

Honourable Clyde Jackman
Minister

June 18, 2007

GUIDELINES

for

ENVIRONMENTAL IMPACT STATEMENT/ COMPREHENSIVE STUDY REPORT

NEWFOUNDLAND & LABRADOR REFINERY PROJECT

Proponent: Newfoundland and Labrador Refining Corporation

INTRODUCTION

The Newfoundland and Labrador Refining Corporation is required through the provincial environmental assessment process to prepare an Environmental Impact Statement (EIS) for the Newfoundland and Labrador Refinery Project. The purpose of the EIS is to identify the potential environmental effects associated with the proposed undertaking, identify appropriate mitigative measures and predict the significance of residual and unmitigable effects. Component Studies will be carried out to address baseline information for particular Valued Ecosystem Components (VECs). The EIS will contain a review of all available pertinent information as well as such additional new information or data as provided by the proponent or requested by the Minister of Environment and Conservation. The contents of the EIS will be used by the Minister of Environment and Conservation, in consultation with Cabinet, to determine the acceptability of the proposed project based on its anticipated environmental effects, proposed mitigation, and significance of residual environmental effects. The EIS will be as concise as possible while presenting the information necessary for making an informed decision.

The undertaking is also subject to environmental assessment that will meet the requirements of the Canadian Environmental Assessment Act (CEAA) through a Comprehensive Study Report (CSR). Transport Canada (TC) is the Principle Responsible Authority (RA) for the CEAA assessment. Fisheries and Oceans Canada (DFO) is also a RA for the undertaking while Environment Canada, Health Canada and Natural Resources Canada are Federal Authorities (FA) who are providing expert advice to TC and DFO on the federal environmental assessment.

As more specific information is provided and as additional baseline information is gathered, other concerns and potential effects may be required to be considered by the Minister as recommended by the Environmental Assessment Committee.

The proponent is required to hold public information sessions on the environmental assessment results in the communities of North Harbour, Come-by-Chance, Sunnyside and Arnold's Cove. The proponent should also consider the desirability of a public information session in a larger centre such as Clarenville and/or St. John's.

The purpose of the Guidelines is to assist the proponent in completing an EIS/CSR which conforms to legislative requirements and to address information requirements that will assist in making an informed decision on the undertaking. The contents of the EIS/CSR should be organized according to the following format and address the identified information requirements:

1. EXECUTIVE SUMMARY

The executive summary will contain the following information: identification of the proponent; a project overview; predicted environmental effects (both biophysical and socio-economic); mitigative measures; residual environmental effects; cumulative environmental effects; an outline of the component studies completed; proposed monitoring programs and response plans and a summary of the fundamental conclusions

of the EIS/CSR. The summary will allow reviewers to focus immediately on areas of concern.

The summary will be written in terms understandable to the general public and it will include a Table of Concordance which will identify where specific Guideline requirements are addressed in the EIS/CSR.

2. INTRODUCTION

2.1 *Name of Undertaking*

The undertaking has been assigned the Name “Newfoundland and Labrador Refinery Project.” The proponent should identify the name which it proposes to use for the undertaking.

2.2 *Identification of Proponent*

Name the corporate body and state the mailing address.

Name the chief executive officer and state the official title, telephone number, fax number and e-mail address.

Name the principal contact person for purposes of environmental assessment and state the official title, telephone number, fax number and e-mail address.

2.3 *Purpose of the Environmental Impact Statement*

The purpose of the Environmental Impact Statement/Comprehensive Study Report is to report on the results of the process by which the change in the present or future environment that would result from an undertaking is predicted and evaluated before the undertaking has begun or occurred.

3. THE PROPOSED UNDERTAKING

3.1 *The Prospective Site and Study Area*

A precise description of the boundary of the prospective site is to be presented, accompanied by maps of an appropriate scale showing the entire area of each alternative with:

- principle structures and appurtenant works
- shipping and marine traffic
- types and quantities (ha) of habitat to be disturbed

The information on the boundary and extent of the project area is to be considered for a digital form on computer discs in a format suitable for incorporation in a Geographic Information System (GIS). Maps should be at a 1:50,000 scale and possibly in ARC shape format. As a minimum, the information is to consist of sufficient number of geographic coordinates of point locations, line locations and/or spatial extent, as appropriate, of the features at the selected map scale and projection to either re-create the hard-copy versions provided as part of the EIS/CSR or to accurately display the features digitally. (Information already available on the National Topographic maps need not be provided.) The information must be organized and labeled such that each unique feature is distinguishable from all others. Appropriate descriptive parameters of each data set such as projection, UTM Zone, datum and data collection method (e.g., GPS, aerial survey, etc.) must also be included. The format should be in ASCII tabular format or in a spreadsheet or database format such as Lotus 1-2-3, Excel, dBase or similar software.

3.2 *Rationale/Need/Purpose of the Project*

The rationale for the project will describe its perceived benefits, both local and provincial. If the undertaking is in response to an established need, this should be clearly stated.

3.3 *Alternatives*

3.3.1 *Alternatives to the Project*

This section will describe functionally different ways to meet the project need and achieve the project purpose. The discussion shall address, but not necessarily be limited to, the null (do nothing) alternative.

3.3.2 *Alternative Methods of Carrying Out the Project*

This section will detail the process the proponent undertook to determine potential sites, alternative processing options and plant design, waste management alternatives and environmental protection opportunities. The proponent's public consultation process will be described and relate the project alternatives to the results of the consultations.

A detailed discussion of technically and economically feasible alternatives, and the biophysical and socio-economic selection criteria (e.g., habitat alteration, construction costs, operation and maintenance savings, technical factors, employment and training) for the alternatives will be provided. The discussion will include, among other things, location, design, construction standards, maintenance standards, watercourse crossings, etc., which were or could have been considered. The discussion should also take into account the respective alternative energy and water requirements, together with the alternative's effects on the generation of emissions, effluents and wastes.

If only one alternative is viable or possible, a statement will be made to this effect with supporting argument. Additional information on any alternatives which may have been considered and rejected, but which may still be regarded as viable should be provided. State reasons for the rejection of those alternatives.

3.4 Relationship to Legislation, Permitting, Regulatory Agencies and Policies

The EIS/CSR will identify and discuss the project within the context of all existing relevant legislation and policies (municipal, provincial and federal). The proponent will provide a comprehensive list of permits and regulatory approvals required for the undertaking. The list will include the following details:

- activity requiring regulatory approval
- name of permit and/or regulatory approval (e.g. authorization).
- legislation requiring compliance
- regulatory agency

3.5 General Project Description

The EIS/CSR will describe the scope of the project for which an assessment is being conducted.

The EIS/CSR will provide a written and graphic description (e.g. maps and drawings) of the physical features of the undertaking particularly as it is planned to progress through the construction and operation phases of its lifespan. The description should also address other phases of the project as can reasonably be foreseen, including modification, decommissioning and abandonment. Any assumptions which underlie the details of the project design shall be described, including effects avoidance opportunities inclusive of pollution prevention, and adherence to best management practices. Where specific codes of practice, guidelines and policies apply to items to be addressed, those documents shall be cited and included as appendices to the EIS, including mapping at an appropriate scale. Physical features include, but are not limited to:

- access road(s), including the North Harbour access road if being seriously considered, and intersections, including those which may require upgrading, as well as service roads
- lighting
- stream crossings, including culverts, bridges and fording sites
- temporary stream diversions
- temporary construction camp(s), laydown areas
- borrow pits and major excavations
- temporary sewage and waste disposal facilities
- methods of handling waste and refuse at work and camp locations
- refinery infrastructure, including process facilities, crude and product storage tanks, oil/water separation, dyking, pipelines/conveyors and utilities (including water supply,

- water treatment, discharges, generation, co-generation, steam plant, transmission lines, desalination plant and associated physical works)
- support buildings, including but not limited to, administrative and engineering offices, warehouses, maintenance buildings and laboratory
- marine infrastructure, including causeway, access trestle, jetty (phase 1), jetty expansion (phase 2), berthing, heavy construction dock, product transfer facilities and anchorage(s)
- effluent treatment plant components, as well as effluent discharge locations and configuration and including anticipated effluent plume(s).
- shipping and marine traffic

3.6 Construction

The details, materials, methods, schedule, and location of all planned construction activities related to the physical features will be presented including estimates of magnitude or scale where applicable. This is to include but not be limited to, the following:

- general construction practices incorporating erosion and sedimentation control construction schedule, including proposed time frames for right-of-way clearing, slash disposal, construction adjacent to watercourses, utility placement, processing and storage facilities and marine infrastructure
- construction camp operation, including solid waste disposal and disposal of construction waste, as well as identified opportunities for waste recycling
- site preparation (i.e., grubbing/clearing of right-of-way, cut and/or fill operations, etc.)
- water body alteration: a 15 metre undisturbed buffer along the high water mark of all fresh and marine water bodies must be maintained. Identify any alterations that must be carried out in the water or within buffer areas, such as for docks, marine works, water supply intakes, stream crossings, storm drainage works or infilling and any stream activities
- stream crossing structures: location of watercourse crossings for access and service roads, transmission lines, as well as pipeline crossings (specifically Come by Chance River), their proposed infrastructure (e.g., bridge, culvert), and their proposed specifications (e.g., clearance from watercourse, height, width, length, diameter, and construction materials); infill area or footprint together with design criteria and standards, length, width, cross section and estimated types and amount of fill material required
- electrical systems: location of substations, transmission and method of providing external cable transport mechanisms whether aerial or buried
- inventory all significant emissions during construction, including but not limited to sources from heaters, boilers, vents, storage tanks, stockpiles, ponds, basins, vehicles, road surfaces, cooling towers, effluent treatment systems, mobile sources and vessels idling at dock. Provide a description of how the emission inventory was derived (i.e., emission factor references).
- excavations
- blasting operations
- vehicle types, truck routes, hours of operation of vehicles

- the type, size and frequency of support, carrier and dredging vessels involved in construction of the infrastructure of the refinery
- transport, storage and use of hazardous materials, fuels, lubricants and explosives
- establishment, operation and removal of construction camp and yard areas including their water, sewage and food handling provisions
- measures to be employed to prevent project workers from setting up “residences” in roadside/gravel pit camping areas.
- sources and estimated volumes of acceptable types of aggregate and pit-run material with identification of any currently known sources likely to be used
- disposal areas for excess/waste rock and overburden, including locations of any currently known or planned disposal sites
- disposal areas for organic soil, slash, grubbing and wood fibre, including locations of any currently known or planned disposal sites
- removal of temporary operations
- site rehabilitation and monitoring

In order to properly assess the socio-economic impacts in the region specific information on the 3,000 construction jobs will be detailed. Specific numbers by National Occupational Classification (NOC), gender and employment equity considerations, period of employment, as well as an indication of the proportion of these positions which may normally be filled by local area contractors will be provided. Identify any measures to be implemented that may require contractors and sub-contractors to include employment equity considerations. Initiatives for the hiring of journeymen, apprentices, engineering and technology students during construction and also those initiatives to increase opportunities for under-represented groups will be described. Under-represented groups are to be identified through both census data demographic characteristics and labour force data for census subdivisions in the employment catchment area. Provide an analysis of the availability of the skilled workforce necessary to complete the project and how any shortages in skilled trades may be addressed through such measures as training initiatives and skills upgrading. Ideally, the description must identify any corporate hiring objectives, quantitative and qualitative goals, special measures and policies; monitoring of compliance with objectives, goals, measures and policies; and provide for a communication plan and any required re-evaluation process of objectives, goals, measures and policies.

3.7 *Operation and Maintenance*

All aspects of the operation and maintenance of the proposed development will be presented in detail, including information on operation and maintenance positions by occupation identified by NOC Code, gender and period of employment. Operation includes, but is not limited to, product delivery, product processing, product export and waste handling (including any options for disposal at sea).

As part of the operational details a complete description of all planned vessel traffic must be included. Vessel traffic both approaching and leaving Placentia Bay, within Placentia

Bay shipping lanes, anchorage plans and frequencies, vessel sizes and types and vetting systems to be employed must be described. In particular, traffic within the vicinity of the marine component of the Cape St. Mary's Ecological Reserve must be included and mapped showing the proximity of vessel traffic to the marine component. The EIS/CSR should demonstrate that the pertinent authorities (e.g., Placentia Bay Traffic Committee, Atlantic Pilotage Authority, etc.) have been consulted regarding the provision of necessary infrastructure and administrative support for vessel traffic and anchorage.

Inventory all significant emissions during operation, including but not limited to, sources from heaters, boilers, vents, storage tanks, stockpiles, ponds, basins, vehicles, road surfaces, cooling towers, effluent treatment systems, mobile sources and vessels idling at dock. Emissions from on-site thermal generation of supplied power must be incorporated if such a power source is being considered. As part of the inventory provide emission estimates that may result from upset conditions, including duration of the upset conditions. Include a description of how the emission inventory was derived (i.e., emission factor references).

From the inventory of emissions, separately identify expected greenhouse gas emissions from all project components and activities and identify the best available and economically achievable technologies (BATEAs) and best management practices (BMPs) to be employed to reduce greenhouse gas emissions. The Greenhouse Gas (GHG) footprint should be described by providing an emission breakdown for each project component as well as a comparison with alternative technologies. Provide a review structure whereby emission reductions can be achieved as improved BATEAs and BMPs become available.

All sources of effluent must be identified and characterized, including handling methods, flow rates and treatment efficiencies for each component of the treatment plant. Effluent includes, but is not limited to, process effluent (from process and cooling water), stormwater, bilge water, ballast water, sewage and surface runoff. Estimated annual quantities of each effluent must be provided. Include details of effluent treatment plant maintenance planning and how maintenance scheduling or available redundancies enable all or part of the plant to be inspected and maintained. Cleaning methods and residue disposal must also be described. In addition proposed sampling parameters and schedule must be provided for discharges.

Provide detailed estimates of energy consumption profiles on an annual and daily basis including peak and average requirements. In particular, indicate electricity consumption forecasts and the planned onsite generation versus purchased electricity split. Energy efficiency technologies such as co-generation combining electricity and steam production, combined cycle and other such approaches must be fully outlined.

Detail the means of handling and storage for sulphur recovered from processing and for coke produced by the delayed coker, including the form in which it will be handled and how the product will be stored and transferred to bulk carriers for sale and/or disposal.

Fully describe chemical storage facilities indicating how chemicals, reagents, catalysts and other potentially hazardous or toxic materials are to be handled, stored, segregated and contained. Identify chemicals by their Chemical Abstract Service Registry Number (CASRN) together with associated quantities, characteristics and toxicities.

Include in operational details water use for non-domestic purposes, including water used in any desalination process contemplated. Provide water withdrawal requirements throughout the year in consideration of hydrology of ponds and supporting watersheds and the ability of the basin to support daily demand and recharge throughout the year. Identify water level variations in ponds as a result of water extraction throughout the year. Also identify water withdrawal requirements throughout the year from the marine environment. Include details on the intake structure (design details, size of fish screens) and proposed dams. If any conservation or technology measures are to be employed they should be identified.

Include information on any food handling provisions during both construction and operation as well as disposal provisions for associated wastes.

Initiatives through such measures as training initiatives and skills upgrading for the hiring of journeypersons, apprentices and engineering and technology students during operation and maintenance, as well as initiatives to increase opportunities for under-represented groups in occupations in which they are under-represented will be described. Under-represented groups are to be identified through both census data demographic characteristics and labour force data for census subdivisions in the employment catchment area.

Identify the refinery's potential initiatives for employee well-being through such things as recreational facilities, Employee Assistance Program and accommodation for childcare and homecare responsibilities. In order to gauge the adequacy of recreational opportunity and childcare and homecare provide an assessment of off-site facilities and services where those facilities and services will not be available on-site.

Identify the operational emergency response, safety and fire fighting facilities as well as preventative operating practices and support services. This will include on-site as well as regionally supplied training and preventative measures.

Maintenance includes, but is not limited to, routine ongoing maintenance of the refinery and site infrastructure, as well as periodic maintenance requiring plant closure or processing shut down. In addition to the employment information related to operation and maintenance it is important to include environmentally relevant information such as the location of maintenance support areas, material storage locations, and the likely

maintenance and winter treatment. Dredging has been suggested as not required, however the potential for maintenance dredging at either the marine terminal or wharf should be considered and include management of dredged material.

Indicate any consideration of establishing a community liaison committee as an opportunity to establish and maintain an open line of communication between the facility and local community groups and residents as well as any committee contemplated to maintain an open line of communication between the facility and fish harvesters.

3.8 *Abandonment*

The predicted lifespan of temporary facilities and the refinery will be indicated. If the refinery is not intended to operate in perpetuity, details regarding decommissioning and abandonment will be presented. Identify, at least in general terms, the issues requiring consideration in decommissioning based on current legislation for hazardous and other materials and structural requirements.

4. ENVIRONMENT

4.1 *Existing Environment*

The EIS/CSR will identify the study area and will describe the existing biophysical and socio-economic environment of the study area, and the resources within it, emphasizing **Valued Ecosystem Components (VEC's) (as defined by Beanlands and Duinker, 1983)**. In addition, the EIS/CSR will describe environmental interrelationships and sensitivity to disturbance. Description will reflect four seasons in the study area where appropriate, through the use of original baseline studies or existing data. If the study results or data has been extrapolated or otherwise manipulated to depict environmental conditions in the study area, modeling methods and equations will be described and identify calculations of margins of error.

The timing and extent of any surveys for flora, fauna and ecologically sensitive areas must be provided.

A qualitative and quantitative description of the present environment will include, but is not limited to:

- meteorological conditions, including weather patterns as they relate to vessel traffic, processing operation and routine and periodic maintenance, as well as meteorological conditions on sea state (i.e., currents and tides, etc)
- atmospheric conditions, including wind speeds and directions, precipitation amounts and precipitation chemistry. Particular attention is to be paid to ambient dust levels in areas where construction activities may contribute to increased dust levels

- ambient air quality baseline assessment for common air contaminants prior to construction. Ideally at least one full year of ambient monitoring would be appropriate to capture baseline concentration values under the full range of meteorological conditions affecting air dispersion
- ambient water quality baseline assessment for common water quality parameters prior to construction. Ideally at least one full year of ambient monitoring would be appropriate to capture baseline concentration values under the full range of meteorological conditions affecting water quality
- hydrological conditions consisting of hydrologic, hydraulic and design parameters and the methodologies used to determine the dimensions and capacities for all watercourse crossings, including but not limited to: design return period, climate data, watershed characteristics, ice formation, ice breakup and movement, and estuarine features; detailed information (to meet the requirements of the Water Resources Management Division of the Department of Environment and Conservation) concerning number, location, and estimated (identified from 1:50,000 topographic mapping, aerial photography and aerial reconnaissance) site information on each proposed crossing including: water depth, width, flow rate, substrate type, and potential obstructions to navigation
- wetland resources including location, size and class, classified using the Canadian Wetland Classification System, of any wetland within a predicted zone of influence and conduct of a wetland evaluation. The true ecosystem value of each wetland is to be examined using comprehensive valuation methodology that assesses component, functional and attribute values, including their wildlife habitat potential (including wildlife at risk), groundwater recharge role and potential, and their role in surface water flow regulation (storm water retention and flood control). Field surveys and investigations required to supplement available data must be completed in an acceptable manner
- flora, including typical species, species-at-risk, and potential habitat for flora species-at-risk, with particular emphasis on *Erioderma pelliculatum* which is globally rare and listed as “vulnerable” under provincial legislation. Flora species at risk include those species listed under the federal *Species at Risk Act* and the provincial *Endangered Species Act* as well as COSEWIC listed species. Current information can be obtained from appropriate sources and augmented by field surveys and investigations required to supplement available data. Available data, survey results and detailed mitigation measures that demonstrate a special emphasis on avoidance of environmental effects is to be included in the EIS/CSR
- fauna (including migratory species), fauna species-at-risk, and potential habitat for fauna species-at-risk. Fauna species at risk include those species listed under the federal *Species at Risk Act* and the provincial *Endangered Species Act* as well as COSEWIC listed species. Fauna and avifauna in this context includes, but is not limited to, eagles, osprey and otter. Current information can be obtained from appropriate sources and augmented by field surveys and investigations required to supplement available data. Available data, survey results and detailed mitigation measures that demonstrate a special emphasis on avoidance of environmental effects is to be included in the EIS/CSR

- fish and fish habitat, including marine and freshwater benthos. Marine and freshwater fish species (including life stages) directly or indirectly supporting commercial, recreational or aboriginal fisheries should be identified. Fish habitat must be described with enough information to allow for quantification of available habitat.
- fisheries and aquaculture. Identify the type, location, and magnitude/extent of existing, past and potential commercial, recreational and aboriginal fisheries within freshwater and marine environments within the proposed project area. Address the extent to which these fishing activities will be disrupted during both the construction and operation phases of the project.

The identification of known data gaps is imperative.

Discussion of the description of the existing environment will be developed for each alternative drawing specific reference to the VECs. Detailed discussions will be developed for the following VECs:

- Migratory birds, including seabirds, shorebirds, waterfowl, songbirds or other landbirds within the footprint of the proposed refinery on land and their habitats, with emphasis on species at risk or species under hunting pressure. Information on breeding and wintering abundance and distribution should be provided. Also provide relative vulnerability of each bird group to oil spills and/or refinery processes
- flora and fauna species at risk, including rare or endangered plant species, including those listed on Schedule 1 of the federal Species at Risk Act, those listed by COSEWIC, and those listed by the provincial Endangered Species Act
- Water resources, including expected fresh water required for operation as well as water quality
- Historic resources, including, but not limited to cultural sites, archaeological, paleontological, burial, cultural, spiritual, and heritage sites
- Air quality
- Commercial fisheries and aquaculture
- Fish and fish habitat, consisting of both marine and freshwater species and habitat. In particular, marine fish habitat, fish species and any fisheries that occur in the area of the proposed marine infrastructure (outfall, heavy lift dock, tug basin, causeway, access trestle, jetty and jetty expansion) must be described. In addition freshwater fish habitat, fish species and any fisheries that occur in the ponds and streams in the proposed location for the refinery, including any outlet streams from ponds, must be described. As well, fish habitat, fish species and any fisheries that occur in the system of ponds and streams to be used as a water supply must be described
- Socio-economic, including environmental health (factors in the environment that have exposure potential for humans), the existing public health and acute care systems and public health and acute care services for the area, baseline health status, existing municipal infrastructure and services as well as capacity and employment and training

Component Studies will be prepared for the following VECs (where new information becomes available as a result of baseline studies, additional component studies may be required):

- **Air Quality**
- **Migratory Birds (seabirds, waterfowl, land/song birds)**
- **Fish and Fish Habitat (both marine and freshwater)**
- **Historic Resources**
- **Socio-economic**

Component studies generally have the following format: (i) Rationale/Objectives, (ii) Study Area, (iii) Methodology, and (iv) Study Outputs.

(i) Rationale/Objectives

In general terms, the rationale for a component study is based on the need to obtain additional data to determine the potential for significant effects on a valued ecosystem component due to the proposed undertaking, and to provide the necessary baseline information for monitoring programs.

(ii) Study Area

The boundaries of the study area will vary depending on the valued ecosystem component being investigated.

(iii) Methodology

Methodology will be proposed by the proponent, in consultation with resource agencies, as appropriate. The methodologies for each component study will be summarized in the EIS/CSR.

(iv) Study Outputs

Study outputs will be proposed by the proponent. Information and data generated will be sufficient to adequately predict the effects on the valued ecosystem component.

4.2 *Data Gaps*

Information gaps from a lack of previous research or practice will be described indicating baseline data/information which is not available or existing data which cannot accurately represent environmental conditions in the study area over four consecutive seasons through a complete year. If background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study area, modeling methods and equations shall be described and shall include calculations of margins of error.

4.3 *Future Environment*

The predicted future condition of the environment described under 4.1 within the expected life span of the undertaking, if the undertaking were not approved, will be described. This information is required when attempting to distinguish project-related environmental effects from environmental change due to natural processes, such as, surface erosion, cyclical population changes, etc. Specific characteristics of the future environment to be considered if the undertaking were not approved include degree of habitat fragmentation, air quality and greenhouse gas (GHG) emissions and will be described.

5. ENVIRONMENTAL EFFECTS

The EIS/CSR will describe the scope of the assessment being conducted for the undertaking.

The EIS/CSR will contain a comprehensive analysis of the predicted environmental effects of each project alternative for the VEC's. If the impacts are attributable to a particular phase of the project (construction, operation, maintenance or decommissioning) then they will be designated as such.

The EIS/CSR will also assess the effects of the environment on the refinery. In particular the EIS/CSR must identify the vulnerability of the refinery to climatic elements (including wind, weather and global climate change) and describe the provisions for minimizing any identified risk.

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 must be addressed.

Predicted environmental effects (positive and negative, direct and indirect, short and long-term) will be defined quantitatively and qualitatively for each project alternative and for each valued ecosystem component. In this regard, the EIS/CSR will offer the study strategy, methodology and boundaries of the assessment which includes the following considerations:

- the VEC within the study boundaries and the methodology used to identify the VEC;
- definition of the spatial and temporal study boundaries for the interactions of the project, as proposed or subject to subsequent modification, with VECs and the methodology used to identify the study boundaries;
- the temporal boundaries (i.e., duration of specific project activities and potential effects) for construction and operation
- the strategy for investigating the interactions between the project and each VEC and how that strategy will be used to coordinate individual studies undertaken
- the strategy for assessing the project's contribution to cumulative effects on each VEC

- the strategy for predicting and evaluating environmental effects, determining necessary mitigation, remediation and/or compensation, and for evaluating residual effects
- definition of impact significance criteria against which to evaluate the potential impact of interactions;
- description of potential interactions;
- discussion of issues and concerns which relate to specific interactions;
- discussion of the existing knowledge on information related to the interactions;
- analysis of potential effects (significance, positive or negative, etc.).

In the latter regard, the proponent will offer a definition of significance for each category examined (e.g. biophysical or socio-economic).

Environmental effects will be defined and discussed in the following terms for the phases of the project (construction, operation, modification and decommissioning): nature, spatial extent, frequency, duration, magnitude (qualitative and quantitative), significance, and level of certainty.

The environmental effects of the project, including the environmental effects of malfunctions or accidental events that may occur in connection with the project will be discussed with respect to risk, severity and significance. Consequences of low probability, high impact events, including design failure, will also be described. In relation to accidents and malfunctions provide the following information to support an assessment of potential effects on the environment, including but not limited to, birds, species at risk and their habitat(s):

- analysis of the safety of the shipping route chosen
- prediction of the risk to sensitive environmental components from the introduction of new ship traffic in the area of the project and the overall increase in ship traffic in Placentia Bay
- discussion of accidents and malfunctions that could occur related to shipping and processing activities, the probability of such events occurring, the fate of any hazardous materials that could be released as a result of such events, and the potential interactions with environmental features
- analysis of hydrographic, oceanographic, and climatological features and conditions that could adversely affect navigational safety and project operations
- identification of maximum operating parameters assumed in the design, in terms of wind, wave, current and ice conditions beyond which, a) docking/undocking would not be attempted, b) cargo transfer operations would cease, and c) the vessel would vacate the berth
- reference to the standards, codes and regulations applicable to governance of the project

Environmental effects from emissions estimates is required as part of the assessment. Preliminary dispersion modeling, incorporating baseline measurements as background values for construction and operation, must be presented. The modeling must also account for combined effects of other significant air contaminant emission sources within the general project area. The proponent is advised that stack emission tests and

accompanying dispersion models will be required following commencement of refinery operations to demonstrate compliance with ambient air quality standards. As part of the emissions effects provide an assessment of potential for emissions to effect *Erioderma* populations. Also as part of the emissions effects include a clear discussion of potential effects on land and sea products harvested, picked, hunted and otherwise collected for human consumption.

Environmental effects on marine and freshwater quantity and quality is also required as part of the assessment. Preliminary modeling, incorporating baseline measurements as background values for construction and operation, must be presented.

Environmental effects on the socio-economic environment are to be detailed and include, but will not be limited to, training needs, public health services in relation to potential demand as a result of the refinery, adequacy of existing acute care services, potential need for an increase in community health support services, low income individuals and families especially relating to displacement due to potential increases in housing costs, existing municipal infrastructure and capacity and services in terms of commercial/residential spin-off.

Environmental effects on existing and emerging commercial fisheries in Placentia Bay are to be detailed, as are environmental effects on existing, proposed and potential aquaculture sites. Provide a quantitative analysis of the loss of traditional fishing grounds due to any required increase in anchorage, shipping lanes and vessel traffic. Evaluate effects on fishing vessels due to movement of additional tankers, tug boats, etc., during inclement weather in Placentia Bay. In addition evaluate response time for emergency response and contingencies on fish processing facilities, landing sites and fishing vessels around Placentia Bay.

Environmental effects on both marine and freshwater fish habitat, fish species and any fisheries that occur in the area of the proposed marine infrastructure, refinery location and water supply must be evaluated. As part of the evaluation any effects associated with water withdrawal must be examined, as must the potential effects on any downstream habitat.

Environmental effects due to increased risk for introduction of Alien Invasive Species from both vessel hulls and ballast water must be evaluated.

The EIS/CSR must also address environmental effects, as defined under CEAA. "Environmental effect" refers to any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and includes any change in the project that may be caused by the environment.

Cumulative Environmental Effects:

Consideration of any cumulative effects on valued ecosystem components that are likely to result from the project in combination with other projects or activities that have been or will be carried out (e.g., existing and proposed shipping and industrial activity in Placentia Bay) will be discussed in the EIS/CSR. Other projects or activities that should be considered include at least the existing facilities of North Atlantic Refining and the NTL Transshipment Facility, as well as proposed future developments such as the LNG Transshipment Facility, the VBNC Long Harbour Commercial Plant and potential aquaculture sites.

Addressing cumulative environmental effects will involve considering:

- temporal and spatial boundaries;
- interactions among the project's environmental effects;
- interactions between the project's environmental effects and those of existing projects and activities;
- interactions between the project's environmental effects and those of planned projects and activities; and,
- mitigation measures employed toward a no-net-loss or net-gain outcome (e.g., recovery and restoration initiatives pertinent to a VEC that can offset predicted effects).

Specifically evaluate the contribution of emissions from the refinery and other point sources (e.g., North Atlantic Refining Limited) for a prediction of changes in ambient air quality on an episodic, seasonal and annual basis.

Specifically evaluate the cumulative effects of disturbance and accidental events on seabirds.

6. Environmental Protection

6.1 Mitigation

Mitigative measures that are technically and economically feasible, that have or will be taken, to avoid, minimize or eliminate the negative, and enhance the positive environmental effects, will be described and discussed with emphasis on pollution prevention, avoidance of environmental effect and best management practices. Mitigation includes the elimination, reduction or control of the adverse effects or the significant environmental effects of the project and may include restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

Mitigation will be evaluated based on the use of best available and economically achievable technologies (BATEAs) and best management practices (BMPs) to for minimizing adverse environmental effects.

Mitigative measures specific to the following must be addressed in particular:

- air quality, including but not limited to, potential fugitive emissions from ship deck hatches during loading and unloading operations
- dust emissions and runoff from crushing operations, concrete batch plants, aggregate and overburden stockpiles, unpaved roadways and cleared areas. Include dust control and dust recovery systems for conveyors proposed to handle produce coke and sulphur.
- water quality and quantity: outline siltation, erosion and run-off control features, storm drainage management procedures and measures, including specific reference to seasonal variation, that will be used in the following situations: (a) installation of watercourse structures; (b) installation of dams; (c) construction of service roads; and (d) any in water works
- water desalination: mitigation of potential effects of water desalination technology on the local marine environment
- process effluent and sewage
- vessel traffic: outline existing and proposed measures for increased vessel traffic safety and accident prevention. Include any technological improvements contemplated by the Smart Bay initiative as well as any measures that may be proposed by the Placentia Bay Traffic Committee which are to be put in place before refinery operations begin
- flora species: discuss measures to be taken to minimize effects. Include any plans for landscaping and preservation of existing vegetation. Demonstrate how priority will be placed on the use of native species for revegetation efforts. Describe steps to prevent the introduction of invasive species
- fauna species: describe measures to be taken to minimize effects on terrestrial and aquatic fauna (including avifauna). Include any plans for preservation of existing habitat and compensation for loss or degradation of aquatic and terrestrial habitat (i.e., habitat rehabilitation or replacement)
- socio-economic: describe measures to be taken or those required to ease housing demand and alleviate effects on low/fixed income individuals and families. Also outline any measures to be employed to prevent project workers from setting up “residences” in roadside/gravel pit camping areas
- commercial fisheries and aquaculture: describe measures to be taken to minimize effects on existing and emerging commercial fisheries and existing and proposed aquaculture sites in Placentia Bay, including, if necessary, compensation for degradation to fish harvesting and aquaculture operations and for effects on market perception of fish products.

Proposed mitigative strategies integral to the phases of the project (construction, operation, maintenance and decommissioning) will be clearly identified and addressed. The effectiveness of the proposed mitigative measures will be discussed and evaluated.

Where possible and appropriate, compensation for losses that cannot be mitigated by any other means will be examined. Mitigation failure will be discussed with respect to risk and severity of consequence.

There must be full consideration for the precautionary principle which states, “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”. The best available technology and best management practices must be considered. Consideration must be given for impact avoidance through implementation of scheduling and siting constraints and pollution prevention opportunities.

6.2 *Emergency Response/Contingency Plan*

An emergency response plan will be outlined that details measures to be taken to effectively respond to any foreseeable mishap that may occur as a result of the undertaking. In addition the outline will describe any partnering opportunities with area communities and other industry that may be affected by any emergency or be expected to respond to, and recover from, an emergency response.

A contingency plan will be outlined that details measures to be taken to effectively respond to a marine or terrestrial spill event in a timely manner. The plan should reflect a consideration of the risk of spills associated with construction, operation and maintenance and the environmental sensitivities to such a spill. The contingency plan must specifically address contamination or drainage to surface water and/or groundwater resources and protection of water quality as well as contingency and remediation plans for drainage to aquatic and terrestrial habitat as a result of accidental events. In addition the outline will describe any partnering opportunities with area communities and other industry that may be affected by any contingency or be expected to respond to, and recover from, a contingency response.

6.3 *Environmental Monitoring and Follow-up Programs*

Environmental compliance, effectiveness and effects monitoring programs for construction, operation, maintenance and decommissioning phases of the project will be described. Compliance monitoring is conducted to ensure compliance with appropriate legislation and/or ensure commitments made in the EIS/CSR are fulfilled. Monitoring and follow-up programs must allow for testing of the accuracy of effects prediction and effectiveness of mitigation measures. Programs must support an adaptive management approach and demonstrate preparedness for a range of potential outcomes to be confirmed through follow-up.

Important ingredients of monitoring programs include:

- elements of the environment (i.e., air emissions, marine and freshwater quantity and quality, habitat, etc.) that are to be monitored
- where monitoring will occur
- frequency and duration of monitoring
- identification of resource agencies that will review program design and results
- detailed statement of objectives
- submission of results, and
- protocols for the interpretation of results and subsequent actions to be taken based on findings

Details of a proposed environmental effects monitoring program for emission dispersion must be presented which will include, but not be limited to, air quality monitoring and modeling to include potential effects on human health, *Erioderma* populations and monitoring of terrestrial products harvested, picked, hunted or otherwise collected for human consumption. It is expected that the emission dispersion environmental effects monitoring program will incorporate a commitment to full community disclosure.

Details of a proposed environmental effects monitoring program for effluent discharge must be presented which will include, but not be limited to, monitoring of marine products harvested, picked, hunted or otherwise collected for human consumption. It is expected that the effluent discharge environmental effects monitoring program will incorporate a commitment to full community disclosure.

Details of a proposed environmental effects monitoring program for fish habitat.

Details of a proposed eagle monitoring program must be provided.

Monitoring of employment on the construction positions will be detailed and specific numbers by NOC, gender and period of employment during each year of construction will be provided to the Minister of Environment and Conservation at the conclusion of each construction season. The monitoring should also include succession planning and opportunities for advancement and training upgrading.

Known or planned follow-up programs specifically related to detecting and monitoring cumulative environmental effects are to be described. Objectives, methodology, duration and reporting covered by the program evaluating effectiveness of avoidance and mitigation measures on long-term effects from the project are to be described. Programs may be proposed specifically for wildlife (including migratory birds) and their habitats, species-at-risk and their habitat, wetlands, air quality and water quality.

6.4 *Rehabilitation*

A plan of proposed rehabilitation measures for the activities associated with the project will be given with an explanation of how the measures will reduce or eliminate various negative effects during construction, operation, maintenance and decommissioning

7. RESIDUAL EFFECTS AND SELECTION CRITERIA FOR PREFERRED OPTION

7.1 *Residual Effects*

Residual effects are those adverse effects or significant environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies, best management practices or other acceptable means. Irretrievable commitment of resources and irreversible effects should be clearly identified.

The EIS/CSR will list and contain a detailed discussion and evaluation of residual effects, which will be defined in terms of nature, spatial extent, frequency, duration, magnitude (qualitative and quantitative), significance (including the criteria for determining significance) and level of certainty. Those effects that cannot be mitigated or avoided will be clearly distinguished from those effects that will not be mitigated or avoided. Positive residual effects will also be discussed and evaluated.

The EIS/CSR will contain a concise statement and rationale for the overall conclusion relating to the significance of the residual adverse environmental effects. The EIS/CSR will, for ease of review, include a matrix of the environmental effects, proposed mitigation and residual adverse effects.

7.2 *Effects Evaluation and Selection of Preferred Alternative*

This section (as compared to Section 3.3 - Alternatives) is intended to provide a detailed discussion and comparison of the residual effects relative to the preferred option and viable alternatives (as applicable).

All selection criteria, including biophysical, socio-economic and technical, will be presented and discussed in sufficient detail to allow a comparative analysis with regard to costs, benefits and environmental risks associated with both the preferred and alternative options.

7. PUBLIC PARTICIPATION

A proposed program of public information will be outlined. Open House Public Information Sessions will be held to present the proposal and to record public concerns. The proponent will hold public information sessions in the communities of North

Harbour, Come by Chance, Sunnyside and Arnold's Cove. Consideration should also be given to the holding of public information sessions in larger centres such as Clarenville and/or St. John's. Public concerns will be addressed in a separate section of the EIS/CSR. Protocol for these sessions will comply with Section 10 of the Newfoundland and Labrador Environmental Assessment Regulations, 2000. Public notification specifications are outlined in Appendix B.

7. ENVIRONMENTAL PROTECTION PLAN

A site specific Environmental Protection Plan (EPP) for the proposed undertaking must be submitted to, and approved by, both the Minister of Environment and Conservation and Fisheries and Oceans Canada *before* any construction on the project begins. For the purposes of the EIS/CSR, an outline of the EPP will be included. The EPP will be a "stand alone" document with all relevant maps and diagrams. Statements regarding the commitment to and philosophy of environmental protection planning and self-regulatory and compliance monitoring will be restricted to the EIS/CSR. The target audience for the EPP will be the resident engineer, site foreman/supervisor, proponent compliance staff and the provincial environmental inspector(s). Therefore the EPP will concentrate on addressing such issues as construction/operation mitigation, permit application and approval planning, monitoring activities, contingency planning for accidental and unplanned events and contact lists. In addition, the EPP will contain a tabular breakdown of major construction and operational activities into sub-components, followed by permits required, field mitigation and contingency planning where appropriate. The objective is to present concise, comprehensive and easily accessed environmental protection information for field use by the target audience.

10. REFERENCES CITED

Provide a bibliography of all citations in the EIS/CSR. Provide a bibliography of all project-related documents already generated by or for the undertaking.

11. PERSONNEL

Brief descriptions of the expertise and qualifications of personnel involved in the completion of the EIS/CSR will be provided.

12. COPIES OF REPORTS

Copies of reports produced for any studies undertaken specifically in connection with this Environmental Impact Statement/Comprehensive Study Report will be submitted.

APPENDIX A Public Notices

Under the provisions of the Environmental Assessment Regulations 2003, Section 10, and where the approved Guidelines require public information session(s), the following specified public notification requirements must be met by the proponent prior to each meeting:

Minimum information content of public advertisement - (Proponent to substitute appropriate information for italicized items):

<p style="text-align: center;">PUBLIC NOTICE</p> <p style="text-align: center;">Public Information Meeting on the Proposed <i>NAME OF PROPOSED UNDERTAKING</i> <i>LOCATION OF PROPOSED UNDERTAKING</i></p> <p style="text-align: center;">Will be held at <i>DATE AND TIME</i> <i>LOCATION</i></p> <p style="text-align: center;">This meeting will be conducted by the proponent <i>PROPONENT NAME AND CONTACT PHONE NUMBER</i></p> <p style="text-align: center;">as part of the required environmental assessment process for this project. The purpose of this meeting is to describe all aspects of the proposed project, the activities associated with it, and to provide an opportunity for all interested persons to request information or state their concerns.</p> <p style="text-align: center;">ALL ARE WELCOME</p>

Minimum newspaper ad size: 2 column widths.

Minimum posted ad size: 7" x 5"

Minimum newspaper ad coverage: Weekend preceding meeting and 3 consecutive days prior to meeting date; to be run in newspaper locally distributed within meeting area or newspaper with closest local distribution area.

Minimum posted ad coverage: Local Town or City Hall or Office, and local Post Office, within town or city where meeting is held, to be posted continually for 1 full week prior to meeting date.

Any deviation from these requirements for any reason must receive prior written approval of the Minister of Environment and Conservation.