REVISED DRAFT TERMS OF REFERENCE FOR THE ENVIRONMENTAL IMPACT REVIEW
(Revised 30 May 2014)

(Environmental Impact Statement Guidelines)

Beaufort Sea Exploration Joint Venture Drilling Program

Section A INTRODUCTION

These Terms of Reference are:

- issued by the Environmental Impact Review Board (EIRB) to the developer, Imperial Oil Resources Ventures Limited (IORVL or the "Developer") representing the Beaufort Sea Exploration Joint Venture Drilling Program[1], to provide guidance and set out information requirements and expectations of the EIRB of the Developer for the preparation of an Environmental Impact Statement (EIS) that will satisfy the requirements of the *Inuvialuit Final Agreement* (IFA);
- designed to facilitate an efficient and timely review process with the objective of avoiding duplication and overlap and should, to the extent possible, satisfy the requirements of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) under which authority the National Energy Board (NEB) may conduct an environmental assessment; and
- intended to set out the scope of the environmental review for Inuvialuit, the public and stakeholders.

These Terms of Reference are issued by the EIRB as a result of a decision by the Environmental Impact Screening Committee (EISC) dated December 11, 2013 on the IORVL Beaufort Sea Exploration Joint Venture Drilling Program, in which the EISC determined that the proposed Development could have significant negative environmental impacts and referred the Development to the EIRB for a public review under subsection 11(20) of the IFA.

Although these Terms of Reference are intended to satisfy, to the extent possible, the requirements of CEAA 2012, the EIRB does not assert that these Terms of Reference are a comprehensive summary of those requirements. Any determination or decisions regarding the requirements of CEAA 2012 are within the jurisdiction of the NEB.

[1] The Beaufort Sea Exploration Joint Venture represents Imperial Oil Resources Ventures Limited, ExxonMobil Canada Ltd., and BP Exploration Operating Company Limited.

Section B SCOPE OF THE DEVELOPMENT

The Development involves drilling one or more wells within Exploration Licence (EL) 476 or 477 located in the Beaufort Sea in the offshore of the Inuvialuit Settlement Region (ISR). These ELs are in water depths that range from 60 m to 1500 m, and lie about 175 km north-northwest of Tuktoyaktuk. These wells would be drilled in water depths of 80 to 850 m.

The preferred or baseline case set out by the Developer would have the first well drilled in EL 477 commencing in the 2020 open water season, before the expiry of EL 477 (on 30 September 2020). The well(s) are assumed to require at least two years to complete and IORVL's proposed drill program schedule indicates that it may take three seasons to complete.

IORVL, on behalf of itself and its partners, has indicated that a floating drilling unit would be the system of choice. IORVL has not identified the type of floating drilling unit (e.g., semi-submersible or drill ship) or the type of station keeping that would be used by the floating drilling unit (e.g., mooring system that uses mooring lines and anchors attached to the seafloor or a dynamically-positioned system that uses the unit's own propellers and thrusters). IORVL states that the proposed floating drilling unit would be up to standard and appropriate for the job it is designed to do.

IORVL has stated that it would use icebreaking support vessels for ice management around the drilling location and ice-strengthened vessels for supply, fuel, and warehousing. The ice-strengthened supply vessel(s) could be used for, amongst other things, oil spill response operations and for drilling support.

In addition to drilling activities, IORVL has provided high-level information on possible transit routes to or out of the drilling location. No decision has been made regarding overwintering of the drilling unit and/or the support vessels in the Canadian Beaufort Sea.

IORVL indicates that it will prepare a relief well plan as part of its Operations Authorization (OA) application to the NEB and that this plan will not include a same season relief well (SSRW). IORVL states that a relief well could be started but not be finished in the same season. IORVL's position is that a relief well is not a same season well control measure and that it is not possible to drill a well in a single season given the short drilling season in the Arctic, and that faster options exist to bring a well under control.

IORVL states that they could need onshore facilities for accommodation, storage, and docking area. Other activities that may be required for the Development include the dredging of Tuktoyaktuk harbour; mobilization and demobilization of drilling and related vessels, equipment, supplies, and people; and over-wintering of drilling and related vessels, equipment, and supplies in the ISR.

Note: Section B, the 'Scope of the Development' in this draft, is not comprehensive of all potential project components and activities, particularly any onshore facilities and activities that may be required and/or the potential need to dredge Tuktoyaktuk harbour and other potential locations. Should these facilities and activities be required and a complete description of these components and activities provided by the Developer at a later time, additional information requirements may be added to these draft Terms of Reference.

Section C SCOPE OF THE ASSESSMENT

C1 SCOPE OF FACTORS AND EIS REQUIREMENTS

The Developer will have regard to the following in its consideration of the factors and information requirements outlined below and in preparing the EIS:

- the EIRB's 'Environmental Impact Review Guidelines' dated April 29, 2011;
- the factors set out in Section 19 of the CEAA 2012; and,
- the National Energy Board's document 'Filing Requirements for Offshore Drilling in the Canadian Arctic', dated 2011.

C2 FACTORS TO BE CONSIDERED - INFORMATION REQUIREMENTS

This section outlines the factors to be addressed and the information required in the EIS.

C2.1 PRINCIPLES

The following principles should be incorporated into the EIS by the Developer and are applicable to all components of the Development:

- *Sustainable Development* – the Development should meet the needs of present generations without compromising the ability of future generations to meet their own needs. The objective of sustainable development is to achieve a balance between preserving environmental integrity, ensuring social equity and improving economic efficiency. The Developer should strive to integrate sustainable development within the EIS and clearly outline how sustainable development has been incorporated into project design, how the views of the Inuvialuit regarding sustainability have been included, and how it will be monitored; and
- *Precautionary Approach* – the Development should be designed and executed in a careful and precautionary manner before any action is taken. The precautionary approach or "precautionary principle" can mean "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (Principle 15 of the 1992 Rio Declaration on Environment and Development). The Developer

should clearly demonstrate how it has applied such an approach in the EIS and in what circumstances.

C2.2 PURPOSE AND ALTERNATIVES

- Purpose and need of the proposed Development
- Description of the proposed Development
- Alternative means of carrying out the proposed Development, including the advantages and disadvantages of each alternative, that are technically feasible and the environmental impacts of any such alternatives
- Rationale for choosing the proposed undertaking as the preferred option, including the advantages and disadvantages, and explanation as to why the proposed approach is the best option

C2.3 TRADITIONAL KNOWLEDGE AND PUBLIC COMMENTS

C2.3.1 Factors to be addressed

- Traditional knowledge
- Community knowledge
- Issues and concerns raised by potentially affected parties
- Inuvialuit and other aboriginal harvesting areas, practices and activities
- Cultural and economic value of harvesting

C2.3.2 Information required

C2.3.2.1 The extent of the Developer's public engagement process.

C2.3.2.2 Concerns and issues raised by individuals, organizations and communities in the Inuvialuit Settlement Region.

C2.3.2.3 How public and community consultations have contributed to the development of the EIS, management plans, and proposed mitigation measures for the Development.

C2.3.2.4 What future consultations with Inuvialuit communities and public consultations are being planned, and how the outcome of these consultations will be used in the context of the proposed Development.

C2.3.2.5 Traditional Knowledge and community knowledge that has been or will be collected and used in context of the proposed Development.

C2.3.2.6 Detailed explanation on how Traditional Knowledge was incorporated into proposed mitigation measures and management planning.

C2.3.2.7 How information received regarding Inuvialuit harvesting areas, practices and activities, and the cultural and economic value of harvesting, has been or will be used in context of the proposed Development.

C2.4 ENVIRONMENT AND IMPACT ASSESSMENT

C2.4.1 Factors to be addressed

- A description, including baseline environmental conditions, of the affected environment, including the human environment
- Environmental effects of the Development
- Changes to the Development that may be caused by the environment
- Environmentally significant or sensitive areas
- Wildlife or environmental monitoring and inspection plans
- Accidents and malfunctions and their effects
- Waste management plans
- Chemicals anticipated to be used in the proposed Development, particularly those that may be used in drilling activities and spill countermeasures
- Mitigation measures that are technically feasible and that would prevent, reduce or eliminate any adverse environmental effects of the Development
- Significance of the residual effects described above
- Cumulative environmental effects that are likely to result from the development in combination with other Developments or activities that have been or will be carried out

C2.4.2 Information required regarding impact assessment methodology

C2.4.2.1 A description of the methods used to predict the potential effects of the Development on the biophysical and socio-economic environment, and the effects of the environment on the Development. The description should clearly explain the methodologies, data used to reach conclusions on assessments of effects, and standards and practices used to mitigate the effects. If the highest or most stringent standards or best and appropriate practices are not used, provide rationale and justification of why the proposed approached was selected.

If the valued ecosystem component (VEC) or valued socio-cultural component (VSC) approach is used, the VECs or VSCs (referred to as valued components) for which effects are predicted must be described and justified.

If the VEC and/or VSC approach is not used, the Developer should provide details of any alternative approaches considered, the approach selected together with the criterion for selection, and merits and advantages of the proposed approach as well as how this approach provides for equal or greater assessment.

In identifying the valued components, the Developer shall consider those identified to be of concern during any public workshops or meetings held by the Developer, or that the Developer considers likely to be affected by the Development. In justifying the methods used to select the valued components,

the Developer shall note that the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. If using the valued components methodology, the following valued components shall be considered by the Developer:

- Fish and fish habitat;
- Marine mammals and marine habitat;
- Resident and migratory birds;
- Resident and migratory terrestrial animals;
- Species harvested by Inuvialuit, species at risk and species of special status;
- Linkages between VECs, VSCs and related effects pathways resulting from Project-related impacts (e.g., how impacts on the biological environment could affect the human environment) and evaluate the significance of the interactive effects;
- Water quality;
- Air quality;
- Land and resource use including harvesting by the Inuvialuit in the ISR; and
- Traditional, commercial and public recreational use.

C2.4.2.2 This list of valued components shall be modified as appropriate by the Developer following consultations with the Inuvialuit of the ISR, the communities within the ISR, public and relevant stakeholders. If the Developer believes that certain valued components will not be impacted, the foundation for this conclusion should be provided, along with the methodology and other background materials that support such a conclusion.

C2.4.2.3 If another method is used to predict potential effects of the Development, the proponent must identify and justify the biophysical or socio-economic elements for which effects are predicted.

C2.4.2.4 For all components of the Development, the Developer will define the appropriate spatial and temporal boundaries used for its assessment for each biophysical or socio-economic element assessed. The Developer will also provide a justification and rationale for all of the spatial and temporal boundaries chosen including the use of any thresholds in the determination. The Developer shall provide a description of the boundaries of the Development in a regional context showing existing and planned future land use, current infrastructure, and proposed improvements to this infrastructure.

C2.4.2.5 In determining the spatial boundaries to be used in assessing the potential adverse environmental effects of the components of the Development, the Developer shall consider, but not be limited to, the following criteria:

- The physical extent of the Development components, including any offsite facilities or activities. The physical extent shall include all areas affected by the Development, including those impacts onshore, in or on the water, on the shoreline or coast;
- The extent of aquatic and terrestrial ecosystems potentially affected by the Development, including potential accidents and malfunctions;

- The extent of potential effects arising from noise and atmospheric emissions, and ballast water;
- The extent to which the communities within the ISR may be affected by any Development component;
- The extent to which traditional land use and Inuvialuit rights could potentially be affected by the Development component; and
- The extent of the lands used for residential, commercial, industrial, recreational and aesthetic purposes.

C2.4.2.6 For the assessment of the potential effects related to an accidental or unauthorized release of oil, other hydrocarbons, or chemicals, the spatial boundaries will be expanded to take into account the areas that could be affected by a worst-case accident or malfunction scenario.

C2.4.2.7 The temporal boundaries of the Development shall cover the construction, operation, maintenance, and where relevant, closure, decommissioning and restoration of the sites affected by the Development. Temporal boundaries shall also consider seasonal and annual variations related to environmental components for all phases of the Development, where appropriate. To determine the temporal boundary of assessment, the Developer shall take into account the following elements:

- Duration of the operational period;
- Design life of engineered structures, facilities and equipment; and
- Frequency and duration of natural events and human-induced environmental changes.

C2.4.3 Information required regarding baseline data

C2.4.3.1 A description of the biophysical and socio-economic setting, including the current state of the environment within the study area. This is equally applicable for the terrestrial and marine components of the Development. The Developer is not required to provide extensive descriptions of features of the environment or socio-economic elements that are not relevant factors or issues related to the Development. However, the Developer must provide a sufficient description of the local setting to allow the EIRB, other regulators, the public, and stakeholders to clearly understand the rationale for environmental assessment decisions. If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations should be described, and should include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error as well as the need and justification for any manipulation of the data together with how any manipulation was done and the implications of such manipulation.

C2.4.3.2 In describing the existing environment, consideration must be given to its current state, including trends and recent changes. To assist in identifying and accounting for trends and changes in the environment that are not caused by the Development but that may either combine with those impacts related to the Development or cause a change to the Development:

- A description of any substantive changes to the physical, biological and human environment of the Project area that have occurred since; circa 1970, to the extent known, and indicate whether those changes are ongoing; and
- A description of substantive changes in Inuvialuit use of the land, and social and cultural conditions, to the extent known, since circa 1970.

C2.4.3.3 With respect to all components of the Development, without limiting itself to this list, the Developer will provide the baseline information outlined in the following as appropriate. If such information is not provided, the Developer will provide a rationale as to why it has not done so and how such gaps would be filled.

C2.4.3.4 Physical environment baseline information required:

- Possible natural hazards potential;
- The prevailing climate conditions, including the identification of available data sources (e.g., Meteorological Service of Canada, recording stations);
- The predominant meteorological conditions, including wind direction, wind velocity, severe outflow conditions, seasonal variations, visibility, darkness, temperature, icing, storms and polar lows as well as air quality information;
- Surface water and groundwater quality and quantity;
- Sediment regime (e.g., erosion zones, sediment transport, accumulation zones, sediment flux – processes and magnitude) for all areas where the proposed Development is planned to occur, including at the drilling location and area, dredging and filling areas, potential open water sediment-disposal sites, shore line and onshore locations;
- Noise environment (near the marine structures and at sensitive points);
- A description of marine environments, including the type of water body (e.g., estuary, coastal, marine), and any special management areas in or near the study area;
- A description of oceanography, including a description of the physical characteristics of the Beaufort Sea in and around the drill site and other Development components including, but not limited to, wave regime, tidal range, offshore currents, the time of year and weather conditions that influence the characteristics of flow;
- A description of ice conditions, including ice cover, ice movement, ridging, ice thickness and ice hazards;
- A description of surface and sea floor geology including such factors as, soil competence, and ice keel scours and shallow gas for all areas where the proposed Development activities are planned (e.g., offshore drilling location and area, and shelf and coastal transportation corridors);
- A description characterizing sediments in relation to parameters identified in the Canadian Sediment Quality Guidelines, the *Canadian Environmental Protection Act, 1999*, and its *Disposal at Sea*

Regulations including areas to be dredged or used for dredge spoil disposal; and

- A description of shoreline characterization and mapping of sensitive shorelines in all areas that may be at risk of shoreline oiling as a result of a potential accident or malfunction arising from project activities.[2]

C2.4.3.5 Biologic and biophysical environment baseline information:

- The identification, description, and mapping of marine habitats, including habitat type, location and range, habitat suitability, diversity, abundance, and sensitive aquatic habitat;
- The identification and relative predominance of aquatic vegetation;
- A description of marine habitat use and species presence, including population status, life cycle, sensitive periods, habitat requirements for each life stage, abundance (local and regional), distribution and use of habitat type, and for anadromous species, the seasonal range, migration patterns, and sensitivity to disturbance;
- A description of any existing wildlife harvesting in the area;
- A description of marine and migratory bird species presence, including population status, life cycle, sensitive periods, habitat requirements for each life stage, abundance (local and regional), distribution and use of habitat type including important bird areas and key migratory bird sites, the seasonal range, migration patterns, and sensitivity to disturbance;
- A description of underwater natural and man-made noise levels at sensitive sites;
- The identification and description of any federal, provincial and/or territorial listed species at risk in the study area, including distribution and population status, the identification of their habitat and critical habitats, critical timing windows, known factors limiting their distribution and population, sensitivity to disturbance, and whether any species recovery plans are available;
- A description of how the ecosystem(s) present function including a full description of the food chain(s);
- A description of any known issues with respect to the health of harvested species (e.g., parasites, disease) and known baseline contaminant concentrations in harvested species;
- A description of the functioning ecosystem services within the area; "ecosystem services" are those processes through which the environment produces resources or conditions that are important and valuable to human life including clean air and water, adequate habitat for fisheries, and regulation of disease;

[2] Note that Environment Canada (EC) has established characterization criteria contained within the Arctic SCAT (Shoreline Clean-up Assessment Technique) Manual 1 as a useful guide for this - Environment Canada, Emergency Prevention, Preparedness and Response – A Program of the Arctic Council, The Arctic SCAT Manual – A Field Guide to the Documentation of Oiled Shorelines in Arctic Regions, 2004

- A listing and distribution or abundance of existing invasive, non-native species;
- A description of ecosystems' ability to recover from adverse environmental impacts, including a timeline of such recovery and factors that might complicate such a recovery; and
- The location and description of protected areas in the region.

C2.4.3.6 Human environment baseline information:

- A description of harvesting activities;
- A description of commercial vessel traffic, including tourism, from existing port or terminal data, including frequency, goods, quantities, shippers, origin and destination, and the importance to the local and regional economy;
- A description of human health, with respect to potential contamination of food sources, noise and air quality issues as applicable;
- A description of routes and channels from and to the ocean that commercial shipping uses, main hazard areas for other users in relation to shipping, and frequency and magnitude of shipping incidents;
- A description of tourism and commercial recreation activities taking place in the study area; and
- An inventory, description, including maps, and evaluation of any archaeological and historical resources likely to be affected by the marine and onshore components.

C2.4.3.7 A description of factors of the unique Arctic environment where the proposed Development would occur with particular attention to wildlife concentrations, wildlife harvesting, cultural identity, ice, permafrost, and extreme seasonal variations.

C2.4.3.8 A description of wildlife and wildlife habitat protection plans and follow-up wildlife effects monitoring programs[3].

C2.4.3.9 A description as to the use of monitors and inspectors to observe marine mammals and birds and monitor the effectiveness of mitigation measures and monitoring, inspection and follow-up plans.

C2.4.4 Information required regarding the Impact Assessment including cumulative effects

C2.4.4.1 The Developer shall clearly explain the methodology used in its assessment of the environmental effects of the Development. In this description, the Developer shall consider environmental effects, such as direct and indirect, reversible and irreversible, short- and long-term and cumulative environmental effects of all Development components. In predicting and assessing the Development's effects, the Developer will clearly state the

[3] See the draft Wildlife and Wildlife Habitat Protection Plan and Wildlife Effects Monitoring Program Guideline prepared by the Government of the Northwest Territories Department of Environment and Natural Resources – Wildlife Division dated 27 May 2013 for additional information

elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact. This assessment shall focus primarily on the biological, biophysical and socio-economic values affected by the Development.

C2.4.4.2 A description on the effects on the physical environment including:

- A description of the sources, quantities and frequency of Development-related emissions of greenhouse gas, nitrogen oxides, sulphur oxides and volatile organic compounds as well as fine particulate matter and air toxins that could result from the construction and operation of the marine Development components and from accidents or malfunctions;
- A description of air quality assessments including the sources, quantities, and frequency of emissions accounting for the worst case scenario and potential associated in-situ burn;
- An estimate of emissions of common air contaminants and any expected air toxics using activity information and emission factors if, as a result of the Development, there will be an increase in ship activity over current activity levels. If proposed emission levels are notably higher than current emission levels, provide a quantitative estimation of ambient air quality concentrations (i.e., through validated dispersion modeling).
- A description of the sources, quantities and frequency of Development-related discharges to the marine environment from drill ships and all other vessels. This should include, but not be limited to, discharges of ballast water, grey water, sewage, deck wash, muds and drill cuttings that could result from the construction and operation of the marine Development components and from accidents or malfunctions.

C2.4.4.3 A description on the effects on the biologic and biophysical environment including:

- The potential effects on the marine environment, including the effects of increased vessel traffic and dredging;
- The anticipated changes in the composition and characteristics of the populations of marine mammals and various fish species, including shellfish and forage fish, following modifications to the aquatic environment, including;
    - disruption of sensitive life stages or habitat;
    - disruption of feeding activities;
    - distribution and abundance;
    - contaminant levels in harvested species; and
    - marine mammal health and condition.
- A description and assessment of any work, undertaking, or activity that results in serious harm to fish that are part of commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery including the description of any mitigation measures;

- A description and assessment of any potential impacts to migratory birds, including cumulative effects, the potential effects of spills, increased vessel traffic, chronic discharges, disturbance and disruption of activities, collision with structures, and attraction to operations;
- A description of any potential adverse impacts, mitigation measures, and proposed monitoring of mitigation measures for species listed pursuant to the *Species at Risk Act, Species at Risk (NWT) Act*, and the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC);
- A description on the limitations of any response and cleanup plan in completely mitigating the cumulative effects of an oil spill;
- The trans-boundary cumulative effects of an oil spill on migratory species such as marine mammals, bowhead and beluga whales, polar bears, and bird species;
- A description and identification and assessment of the potential impacts of ice breaking on sea ice habitat;
- A description, in the context of prevention measures, mitigation, and monitoring, of the management of wildlife attractants, attraction of wildlife (e.g., polar bears, and birds) to drill ships and vessels or the open water leads created by them, effect of noise from drill ships and marine vessels on the movement and behaviour on marine mammals (e.g., whales, bears, and seals) as a result of drilling and associated activities including ice breaking support and ice management, human-wildlife interactions, wildlife awareness and wildlife safety training for personnel;
- A description of any potential changes in the food web in relation to baseline;
- A description of any modifications to the marine habitats for fish, invertebrates and marine mammals with regard to their productivity, life cycles, migration, or local movements;
- A description of potential effects of the marine traffic on marine mammal individuals or populations, including;
    - risk of collision with other vessels,
    - disruption of activities (e.g., feeding, calving, movement, migration, etc.) and alteration of habitat,
    - ship strikes,
    - effect of noise on the behaviour and habits of marine mammals,
    - effect of increased turbidity on the feeding activities of marine mammals and other marine species,
    - effect of ballast discharge and the potential for the introduction of invasive species; and quantity and effect of discarded waste and litter; and
- A description of potential effects on the terrestrial environment and terrestrial wildlife from construction, operation and closure of shore-based facilities.

C2.4.4.4 A description of the effects on the human environment including:

- Any potential effects on human health associated with potential contamination of traditional foods including terrestrial and marine wildlife;
- Potential effects of intensified shipping and port activities on regional shipping networks, and commercial and recreational boating during construction and operation;
- Potential effects on wildlife harvesting, including a consideration of;
    - changes in harvester travel patterns resulting from increase vessel traffic,
    - disturbance of harvest patterns and harvest level, or loss or alteration of high-value harvest areas,
    - changes in the abundance and distribution of harvested resources,
    - changes to harvesting costs,
    - changes to harvest effort as perceived by harvester, and
    - changes in the quality of harvested species, including contamination that would adversely affect their consumption or sale;
- Effects on noise level at site boundaries and sensitive sites;
- Any potential effects on the physical and cultural heritage, and on archaeological resources;
- Any potential effects on the visual environment and the effects that change to the aesthetic quality will have on businesses which rely on the aesthetic and recreational interest of the area;
- Any effects of the Development on the recreational interest and potential of the area, including the steps that will be taken to maintain the recreational interest of the zones affected by the various components of the Development;
- Any potential effects on unique sites or special features, such as environmentally sensitive areas, reserves or protected areas; and,
- Any potential effects of the Development on other land uses.

C2.4.4.5 A description and evaluation of the potential effects of Development-related accidents and malfunctions on the environment, including impacts on social, economic or cultural (including heritage resources) elements of the environment and human health to people in proximity of spilled contaminants. Particular attention should be focused on sensitive components of the environment that could be affected in the event of an accident or malfunction, and that could potentially make the consequences worse (e.g., proximity of communities, natural sites of particular value, and concentrations of wildlife).

Where potentially significant impacts could occur as a result of an accident or malfunction, the Developer will consider assessing the probability of such an occurrence, taking into account weather or external events that present

contributing or complicating factors. In particular, the Developer will assess the risks for minor and major accidental releases of oil or other hydrocarbons.

As appropriate, the Developer shall also provide an analysis of the potential environmental effects of such releases on the marine and terrestrial environment and on human health within the spatial boundaries described. In conducting this assessment, the Developer will consider, without being limited to, the following points, as appropriate:

- Properties and volumes of oil, other hydrocarbons, and other chemicals and their behaviour during an accidental spill;
- Probability analysis of the likelihood of an accidental oil release;
- Modelling of the dispersion of oil and other hydrocarbons, including a description of the fate, behaviour, effects, and trajectory models used for spills on land or at sea, including any formulated hypotheses, accompanied by supporting documentation and the results of the modelling;
- Hydrologic trajectory models of oil spills to water shall be conducted across all seasons of active operations, including shoulder seasons when interactions with ice will need to be factored-in. All hydrologic trajectory models should be informed by the fate and behaviour characteristics for each of the petroleum products that have a potential for a spill to water as a result of an accident or malfunction; and
- An assessment of potential risks during navigation (e.g., vessel collisions or grounding)[4].

C2.4.4.6 A description of how chemicals to be used in the Development would be selected, how low toxicity alternatives were considered in the selection process, and, rationale for selecting chemicals if low toxicity alternatives are not considered.

C2.4.4.7 A description of the cumulative effects assessment, the Developer will consider, without being limited, to the following:

- Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VEC and VSC selected. The boundaries for the cumulative effects assessments will generally be different for the different VECs and VSCs considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding Development effects;
- Identify and justify the environmental components that will constitute the focus of the cumulative effects assessment, emphasizing this assessment on the VECs and VSCs most likely to be affected by the Development and other Developments and activities within the temporal and spatial boundaries selected;
- If a VEC and/or VSC approach is not used by the Developer, provide details on requirements to address potential impacts on all marine, terrestrial, and bird species including migratory birds (e.g., spills,

[4] Refer to Sections 3.8 and 3.15 of Transport Canada's publication, "TERMPOL Review Process 2001"

increased marine, surface, or air traffic, attraction to offshore platforms or lights, collisions with vessels, vehicles, crafts, and structures);

- Identify the sources of potential cumulative effects. Specify other past, present or reasonably foreseeable physical activities and Developments, including current and potential marine shipping, planned offshore exploration and development and current and planned onshore physical activities that could cause effects on each selected VEC or VSC within the boundaries defined, and whose effects would act in combination with the residual effects of the Development;
- A description of the mitigation measures that are technically and economically feasible. The Developer shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the Developer's responsibility that could be effectively applied to mitigate these effects, the Developer will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term;
- Determine the significance of the cumulative effects; and
- A description of the follow-up program to verify the accuracy of the assessment and to assess the effectiveness of associated mitigation measures for both project-specific and cumulative effects that are potentially significant or about which there is uncertainty.

C2.5 PREVENTION (HOW TO DRILL AND WORK SAFELY WHILE PROTECTING THE ENVIRONMENT)

C2.5.1 Factors to be addressed

- Design and operating limits of the proposed drilling system and support vessels
- Policies, procedures, and practices that would be used to modify operations as conditions approach, or are forecast to approach operating limits
- Hazard identification, risk assessment, risk management and mitigation measures
- Ice management
- Training and competency expectations
- Governance and bridge documentation
- Well control, including relief well
- Environmental and aquatic effects monitoring plan(s)

C2.5.2 Information required

C2.5.2.1 A description of features or aspects that would be considered hazards to the proposed Development activities including, but not limited to, the risks related to normal and abnormal operating conditions, ice encroachment, unmanageable or unmanaged ice, uncontrolled flooding of the installation,

loss of ballast control or stability, loss of station keeping control, pipeline leaks or ruptures, vessel collision, heavy weather, and difficulties with support facilities such as ice breakers, supply vessels, ice roads, aircraft or shuttle tankers.

C2.5.2.2 A description of how hazard identification and risk evaluation would be conducted.

C2.5.2.3 A description of hazards identified.

C2.5.2.4 A description of the policies, procedures, and practices to anticipate, prevent, mitigate, and manage such hazards.

C2.5.2.5 A description of ice management and other support activities that may be required for the drilling of the exploration wells, their capabilities and limitations including assumptions and methodology on how ice management and other support activities requirements were determined, the confidence in this determination, and how these assumptions, methodologies, and conclusions have been validated.

C2.5.2.6 A description of the policies, procedures, and training to secure the well when operating or design conditions are forecast to affect drilling operations or have the potential to affect safety and environmental protection.

C2.5.2.7 A description of the effectiveness and reliability of available methods for monitoring the condition and integrity of the well, well control, well capping, well containment, and relief well, including consideration of emerging technologies that could be used for the proposed Development.

C2.5.2.8 A description of the systematic, explicit, comprehensive, proactive and documented processes for the establishment of training, supervision and competency expectations requirements of personnel employees, operators, contractors, subcontractors, consultants, agents and other persons working on the Development, how such competencies would be assessed, and how any deficiencies would be corrected.

C2.5.2.9 A description of how a robust and effective culture to promote safety and protection of the environment would be implemented.

C2.5.2.10 A description of the governance and bridge documentation between the Developer and any drilling contractors, sub-contractors, service companies, marine services companies, and others services required in the undertaking of the proposed Development.

C2.5.2.11 A description of options for regaining well control including relief well, the criteria for selection, and their likely effectiveness and reliability.

C2.5.2.12 A description of the measures to anticipate, prevent, mitigate, and manage any well control situations and release of oil, gas, condensates, other chemicals or drilling fluids spills into the physical environment. The description should include the uncertainties in the calculations, such as; limited information and limited historical data on the hazards, limited information available regarding the likelihood of the equipment or technique for successfully regaining control of a well, limited experience within the industry of installing and operating the equipment or technique and limited experience within the industry of deploying such equipment or techniques in the Arctic deep water.

C2.5.2.13 A description of the Developer's capabilities, state of preparedness to respond to drilling accidents, spills, and malfunctions including consideration of emergency planning requirements, emergency response planning requirements, infrastructure, equipment, supplies, personnel, and training and competency needs.

C2.5.2.14 A description of oil spill countermeasures and response plans including adequacy, likely effectiveness, number and types of equipment, trained and competent personnel, policies and procedures, exercises, and incident management system in the event of an emergency situation or an out-of-control well condition.

C2.5.2.15 A description of the appropriate best practices for prevention, management, and mitigation of an event that might adversely affect safety, the environment, and traditional and cultural activities of the Inuvialuit.

C2.5.2.16 A description of how lessons learned from past events or near miss events in the Arctic offshore and elsewhere (including, but not limited to recent significant events such as the *Deepwater Horizon* - Macondo disaster in the Gulf of Mexico, the loss of the self-propelled *Ocean Ranger*, an out of control well and significant oil release into the Timor sea at the Montara site from the *West Atlas*) have been incorporated and used in the development of the proposed Development. A description of how these would be considered, evaluated, and updated in light of any new events, best practices, and lessons learned by the applicant, its joint venture partners, drilling contractors, service providers, support activities service providers, operations nationally and internationally, and by industry.

C2.5.2.17 A description of factors that affect human performance such as, cold, darkness, isolation, remoteness, monotonous work, and fatigue and how they have been considered in the design and operation of the proposed Development.

C2.6 PREPAREDNESS AND RESPONSE (RESPONDING EFFECTIVELY WHEN THINGS GO WRONG)

C2.6.1 Factors to be addressed

- Contingency plans and communication plan(s)
- Same season relief well plan
- Worst-case scenario
- Capping and containment equipment and personnel
- Incident management
- Oil, other hydrocarbons and other chemical spill countermeasures
- The effects from residual oil, other hydrocarbons and chemicals and potential for compensation
- Roles and responsibilities of all parties that may have a role in an emergency or spill preparedness and response situations
- For environmental emergency or spill response, use of Inuvialuit, northern and local wildlife monitors, inspectors, and contractors

C2.6.2 Information required

C2.6.2.1 The contingency plans that outline emergency response procedures (ERP) for oil, other hydrocarbons, and other chemical spills, procedures to be utilised when approaching or when forecasted to approach operating limits for the drilling system, relief well and other support activities such as personnel movement, re-supply, and transits.

C2.6.2.2 The contingency plans and ERP should also include all proposed emergency response exercises and how the results of these exercises will be incorporated into the ERP to improve emergency preparedness.

C2.6.2.3 The community communication plans in the event of an emergency situation that adversely affects the safety, environment, and traditional and cultural activities of the Inuvialuit.

C2.6.2.4 A description of any capping and containment equipment and personnel that would be deployed to secure the well or release source to reduce or minimize the amount of released hydrocarbons, and the effects of such releases to the environment, wildlife, and traditional and cultural activities of the Inuvialuit. The description should include details of the capping and/or containment equipment that would be proposed for use, any constraints and limitations on its use, details on arrangements of its availability if it is to be provided by a third party, where it may be located, timing, how it may be mobilized and deployed at the drilling location, and what support, logistics, and skilled personnel may be required for its deployment.

C2.6.2.5 A description of how incident management would be conducted in an emergency situation or when events have the potential to affect safety, protection of the environment, and traditional and cultural activities of the Inuvialuit.

C2.6.2.6 A description of the plans, policies, procedures, practices, training and competencies, exercises, and equipment for escape, evacuation, and rescue of personnel in these events.

C2.6.2.7 A description of oil and chemical spill countermeasures that would be available in the event of a release to the environment. Specifically, spill countermeasures should include:

- How any released oil, other hydrocarbons or chemicals would be detected and tracked;
- Forecast trajectory modelling with its capabilities, strengths and weaknesses, including details of the operator's capability in using real time wind and current data to implement an oil spill trajectory model both for open sea and for ice-infested areas;
- Required input to this trajectory modelling;
- Remote-sensing to be used to detect and track the released oil, other hydrocarbons or chemicals, particularly in and under ice and for prolonged periods (several months);

- An outline of the plans and procedures for spill removal, in-situ burning, and use of spill treating agents such as dispersants and chemical herders and how and when such agents might be applied;
- A description of the storage, management, handling, and use of such chemicals including storage in cold weather conditions, any changes to chemical's effectiveness should it be frozen or be exposed to conditions outside of the manufacturer's specified conditions, and safety and precautions to be used in handling;
- A description of an air quality assessment to account for an *in-situ* burn option, including quantities of emissions associated with the burn. The parameters should include, but not be limited to, greenhouse gases, nitrogen oxides, sulphur oxides and volatile organic compounds, particular matter, and air toxions. Dispersion and deposition modeling should be conducted in order to estimate ambient air quality concentrations and expected deposition loading, and residual by-products in the marine environment;
- How a Net Environmental Benefits Analysis (NEBA) would be done to select appropriate spill countermeasures and endpoints;
- A description of the efficiency, and efficacy of any spill countermeasures to be used including;
    - what equipment is at hand and the skill and competence of the people involved,
    - how much equipment and how many skilled and competent people involved would be at hand or mobilized,
    - the effectiveness of such equipment and people in the conditions expected to be encountered at the relevant locations for any spill countermeasures,
    - management systems and process that would be in place to prevent any unauthorized modifications to any of the critical countermeasures equipment or procedures,
    - the Developer's ability to respond to spills in the off-season, with regard to the actual geography and transit paths to and from the drill site,
    - the limits the planned installations and other Arctic conditions pose to ice breaking equipment, and,
    - how response to spills are anchored in proven clean-up technologies;
- A description of the industry and oil spill response organization's ability to retrieve spilled oil in frozen, broken and refreezing ice conditions, high wind, high seas, ice fog and other Arctic conditions that limit ability to deploy spill response techniques;
- A description of the availability of equipment, personnel, and infrastructure at the drilling or spill location;
- A description of what people, equipment, infrastructure, and support may be envisioned as needed from local, regional, national, or international organizations, including details of any mutual aid

agreements, agreements with oil spill response organizations, and any reliance on international, national, provincial or territorial, regional or local government departments or agencies;

- A description of the training and readiness of the Inuvialuit to participate in any oil spill situation.

C2.6.2.8 A description of NEBA examples for the Development drilling location and valued ecosystem components at the start, middle and end of an open water drilling season that compares response options such as containment and recovery, in-situ burning, and aerial, source, or subsea dispersant application as well as the methodology used, factors considered, conclusions reached, and results of the NEBA.

C2.6.2.9 A description of roles and responsibilities of all parties that may have a role in the emergency and any spill response situation.

C2.6.2.10 A description of incident reporting requirements to government regulators, departments, and response agencies.

C2.6.2.11 A description of how Inuvialuit and local wildlife monitors, inspectors and contractors would be deployed during incident response, their independence and ability to observe and report any situation that might be of concern to northerners' regarding safety, protection of the environment, wildlife, and traditional and cultural activities.

C2.6.2.12 A description of the operator's accountability and responsibility for all authorized activity, for stopping any flow of hydrocarbon, for containing any releases, for cleaning up the environment, and for compensation for any losses, a description of the policies, procedures, and practices that would be used in an expeditious manner, particularly for loss of wildlife harvesting and traditional and cultural activities.

C2.7 CLEANUP AND COMPENSATION

C2.7.1 Factors to be addressed

- Post-operation reclamation, abandonment and clean-up activities
- State of knowledge of long-term adverse environmental effects of Arctic spills
- Post-spill clean-up and reclamation activities
- Financial viability and financial responsibility

C2.7.2 Information required

C2.7.2.1 A description of the policies, procedures, and practices that would be in place to clean up the environment and compensate the Inuvialuit and other affected parties for loss of wildlife harvesting and traditional and cultural activities.

C2.7.2.2 A description of the policies, procedures, and practices that would be in place to compensate the Inuvialuit and other affected parties for the worst-case scenario, how they would be developed and communicated to the Inuvialuit, and changes to these as a result of changing situation and circumstances.

C2.7.2.3 A description of how the financial viability and financial responsibility, required by the IFA ss.13(13), would be determined, which financial instruments would be used to satisfy the statutory and regulatory requirements, when these instruments would be in place, and how long such instruments would be in place after the completion of any authorized activity.

C2.8 MANAGEMENT OF CHANGE

C2.8.1 Factors to be addressed

- Anticipated changes between submission of the EIS and the time of proposed drilling activities
- How these anticipated changes would be addressed in policies, plan, procedures and practices
- Management of change for contingency plans
- Communication of management of change

C2.8.2 Information required

C2.8.2.1 A description of how any changes from the time of submission to the time of the proposed drilling activities, including but not limited to, changes in the physical environment (meteorological-ocean-ice attributes), biological environment (e.g., marine mammals, fish, and birds), advances in technology and practices, safety and environment culture, and statutory and regulatory changes, would be accounted for and addressed in all policies, plans and procedures.

C2.8.2.2 A description of how the well control plans; oil and chemical spill response plans; escape, evacuation and rescue plans; and other contingency plans would be updated and revised in light of any lessons learned, weakness in the plans and systems, changes in the availability, status, and effectiveness of key safety, emergency response, and environmental protection equipment and personnel, and changing physical environment conditions.

C2.8.2.3 A description of management of change policies, procedures, and practices that encompass all aspects of the proposed Development and includes how these would cascade to drilling contractors, sub-contractors, service providers, and others who may be supporting the proposed Development were it to be approved.

C2.8.2.4 A description of how all the above would be effectively communicated internally, and externally to regulators, government departments, and to northerners.

C2.9 OPERATIONAL MONITORING AND FOLLOW-UP

C2.9.1 Factors to be addressed

- Monitoring of suspended or abandoned well(s)

- Ongoing collection and communication of environmental baseline data

C2.9.2 Information required

C2.9.2.1 A description of how the integrity of suspended well(s) or abandoned well(s) would be monitored and remedial action initiated and completed if there is any risk to safety, environment, wildlife, and traditional and cultural activities of the Inuvialuit.

2.9.2.2 A description of the state of knowledge of long-term impacts of a spill on the unique Arctic environment, way of life, and communities in the ISR, adjacent areas of Yukon and the U.S. side of the Beaufort and Chukchi Seas and Alaska.

C2.9.2.3 A description of how ongoing environmental data would be acquired and shared during any authorized activity, and following the completion of the proposed Development.

SECTION D SAME SEASON RELIEF WELL, WORST CASE SCENARIO AND WILDLIFE COMPENSATION

D1 SAME SEASON RELIEF WELL POLICY

D1.1 INTRODUCTION

D1.1.1 The Developer has requested a review and ruling from the NEB[5] on the Developer's proposal for Same Season Relief Well (SSRW) equivalency. The Developer is proposing to use best technology available and apply the best safety practices that would provide an equivalent level of safety and environmental protection as same season relief well capability. Accordingly, in advance or in the absence of any decision regarding SSRW equivalency, the following information on the proposed approach by the Developer for SSRW equivalency will be critical in providing the EIRB with the necessary information to fulfill its responsibilities in establishing liability and compensation by the Developer based on the worst case scenario.

D1.2 INFORMATION REQUIRED

D1.2.1 A description of how the Developer would prevent a well, that it plans to drill, from going out of control. This would include, but not be limited to:

- What information the Developer would need to plan a well;
- Any gap or uncertainty in the information available to plan a well;
- How the well would be planned, designed, and constructed;

[5] The NEB's SSRW policy for the Canadian Arctic offshore, outlined in the NEB's *"Filing Requirements for Offshore Drilling in the Canadian Arctic*" *s.4(17)(c)*), states that the applicant must demonstrate, in its Contingency Plan, the capability to drill a relief well to kill an out-of-control well during the same drilling season. The intended outcome of this policy is to minimize harmful impacts on the environment.

- Oversight, validation, and verification that the well is planned and designed to the highest standard for safety, protection of the environment, and conservation of the oil and gas resources; and,
- A description of the reliability of the equipment and procedures, redundancy of equipment, and availability of sufficient number of trained, competent, and skilled personnel.

D1.2.2 A description of how the Developer would construct the well as designed, and how the Developer would monitor and assess well progress, operating conditions, well integrity, drill ship and well drilling and control systems conditions, and forecast conditions for continued operations that are safe and protect the environment.

D1.2.3 A description of the Developer's contingency plans and how it would manage any situations that may result in the well going out of control, and how the Developer would bring that well under control.

D1.2.4 A description of how the Developer would undertake same well intervention particularly in situations when the well or wellhead is damaged, has debris, and when the drill ship and/or personnel operating them have been damaged and would not be able to undertake safety critical or routine operations.

D1.2.5 A description of the Developer's plans to drill a relief well as it works to bring the out of control well back into control. This would include plans to drill a relief well in its normal operating window as well as in late season conditions with weather and ice conditions that would be beyond the normal operating limits.

D1.2.6 A description of how the Developer would accomplish the completion of a relief well in the same season in which it has gone out of control. This should include drilling system capabilities to achieve this outcome, support and ice breaking and ice management required to successfully complete the relief well and to kill an out of control well, and a time table of doing so.

D1.2.7 A description of any capping and/or cap and flow (containment) equipment and personnel that would be deployed to ensure that the source of any oil pollution is first secured, and any release is effectively contained and collected near the source of the discharge as quickly as possible to reduce or minimize the amount of released hydrocarbons and the effects of such releases to the environment, wildlife, and traditional and cultural activities of the Inuvialuit, despite any conditions to the contrary in the Well Authorizations and Approvals, including:

- Any constraints and limitations on its use;
- Information demonstrating how the well has been designed and constructed so that the deployment and use of a capping and/or cap and flow equipment would maintain well integrity and not result in any adverse conditions including any sub-surface or formation blow out or flow outside the casing to the surface;
- Arrangements of its availability if it is to be provided by a third party;
- Where it may be located;
- How it may be mobilized and deployed at the drilling location together with support, infrastructure, and a timetable for doing so; and,

- What support, logistics, and skilled personnel may be required for its deployment.

D1.2.8 Should the Developer propose an alternative to same season relief well capability, the EIRB requires a full description of the alternative and its anticipated performance in the event of a spill and a demonstration of how the proposed approach would achieve the desired outcome, particularly in adverse environmental conditions that may be worsening and reaching the operating limits of the drilling system:

- If the alternative is based on singular reliance on same well intervention, a description of how capping will affect the risk of increasing pressure inside the well with the potential risk of bursting either the rupture disks or the outermost casings;
- If the alternative proposes an acoustic backup system to activate the same well intervention[6], this section should require a description of how salinity and temperature stratification of water layers due to Mackenzie River outflow and/or ice melt, natural and man-made ice breaking noise, and underwater noise from support and ice management vessels will affect the transmission of the acoustic signal to the countermeasures when installed in deep water; and
- If the alternative proposes singular reliance on same well intervention, a description of the ability of a drilling unit to drill its own relief well after losing well control, where damage to the wellhead and/or blowout preventer precludes same-well intervention techniques due to risks to personal safety is required or inability to initiate, continue, or complete the necessary tasks.

D1.2.9 A description of the full extent of spill mitigation measures that will be available to operators in the case of an uncontrolled blowout; in explaining these mitigation measures, the Developer must disclose the full extent of limitations that might exist for deploying each of these measures such as wind and wave conditions, meteorological conditions, ocean currents, ice cover and temperature. The description should also include information on equipment and personnel available at the drill site, those that would be accessed regionally, and that which may require mobilization from other regions, from mutual aid or cooperative agencies and from contracted oil spill response organizations.

D1.2.10 A description of how the inadequacy, ineffectiveness, and the unavailability of effective oil spill countermeasures, lack of infrastructure, limited number of suitable equipment and personnel, and other limitations identified in the U.S. National Research Council's April 2014 report titled *Responding to Oil Spills in the U.S. Arctic Marine Environment* would be addressed.

D1.2.11 A description of the technological methods that the Developer plans to have available for responding to an uncontrolled blowout. When describing these technological methods, the Developer must disclose where the methods were

[6] Pursuant to the October 2010 Bureau of Offshore Energy Management Regulation Enforcement - *Drilling Safety Rule*

developed, if they have been used in the field previously, if they have been tested under Arctic conditions, if the Developer has performed drills to deploy these technologies under realistic operating conditions.

D1.2.12 The plans for ensuring redundancy in operating and emergency response capabilities - redundancy must also be demonstrated to ensure that if any planned safety or emergency measures fail upon initial deployment, the Developer will be able to deploy secondary or even tertiary measures to ensure safety and mitigate any possible negative environmental impacts.

D2 WORST CASE SCENARIO AND WILDLIFE COMPENSATION

D2.1 INTRODUCTION

D2.1.1 The EIRB, pursuant to paragraph 13(11)(b) of the IFA, must prepare an estimate of the potential liability of the Developer, determined on a worst case scenario, taking into consideration the balance between economic factors, including the ability of the Developer to pay, and environmental factors. Although recognizing that defining the worst case scenario for this Development involves regulatory authorities[7] and Inuvialuit bodies other than the EIRB[8], the EIRB requires the following information relating to the worst case scenario to adequately conclude on potential environmental impacts, temporal and spatial boundaries of the event and direct impacts on the Inuvialuit's ability to harvest wildlife resources.

D2.2 INFORMATION REQUIRED

D2.2.1 A description of the process used to develop the worst case scenario including information concerning the consultation with the Inuvialuit.

D2.2.2 A description of the worst-case scenario including:

- The expected flow rate of oil escaping during an uncontrolled blow out, and the maximum duration for such flow;
- Chemical and physical characteristics of oil likely to escape during an uncontrolled blow out;
- Modelling used for an uncontrolled blow out under conditions that will actually provide for a "worst case";

[7] The NEB *"Filing Requirements for Offshore Drilling in the Canadian Arctic" s.4(18)(4)* requires a "Description of the worst case scenario, including but not limited to an adequate and credible estimate of the amount of oil that could be spilled from a subsea well blowout - including the maximum daily flow or release rate, the cumulative release volume, maximum duration such oil could flow, pore pressure and formation information, pressure/flow rate data underpinning such estimates, oil characteristics and properties of the oil likely to escape during an uncontrolled event, the amounts that can remain suspended in the water column or settle and be inaccessible to all of the proposed countermeasures, and the prospective location of the inaccessible oil in the case of dispersant use and in the case that no dispersants are used".

[8] Reference the "Beaufort Sea Steering Committee Report. Volume 2 - Report of Task Group One: Worst Case Scenario. April 1991"

- Physical environmental factors likely to affect spill rate and spill dispersion such as presence of ice, waves, water temperature, ocean currents, and wind direction and velocity;
- Factors that could exacerbate the scope and effects of an uncontrolled blowout such as timing;
- Capacity of the oil spill countermeasures to cope with the release volumes particularly in conditions beyond the effective operating limits of the countermeasures and available numbers;
- Maximum geographic area impacted under a worst case scenario, including not only impacts to land, but also impacts to the entire biophysical environment; and,
- A description of any long term impacts due to the presence of oil and other chemicals associated with drilling, mitigation, spill dispersal, and/or in situ burning that may occur; this identification should include likely impacts to critical species in the Arctic food chain in the entire water column, it should also include a discussion of impacts up the entire food chain, both short and long term.

D2.2.3 A description of the percentage of time when no response is possible during the operating season months, due to presence of ice, weather, sea state (lack of wave action for mixing dispersants), temperature, wind chill, ice, visibility due to darkness, fog and precipitation, or a combination of those factors.

D2.2.4 Contingency and management plans to prevent damage to wildlife and its habitat and to avoid disruption of harvesting activities as a result of the Development, and, if damage occurs, to restore wildlife and its habitat as far as is practicable to its original state and to compensate hunters, trappers and fishermen for:

- Loss or damage to property or equipment used in wildlife harvesting or to wildlife harvested;
- Present and future loss of income from wildlife harvesting; and,
- Present and future loss of wildlife harvested for personal use or which is provided by participants to other participants for their personal use.

D2.2.5 A description of the methodology of determining the compensation amounts for: stopping the flow; for containing the released volumes; for clean-up of the affected environment; and for compensation for current and future hunting, fishing, and harvesting opportunities including restoration and reclamation of the wildlife habitat.

D2.2.6 A description of the financial viability and responsibility to account for actual wildlife harvest loss including loss in the worst-case scenario for reduction in hunting, trapping or fishing income for those Inuvialuit who depend on that income as part of their gross income; any material reduction in wildlife take or harvest for those Inuvialuit who harvest for subsistence purposes; as well as remedial measures including cleanup, habitat restoration and reclamation.

Section E SOCIO-ECONOMIC INFORMATION

E1 SOCIO-ECONOMIC IMPACTS AND BENEFITS

E1.1 INTRODUCTION

E1.1.1 As noted above, the EIRB must prepare an estimate of the potential liability of the Developer determined on a worst case scenario. In assisting the EIRB at arriving at conclusions and recommendations regarding this estimate, the EIRB will require the following information from the Developer regarding the socio-economic environment and the potential socio-economic impacts from the proposed Development particularly under worst case scenario conditions.

E.1.1.2 As the EIRB Panel's Decision Report will be submitted to governmental authorities competent to authorize the Development, if the EIRB concludes that any of the effects are significant, governmental authorities may be required to justify potential significant effects. The information used as the basis for this justification will be of critical importance to the Inuvialuit and Inuvialuit communities within the ISR. Accordingly, in addition to describing the socio-economic environment and potential socio-economic impacts under worst case scenario conditions, the EIRB will require information on the social and economic benefits accorded to the Inuvialuit and their communities resulting from the Development.

E1.2 INFORMATION REQUIRED

E1.2.1 A description of existing and projected population densities and distributions in the region, including resident populations and transient populations.

E1.2.2 A description of present and future use of land and resources, including:

- Cultural and traditional use;
- Commercial wildlife harvesting;
- Infrastructure and services;
- Housing; and,
- Recreation and tourism.

E1.2.3 A description of the socio-economic impacts, both positive and negative, by the Development on Inuvialuit communities and on the Inuvialuit population in the ISR.

E1.2.4 A description of existing community services (e.g., police, health care, fire, ambulance, social services, recreation, basic infrastructure, justice, commercial, retail and industrial services) and the effects of the Development on these services, particularly under worst case scenario conditions.

E1.2.5 A description of the proposed mitigation measures to eliminate or reduce negative socio-economic impacts from the Development, particularly under worst case scenario conditions.

E1.2.6 A description of the local and regional economies, including a profile of the local labour force and labour market conditions, a description of the existing labour pool and unemployment rates, particularly as they relate to the types of

jobs which will be created by the Development, both during construction and at the operations stage.

E1.2.7 A description of training initiatives and employment opportunities for the Inuvialuit and Inuvialuit communities during all phases of the Development for both offshore and onshore.

E1.2.8 A description of any additional social and economic benefits, either direct or indirect, from the operations and abandonment phases of the Development.

Section F DEFINITIONS

As noted above, these Terms of Reference are, in addition to satisfying the requirements of the IFA, also drafted to the extent possible, to satisfy the requirements of the CEAA 2012. The following definitions are provided, therefore, to assist in comparing certain terms applicable and pursuant to the IFA to the same or similar terms found in CEAA 2012:

"Environmental effects" means the environmental effects as described in the EIRB's 'Environmental Impact Review Guidelines' dated April 29, 2011.

In considering the requirements of CEAA 2012, the definition of environmental effects noted above is considered, for these Terms of Reference, to be inclusive of the definition of environmental effects set out in Section 5 of the CEAA 2012.

"Development" may include physical activities in the ISR that consequently may be a "designated project" pursuant to the *Regulations Designating Physical Activities* under the CEAA 2012.

"Developer" has the same meaning as "proponent" under the CEAA 2012.

"Mitigative and Remedial Measures" includes "mitigation measures" as defined under the CEAA 2012.

"Environment" in these Terms of Reference has the same meaning as "environment" found in CEAA 2012.

"Human Environment includes socio-economic conditions, which are the components of an individual, family or community's economic activity, social relations, well-being and culture".

"Environmental Impacts" include impacts on the Environment and the Human Environment.

"Net Environmental Benefit Analysis" (NEBA) is a methodology for comparing and ranking the net environmental benefit associated with multiple management alternatives. Net environmental benefits are the gains in environmental services or other ecological properties attained by actions, minus the environmental injuries caused by those actions, and ranking risks in order to prioritize courses of action and/or outcomes[i].

[i] Efroymson. R.A., J.P. Nicolette, and G.W. Suter II. A Framework for Net Environmental Benefit Analysis for Remediation or Restoration of Petroleum Contaminated Sites. Oak Ridge National Laboratory. January 2003