSR information onto the spill path mapping.*
3. *In the process of identifying HSRs, consult with First Nations, Métis, government agencies and the general public regarding identification of sensitive water uses including sensitive fish and wildlife populations and habitat.*
4. *To address the differences between oil versus gas pipeline routing, where the existing pipeline route may be too close to Highly Sensitive Receptors, reroute the pipeline or justify why rerouting is not necessary, including description of specific mitigation to be applied to protect HSRs. Special attention should be paid to HSRs in the vicinity of Nipigon Lake, Trout Lake, the Ottawa River, the Rideau River, the Oxford-Marsh Aquifer, the Nepean Aquifer and other areas where there is elevated public concern.*
5. *On the new pipeline segment, study the alternative railway route identified earlier and evaluate it against the proposed route using the ten criteria listed previously plus proximity to St. Lawrence River. Reroute the pipeline to follow the railway route or justify why rerouting is not necessary, including description of specific mitigation to be applied to protect HSRs.*
6. *Use information described above to inform designation of "significant water crossings", valve locations, contingency plans and emergency response plans.*

- 7. Prior to commencing operations, prepare Watercourse Crossing Management Plans for every watercourse crossed by the pipeline route in Ontario, including a complete identification and description of associated fish and wildlife resources.*

4.2 Rideau River and Canal

While TransCanada commits to file more detailed environmental protection information, DNV GL comments that the high profile of the Rideau River and Canal warrants the following recommendation:

- 8. Prepare a draft and final detailed Rideau River/Canal Trenchless Crossing Environmental Protection Plan complete with open-cut crossing protection measures if the trenchless crossing methodology proves infeasible. Share the draft plan with the public, government agencies and First Nations and Métis communities and prepare a final plan incorporating appropriate comments.*

4.3 Fish and Wildlife

The following recommendation is warranted:

- 9. Provide information on how western chorus frog habitat was avoided by rerouting or justify why rerouting is not necessary, including description of specific mitigation to be applied to protect western chorus frogs and their habitat.*

4.4 Parks and Natural Areas

The following recommendations are warranted:

- 10. Given that integrity digs or oil spills could occur at any point along the pipeline, prepare draft and final detailed Park Protection Plans for the eight Provincial Parks, four Conservation Reserves, four Conservation Areas and two unaddressed Heritage Rivers (Missinaibi and Mattawa) crossed in Ontario. Share the draft plan with the public, government agencies and First Nations and Métis communities and prepare a final plan incorporating appropriate comments.*
- 11. Provide information on how wetlands and other environmentally sensitive areas were avoided by rerouting or justify why rerouting is not necessary, including description of specific mitigation to preserve wetland function, compensate for wetland loss and protect environmentally sensitive areas.*

4.5 Agricultural Resources

The following recommendation is warranted:

- 12. Utilize the results of the spill path and HSR mapping identified earlier to inform contingency and emergency response plans to minimize the effects of land based oil spills on agriculture.*

4.6 Traditional Land and Resource Use

The following recommendation is warranted:

- 13. Demonstrate how completed TLRU studies have been integrated into the Environmental and Socio-Economic Assessment and changed Project planning.*



4.7 Power Lines

DNV GL notes that power lines to proposed pump stations and mainline block valves are part of the Project and believes that their impacts cannot be deferred to third parties. The following recommendation is warranted:

- 14. Demonstrate how environmental effects of Project-associated power lines will be minimized through route selection and environmental protection planning.*

5 REFERENCES

- Counsel Public Affairs 2014. Summary Report - Part One of the First Nation and Métis Community Discussions, July 2014. Re: TransCanada's Proposed Energy East Pipeline. 22 pp.
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