

ENVIRONMENTAL ASSESSMENT TRACK REPORT

ENCANA CORPORATION'S PROPOSED DEEP PANUKE OFFSHORE GAS DEVELOPMENT PROJECT

SUBMITTED TO THE
MINISTER OF THE ENVIRONMENT

BY

THE CANADA - NOVA SCOTIA OFFSHORE PETROLEUM BOARD
THE NATIONAL ENERGY BOARD
FISHERIES AND OCEANS CANADA
TRANSPORT CANADA
ENVIRONMENT CANADA
INDUSTRY CANADA

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1. INTRODUCTION

The discovery well of a potentially significant natural gas reservoir in the Deep Panuke location was drilled in 1998-1999. Further delineation drilling results led to EnCana Corporation (EnCana) filing a Development Plan Application (DPA) with the Canada-Nova Scotia Offshore Petroleum Board (Board) and the National Energy Board (NEB) in March 2002. The Board regulates oil and gas activity in the Nova Scotia offshore, pursuant to its mandate under the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (Accord Act), while the NEB regulates pipelines under the *National Energy Board Act*.

The 2002 proposal underwent a comprehensive study level environmental assessment (EA) pursuant to the requirements of the *Canadian Environmental Assessment Act* (CEA Act). The five Responsible Authorities (RAs) were the Board, the NEB, Fisheries and Oceans Canada (DFO), Environment Canada (EC) and Industry Canada (IC). At the conclusion of the 2002 comprehensive study then Minister of the Environment David Anderson decided that the project was not likely to cause significant adverse environmental effects and referred the project back to the RAs for action to be taken under section 37 of the CEA Act. In early 2003, shortly after the Minister's decision, but before the coordinated CNSOPB and NEB regulatory process commenced, EnCana, the project proponent, decided not to proceed with the project.

In June 2006, EnCana decided to reactivate the Deep Panuke project, in a modified configuration, and subsequently submitted a project description to the Board on August 28, 2006. Upon receipt of the project description, the Board declared itself an RA because the project cannot proceed without authorization under sub-sections 142(1)(b) and 143(4)(a) of the Accord Act, the issuance of which is described in the *Law List Regulations* of the CEA Act. Therefore, an EA is required under sub-section 5(1)(d) of the CEA Act. The proposed project is also described in Item 11.1 of the *Comprehensive Study List Regulations* of the CEA Act. Consequently, in accordance with section 12.4 of the Act, the Canadian Environmental Assessment Agency (the Agency) is the Federal Environmental Assessment Coordinator (FEAC) for the EA.

Following the requirements of the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*, the project description was distributed to relevant federal authorities to determine their role in the assessment, if any. The NEB, EC, DFO, IC, and Transport Canada (TC), each determined they were likely to require an EA. Natural Resources Canada (NRCan) indicated a role as a department with relevant expertise in areas such as energy policy and earth sciences. Health Canada and National Defence each determined it had no role in the EA.

Specifically, in order to proceed, the project will or may require the various approvals listed below:

- Board authorizations under subsections 142(1)(b) and 143(4)(a) of the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*;
- NEB section 52 certificate of public convenience and necessity, or section 58 order, pursuant to the *National Energy Board Act*;
- DFO authorization under subsection 35(2) of the *Fisheries Act* for the harmful alteration, disruption or destruction (HADD) of fish habitat. Depending on the construction methods used, the project may also require a section 32 *Fisheries Act* authorization for the destruction of fish by means other than fishing (e.g. use of explosives);
- EC permit under subsection 127(1) of the *Canadian Environmental Protection Act* for disposal of a substance at sea;
- TC approval under subsection 5(1) of the *Navigable Waters Protection Act* for a work to be built or placed in, on, over, under, through or across any navigable water; and
- IC approval under paragraph 5(1)(f) of the *Radiocommunication Act* for sites on which radio apparatus may be located as well as the erection of such things as towers and masts, and for which Exclusion List paragraph 13 (Schedule I, Part I General) does not apply.

The Agency, in its capacity as FEAC, established a federal environmental assessment committee for the Deep Panuke EA. Committee members include a representative from the Agency (chair), the Board, EC, DFO, TC, IC, NEB and NRCan. The proposed elements of the review process have been established by the committee members, and are presented in Appendix 1.

This document has been prepared in accordance with s.21(2) of the CEA Act, which requires that the RAs, after consulting with the public, and as soon as they are of the opinion that they have sufficient information to do so, report to the Minister regarding:

- the scope of the project, the factors to be considered in its assessment and the scope of those factors;
- public concerns in relation to the project;
- the potential of the project to cause adverse environmental effects; and

- the ability of the comprehensive study to address issues relating to the project.

The Minister of the Environment will take this report into account when determining whether to continue with the EA by means of a comprehensive study, or to refer the project to a mediator or review panel.

2. PROJECT OVERVIEW

The proposed Deep Panuke Offshore Gas Development Project consists of a jack-up mobile offshore production unit (MOPU) in a water depth of approximately 44 meters (m), located on the Sable Bank. The Project will initially include drilling one production well and one acid gas injection well, and re-completing four previously drilled wells. Also, following production start-up and based on reservoir performance, up to three additional subsea production wells could be drilled. All subsea wells will be tied back individually to the MOPU with subsea flowlines and control umbilicals. The project location and facilities are illustrated in Figure 1.

Two project options are proposed for the transportation system to deliver Deep Panuke sales product, either:

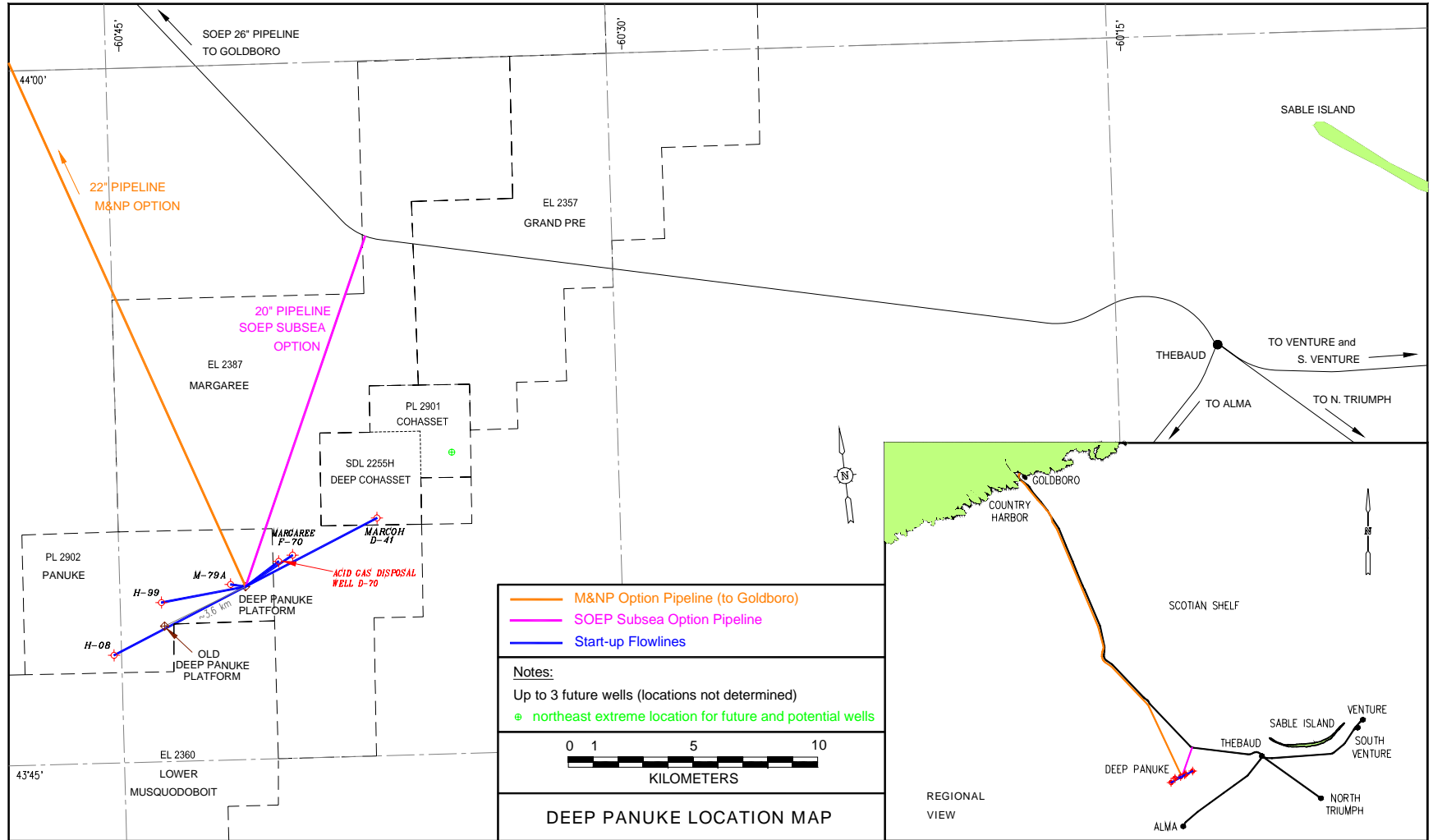
- through a new 176 km subsea pipeline to an onshore interconnection near Goldboro, Nova Scotia, with the existing Maritimes & Northeast Pipeline (M&NP Option), or
- through a new 15 km subsea pipeline to an interconnection with the existing Goldboro Sable Offshore Energy Project (SOEP) subsea pipeline (SOEP Subsea Option).

The production facility will have a design capacity of 300 MMscfd sales gas with turndown capability to 40 MMscfd. The gas processing system on the facility will include inlet compression, separation, sweetening, dehydration, export compression, and measurement. Deep Panuke is a sour gas reservoir with raw gas containing approximately 0.2 percent hydrogen sulphide (H₂S); therefore, gas sweetening equipment is required. Acid gas processing will be performed offshore to remove H₂S and carbon dioxide (CO₂), also known as acid gas. Following its removal from the raw gas stream, the acid gas will be disposed by injection into a suitable underground reservoir.

For the M&NP Option, the condensate stream will be treated and used for fuel. Currently, it is estimated that there will be no surplus condensate produced beyond fuel usage; however, in the event that condensate must be injected, it will be disposed with the acid gas stream in the injection well. For the SOEP Subsea

Option, treated condensate will be re-combined with the gas in the export pipeline.

Figure 1: Deep Panuke Field Layout¹



1. Reproduced with the permission of EnCana Corporation.

The major differences between the new options and the 2002 proposal are: one installation (MOPU) versus three fixed platforms, a new field center location; sub-sea wellheads and sub-sea tie-backs versus platform wells; a reduction of gas export capacity and an increased produced water discharge rate. Additionally, the SOEP Sub-sea Option differs from the original proposal by using an export pipeline tied into the SOEP 26 inch pipeline at a sub-sea location downstream of the Thebaud Platform.

Additional details on the comparison of the original proposal and the two proposed project options are presented in the scoping document in Appendix 2.

3. SCOPE

The scoping document for the EA of EnCana's proposed gas development project has been prepared by the responsible authorities, in consultation with the Agency, and NRCan. The scoping document provides a description of the scope of the project, the factors to be considered and the scope of the factors related to the EA for EnCana's proposed gas development project.

In accordance with Section 24 of the CEA Act, the RAs are obliged to use the previous assessment to the extent appropriate, with adjustments as necessary to take into account any significant changes in the environment, in the circumstances of the project, and any significant new information relating to the environmental effects of the project. Therefore, after reviewing the project description, the RAs propose that the scope of the project to be assessed comprise the following undertakings differing from those originally proposed by the proponent, or those affected by information that has become available since the previous comprehensive study:

- Construction, operation, decommissioning and abandonment of:
 - A mobile offshore production unit, including the gas processing system and associated produced water discharge;
 - The new route portion of a sub-sea gas pipeline from the platform to both the intersection of the previous pipeline route to shore and to the tie-in point with the SOEP pipeline;
 - The onshore and offshore pipeline route in the vicinity of the proposed landfall, due to new information on environmental conditions (including new contamination data, new wildlife data and the recent Keltic Petrochemicals Inc. proposal) or as a result of consultation; and

- All well-sites, including injection wells and sub-sea wells, and associated flow lines.
- Dredging, trenching, blasting and other activities related to installation and construction of pipeline portions along new routes, including activities for the management of the dredged sediments. Any new information or methods being considered for the pipeline route assessed in 2002 should also be included.

The rationale used to determine the scope of the project is related to the nature of the federal decisions (e.g. triggers) involved, as well as the requirements of section 24 of the CEA Act.

Following public consultation, the scoping document was revised and is presented as Appendix 2.

4. PUBLIC CONSULTATION AND CONCERN

The comprehensive study process requires that the public be given an opportunity to participate in the review of the EA. Consultation with the public is required during three distinct stages of the comprehensive study process: during the preparation of the scope of the EA, during the preparation of the comprehensive study and during the comment period administered by the Agency on the completed comprehensive study report. This section describes the public consultation during the preparation of the proposed scope of the project to be assessed, the factors proposed to be considered in the assessment, the proposed scope of those factors and the ability of the comprehensive study to address issues relating to the project.

A public registry has been established for the project (the project is listed on the Canadian Environmental Assessment Registry {reference number 06-03-21748}). Also, documents related to the EA of the project have been listed, and some published electronically, in the Board’s own Public Registry which is located on its website, <http://www.cnsopb.ns.ca/environment/registry.html>, under the “Deep Panuke Project” section.

The Board advertised in provincial and community newspapers on September 22nd, and in the case of weekly papers, during the week of September 25th, to provide notice of the Public Consultation period for the draft scoping document. The notice appeared in The Halifax Daily News, The Chronicle-Herald, The Cape Breton Post, The Inverness Oran, Le Courier de la Nouvelle Ecosse, The Port Hawkesbury Reporter, New Glasgow Evening News, Guysborough Journal, Antigonish Casket, and The Shelburne Coast Guard. In addition, the Board issued a press release, and a notice was posted to the Board’s website under “What’s New” and electronic notification sent to the Board’s media, fisheries and

industry contact lists. A copy of the notice is provided in Appendix 3. The draft scoping document was provided electronically on the Board’s website along with the proponent’s Project Description. The public was invited to contact the Board’s offices for a printed copy if they did not have access to an electronic one. The public was provided with a 21-day review period to provide written comment on the draft scoping document and their views on the ability of the comprehensive study to address issues relating to the project.

All public comments received by the Board on the scoping document were distributed to all RAs, NRCan and the Agency.

There were seven written comments received on the scope of the EA of the project. Comments were received from the Native Council of Nova Scotia, Myles and Associates, Municipality of the District of Guysborough, Guysborough County Regional Development Authority, the Canadian Parks and Wilderness Society (CPAWS), and Greyhawk Ridge Minerals Inc. and Mr. Kevin McAllister, both mineral rights holders. In addition to requesting public comments, the Board requested comments from its Fisheries Advisory Committee (FAC). The committee is comprised of representatives of the fisheries sector from across Nova Scotia (including aboriginal groups), as well as federal and provincial government fishery department representatives. No comments were received from the committee. The Board will respond, on behalf of all the RAs, in writing to acknowledge the receipt of all comments. The RAs have considered all comments and the following table summarizes the comments and the RAs’ response.

**PUBLIC COMMENTS
SUMMARY OF PUBLIC COMMENTS ON SCOPING DOCUMENT AND THE RA’S RESPONSE TO
THOSE COMMENTS**

PUBLIC COMMENT SUMMARY	RAS’ RESPONSE
If a pipeline is constructed to shore and it traverses the lands of mineral rights holders, the Canada-Nova Scotia Offshore Petroleum Board is asked to commit EnCana to compensating mineral rights holders for damages, and to set out the methodology it will follow in quantifying damages, in its project filings. Otherwise, it is asked that any licences, permits or approvals granted to EnCana be conditioned such that EnCana will be required to fairly compensate mineral rights holders for damages resulting from the construction and operation of their pipeline.	The Board and the NEB will conduct a Public Process to hear and consider views of interested persons on the anticipated Applications from EnCana Corporation related to the proposed project, including environmental and non-environmental issues such as mineral exploration rights. Details of the levels and extent of involvement interested parties may have in the Public Process will be made available to the public upon receipt of the anticipated Applications.
Interveners should have the right to subpoena witnesses at the Hearings. The question was	NEB and Board staff drafting the Directions on Procedure have been informed of the

<p>forwarded to the NEB in Feb of 2003, and a response has not yet been received. It is requested that this right be established.</p> <p>Only through a full environmental assessment can the public and interested parties properly comment on the important aspects of project design, development and implementation.</p> <p>There is potential harm to human health and the marine environment should proposed pipeline activities or platform construction disturb discarded conventional munitions (UXOs), munitions containing the chemical warfare agent thickened mustard gas and discarded radioactive materials.</p> <p>The Department of National Defense’s Formation Environment group should be recognized by the CNSOPB/NEB as the sole authority responsible for management of munitions as related to the Deep Panuke project.</p> <p>Several information requests (10) were also included in the letter of comment.</p>	<p>request for interveners to subpoena witnesses. The Board has requested that the federal and provincial governments confer on the Commissioner the powers conferred on persons appointed as Commissioners under the Public Inquiries Act (Nova Scotia) and the Inquiries Act (Canada).</p> <p>It is the opinion of the RA’s that a comprehensive study for the Deep Panuke project will ensure a complete and thorough assessment.</p> <p>Department of National Defence (DND) was contacted during the Federal Coordination Process. At that time they determined that there was not sufficient reason to be involved in the EA as either an RA or an expert federal department. The Board was also informed by DND at that time that there are no known UXO issues in the proposed project area.</p> <p>DND is the recognized authority for offshore munitions issues.</p> <p>These will be addressed by the Board in a written response to the commenter.</p>
<p>There is a procedural obligation binding the CNSOPB, as a federal and provincial government regulatory decision-making body and RA under the CEA Act, to ensure that the “duty to consult” with Aboriginal Peoples is honored. Aside from the legislative approvals, “procedural evidence of a consultation process” between the Proponent and the Native Council of Nova Scotia (NCNS) is required to be identified in the EA.</p>	<p>As described in the CEA Act and the Scope, the EA must consider the environmental effects of the project, including any effect of any change on the current use of lands and resources for traditional purposes by Aboriginal persons.</p> <p>The duty to consult with the aboriginal people is the responsibility of the governments and not the CNSOPB. The CNSOPB has consulted with the governments and is satisfied that there is a process in place for aboriginal consultation respecting this project.</p>

<p>The EA report and review process should have a separate section discussing ESSIM and should provide a clear and concise analysis of the subject.</p> <p>Request that a current socio-economic conditions assessment be included in the EA with special note of the socio-economic condition of the NCNS traditional ancestral homeland community and other disadvantaged groups of peoples in Nova Scotia.</p> <p>The EA should address the subject of a benefits plan and a benefits plan should be part of the public record on the registry.</p> <p>The EA should address how the Proponent proposes to engage with the NCNS community to learn about their uses of lands and waters on, in and offshore.</p> <p>The development of a follow-up monitoring environmental protection program must include direct input from impacted interests</p>	<p>The CNSOPB will require evidence during the regulatory process that the proponent has consulted with the aboriginal people.</p> <p>It is noted that steps taken in support of the EA effort to date include a meeting that EnCana has held with the NCNS to discuss their fisheries. In addition, comments were requested from the CNSOPB Fisheries Advisory Committee (FAC). The NCNS is a member of this committee.</p> <p>The Scope has been modified to include a requirement for the EA to examine the project in the context of the draft Eastern Scotian Shelf Integrated Ocean Management Plan (final draft July 20, 2006).</p> <p>Under CEA Act, the socio-economic impacts from any change that the project may cause in the environment must be assessed in the EA and are included in the scope for the variations from the 2002 assessment.</p> <p>The Board requires a Socio-Economic Impact Statement and Benefits Plan as part of its Development Application. These comments have been forwarded to EnCana for their consideration.</p> <p>The benefits plan will be publicly available; however, it will not be included on the Board environmental public registry, as it is reserved for matters related to environmental considerations under the CEA Act.</p> <p>As addressed in the attached Scope, the EA will consider the environmental effects of the project, including any effect of any change on the current use of lands and resources for traditional purposes by aboriginal persons.</p> <p>The proponent will be required to assess the need for, and components of, a follow-up program within the EA. There will also be a</p>
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<p>and the NCNS community of Mi’Kmaq/Aboriginal Peoples. In addition, public interests and/or Aboriginal communities’ interests identified and expressed should be allowed the opportunity to comment on the Environmental Protection Plan prior to its final approval or acceptance by the decision-makers.</p>	<p>public comment period on the proponent’s EA report. . If the Minister’s decision is to proceed with a comprehensive study, comments received will also be considered by the RA’s during its preparation.</p>
<p>The EA should analyze and address separately the probability or potential for equipment failure on the mobile offshore production unit in the oceans environment and what contingency plans should be developed.</p>	<p>The EA will address the environmental effects of malfunctions or accidents that may occur in connection with the project, as documented in the attached Scope. In addition, spill contingency plans are required by the Board for all offshore development projects.</p>
<p>The EA must address the proposed exclusion zones. In addition, the EA must address how the Proponent intends to deal with the loss of access to fisheries and compensation to the fishers for loss of income. Also, plans to address damage to equipment and trespasses on traditional fishing grounds must be identified for all fisheries.</p>	<p>Currently included in the Scope. The potential environmental impacts on all fisheries in the project area will be required in the EA.</p>
<p>The issue of gas capacity landed onshore must be addressed in the EA. The subject matter should also be cross-referenced to the EA discussion section on the project purpose and need for the project and project viability.</p>	<p>As documented in the attached Scope, and in accordance with paragraph 16(1)(e) of the CEA Act, the assessment will also include a consideration of the need for the project and alternatives to the project.</p>
<p>The proponent must consider and discuss the effects of the Project on species proposed to be listed under the Species at Risk Act (SARA) at this time and throughout the life of the project.</p>	<p>The attached Scope required that the EA must evaluate project effects on SARA-listed species as required under section 79 of SARA. In addition to SARA-listed species, consideration of project effects on all species of conservation concern is required. Protection of any newly listed species over the life of the project is a requirement of SARA.</p>
<p>The Municipality of the District of Guysborough requests that EnCana participate in their Industry Liaison Committee and use this committee as a method of ongoing communication and between industry and the community (especially during the design and</p>	<p>EnCana has been forwarded all public comments and will, therefore, be notified of the request to partake in the Industry Liaison Committee.</p>

<p>construction phase of development).</p> <p>The Municipality requests that detailed near shore pipeline routing be provided to the Municipality and to the public as soon as possible. EnCana should also be requested to follow the 100 meter pipeline corridor and to minimize impact of pipeline routing and construction on the proposed Keltic Petrochemicals Inc. project and the Maple LNG project.</p> <p>Fishery information should reflect the current state of the fishery, and the EA should address the impact that the pipeline will have on the fishery. EnCana should also work with local fishermen on a negotiated process to establish terms of agreement for compensation as a result of the project.</p> <p>The Municipality requested that EnCana provided information related to the security of supply and gas availability at Goldboro.</p>	<p>Any new pipeline routing information will be included in the EA report.</p> <p>The scope identifies a number of factors that must be considered in a discussion of potential interactions/effects of the near-shore and onshore pipeline (e.g., onshore contamination, the proposed Keltic project, new wildlife information). Outcomes of this analysis will inform the need to make any changes to the route as originally proposed.</p> <p>The EA will consider cumulative effects.</p> <p>The Scope includes a requirement that if there is new information available, environmental impacts on fisheries that differ from the original CSR will be assessed in the EA.</p> <p>The subject of this information is outside of EA. However, the proponent has been provided with a copy of all public comments.</p>
<p>A market-ready gas pipeline may influence the design of future projects and diminish the prospects for onshore production facilities.</p> <p>The timing of the Maple/Keltic LNG project may overlap with the Deep Panuke Project. There should be a communication plan in place between EnCana and the companies involved in the Maple/Keltic LNG project, the community and the municipality during the construction period.</p> <p>It was suggested the scope of the EA should be expanded to include:</p> <ul style="list-style-type: none"> • Keltic/Maple LNG project: The proponent should review the Keltic EA with respect to the jetty structure and the 	<p>The subject of this information is outside of EA.</p> <p>The subject of this information is outside of EA. However, the proponent has been provided with a copy of all public comments.</p> <p>The Scope requires cumulative effects of all phases of the project to be considered in the</p>

<p>proposed method of installation of this jetty. The EA should discuss the impact on: the pipeline routing; the pipeline installation method should this structure be installed before the pipeline; the installation method proposed for the jetty structure after the pipeline has been installed; and the location of the LNG storage tanks with respect to the onshore pipeline routing and installation method.</p> <p>It was suggested the EA should also include: a figure that includes the LNG jetty and the proposed pipeline route; a timetable of events associated with the installation of the onshore and offshore pipelines and metering station; and suggestions for communication with Maple/Keltic prior to and during the construction phase.</p> <ul style="list-style-type: none"> • The inshore fishery: Request fishery information for the inshore area be updated to reflect the current state of the fishery. Inclusion of the Guysborough County Inshore Fisherman’s Association’s research findings would be also useful in helping monitor the impact, if any, on the lobster fishery. <p>Suggest the EA address the potential impact of the pipeline installation method and timing on plankton, particularly lobster larvae from egg to stage 6 when the lobsters are motile enough to seek gravel bottom.</p> <ul style="list-style-type: none"> • Limited spatial area in the nearshore: There is limited space in the nearshore area, therefore suggest considering the feasibility of placing the pipeline even closer to the SOEP pipeline than is proposed. • Alternatives to produced water ocean disposal: Suggest the EA consider alternative methods of disposing of the produced water be included. The EA should confirm the produced water analysis and provide a discussion on 	<p>EA. A communications plan is one approach available to the proponent to address these potential interactions.</p> <p>The jetty structure and LNG storage tanks are not part of the Deep Panuke project, however such components will be considered as part of a revised cumulative effects analysis as well as any additional risk analysis work that may be needed to fully consider interactions with the proposed Keltic project.</p> <p>These comments have been provided to the proponent and will, therefore, be notified of these suggestions.</p> <p>The Scope includes a requirement that if there is new information it must be considered for the EA.</p> <p>Potential impacts of the pipeline installation will be considered in the EA.; if there are changes to the pipeline routing, changes in the environmental conditions or new information available since the original proposal.</p> <p>The Scope requires consideration in the EA of the spatial nearshore area, if different than that proposed in 2002. All public comments have been forwarded to EnCana for their consideration.</p> <p>The Scope requires technically and economically feasible alternatives to be assessed.</p>
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<p>why the volume of produced water has increased while the reserve decreased?</p> <ul style="list-style-type: none"> • Socio-economic impact to the local community. <p>The EA should include the socio-economic impact of: (i) The additional volumes of natural gas in the Maritimes & Northeast Pipeline on the transportation (toll); and (ii) The Goldboro Bypass Option – Recommendation # 28 of the 1997 Sable Gas Projects Joint Public Review Panel Report – How will increased volumes that take total natural gas volumes shipped through the M&NE pipeline beyond the 530,000 mmscf/day threshold impact shipper ability to access natural gas at Goldboro directly, without paying the transportation costs?</p> <p>EA should discuss how EnCana will meet proposed benefit commitments in the Offshore Strategic Energy Agreement worked out with the province should the project be developed using Option 2 (use the existing SOEI infrastructure), i.e. no jobs in pipeline coating, reduced man hours of employment for Nova Scotians.</p>	<p>Under the CEA Act, the socio-economic impacts from any change that the project may cause in the environment must be assessed in the EA and are included in the Scope for the variations from the 2002 assessment.</p> <p>The Board requires an SEIS and Benefits Plan as part of its Development Application. These comments have been forwarded to EnCana for their consideration.</p>
<p>The EA should consider the potential impacts on the Haddock Box, including the potential effects from marine spills and the effects of produced water.</p>	<p>The Scope requires analyses of marine spill probability and behaviour, and to conduct dispersion modeling for produced water. Should this demonstrate that spills or produced water effluent are likely to reach the Haddock Box, assessment of the resultant effects will be required in the EA.</p>

After considering the comments from the public, the RAs modified the scoping document to include a requirement for the EA to examine the project in the context of the draft Eastern Scotian Shelf Integrated Ocean Management Plan (final draft July 20, 2006). The Plan contains management goals and objectives which should be considered in the development of the EA.

5. POTENTIAL OF THE PROJECT TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS

This section on the potential of the project to cause adverse environmental effects is based on the expertise gained by the Board through its many years regulating the oil and gas industry offshore Nova Scotia, and the expert

knowledge of expert federal authorities, including the RAs. An overview of the environmental setting for EnCana's proposed development program is described in the Project Description, submitted on August 28, 2006, which may be obtained electronically on the Board's website.

Oil and gas exploration drilling activity offshore Nova Scotia began in 1967. Since that time, 208 exploration, delineation and development wells have been drilled. There has been no evidence of significant adverse environmental effect from this drilling activity. There have been EAs prepared for all exploration and development activities offshore Nova Scotia in the last decade or more. This was initially done under Board Policy, and the assessments adhered to the factors described in section 16 (1) of the CEA Act. Many of these EAs were also reviewed by EC and the DFO. Since July 28, 2003, all EAs for oil and gas exploration and development projects must meet the requirements of the CEA Act. All of these project-specific assessments concluded that these exploratory drilling projects and petroleum development projects would not likely cause significant adverse environmental effects taking into account the identified mitigation.

There have been two development projects on the Scotian Shelf which have been thoroughly assessed and have detailed effects monitoring programs. Both of these projects, the Cohasset – Panuke offshore oil project and the Sable Offshore Energy Project, are in close proximity to the Deep Panuke project on the Sable Bank. Results from the environmental effects monitoring programs for these two developments have shown very localized, and relatively short term, minor effects on the ecosystem components considered.

The Board also depends upon the expert advice of EC and the DFO on the potential effects on valued ecosystem components under their mandates. There have been gaps identified in information and data, but considering the application of the precautionary principle and with appropriate mitigation there is low risk of significant effects due to the proposed development project.

Finally, the 2002 Deep Panuke project proposal was previously assessed by means of a CEAA comprehensive study, at the conclusion of which the Minister of the Environment determined that the project was unlikely to cause significant adverse effects taking into account the identified mitigation measures. This new proposal is very similar to the one submitted in 2002 as outlined in Table 1.1 of the attached Scoping document (Appendix 2).

6. POTENTIAL EFFECTS

The table in Appendix 4 summarizes typical potential effects of offshore gas development projects and is based on expert knowledge and the previous assessment of exploration and development projects on the Scotian Shelf.

7. ABILITY OF THE COMPREHENSIVE STUDY TO ADDRESS ENVIRONMENTAL ISSUES RELATING TO THE PROJECT

The regulators and expert federal authorities have gained much expertise on the environmental effects of exploration and development on the Scotian Shelf and Slope over the past few decades. Given the nature of this EA, the conclusions of the CSR prepared in 2002 for the Deep Panuke project and understanding of effects anticipated from the revised project proposal, it is the opinion of the responsible authorities that a comprehensive study can fully address issues related to the project.

During the public consultation on the Scope of the EA one comment was received stating that “only through a full environmental assessment can the public and interested parties properly comment on the important aspects of project design, development and implementation”. It is the opinion of the RAs that the comprehensive study process for the Deep Panuke project as summarized below provides several opportunities for public comment and participation, which will ensure a complete and thorough assessment of the project.

If the decision of the Minister is to refer the project to the RAs, under paragraph 21.1(1)(a) of the CEA Act, the comprehensive study process will be coordinated with the joint regulatory process established by the Board and the NEB for the review of the Deep Panuke Project. This is consistent with the Memorandum of Understanding on Effective, Coordinated and Concurrent Environmental Assessment and Regulatory Processes for Offshore Petroleum Development Projects in The Nova Scotia Offshore Area signed by the governments of Canada and Nova Scotia in 2005. This process will ensure that the public is provided with ample opportunity, in addition to those provided under subsection 21(1) and section 22, to participate in the comprehensive study.

A commissioner will be appointed by the Board and a NEB Board member will be appointed by the NEB to conduct a public review process of the project, including the environmental components. A secretariat will be established to assist in the review process.

The public process will include initial public consultation sessions by the commissioner and NEB Board member, written evidence and information request/response process and an oral hearing. Members of the public may choose the level and extent of involvement in the public process that best suits

their interests and needs, including filing a letter of comment, providing an oral statement, seeking intervener status, or attending the hearing as an observer.

As part of the public review process, an oral hearing will be conducted that will consider all aspects of the project (environment, development plan, benefits plan, pipeline facilities, etc.) with the Commissioner and the NEB Board Member as joint chairs. The RAs will consider the submissions made during the public process, and the Commissioner and NEB Member's findings on environmental matters prior to finalizing the CSR. The CSR will document how this input was considered in the preparation of the report.

Following this, a period to be determined by the Agency will be made available to the public to examine and comment on the final CSR.

Also, if the Minister decides to continue this environmental assessment as a comprehensive study, the CEA Agency has made up to \$30K available in funding for the public to participate in the comprehensive study.

APPENDIX 1:

PROPOSED REVIEW ACTIVITIES
Submit Project Description
Federal Coordination
Public comment period for Draft Scope (21 day public comment period)
Submit Track report
Minister's track decision
Forward Scope to proponent
Proponent submits Environmental Assessment
Review of EA by RAs, expert FAs, Public
Consider and compile comments to forward to Proponent
Consider environmental information from the regulatory public review process of the project
Board completes draft CSR
Review of CSR by RAs and expert FAs
Complete CSR/Translate/Submit to Federal Minister of Environment for Agency-coordinated public comment period
CSR s.22 public comment period
Agency Reviews CSR – s.22 public comments received and submits recommendation to the Minister of the Environment regarding environmental assessment decision statement.
Minister of the Environment issues environmental assessment decision statement.

APPENDIX 2:

**Scope of the Environmental Assessment for the Proposed EnCana
Corporation Deep Panuke Offshore Gas Development Project**

**Scope of the Environmental Assessment
For the
Proposed EnCana Corporation
Deep Panuke Offshore Gas Development Project**

October 17, 2006 Draft

**Scope of Environmental Assessment for the
Proposed EnCana Corporation
Deep Panuke Offshore Gas Development Project**

1. Purpose

This document provides scoping information for the environmental assessment (EA) of the proposed Deep Panuke Offshore Gas Development Project (Deep Panuke). The EA will be reviewed by the federal government, in accordance with the *Canadian Environmental Assessment Act* (the Act). Deep Panuke was previously assessed as a comprehensive study which concluded in 2002, at which time the Minister of the Environment determined that the project was not likely to cause significant adverse effects. This new assessment is required because the manner in which the project is proposed to be carried out has been modified from what was originally proposed.

Included in this document is a description of the scope of the project that will be assessed, the factors to be considered in the assessment, and the scope of those factors. These are based on the requirements for the federal EA process, as set forth in the Act. The rationale used to determine the scope of the project is related to the nature of the federal decisions (e.g. triggers) involved, as well as the requirements of section 24 of the Act, which oblige the use of the previously completed EA to the extent appropriate.

2. Regulatory Decisions

Deep Panuke is subject to federal environmental assessment in accordance with the Act and its regulations. Those requirements include identification of federal authorities that are likely to require an environmental assessment of the project, or are in possession of specialist or expert information or knowledge that is necessary to conduct the environmental assessment. This is referred to as the federal coordination process. The EA document should summarize the outcome of the Deep Panuke federal coordination process in its discussion of regulatory context.

In order to proceed, the project will or may require the various approvals listed below.

- Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) authorizations under sub-sections 142(1)(b) and 143(4)(a) of the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*;
- National Energy Board (NEB) section 52 certificate of public convenience and necessity, or section 58 order, pursuant to the *National Energy Board Act*;
- Fisheries and Oceans (DFO) authorization under section 35(2) of the *Fisheries Act* for the harmful alteration, disruption or destruction (HADD) of fish habitat. Depending on the methods used to install the pipeline, the project may also

require a section 32 *Fisheries Act* authorization for the destruction of fish by means other than fishing (e.g. use of explosives);

- Environment Canada permit under paragraph 127(1) of the *Canadian Environmental Protection Act* for disposal of a substance at sea;
- Transport Canada approval under paragraph 5(1) of the *Navigable Waters Protection Act* for a work to be built or placed in, on, over, under, through or across any navigable water; and
- Industry Canada approval under paragraph 5(1)(f) of the *Radiocommunication Act* for sites on which radio apparatus may be located as well as the erection of such things as towers and masts, and for which Exclusion List paragraph 13 (Schedule I, Part I General) does not apply.

The above-named departments are hereafter collectively referred to as the Responsible Authorities. All authorizations named above are described in the Law List Regulations of the Act. Their issuance therefore constitutes a power as described in sub-section 5(1)(d) of the Act and results in the requirement to ensure that an EA is conducted.

In addition, there are other applicable federal statutes and regulations, notably the *Species at Risk Act* (SARA), the *Migratory Birds Convention Act* and the *Oceans Act*. The proponent must demonstrate how the project design will ensure compliance with all regulatory requirements.

3. Definitions

In this document,

“Environment” means the components of the earth and includes:

- (a) Land, water, air and all layers of the atmosphere;
- (b) All organic and inorganic matter and living organisms; and
- (c) The interacting natural systems that include components referred to in paragraphs (a) and (b).

“Environmental effect” means:

- (a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in sub-section 2(1) of 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, or
- (iv) any structure, site or thing that is of historical, archaeological, 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;

4. Scope of the Project

The proposed Deep Panuke project is a modified version of one that was previously assessed as a federal comprehensive study in 2002. For this EA, two project options are proposed, both of which differ from the original proposal:

- a mobile offshore production unit (MOPU) with a dedicated pipeline to shore, with connection to the existing Maritimes and Northeast Pipeline (M&NP Option); and
- a MOPU with a sub-sea tie-in to the existing SOEP 26 inch pipeline downstream of the Thebaud Platform (SOEP Sub-sea Option).

The main differences between the new options and the 2002 proposal are: wet trees with sub-sea tie-backs versus dry trees drilled from a wellhead jacket; one installation (MOPU) versus three platforms, a new field center; a reduction of gas export capacity, and an increased produced water discharge rate. Additionally, the SOEP Sub-sea Option differs from the original proposal by using a multiphase export pipeline tied into the SOEP 26 inch pipeline at a sub-sea location downstream of the Thebaud Platform. The M&NP Option may include minor onshore route modifications and possibly a stream crossing. A comparison of the original proposal and the two proposed project options is presented in Table 1 (at the end of the document). Figure 1 (also at the end) provides an overview of the field layout for both options.

The project to be assessed will comprise undertakings differing from those originally proposed by the proponent, or those affected by information that has become available since 2002. These include:

- Construction, operation, decommissioning and abandonment of:
 - A mobile offshore production unit, including the gas processing system and associated produced water discharge;
 - The new route portion of a sub-sea gas pipeline from the platform to both the intersection of the previous pipeline route to shore and to the tie-in point with the SOEP pipeline;
 - The onshore and offshore pipeline route in the vicinity of the proposed landfall, due to new information on environmental conditions (including new contamination data, new wildlife data and the recent Keltic Petrochemicals Inc. proposal) or as a result of consultation; and
 - All well-sites, including injection wells and sub-sea wells, and associated flow lines.

- Dredging, trenching, blasting and other activities related to installation and construction of pipeline portions along new routes, including activities for the management of the dredged sediments. Any new information or methods being considered for the pipeline route assessed in 2002 should also be included.

5. Factors to be Considered

The assessment will include a consideration of the following factors as described in sub-sections 16(1) and (2) of the *Canadian Environmental Assessment Act*.

Factors to be considered in accordance with sub-section 16(1) are:

- 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;
- The significance of the environmental effects referred to above;
- Comments from the public that are received in accordance with the *Canadian Environmental Assessment Act* and its regulations; and
- Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project.

In accordance with paragraph 16(1)(e) of the *Canadian Environmental Assessment Act*, the assessment will also include a consideration of the need for the project and alternatives to the project.

Factors to be considered in accordance with sub-section 16(2) are:

- The purpose of the project;
- Alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
- The need for, and the requirements of, any follow-up program in respect of the project; and
- The capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

The likelihood and significance of predicted adverse environmental effects should be considered in the context of sustainable development principles, as set forth in the *Canadian Environmental Assessment Act* and other legislation. Measures proposed for mitigating adverse environmental effects should be considered in a hierarchical sequence with a clear priority of avoidance of adverse environmental effects.

It is recognized that environmental assessment is conducted at the early phases of project planning when alternative means of carrying out the project are under study and project details have yet to be finalized. As set out in this scoping document, alternative means of carrying out the project must be considered in the environmental assessment.

It is expected that the project modifications, and alternative means of carrying them out, will reflect a consideration of sustainable development principles, incorporate the applicable best management practices and make provision for compliance with applicable legislative requirements. It is further expected that the consideration of alternative means will facilitate identification of site, configuration, design and management options for the revised project that would be preferable in terms of avoiding or minimizing adverse environmental effects.

Furthermore, the Offshore Waste Treatment Guidelines¹ complement EA needs in directing the proponent to examine and report upon the technical and economic feasibility of alternatives (e.g., produced water management options).

6. Scope of the Factors to be Considered

In accordance with section 24 of the Act, the Responsible Authorities are obliged to use the previous assessment to the extent appropriate, with adjustments as necessary to take into account any significant changes in the environment, in the circumstances of the project, and any significant new information relating to the environmental effects of the project.

Since the 2002 CSR was completed, there have been regulatory changes that may affect the significance thresholds for various potential effects. Key changes are designation of the Gully as a Marine Protected Area (MPA) pursuant to the *Oceans Act*, and the promulgation of the *Species at Risk Act* (SARA). The EA, in its consideration of the significance of the effects, must take these into account. The EA should also examine the project in the context of the draft Eastern Scotian Shelf Integrated Ocean Management Plan (final draft July 20, 2006). The Plan developed under the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative contains management goals and objectives which should be considered in the development of the EA.

The EA must also verify commitments from the 2002 CSR and should provide any updates based on new scientific information/methods (e.g., recent studies on impacts of produced water or other discharges and monitoring results, pelagic seabird monitoring protocols, Sable Island monitoring efforts). Also, work undertaken by EnCana for other recent projects in the offshore, which would be applicable to the Deep Panuke project (e.g., bird protocol developed for the Cohasset decommissioning spill response plan) should be identified and considered in the EA.

The review will consider the potential effects of the proposed project within spatial and temporal boundaries that encompass the periods and areas during and within which the proposed project may potentially interact with, and have an effect on, components of the

¹ “Offshore Waste Treatment Guidelines”, National Energy Board, Canada-Newfoundland Offshore Petroleum Board and Canada Nova Scotia Offshore Petroleum Board, August 2002.

environment. Relevant factors in determining boundaries include such matters as ocean currents, wind conditions, and species migration patterns.

The EA should demonstrate how every reasonable effort to adopt best available technologies and best management practices is being taken. Specifically, the EA will include consideration of environmental effects related to:

- **Accidental Releases:** Accidental releases during the development drilling, construction and production phases of the project must be considered. The revised well count and project life, the new multiphase export pipeline (SOEP Subsea Option), the subsea tie-in construction activity (SOEP Subsea Option), and the new subsea flowlines will change the probability of spills during the project. As a result, the spill probability assessment must be updated with these new parameters. The relocation of the field center, production wells and acid gas injection well, the presence of flowlines, and, for the SOEP Subsea Option, the multiphase pipeline to SOEP, result in new potential scenarios for marine spills and atmospheric releases which are closer to Sable Island and the workers at the SOEP sites. Marine spill probability and behaviour from new well locations, pipeline routes and inter-field flow lines should be analyzed and presented in the EA. Lessons learned from recent spill events in Atlantic Canada should also be considered in the assessment, as well as how the export of condensate (rather than its use as the primary project fuel) and the associated need to transport and store additional fuel on the MOPU affects conclusions of the 2002 spill assessment.
- **Increased Produced Water Discharge:** The approved CSR Base Case was based on produced water overboard rates of 1080 to 1560 m³/day (45 to 65 m³/hr). The proposed Project options now include a design rate of 6400 m³/day (265 m³/hr). This discharge rate must be used in a new produced water dispersion modeling study and the results used to update effects predictions. The new information must be presented in the EA. In addition to the new dispersion modeling that is to be conducted, the following should be discussed:
 - characterization of expected produced water constituents and a recognition of those sensitive environmental components which could be affected
 - consideration of potential effects of sheens from produced water and other sources on migratory birds (Reference could be made to the proposed Environmental Studies Research Fund study to examine the potential effect of sheens on seabirds); and,
 - additional monitoring that may be required based on outcomes of a revised analysis.
- **Air emissions:** Air dispersion modeling was conducted for the original design based on normal operation emissions data and the original flare design. If emission estimates and operating conditions (i.e. stack height, flow rates, temperatures) have not changed appreciably from 2002 assessment, it would be appropriate for the EA to reference this previous work and comment on the effects of the changes. If there are appreciable differences in emissions and

operating conditions, new dispersion modeling must be performed and presented in the EA.

The following considerations need to be included in a revised assessment of impacts to air quality, based on relevant project modifications:

- revised emissions estimates for both options with emissions identified according to source; and
 - potential local effects and contributions to atmospheric loadings as they pertain to ambient air quality objectives in the immediate area.
- **Presence of new sub-sea infrastructures:** New sub-sea flowlines, umbilicals, sub-sea protection structures, and the export pipeline to the SOEP pipeline and associated sub-sea templates for the SOEP Sub-sea Option will result in the loss of access to fisheries resources and risk for gear damage. In particular there is a new quahog fishery that opened on the Sable Bank in 2005. The EA should assess the effects of new sub-sea infrastructure on fishing activity, including the new quahog fishery.
 - **Construction work for subsea infrastructures:** The installation of flowlines, umbilicals, subsea protection structures, pipeline to subsea tie-in, tie-in activities (SOEP Subsea Option) and new portion of the pipeline route resulting from the relocated field center (M&NP Option) will require assessment of fisheries interaction, noise, air emissions and marine discharges from construction activities, including hydrotest fluid discharge from the flowlines and pipeline. In addition, these new subsea installations will impact benthic habitat in areas that were not surveyed for the 2002 proposal. Therefore, an updated benthic report is required to serve as baseline data for the EA.
 - **Drill Waste Discharges:** The EA must update the analysis of drilling waste discharge and associated effects in light of the modified number of wells, locations, and changes in the discharge of water-based drilling fluids and associated cuttings.
 - **Near-Shore and Onshore Effects:** The EA must analyze potential interactions and effects of the pipeline (M&NP Option) with onshore contamination related to past mining activity and potential for acid rock drainage. Also, interactions related to the proposed Keltic Petrochemical and LNG facility need to be addressed. The need for additional consequence analysis should be considered, building on the onshore pipeline risk analysis work completed for the 2002 CSR. Also, consideration should be given to the outcomes of the risk assessment work conducted as part of the Keltic regulatory review process.
 - **Wildlife and Habitat:** The EA must evaluate any modification to the previously assessed onshore pipeline route, including any stream crossing, and potential interactions and cumulative effects on wetlands taking into account the *Federal Policy on Wetland Conservation* (FPWC). Potential project effects on terns and other near-shore and onshore birds, including the endangered Roseate Tern, must be considered. Reference should be made to new data available on the

Country Island Common, Arctic and endangered Roseate Tern colonies, specifically in relation to foraging activity and to the draft Recovery Strategy for the Roseate Tern. The wildlife information that was collected for the proposed pipeline corridor and summarized in the 2002 CSR (e.g. Terrestrial Field Survey Results from 2001 and 2002) should be re-interpreted based on updates to the conservation status of the identified species. Any wildlife information that has been collected since the 2002 CSR should also be presented and considered.

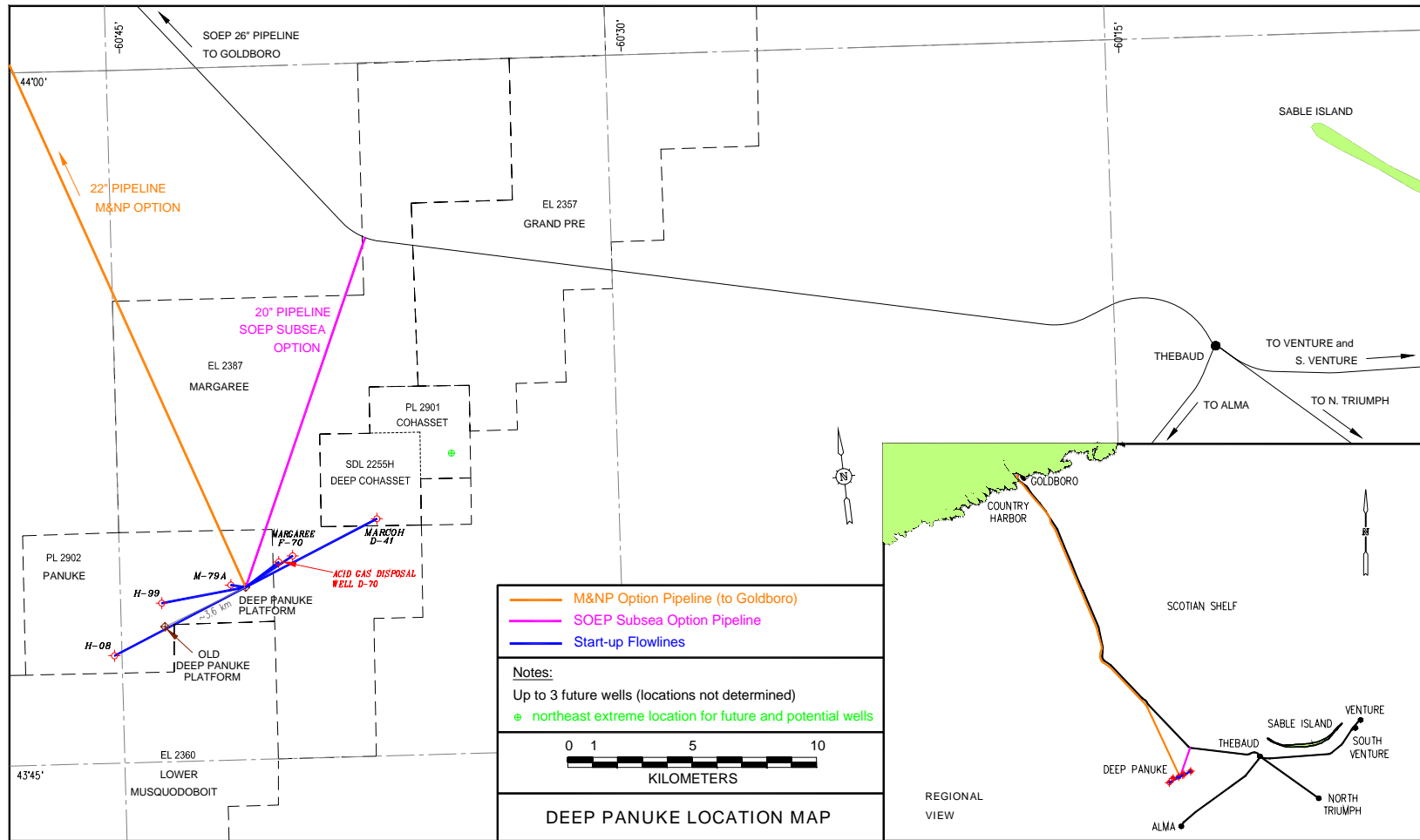
- **Impediments to Navigation:** The EA will evaluate the project's possible effects on navigation in the near-shore, with particular attention to safety.
- **Species at Risk:** Since the 2002 CSR was completed, several species in the project area have been newly listed, or re-designated under the SARA. The EA must evaluate project effects on SARA-listed species as required under section 79 of SARA. In addition to SARA-listed species, consideration of project effects on all species of conservation concern is required. EC's 2004 publication "*Environmental Assessment Best Practice for Wildlife at Risk in Canada*" should be considered for guidance.
- **Cumulative Effects:** The new EA must provide a revised cumulative effects assessment based on the project modifications and changes to the environmental setting. For example, consideration of the proposed Keltic project, and cumulative effects on seabirds from ongoing oil and gas activity in the Newfoundland and Labrador offshore (particularly along the NL-NS border) will be important to the analysis.
- **Effects of the Environment on the Project:** The EA must consider how the proposed mobile production unit could be affected differently by storms/winds/waves/ice than the previously proposed fixed platforms.

Table 1.1 Comparison of Approved Base Case and New Project Options¹

Table 1.1 Comparison of Approved Base Case and New Project Options			
Project Item	Base Case (Approved CSR)	M&NP Option	SOEP Subsea Option
Well count and configuration	Maximum of 8 – Platform Wells <ul style="list-style-type: none"> • 5-6 new drill prod wells: H08, PI-1B, M79A, PP3C and 1-2 futures • 1-2 new drill injection wells 	Maximum of 9 – Subsea Wells <ul style="list-style-type: none"> • 4 re-entry wells: H-08 [PL 2902], M-79A [PL 2902], F-70 [EL 2387], and D-41 [SDL 2255H] • 1 new production well: H-99 [PL 2902] • 1 new injection well: D-70 [EL 2387] • up to 3 future wells [currently undefined location on PL 2901, SDL 2255H, PL 2902 or EL 2387] • Buried flowlines and umbilicals from wellheads to installation 	
Project Life	Expected mean case: 11.5 years	Expected mean case: 13.3 years Expected range: 8 – 17.5 years	
Field Center	Base Case	Relocated 3.6 km NNE	
Base Structure	3 fixed platforms including <ul style="list-style-type: none"> • production platform • utilities/quarters platform • wellhead platform 	1 MOPU integrated facility	
Discharge of muds / cuttings for new wells	drilled from field center WBM/cuttings overboard SBM/cuttings skipped and shipped or injected	drilled from individual well locations WBM/cuttings overboard no SBM	
Delivery Point	M&NP tie-in onshore, adjacent to SOEP		SOEP subsea tie-in SOEP 26” pipeline
Export pipeline	24 inch, 176 km single phase Trenched ~ 50% of route	22 inch, 176 km single phase Trenched ~ 50% of route	20 inch, 15 km multiphase Trenched 100% of route
Export gas	11300 10 ³ m ³ /day 400 MMscfd sales quality	8500 10 ³ m ³ /day 300 MMscfd [at plateau production rate] sales quality	8500 10 ³ m ³ /day 300 MMscfd [at plateau production rate] sweet and dehydrated
Export condensate	N/A		200 m ³ /day sweet and stabilized, commingled with gas
Condensate Use	Fuel, surplus injected		Sales product
Produced water	1100 to 1600 m ³ /day [7000 to 10,000 bpd] discharged overboard	6,400 m ³ /day [40,000 bpd] discharged overboard	
Acid Gas	dedicated injection well approximately 180 10 ³ m ³ /day [6 MMscfd]	dedicated injection well approximately 130 10 ³ m ³ /day [4.5 MMscfd]	

1. Reproduced with the permission of EnCana Corporation.

Figure 1: Deep Panuke Field Layout¹



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APPENDIX 3:

NOTICE REQUESTING PUBLIC COMMENT



PUBLIC NOTICE

The Deep Panuke Offshore Gas Development Project is subject to a comprehensive study under the *Canadian Environmental Assessment Act*. The Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), along with the Department of Fisheries and Oceans, Environment Canada, Industry Canada, Transport Canada, and the National Energy Board, as the federal responsible authorities for the project assessment, invite the public to comment on the proposed scope of project, the factors to be considered, the proposed scope of the factors and the ability of the comprehensive study to address issues relating to the project

Please contact the CNSOPB for a copy of Scoping Document noting differences between this proposal and the original 2002 Deep Panuke project filing, and other information related to the Deep Panuke project. These documents are also available for review on the CNSOPB website, www.cnsopb.ns.ca, as well as at several locations around the Province, including:

- Clean Nova Scotia, 126 Portland Street, Dartmouth
- Cyril Ward Memorial Library, 27 Pleasant Street, Guysborough
- Port Hawkesbury Branch Library, 304 Pitt Street, Port Hawkesbury
- Canso Branch Library, 18 School Street, Canso
- Sherbrooke Branch Library, 11 Main Street, Sherbrooke
- Antigonish Library, College Street, Antigonish

Comments from interested parties must be received in writing by Friday, October 13th, 2006. They may be addressed to:

Eric Theriault, Advisor, Environmental Affairs,
Canada-Nova Scotia Offshore Petroleum Board
6th Floor, TD Centre, 1791 Barrington Street
Halifax, Nova Scotia B3J 3K9
Tel (902) 422-5588 Fax (902) 422-1799
Email: Eric.theriault@cnsopb.ns.ca
www.cnsopb.ns.ca

The Canada-Nova Scotia Offshore Petroleum Board is an independent joint agency of the Governments of Canada and Nova Scotia responsible for the regulation of petroleum activities and resources offshore Nova Scotia.

APPENDIX 4: TYPICAL POTENTIAL EFFECTS OF DEVELOPMENT PROJECTS

Activity/VEC	Interaction
Presence of Structures	
Migrating Birds	Attraction
Seabirds	Attraction
Fish	Attraction
Species at Risk	Attraction
Fisheries	Exclusion of fishing within safety zone around the project
Impediments to Navigation	Exclusion of vessels within safety zone around the project
Lights and Flares	
Seabirds including species at risk	Attraction/Mortality of seabirds due to physical interactions with the flare and collisions due to lighting
Air quality	Impacts to air quality from flare emissions
Underwater Noise – Boats	
Fish Behaviour	Disturbance
Fish	Effects on health
Fisheries	Reduction in catch
Baleen Whales	Disturbance
Toothed Whales	Disturbance
Seals	Disturbance
Sea-associated Birds	Disturbance
Seabird Colonies	Disturbance
Sea Turtles	Disturbance
Species at Risk	Disturbance/effects on health
Disturbance/Noise – Aircraft	
Baleen Whales	Disturbance
Toothed Whales	Disturbance
Seals in the water	Disturbance
Seals on land	Disturbance

Activity/VEC	Interaction
Sea Associated Birds	Disturbance
Seabird Colonies	Disturbance
Sea Turtles	Disturbance
Species at Risk	Disturbance
Underwater Noise – Stationary Source	
Fish Behaviour	Disturbance
Fish	Effects on health
Fisheries	Reduction in catch
Baleen Whales	Disturbance
Toothed Whales	Disturbance
Seals in the water	Disturbance
Sea-associated and Terrestrial Birds	Disturbance
Sea Turtles	Disturbance
Routine Discharges	
Grey and Black Water	
Marine Animals including species at risk	Effects on health due to interaction with discharged waste
Cooling Water	
Fish	Effects on health due to interaction with discharged waste
Sea-associated birds	Effects on health due to interaction with discharged waste
Marine Mammals	Effects on health due to interaction with discharged waste
Species at Risk	Effects on health due to interaction with discharged waste
Waste Materials and Garbage	No Interaction as shipped to shore for disposal
Oily Wastes	
Fish	Injury/Mortality due to interaction with discharged waste

Activity/VEC	Interaction
Fisheries	Injury/Mortality due to interaction with discharged waste
Baleen Whales	Injury/Mortality due to interaction with discharged waste
Toothed Whales	Injury/Mortality due to interaction with discharged waste
Seals in the water	Injury/Mortality due to interaction with discharged waste
Sea-associated Birds	Injury/Mortality due to interaction with discharged waste
Sea turtles	Injury/Mortality due to interaction with discharged waste
Species at Risk	Injury/Mortality due to interaction with discharged waste
Bilge and Displacement Water	No Interaction due to processed prior to discharge
Drilling Muds and Cuttings	
Scallop Populations	Sub lethal effects
Scallop Fishery	Reduction in catch
Deep-sea corals	Mortality
Benthic Communities	Injury/Mortality
Invertebrate Fisheries	Reduction in catch
Produced Water	
Marine Water Quality	Temperature / pH / Increase in Heavy Metals and Oil Concentration / Increased Nutrients
Benthic Communities	Injury/Mortality
Marine Fish	Injury
Eggs and Larvae	Injury/Mortality
Sea-associated Birds	Mortality
Species at Risk	Injury/mortality
Accidental Events (spills or blowouts)	
Benthic Communities	Injury/Mortality

Activity/VEC	Interaction
Commercially Important Benthic Species	Injury/Mortality
Invertebrate Fisheries	Reduction in catch
Bottom Dwelling fish	Injury/Mortality
Eggs and Larvae	Effects on the Fishery
Fish Populations	Injury/Mortality
Fisheries	Tainting-reduced catch
Marine Mammals	Injury/Mortality
Sea-associated Birds	Mortality
Species at Risk	Injury/mortality
Air Quality	Impacts to air quality from gas blowout
M&NP Pipeline Option (with the nearshore and onshore environment)	
Wildlife and habitat including species at risk	Disturbance, displacement, mortality, habitat loss
Marine Water Quality	Contaminated sediments
Invertebrate Fisheries	Reduction in catch
Fisheries	Reduction in catch
Benthic Communities	Injury/Mortality
Socio-economic environment caused by changes to the biophysical environment	Effects due to interactions with the present and possible future commercial fishery