FINAL REPORT

Environmental Protection Plan for Project Construction and Commissioning of the Grassy Point LNG Transshipment and Storage Terminal

NEWFOUNDLAND LNG LTD.

REPORT NO. 1038201



FINAL REPORT NO. 1038201

FINAL REPORT TO **Newfoundland LNG Ltd.**

ON Environmental Protection Plan for Project Construction and Commissioning of the Grassy Point LNG Transshipment and Storage Terminal

May 22, 2008

Jacques Whitford 607 Torbay Road St. John's, NL, A1A 4Y6

Phone: 709-576-1458 Fax: 709-576-2126

www.jacqueswhitford.com



PREFACE

Environmental Protection Plan Responsibilities Environmental Protection Plan Distribution List Environmental Protection Plan Revision Procedures Revision Request Form Revision Control Record



Environmental Protection Plan Responsibilities

Newfoundland LNG Ltd. will:

- provide final approval for the Environmental Protection Plan (EPP) and subsequent revisions;
- inspect and monitor all activities during site construction;
- conduct a review of the EPP on an as needed basis; and
- liaise with relevant government agencies and community interest groups as required.

The designated Health, Safety and Environment (HS&E) Manager will:

- be responsible for EPP implementation;
- be Newfoundland LNG's Ltd. site representative;
- review revision requests;
- conduct a review of the EPP on an as needed basis;
- ensure revisions are distributed to EPP holders;
- be responsible for holding an environmental orientation session for the contractor and its personnel, and other personnel to be involved in the Project on an as needed basis;
- ensure that EPP holders and their staff are familiar with the EPP and its procedures;
- ensure that all applicable permits, approvals and authorizations are obtained;
- monitor or designate a representative to monitor project work to ensure compliance with the EPP and all regulatory requirements and commitments; and
- ensure reporting to all appropriate agencies all incidents of non-compliance.

EPP Holders will:

- keep their copy current and ensure all revisions are entered on revision control record;
- familiarize themselves and their personnel with the EPP and any revisions; and
- initiate changes to improve and update the plan.

Contractors, Subcontractors and Site Personnel will:

- familiarize themselves with the EPP;
- ensure implementation of EPP commitments;
- ensure that all site personnel and subcontractors comply with the EPP, all requirements of the contract and all applicable laws and regulations;
- maintain a training record;
- obtain all applicable permits, approvals and authorizations in coordination with the HS&E Manger;
- implement any conditions outlined in permits, approvals and authorizations;
- be responsible for clean-up, reclamation or restorative measures as directed by Newfoundland LNG Ltd. and/or appropriate government agency; and



- maintain regular contact with the Newfoundland LNG Ltd., including but not limited to:
 - immediately reporting concerns over any aspect of the EPP, and
 - immediately reporting any spills or other event that may have an effect on human health or environmental health and/or safety.

Environmental Protection Plan Distribution List

This distribution list provides the name, address, telephone number, e-mail and organization for the EPP control copy holders. Revisions and updates made to this document are distributed to each person on the list. Subsequently, additional non-controlled copies may also be circulated. However, it is the responsibility of the non-control copy holder to contact the Newfoundland LNG Ltd. for the latest and most recent control copy.

Copy Number	EPP Holder Name	Address	Telephone Number	E-mail Address	Organization Name

EPP Revision Procedures

This will be a controlled document and revisions may only be made by Newfoundland LNG Ltd. It is anticipated that most of the revisions to the EPP for construction will arise from the environmental management team at site. This team comprises the HS&E Manager, engineering design and construction management personnel. Other revisions will be as required from provincial and federal government agencies and other stakeholders. Plan holders and readers/reviewers may initiate proposed revisions by forwarding recommended changes to Newfoundland LNG Ltd. using the Revision Request Form. The request will be reviewed and appropriate revisions sent to all the Plan holders.



Revisions must be approved by Newfoundland LNG Ltd. The approved revisions will be issued by Newfoundland LNG Ltd. to all holders of controlled copies of the EPP. Each revision will be accompanied by a Revision Control Record that:

- provides revision instructions; and
- lists the sections being superseded.

An updated Table of Contents will be included with each revision. A revision number and revision date will be added to each revised page. Following confirmation and receipt of revisions, EPP holders will:

- check the Revision Control Record to ensure that all the pages have been received;
- read the text of the revision;
- remove and destroy the superseded pages;
- insert the revised pages in the proper place;
- page check the manual, using the updated table of contents to ensure the manual is complete and current;
- enter the revision number and the date entered into the Revision Control Record;
- incorporate the revision into the area of responsibility, as appropriate;
- ensure that their personnel are familiar with the revisions; and
- acknowledge receipt of revisions by forwarding by fax or mail a signed and dated acknowledgement form to Newfoundland LNG Ltd.



Environmental Protection Plan Revision Request Form

Section(s) To Be Revised:

Nature Of Revision(s):

Rationale For Revision: (i.e., environment/worker safety, etc.)

Submission:

Please submit to the Newfoundland LNG Ltd., HS&E Manager



Environmental Protection Plan Revision Control Record

This record of revisions will be kept current by the EPP holder to track any revisions made to each EPP section.

Revision Number	EPP Section	Revision Date	Description/ Comments	EPP Holder's Signature



Table of Contents

PREFACE	i
1.0 INTRODUCTION	1
1.1 Newfoundland LNG Ltd. Commitment to Health, Safety and Environment	1
1.2 Purpose of the Environmental Protection Plan	1
1.3 Organization of the Environmental Protection Plan	2
1.4 Development and Implementation of the Environmental Protection Plan	2
1.5 Project Personnel and Responsibilities	3
1.5.1 Newfoundland LNG Ltd. Project Manager	3
1.5.2 Company Health, Safety and Environment Manager	3
1.5.3 Construction Manager	4
1.5.4 Environmental Monitor	4
1.5.5 Site Safety Supervisor	5
1.5.6 Contractor Representatives	5
1.5.7 All Company and Contractor Personnel	6
1.6 Environmental Orientation and Training	6
1.7 Newfoundland LNG Ltd. Project Overview and Schedules	7
2.0 ENVIROMENTAL PROTECTION PROCEDURES	8
21 Surveying	0
2.1.1 Environmental Concerns	8
2.1.2 Environmental Protection Procedures	9
2.2 Clearing of Vegetation	9
2.2.1 Environmental Concerns	9
2.2.2 Environmental Protection Procedures	10
2.3 Grubbing and Disposal of Related Debris	11
2.3.1 Environmental Concerns	11
2.3.2 Environmental Protection Procedures	11
2.4 Erosion Prevention	11
2.4.1 Environmental Concerns	11
2.4.2 Environmental Protection Procedures	12
2.5 Buffer Zones	13
2.5.1 Environmental Concerns	13
2.5.2 Environmental Protection Procedures	13
2.6 Watercourse Crossings	13
2.6.1 Environmental Concerns	13
2.6.2 Environmental Protection Procedures	14
2.7 Blasting	15
2.7.1 Environmental Concerns	15
2.7.2 Environmental Protection Procedures	16
2.7.2.1 General Blasting	16
2.7.2.2 Blasting in Close Proximity to Water bodies	17
2.8 Dust Control	17
2.8.1 Environmental Concerns	17
2.8.2 Environmental Protection Procedures	17



2.9	Trenching	18
2.9.1	Environmental Concerns	18
2.9.2	Environmental Protection Procedures	18
2.10	Dewatering – Work Areas	18
2.10.	1 Environmental Concerns	18
2.10.	2 Environmental Protection Procedures	18
2.11	Noise Control	19
2.11.	1 Environmental Concerns	19
2.11.	2 Environmental Protection Procedures	19
2.12	Concrete Production	20
2.12.	1 Environmental Concerns	20
2.12.	2 Environmental Protection Procedures	20
2.13	Linear Developments	21
2.13.	1 Environmental Concerns	21
2.13.	2 Environmental Protection Procedures	21
2.14	Vehicular Traffic	23
2.14.	1 Environmental Concerns	23
2.14.	2 Environmental Protection Procedures	23
2.15	Storage Handling and Transfer of Fuel and Other Hazardous Substances	23
2.15.	1 Environmental Concerns	24
2.15.	2 Environmental Protection Procedures	24
2.16	Waste Management Plan	27
2.16.	1 Environmental Concerns	27
2.16.	2 Environmental Protection Procedures	27
2.17	Access Management Plan	29
2.17.	1 Environmental Concerns	29
2.17.	2 Environmental Protection Procedures	29
2.18	Marine and Migratory Bird Protection	30
2.18.	1 Environmental Concerns	30
2.18.	2 Environmental Protection Procedures	31
2.19	Archaeological Protection	32
2.19.	1 Environmental Concerns	32
2.19.	2 Environmental Protection Procedures	32
2.20	Works In/Around Marine Environment	33
2.20.	1 Environmental Concerns	33
2.20.	2 Environmental Protection Procedures	33
2.21	Marine Construction	34
2.21.	1 Environmental Concerns	34
2.21.	2 Environmental Protection Procedures	34
2.22	Hydrostatic Testing	35
2.22.	1 Environmental Concerns	35
2.22.	2 Environmental Protection Procedures	35
2.23	Greenhouse Gas Emissions	35
2.23.	1 Environmental Concerns	36
2.23.	2 Environmental Protection Procedures	36
2.0		.
ა. Ս ვ 1	Key Project and Regulatory Personnel and Emergency Contact Information	30 27
5.1	They intoject and they diatory reporting and entergency contact information	57



3.1.1 Incident Reporting Procedures	37
3.1.2 Communications Planning	37
3.1.3 Contact List	37
3.2 Fire Contingency Plan	
3.2.1 Environmental Concerns	
3.2.2 Contingency Procedures	
3.3 Spill Contingency Plan	
3.3.1 Environmental Concerns	40
3.3.2 Contingency Procedures	40
3.4 Wildlife encounters	43
3.4.1 Environmental Concerns	43
3.4.2 Contingency Procedures	44
3.5 Discovery of Historic Resources	45
3.5.1 Environmental Concerns	45
3.5.2 Contingency Procedures	45
3.6 Vessel Accidents	
3.6.1 Environmental Concerns	
3.6.2 Contingency Procedures	46
4.0 SITE-SPECIFIC APPROACH TO EPP DEVELOPMENT	47
5.0 PERMITS, APPROVALS AND AUTHORIZATIONS	47
6.0 REFERENCE MATERIAL	48

List of Tables

Table 1	List of Contact Names and Numbers	38
Table 2	Permits, Approvals and Authorizations	47



1.0 INTRODUCTION

1.1 Newfoundland LNG Ltd. Commitment to Health, Safety and Environment

Newfoundland LNG Ltd. is committed to excellence and leadership for health, safety and environmental protection planning. Health, Safety and Environment (HS&E) is one of the values and will not be compromised.

Newfoundland LNG Ltd.'s commitment to HS&E excellence is fundamental to operations and is reflected in management's day-to-day activities. Newfoundland LNG Ltd. is committed to an incident-free workplace, and that includes environmental incidents as well as safety incidents. This responsibility extends to all Newfoundland LNG Ltd.'s stakeholders, including customers, contractors, neighbors, government and the investment community. Newfoundland LNG Ltd. will dedicate ourselves to achieving zero incidents and zero adverse environmental impacts by deploying a world-class HS&E management program that is consistent with national and international HS&E standards for major industrial facilities.

1.2 Purpose of the Environmental Protection Plan

Environmental protection planning provides a practical way in which a proponent can demonstrate its understanding of environmental regulations, practices and procedures required to reduce or eliminate the potential environmental effects of the project.

Newfoundland LNG Ltd. has committed to the development and implementation of a comprehensive Environmental Protection Plan (EPP) to help ensure a high level of environmental protection throughout its work areas and activities associated with the construction and development of the Grassy Point Liquefied Natural Gas (LNG) Transshipment and Storage Terminal (the project). An EPP is a working document for use in the field for Project personnel and contractors, as well as at the corporate level, for ensuring commitments made in policy statements are implemented and monitored. EPPs provide a quick reference for Project personnel and regulators to monitor compliance and to make suggestions for improvements.

This EPP provides the general protection procedures for the routine activities associated with construction and commissioning activities anticipated for the Project and identifies applicable permits, authorizations and approvals, as well as key site-specific conditions of approvals, as appropriate. The specific purposes of the EPP are to:

- ensure that commitments to reduce environmental effects are met;
- document environmental concerns and appropriate protection measures;
- provide concise and clear instructions to Project personnel regarding procedures for protecting the environment and minimizing environmental effects;
- provide a reference document for Project personnel when planning and/or conducting specific activities and working in specific areas;
- provide a training aid during implementation efforts;



- communicate changes in the program through the revision process;
- provide a reference to applicable legislative requirements and guidelines; and
- provide direction for developing contingency plans for accidental events.

The EPP focuses on environmental protection procedures for marine and land-based construction and commissioning activities associated with the Project. In particular, this version of the EPP focuses on site preparation, construction activities and commissioning. Additional procedures are under development for future operational activities at the terminal. Newfoundland LNG Ltd. will submit revisions and updates of the EPP to the applicable government authorities for review prior to the implementation. An updated version of the EPP will be maintained according to the document revision procedure.

1.3 Organization of the Environmental Protection Plan

This EPP provides instructions to ensure Project personnel understand and implement environmental protection procedures for both routine activities and unplanned events and activities associated with the construction of the Project for Newfoundland LNG Ltd.

The style and format of the EPP is intended to enhance its use by Project personnel in the field and to provide an important support document between the overall approach to environmental protection planning and the specific requirements in various permits, approvals and authorizations issued for specific Project components and activities.

The EPP comprises the following sections:

- **Preface** describes the distribution of the EPP, and outlines its maintenance (roles and responsibilities), revision and document control procedures.
- Section 1 provides an introduction to the EPP. It outlines the EPP purpose, organization, development and implementation, site-specific approach to EPP development, environmental orientation and Newfoundland LNG Ltd. Project Overview.
- Section 2 provides an overview of the environmental concerns and general environmental protection procedures for planned Project activities.
- Section 3 provides the contingency plans for potential unplanned and accidental events and the key Project and regulatory personnel and emergency contact information.
- Section 4 contains the site-specific EPPs for the principle work areas for the construction. Site-specific EPPs for the initial aspects of the 2008 workscope include: marine facilities; LNG storage tanks; access and service roads; and site utilities. Site-specific EPPs will be modified or expanded as needed throughout the construction phase of the Project as engineering design, work methods and overall schedule progress.
- Section 5 lists the permits, approvals and authorization required during construction.
- Section 6 will reference other key sources of information of HS&E performance.

1.4 Development and Implementation of the Environmental Protection Plan

The focus of this EPP is for the construction and commissioning of the Grassy Point LNG Transshipment facility. The EPP will be revised and expanded as required to meet the requirements of



reviewers, and to meet the Terms and Conditions of environmental approvals.

EPPs typically undergo continuous revision to reflect new and site-specific construction sequences and work methods and environmental protection requirements and responsibilities. This EPP is structured to allow for updates and revisions as work continues.

1.5 Project Personnel and Responsibilities

This section outlines the roles and responsibilities of all Project personnel, including Newfoundland LNG Ltd. company personnel and contractor personnel, with respect to environmental management of this Project.

1.5.1 Newfoundland LNG Ltd. Project Manager

The Newfoundland LNG Ltd. Project Manager is the primary person responsible for all aspects of the Project, including environmental, health and safety performance. Specific environmental responsibilities of the Project Manager include:

- ensuring adequate plans and resources are in place to achieve Company commitments to minimize environmental impacts;
- ensuring compliance with relevant regulations, authorizations, permits and protocols;
- reviewing incident reports as they are submitted and ensuring the proper course of action is taken to manage unexpected environmental conditions or events;
- ensuring ongoing communication with appropriate regulatory agencies and other interested parties on behalf of the Company; and
- ensuring that revisions are updated and incorporated to this EPP.

1.5.2 Company Health, Safety and Environment Manager

The HS&E Manager will be primarily, responsible for the overall health and safety of workers and protection of the environment during Project construction and commissioning. Specific responsibilities of the HS&E Manager include:

- meeting with the Construction Manager, Environmental Monitor, Site Safety Supervisor and contractor representatives to assess the adequacy of the EPP and its implementation, as well as to identify opportunities for improvement.
- responsibility for approving access to environmentally sensitive areas;
- supervisory all stream crossing associated with construction activities;
- responsibility for determining a disposal area off site for unsuitable earth material;
- responsibility, along with the Contractor, for determining the requirements of ditch blocks/check dams or sediment traps to intercept runoff;
- determining drainage discharge locations;



- receiving, along with the Contractor, reports all spills of fuel and hazardous materials immediately after the event. Any spill to the marine environment and spills of 70 L or more on land will be reported immediately;
- acting as the initial contact person for any releases or spills of substances (emergencies);
- providing, along with the Construction Manager, information about the emergency and potential consequences to Company employees, contractors and the public;
- responsibility for ensuring an Incident Report Form will be completed and submitted to the Newfoundland LNG Ltd. Project Manager and the Construction Manager. Incidents of a less severe nature must be reported to the HS&E Manager within 24 hours of the incident;
- responsibility for reviewing Spill Prevention Plans submitted by the Contractor for approval by the HS&E Manager;
- contacting the Provincial Archaeology Office (PAO) for any historic resources finding;
- responsibility for implementing training and orientation of all contractors on site; and
- responsibility for conducting safety audits for all personnel and contractors on site.

1.5.3 Construction Manager

The Company Construction Manager will oversee all construction operations at the site. In regard to HS&E, the Construction Manager will be responsible for:

- promoting and demonstrating commitment to HS&E;
- ensuring adherence with Newfoundland LNG Ltd.'s and Contractor HS&E policy, standards and procedures;
- ensuring all personnel at the site are competent and adequately oriented;
- being familiar with the elements of this EPP;
- ensuring the elements of this EPP are enacted;
- communicating any new revisions to the EPP at the daily tailgate meetings; and
- implementing any necessary corrective actions.

1.5.4 Environmental Monitor

The Company will retain the services of an independent third-party to serve as an Environmental Monitor and oversee implementation of this EPP. The Environmental Monitor will report to the HS&E Manager and will provide advice and input as to the means necessary to meet the expectations of this EPP and the relative success thereof. The Environmental Monitor has the authority to stop an operation if they determine there are unacceptable risks to health, safety and the environment, in consultation with the HS&E Manager, Construction Manager, Site Safety Supervisor or their designate.

In general, the Environmental Monitor's responsibilities include:

 ensuring compliance with all applicable permits, contract documents, Newfoundland LNG Ltd. and Contractor HS&E policies and commitments made during the planning and application process;



- assisting in the preparation and delivery of environmental orientation presentations to Company and Contractor staff;
- suspending work in the event of non-compliance with the recommendations of this EPP, permit or authorization conditions or as standard procedure to prevent unacceptable risks to health, safety and environment;
- advising on the proper course of action to be taken to manage unexpected environmental conditions or events;
- monitoring work site activities and conditions on a daily basis to identify problem areas;
- ensuring that monitoring and follow-up studies are conducted as necessary;
- assisting with the implementation of emergency plans;
- liaising with appropriate regulatory agencies during onsite inspections or visits and other interested parties;
- organizing on-site meetings as required to address site specific issues; and
- working with HS&E Manager as needed.

1.5.5 Site Safety Supervisor

The Company will retain the services of an independent third-party to serve as a Site Safety Supervisor who will assist with implementation of the EPP and Newfoundland LNG Ltd.'s HS&E Policy. The Site Safety Supervisor will report to the Construction Manager and will provide advice and input as to the means necessary to meet the expectations of this EPP and the relative success thereof. The Site Safety Supervisor, in consultation with the Construction Manager or their designate, has the authority to stop an operation if they determine there are unacceptable risks to health and safety. In general, the Site Safety Supervisor's responsibilities include:

- ensuring compliance with Newfoundland LNG Ltd. Contractor health and safety policies;
- assisting in the preparation and delivery of orientation presentations to Company and Contractor staff;
- suspending work in the event of practices being performed that contravene health and safety policies and/or pose unacceptable risks to health and safety;
- advising on the proper course of action to be taken to manage unexpected health and safety issues;
- monitoring work site activities and conditions on a daily basis to identify problem areas;
- assisting with implementation of emergency plans;
- liaising with appropriate agencies during on-site inspections; and
- organizing on-site meetings as required to address site specific issues.

1.5.6 Contractor Representatives

All Contractors working at the site will be oriented to the Newfoundland LNG Ltd. HS&E expectations and this EPP. All workers are required to:

protect themselves, others and the environment by identifying hazards and implementing



appropriate solutions;

- comply with all regulations, this EPP, and the Newfoundland LNG Ltd.'s HS&E policy, contractor safety policies and/or procedures that pertain to the operations; and
- notify the Construction Manager or immediate supervisor of any incident that results in (or could have the potential to result in) injury to personnel, property or the environment.

1.5.7 All Company and Contractor Personnel

All persons working on the Project have the authority and responsibility to:

- familiarize themselves with the EPP and any revisions that may be made during construction;
- adhere to the EPP and comply with applicable Newfoundland LNG Ltd. HS&E policies, regulations, permits and authorizations;
- initiate EPP revision requests if required, to improve the quality of the EPP; and
- shutdown an operation if they believe there are risks to the health, safety and environment.

1.6 Environmental Orientation and Training

All personnel working on the Project will be familiar with the EPP and the environmental protection procedures described herein. Newfoundland LNG Ltd. will ensure that all contractor employees receive a site-specific orientation to this EPP. The following will be included in the training program:

- communication on Newfoundland LNG Ltd. HS&E commitment and obligations to the EPP;
- work description with discussion of the individual activities and the particular environmental concerns associated with each activity;
- orientation to sensitive environmental features on site;
- instruction on the specific environmental protection procedures for the work, including applicable documentation;
- communication procedures to report any unplanned events requiring emergency response;
- maintenance of the EPP; and
- enforcement of the EPP.

In addition to the environmental orientation, the following opportunities will be implemented prior to and during the construction process:

- A detailed review with the Newfoundland LNG Ltd. Construction Manager will be completed prior to commencement of construction operations. The HS&E Manager will meet with the Construction Manager, the associated Project Team Leads, the Environmental Monitor and the Site Safety Supervisor to review in detail the requirements of this plan and ensure adequate preparations have been made.
- The Construction Manager will hold a Project kick-off meeting with the main supervisory personnel for all contractors to review this plan, the key elements, and the roles and responsibilities therein, at every critical phase of Project construction.



 Tool box meetings will be held prior to commencement of each shift. Tool box meetings will be held by all Team Leads working at the site and all workers will attend. It will be held to discuss any health, safety and environmental issues that have arisen or are expected to arise that day.

1.7 Newfoundland LNG Ltd. Project Overview and Schedules

Newfoundland LNG Ltd. is proposing to construct and operate an LNG Transshipment and Storage Terminal at Grassy Point, Placentia Bay. The Grassy Point site is located on the island of Newfoundland at the head of Placentia Bay, within Come By Chance Harbour, approximately 1.5 km west of the Town of Arnold's Cove. The Proponent for this proposed Project is Newfoundland LNG Ltd., a St. John's-based independent energy services company, which was incorporated in 1999. Newfoundland LNG Ltd. is a joint venture of North Atlantic Pipeline Partners, L.P. and LNG Partners LLC, which are private entities incorporated in Newfoundland and Delaware, US respectively.

The proposed LNG facility will consist of the following components:

- a marine terminal comprised of three jetties with berthing capability for LNG carriers up to 265,000 m³;
- a tug basin;
- eight 160,000 m³ gross capacity LNG storage tanks; and
- supporting infrastructure including an access road, office facilities, security fencing and utilities such as water, sewer and power.

The Project will be designed to provide facilities for LNG cargo transfer, LNG storage and a lay-up site for transiting LNG carriers. The terminal will provide LNG storage and offloading services for larger LNG vessels for transfer to smaller LNG carriers for distribution to LNG import terminals along the Eastern Seaboard of the United States. This LNG Project, unlike other proposals in Canada, is not an LNG import terminal and is not intended for the re-gasification of LNG. Rather, this facility will operate as a component of the LNG delivery chain, providing transshipment and storage services for clients with pre-existing supply arrangements.

The main facility processes will include:

- LNG transfer systems to and from LNG carriers (LNGCs) and LNG storage tanks;
- LNG storage (single-containment, double-wall, metal tanks);
- Boil-off gas (BOG) re-liquefaction systems;
- ship-to-ship (STS) transfer of LNG; and
- facility power generation.

The Project's construction schedule depends upon the demands of expected customers. It is currently scheduled to be constructed in three phases. Phase 1 will include site preparation for eight 160,000 m³ LNG storage tanks and associated process area, one or two berths for LNGCs and the tug basin. Phase 1 of the on-land construction and the 18 month marine construction project is expected to begin in 2008. Phase 1 on-land construction is scheduled for completion in 2010. Phase 2 will include up to four 160,000 m³ LNG storage tanks, LNG transfer arms at all berths, BOG compressors and blowers, two re-liquefaction trains and associated cooling system, seawater cooling system, power generation



equipment and associated fuel gas system, atmospheric vent stack and associated heating system, control system, additional fire, gas and low temperature detection systems, associated piping and equipment for facility, utilities and the third berth for LNGCs. Construction of Phase 2 is expected to begin in February 2009 and be completed in September 2012. Phase 3 will include completion of the remaining 160,000 m³ LNG storage tanks (total of eight for the facility), additional BOG compressors and blowers, two additional re-liquefaction trains and associated cooling system, additional power generation equipment and associated fuel gas system, additional fire, gas and low temperature detection systems, and associated piping and equipment for facility, and utilities for the additional infrastructure. Construction of Phase 3 is expected to begin in May 2011 for completion in July 2014.

At peak construction, 350 to 450 persons are expected to be working at the site. A majority of the workers on site will be residents of the Province of Newfoundland and Labrador, where practical. There will be no temporary work camps or accommodations set up at the construction site. Workers will be responsible for their own transportation to the work site and will be housed at locally-owned facilities surrounding the Project site.

Main activities during Project construction will include: delivery of materials; dredging and possible blasting for tug basin construction; berth, pile and superstructure installation; installation of the seawater intake and outfall pipes; on-land clearing and site preparation; establishment of electrical supply; establishment of marshalling yard and laydown areas; construction of storage tanks; on-site concrete production; and vehicle and vessel traffic. Commissioning will include hydrostatic testing of tanks and pipes and a systems purge and cool-down.

Emissions during construction would consist of noise, dust and combustion emissions from construction equipment. Emissions during commissioning will result from purging the pipelines and cooling of the tanks with liquid nitrogen and LNG. Liquid effluents (e.g., stormwater run-off) will be addressed through standard compliant construction practices. Interceptor ditches and sedimentation/retention ponds will be constructed to retain stormwater flow and allow any accumulated sediment to dissipate prior to discharging the water back into the environment. All discharge back to the environment will be in accordance with the stipulations of Newfoundland and Labrador Department of Environment and Conservation (NLDEC) and Fisheries and Oceans Canada (DFO). Wastes generated during construction will be handled, stored, transported and disposed of in accordance with all applicable acts, regulations and guidelines. All hazardous waste generated on-site during construction and operations will be disposed off-site in accordance with regulatory requirements.

2.0 ENVIROMENTAL PROTECTION PROCEDURES

2.1 Surveying

Surveying activities may include: vegetation removal; traversing; and establishing targets, permanent bench-marks and transponder stations.

2.1.1 Environmental Concerns

Surveying activities may disturb vegetation, wildlife species, and historic resources.



2.1.2 Environmental Protection Procedures

Vegetation Removal

Width of survey lines will be limited to that which is absolutely necessary for line of sight and unobstructed passage.

- a) Whenever possible, cutting lines to the boundary between treed and open areas will be avoided.
- b) Trees and shrubs will be cut flush with the ground wherever possible.
- c) Cutting of survey lines will be kept to a minimum. Where possible, alternate areas not requiring cut lines will be used.
- d) All trees not exactly on transit lines will be left standing.
- e) No attempt to harass or disturb wildlife will be made by any person.
- f) Vehicles will yield the right-of-way to wildlife.
- g) Archaeological sites and features will not be disturbed during survey work. Any historic resource discoveries will be reported to the PAO.

Traversing

- a) All -terrain Vehicles (ATVs) will not be allowed off the right-of-way except as approved by the Construction Manager. The use of ATVs will be restricted to designated trails, thus minimizing ground disturbance.
- b) No attempt to harass or disturb wildlife will be made by any person.
- c) No motorized vehicles will enter the areas designated as sensitive without notification and approval of the HS&E Manager.

Establishing Targets, Permanent Benchmarks and Transponder Locations

- a) A driven T-bar, well embedded to readily identify each benchmark location, will be used.
- b) No attempt to harass or disturb wildlife will be made by any person.
- c) Access to sensitive areas is to be approved by the HS&E Manager.
- d) Standard iron bars and sledge hammers are to be used to establish benchmarks.
- e) Access by heavy equipment to sensitive areas such as wetlands will only be through established right-of-ways.

2.2 Clearing of Vegetation

2.2.1 Environmental Concerns

Vegetation clearing will be required for site preparation activities for work areas, laydown areas, roads, etc. Concerns associated with vegetation clearing include the loss of rare plants and terrestrial bird habitat, the sedimentation of watercourses, the disturbance or destruction of historic resources, uncontrolled burning of slash, and stockpiling vegetation in or near watercourses.



- 2.2.2 Environmental Protection Procedures
 - a) Clearing activities will comply with the requirements of all applicable permits (Section 5.0).
 - b) Clearing and removal of tress will be restricted to only those areas designated by Newfoundland LNG Ltd.
 - c) Clearing will consist of cutting to within 15 cm of the ground or cut flush to the ground where possible and disposing of all standing trees, as well as the removal of all shrubs, debris and other perishable materials from the area. The *Environmental Protection Guidelines for Ecologically Based Forest Resource Management* (Newfoundland and Labrador Department of Forest Resources and Agrifoods (NLDFRA) 1998) will be adhered to.
 - d) Limits of clearing must be shown on all drawings Issued for Construction. Only those areas designated on drawings will be cleared. Trees will be blazed at intervals in advance of clearing to demarcate the limits of the work. Blazed trees will not be felled. Clearing activities will not remove any trees outside the authorized clearing widths.
 - e) Merchantable or usable timber will be removed by a local contractor.
 - f) Slash and any other construction material or debris will not be permitted to enter any watercourse and will be piled above spring flood levels.
 - g) Chain saws or other hand-held equipment will be used in clearing vegetation except where alternative methods or equipment are approved by Newfoundland LNG Ltd. The use of mechanical clearing methods, such as heavy equipment, will not occur except where it can be demonstrated that there is no merchantable timber, and where the resulting terrain disturbance and erosion will not result in the loss of topsoil or the sedimentation of nearby watercourses and water bodies. All chainsaw operators will be equipped with an adequate fire extinguisher during the fire season, as well as shovels and axes.
 - h) A minumim 30 m buffer zone of undisturbed vegetation will be maintained between construction areas and all water bodies. In instances where steep slopes are encountered, the buffer zone will be increased using the following formula: Buffer Zone + (1.5 x slope (%)).
 - i) Where possible, timber will be felled inward toward the work area to avoid damaging any standing trees within the immediate work area.
 - j) Workers will not destroy or disturb any features which are indicative of a cultural or archaeological site. Such features should be avoided until a report has been made to the PAO and clearance to proceed has been received.
 - k) Newfoundland LNG Ltd. will avoid unnecessary disturbance of wetlands.
 - The current construction schedule does not anticipate clearing of vegetation before mid-July, therefore avoiding the nesting period of most birds. However, if a bird nest is found and nesting birds are observed;

i.) the nest site and neighbouring vegatation should be left undisturbed until nesting is completed; and

ii) construction activities be minmized in the immediate area until nesting is completed.

m) Baseline studies have concluded that no rare plants species were observed. However, if rare plants are observed, operations will be in the immediate area will be suspended until the rare plants are removed. The environmental monitor will be trained by a botanist in the identification



of rare plants and will consult the botanist if a potential rare plant is observed during construction.

2.3 Grubbing and Disposal of Related Debris

2.3.1 Environmental Concerns

The principal concerns associated with grubbing and disposal of related debris are the potential effects of erosion on marine and freshwater ecosystems and water quality through the release of sediment into watercourses, as well as the potential for disturbing historic resources.

2.3.2 Environmental Protection Procedures

- a) Grubbing of the organic vegetation mat and/or the upper soil horizons will be restricted to the minimum area required.
- b) The organic vegetation mat and upper soil horizon material which has been grubbed will be spread in a manner which attempts to cover inactive exposed areas.
- c) Any surplus material will be stored or stockpiled for site rehabilitation and revegetation purposes. The location of stockpiles will be recorded and accessible for future rehabilitation purposes.
- d) Measures will be implemented to reduce and control runoff of sediment-laden water during grubbing, and the re-spreading and stockpiling of grubbed materials. Where grubbed, materials are re-spread or stockpiled, as many stumps and roots as possible will be left on the ground surface to maintain soil cohesion, to dissipate the energy of runoff, and promote natural revegetation. Erosion control measures will be implemented in areas prone to soil loss (Section 2.4).
- e) Mitigation measures such as the placement and maintenance of silt curtains will be used to prevent erosion from exposed areas. All cleared and grubbed areas will be slooped and graded to prevent erosion.
- f) During grubbing, care will be taken to ensure that grubbed material will not be pushed into areas that are to be left undisturbed. Grubbed material will be buried with two feet of soil cover.
- g) Grubbing activities will adhere to the buffer zone requirements outlined in Section 2.5.
- h) Historic resources and features will not be disturbed during grubbing. Any historic resource discoveries will be reported to the PAO.
- i) Newfoundland LNG Ltd. will avoid unnecessary disturbance of wetlands.

2.4 Erosion Prevention

2.4.1 Environmental Concerns

Erosion and resulting effects may cause siltation in water bodies and, subsequently, decrease suitable habitat for marine, aquatic and terrestrial animals.



2.4.2 Environmental Protection Procedures

- a) All work to be carried out by Newfoundland LNG Ltd. will be conducted according to the conditions set out in the permits and/or approvals and authorizations.
- b) Primary means of erosion control are the avoidance of activities contributing to erosion. The disturbance of new areas will be minimized.
- c) All areas of exposed erodible soils are to be stabilized by back-blading or grading to meet engineered slope requirements.
- d) Drainage ditches along the access road will be stabilized if required (e.g., lining vegetation or rock, terracing, interceptor swales, installation of rock check dams) to reduce soil erosion. All measures will be properly maintained following installation.
- e) Further mitigation measures will be implemented if an environmental inspection reveals that silt is entering a water body. These include measures such as temporary drainage ditches, siltation control (settling) ponds, ditch blocks/check dams or sediment dam traps, to intercept runoff. The necessary or appropriate measures will be determined on site.
- f) All work will be monitored for erosion and appropriate repair action taken as necessary.
- g) All existing and new siltation control structures will be maintained and monitored by the contractor to ensure the effectiveness of the system. Releases from these structures will be overland to ensure appropriate filtration prior to entering any water body.
- h) The contractor will be required to remove excess water from siltation control systems prior to excavation of sediment. Trucks will be equipped with liners to prevent loss of wet sediment during transport.
- i) Coordinate construction activities with seasonal constraints (e.g. time clearing, grubbing, and excavation activities to avoid heavy precipitation; avoid sensitive periods for fish and wildlife; shut down and stabilize the work site in accordance with pre-established criteria in advance of the winter season) {before revegetation is no longer possible and before freeze-up};
- j) Implement measures in advance of grubbing and excavation activities, that will allow surface drainage to be diverted around the work area.
- k) Install all perimeter control structures (e.g. silt fencing, sediment traps, settling ponds) prior to any land disturbance.
- I) Maintain vegetated buffer zones as appropriate to protect environmental values.
- m) Minimize the exposed soil area (by limiting the area that is exposed at any one time and by limiting the amount of time that any area is exposed as much as possible).
- n) Stabilize exposed soil as soon as possible (e.g. stabilize interim exposed soil with mulch, erosion control blankets or final exposed soil with fast-growing, non-invasive, native vegetation).
- Maintain sediment control structures (by inspecting and repairing structural problems during and after storm events, removing accumulated sediment at regular intervals or at designated capacities, and by disposing of it at an approved site, given its unsuitability as structural fill material).
- p) Monitor any nearby receiving waters for total suspended solids or contaminants of concern to ensure maintenance of the Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines for the Protection of Aquatic Life (http://www.ccme.ca/publications/ceqg_rcqe.html) when considered in conjunction with existing



ambient water quality and site-specific factors.

q) Take further mitigative actions as necessary based on monitoring results.

2.5 Buffer Zones

2.5.1 Environmental Concerns

Buffer zones are undisturbed natural vegetation boundaries maintained along water bodies. Without adequate buffer zone vegetation, streams, ponds and lakes can become laden with silt from runoff. Vegetation provides cover for fish.

2.5.2 Environmental Protection Procedures

- a) A minimum of a 30 m naturally vegetated buffer between construction areas and water bodies be maintained. This provides adequate protection for sensitive riparian species and habitats.
- b) Silt runoff control fences will be constructed at the toe of the slope outside the buffer zone when required to control runoff from areas of exposed soils towards water bodies. The Site Saftey Supervisor and/or Environmental Monitors will inspect silt fences and buffer strips on a regular basis. Any accumulations of silt observed will be removed and disposed of in an area where it will not re-enter any water body. Also, repairs and replacement of damaged silt fences will be addressed immediately.
- c) A 100-m buffer zone will be established between watercourses and construction of site camps, fuel storage and quarries/borrow pits.
- d) A minimum buffer zone of 25 m will be maintained around any archaeological site within which no construction activities will take place. Where available space poses constraints, this width may be reduced and supplemented by other protective measures. Site-specific mitigative measures for known historic resources in the Project area are addressed in Section 3.5, Discovery of Historic Resources.
- e) Nesting birds will be avoided at all times during construction.
- f) Any alteration that must be carried out within the buffer areas, including docks, berthing area and other marine works, stream crossings, infilling, storm drainage works, must be approved by the Water Resources Management Division of NLDEC.

2.6 Watercourse Crossings

2.6.1 Environmental Concerns

The environmental concerns associated with watercourse crossing and culvert installations include direct disturbances to or mortality of fish, disturbance of waterfowl, loss of fish habitat resulting from sedimentation and removal of substrate and stream bank vegetation. Specific erosion stabilization methods and effective sedimentation control practices will be developed on a site-specific basis.



2.6.2 Environmental Protection Procedures

Stream crossings will be constructed in compliance with the required permit to alter a body of water from NLDEC and the Letter of Advice for Works and Undertakings Affecting Fish Habitat from the DFO. Newfoundland LNG Ltd. recognizes that the DFO does not routinely issue permits for in stream work between September 15 and June 15. The following measures will be implemented to minimize the potential effects of stream crossings:

- a) Between September 15 and June 15, stream crossing construction activities will be undertaken under the direct supervision of the HS&E Manager and/or Environmental Monitors, if approved by DFO. Work will be performed to ensure that materials such as sediment, fuel and oil do not enter watercourses and water bodies. A minimum buffer of undisturbed natural vegetation for 30 m will be left between the access road and the bank of any watercourse which it parallels. Also, in circumstances where steep slopes are encountered, the buffer zone will be increased using the following formula: Buffer Zone + (1.5 x slope(%)).
- b) In those locations where culverts are required, application will be made to NLDEC. The culverts used will be sized to handle the 1-in-50 year return period flood and will be constructed in accordance with the *Environmental Guidelines for Culverts* from NLDEC (Water Resources Division 1992) and the *Guidleines for Protection of Freswater Fish Habitat in Newfoundland and Labrador* (DFO, 1998). The following measures will also be implemented:
 - i. install culvert(s) in accordance with good engineering and environmental practices;
 - ii. unless otherwise indicated, all work will take place in dry conditions, either by the use of cofferdams or by diverting the stream;
 - iii. cylindrical culverts will be counter sunk only where necessary to protect fish habitat such that the culvert bottom is one-third the diameter below the streambed in the case of culverts less than 750 mm outside diameter; for culverts greater than 750 mm outside diameter, the culvert bottom will be installed a minimum of 300 mm below the streambed;
 - iv. in multiple culvert installations, install one culvert at an elevation lower than the others (not more than two culverts at any given location);
 - v. ensure that the natural low flow regime of the watercourse is not altered;
 - vi. a culvert will not be installed before site specific information such as localized stream gradient, fish habitat type and species present have been evaluated;
 - vii. rip-rap outlets and inlets to prevent erosion of fill slopes;
 - viii. use culverts of sufficient length to extend a short distance beyond the toe of the fill material;
 - ix. use backfill material which is of texture that will support the culvert and limit seepage and subsequent washing out;
 - x. align culverts such that the original direction of stream flow is not significantly altered;
 - xi. remove fill and construction debris from the culvert area to a location above the peak flow level to prevent its entry into the stream;
 - xii. confine construction activity to the immediate area of the culvert;
- xiii. fill material will not be removed from streambeds or banks except when removal of material is necessary to ensure a flat foundation for installing a culvert;
- xiv. as required, cofferdams of non-erodible material will be used to separate work areas from the watercourse when excavating for culverts and footings. Where pumping is used to bypass flow, pumps must have sufficient capacity to prevent washout of the cofferdams; and



- xv. cofferdams will be removed upon completion of construction and the streambed returned as closely as possible to its original condition.
- c) If fording a watercourse is necessary, the *Environmental Guidelines for Fording* from NLDEC, Water Resources Division and in the *Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador* (DFO 1998) and the DFO *Temporary Fording Sites Factsheet* will be applied in conjunction with the following:
 - i. areas of spawning habitat will be avoided;
 - ii. where feasible, crossings will be restricted to a single location and crossings made at right angles to the watercourse;
 - iii. equipment activity within the watercourse will be minimized by limiting the number of crossings;
 - iv. all equipment will be mechanically sound to avoid leaks of oil, gasoline and hydraulic fluids;
 - v. no servicing or washing of heavy equipment will occur adjacent to watercourses; temporary fuelling, services or washing of equipment in areas other than the main fuel storage site will not be allowed within 100 m of a watercourse except within a refuelling site approved by Newfoundland LNG Ltd.. Oil filters that have been drained and crushed, punctured or perforated may be disposed of at approved waste disposal sites with the permission of the owner/operator, however spilled fuels and waste oil must be disposed of by an approved used oil collector or brought to an approved return facility;
 - vi. the entire fording area will be stabilized using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way, and the ford area is not natural bedrock, or is easily disturbed by fording; when the substrate of the ford area is not subject to easy disturbance by fording, or coarse material is not easily available within the right-of-way, fording under existing substrate conditions may occur under the direction of the Environmental Monitor;
 - vii. fording activities will be halted during high flow periods;
 - viii. all bank sections which contain loose or erodible materials will be stabilized; if banks must be sloped for stabilization, no material will be deposited within the watercourse; sloping will be accomplished by back-blading and the material removed will be deposited above the high water mark of the watercourse;

2.7 Blasting

2.7.1 Environmental Concerns

The general environmental concerns associated with on-land blasting include:

- destruction of vegetation outside construction zone;
- noise disturbances to wildlife;
- effects to fish and aquatic animals;
- disturbance of historic resources;
- dust generation;
- the potential introduction of silt and ammonia into water bodies; and



the potential for disturbing historic resources.

2.7.2 Environmental Protection Procedures

2.7.2.1 General Blasting

- a) All blasting work to be carried out by Newfoundland LNG Ltd. will be conducted in compliance with the appropriate permits and/or approvals and authorizations. All blasters will have a Blasters Safety Certificate and all blasting will be conducted in adherence to Newfoundland LNG Ltd. safe work procedures and the Occupational Health and Safety legislation.
- b) All magazines for explosive will have the appropriate approvals.
- c) The handling, transportation, storage and use of explosives and all other hazardous materials will be conducted in compliance with all applicable laws, regulations, orders of the Newfoundland and Labrador Department of Government Service (NLDGS) and Newfoundland and Labrador Department of Natural Resources (NLDNR), and the Dangerous Goods Transportation Act.
- d) Blasting patterns and procedures will be used which minimize shock or instantaneous peak noise levels.
- e) Blasting will not occur in the vicinity of fuel storage facilities.
- f) Use of explosives will be restricted to authorized personnel who have been trained in their use.
- g) If required, there will be separate magazines on site for explosives and for dynamite blasting caps.
- h) Where necessary, runoff from blasted areas will be monitored at discharge sites for pH, total suspended sediment (TSS), total petroleum hydrocarbon (TPH), ammonia and iron, as required by the Pollution Prevention Division. Discharge will be treated, if required, prior to entering a water body.
- i) All personnel must comply with safe blasting procedures established by Newfoundland LNG Ltd.
- j) Blasting activities will be coordinated and scheduled to minimize the number of blasts required. In order to minimize the seismic effect, blasting patterns and procedures will be used to reduce the shock wave and noise.
- k) Explosives and auxiliary materials will be stored by each contractor as stipulated in relevant legislation and in compliance with their operations permit and this EPP. Licensed blasters under direct supervision of a professional engineer will undertake blasting.
- Explosives will be used in a manner that will minimize damage or defacement of landscape features, trees and other surrounding objects by controlling through the best methods possible (including time-delay blast cycles) the scatter of blasted material beyond the limits of activity.
- m) Historic resources and features will not be disturbed during grubbing. Any historic resource discoveries will be reported to the PAO.



2.7.2.2 Blasting in Close Proximity to Water bodies

- a) Drilling and blasting activities will be undertaken in a manner that ensures the magnitude of explosions is limited to that which is absolutely necessary. A blasting plan will be reviewed with one of the local DFO officers in advance of work in close proximity to water bodies.
- b) If schools of fish, flocks of birds or any marine mammal (as determined by the Environmental Monitor) are detected in the area, described blasting may proceed only when the fish or marine mammals have left the area. Blasting that may be required near the shoreline in compliance with DFO's *Guidelines for Use of Explosives in Canadian Fisheries Waters* (Wright and Hopky 1998). An EPP will commit to the use of the lowest weight of explosives necessary to break rock, to the decking of charges and to stemming all blasting holes.
- c) Use of acoustic harassment devices or a ramp-up of detonation pressures to encourage fish to move away from blasting area. Efforts will be made to coordinate blasting schedules with the proposed Newfoundland and Labrador Refinery to ensure marine blasting is not simultaneous.
- d) Use of bubble curtains and other acoustic absorbents, where feasible; to contain shock waves from blasting.
- e) Notification of area residents and fishers prior to blasting operations.
- f) Dedicated marine mammal surveys to be conducted within a 1,000-m radius of blasting; no detonation will occur while a marine mammal is inside a 1,000-m radius of the blast.
- g) Acoustic harassment devices or a ramp-up of detonation pressures to be used to encourage marine mammals to move away from the blasting area.

2.8 Dust Control

2.8.1 Environmental Concerns

The environmental concerns associated with dust include human health effects and potential effects on aquatic ecosystems, waterfowl and vegetation.

2.8.2 Environmental Protection Procedures

The following measures will be taken to mitigate potential effects of dust:

- a) Any application of calcium chloride will be in accordance with guidelines available from the Newfoundland and Labrador Department of Transportation and Works (NLDTW).
- b) All dust control agents will be stored in areas away from water bodies.
- c) Efforts to be made to minimize fugitive dust emissions; specific types and frequency of dust control measures to be determined by site conditions and specific request from regulatory officials and/or members of the public.
- d) Locations where water is to be applied, the amount of water to be applied and the times at which it will be applied will be determined by the Construction Manager.
- e) Water will not be applied in situations where surface water could freeze and create a potential traffic hazard.
- f) Water will be applied by means of a pressure type distributor equipped with a spray system of nozzles that will ensure a uniform application of water. Minimal amounts of water



required to control dust will be applied such that potential for surface runoff of sediment is minimized. Waste oil, or other petroleum products, will not be used for dust control under any circumstances.

- g) The Company will designate an Environmental Monitor who will be responsible for identifying and resolving air quality issues, including, but not limited to, public complaints about dust generation.
- h) If dust tracking from the construction site becomes a problem in residental areas, a tire wash down or vehicle wet down area will be established for vehicles exiting the site.
- i) Fine-grained soils and granular materials will be transported in covered trailers or trucks to reduce air-borne particulates.

2.9 Trenching

2.9.1 Environmental Concerns

Where excavation for the construction of water lines or any other infrastructure is undertaken, potential runoff of sediment-laden water could result in effects on marine or freshwater fish and fish habitat, water quality and historic resources.

2.9.2 Environmental Protection Procedures

The following measures will be implemented to minimize the potential effects of trenching.

- a) Where possible, topsoil and excavated overburden and bedrock will be stored in separate stockpiles for later use during rehabilitation.
- b) Any unsuitable material will be disposed of in a disposal area approved by the HS&E Manager.
- c) Dewatering of trenches will make use of measures to minimize and control the release of sediment laden water through the use of filtration, erosion control devices, settling ponds, straw bales, geotextiles or other devices (see Section 2.8).
- d) Historic resources and features will not be disturbed during grubbing. Any historic resource discoveries will be reported to the PAO.

2.10 Dewatering – Work Areas

2.10.1 Environmental Concerns

The major concerns associated with dewatering are siltation and impacts to marine species.

2.10.2 Environmental Protection Procedures

a) Water pumped from excavations or work areas, or any runoff or effluent directed out of the project site will have silt removed by settling ponds, filtration or other suitable treatment before discharging to a body of water. Effluent discharge will comply with the provincial *Environmental Control (Water and Sewage) Regulations* under the Newfoundland and Labrador *Environment Act.*



- b) Where possible, clean water will be discharged to vegetated areas to further reduce any potential effects on watercourses.
- c) The size of sedimentation ponds will be designed to accommodate the anticipated volume of collected water and to meet discharge criteria engineered for water quality.
- d) Discharged water will be encouraged to follow natural surface drainage patterns.
- e) Contingency measures will be implemented to deal with storm events and high run-off in order to minimize adverse environmental effects from these events. Erosion prevention and sediment containment materials such as silt fence material, rip rap, straw bales, filter fabric and designated equipment will be available to address contingency/emergency situations.

2.11 Noise Control

2.11.1 Environmental Concerns

A variety of noises associated with construction and operation activity can negatively affect wildlife distribution and abundance. Noises associated with blasting are temporary in nature and noises associated with drilling are considered long-term, but localized.

2.11.2 Environmental Protection Procedures

Measures will be implemented wherever possible to minimize potential effects arising from a variety of noise sources, including:

- a) Adherence to all applicable permits and approvals.
- b) All equipment will have exhaust systems regularly inspected and mufflers will be operating properly.
- c) All equipment will be fitted with standard and well-maintained noise suppression devices. To mitigate potential effects to local residents, noise-generating construction activity will be carried out during daylight hours to minimize disturbances and local municipal construction by-laws will be followed.
- d) During operation, process equipment (i.e., compressors) will be enclosed in buildings that will be constructed to minimize noise transmission. Isolated pieces of equipment not housed in buildings will be covered with enclosures to reduce noise levels. Vehicles operating on the site will be equipped with mufflers or other noise suppression equipment.
- e) Noise control measures to be determined by site activities and specific request from regulatory officials and/or members of the public.
- f) The Contractor will ensure idling of construction vehicles is limited.
- g) The routing of truck traffic through residential areas will be controlled during the maximum period of activity. Periodic noise monitoring will be undertaken on site.



2.12 Concrete Production

2.12.1 Environmental Concerns

The major concern relating to concrete production activities is the effects of washwater released to the environment. Liquid wastes may contain hazardous materials such as cement, concrete additives and form oil.

Cement is very alkaline and washwater from spoiled concrete or from the cleaning of the batch plant mixers and mixer trucks, conveyors and pipe delivery systems can be expected to have very high pH, which may exceed the acceptable limit, as determined by the provincial regulation of discharges to a body of water. Similarly, spoiled concrete or washwater would contain concrete additives and agents, some of which are toxic to aquatic species. Aggregates, particularly the finer sand fractions, can be expected to be washed from spoiled concrete or discharged in washwater. Uncontrolled release of such washwater, chemicals and sediments could adversely affect aquatic life and aquatic habitat.

2.12.2 Environmental Protection Procedures

Measures will be implemented wherever possible to minimize potential effects arising from concrete production, including:

- a) Wash water from the cleaning of concrete trucks will be discharged either at the concrete manufacturer's place of business (assuming that the plant is in close proximity to the work site), or alternately, at a wash water settling pond for control and treatment, as appropriate. All such discharges will be of minimal volume and will not occur within the buffer zone of water bodies and watercourses or other environmentally sensitive areas.
- b) In the event that water from the closed settling system is released, it will be tested, prior to release, for parameters related to any concrete additives to be used in the production of concrete (e.g., total hydrocarbons, sodium hydroxide), pH and TSS. The water to be released will also meet the limits specified by NLDEC, and will adhere to those portions of the *Fisheries Act* that relate to fish habitat protection and pollution prevention. Release will be via runoff control procedures.
- c) The settling basin will be cleaned on an as required basis to ensure that the retention capacity is maintained at all times.
- d) Concrete additives will be stored in approved containers.
- e) Settling basins will be provided to control run off from aggregate stockpiles.
- f) Wash down water will be contained in settling ponds prior to disposal.
- g) Regular inspections of equipment will be performed.
- h) Form work and concrete placement procedures (on land and marine) will be implemented to prevent the spillage of concrete to any water body.
- i) Miscellaneous concrete equipment cleaning will involve minimal discharge volumes and will not occur within the buffer zone of water bodies and watercourses or other environmentally sensitive areas.



- j) Concrete handling will be conducted under the Workplace Hazardous Materials Information System (WHMIS) program, whereby only trained personnel handle the concrete and only in accordance with manufacturer's instructions and government regulations.
- k) The location and design of the concrete production area and yard should be described with provisions for environmental protection.
- I) All drainage from an aggregate storage area should be directed to a drainage control device such as a settling pond; and
- m) Effluent should be treated as appropriate before release to receiving waters, or alternatively, effluent should be recycled for reuse after treatment. Solids which accumulate in a settling pond should be removed on a regular basis to ensure the settling pond remains effective.

2.13 Linear Developments

2.13.1 Environmental Concerns

Linear developments encompass a diverse range of standard construction-related activities, such as ditching, right-of-way clearing and grubbing, roads, pipelines and transmission line construction. Environmental concerns associated with linear developments include potential sedimentation/erosion, the loss of vegetation, fish/wildlife habitat and historic resources.

2.13.2 Environmental Protection Procedures

Road Construction

- a) Aggregate (fill) materials for road construction will not be removed from any stream.
- b) Siltation control measures such as sediment traps and check dams will be installed where required (Section 2.10). Solids that accumulate in a settling pond or behind a sediment trap will be removed on a regular basis to ensure such devices remain effective.
- c) Work will not be undertaken on easily erodible materials, during or immediately following heavy rainfalls.
- d) Buffer zones will be flagged prior to any disturbance activities.
- e) Mechanical methods of brush control will be used at all times.
- f) Historic resources and features will not be disturbed during grubbing. Any historic resource discoveries will be reported to the PAO.
- g) A minimum 30-m vegetative buffer strip will be maintained around all fill areas adjacent to water bodies. However, in instances where steep slopes are encountered, the buffer zone will be increased using the following formula: Buffer Zone + (1.5 x slope(%)).Right-of-ways, particularly in areas of dense vegetation, will be as narrow as practicable; loss of ground vegetation will be kept to a minimum.
- h) Drainage from areas of exposed fill will be controlled by grade or ditching and directed away from watercourses. Surface water will be directed away from work areas by ditching. Runoff from these areas will have silt removed by filtration or other suitable methods.
- i) The requirements of ditch blocks/check dams or sediment traps to intercept runoff will be determined in the field in consultation with the HS&E Manager and Contractor.



- j) Check dams will be used as required to reduce runoff from work areas with exposed soil.
- k) In areas where natural vegetation must be removed, the vegetation layer will be stored for possible use as erosion control material on exposed slopes.
- I) Temporary erosion control will be applied on exposed slopes in sensitive areas immediately following exposure of a slope.
- m) The cutting and filling phase of road construction, and the development of other work areas, will be conducted in a manner that ensures minimum disturbance and controls potential sedimentation of watercourses and water bodies in or adjacent to the roads, as outlined in the following procedures:
 - i. cutting and filling will be done only upon completion of grubbing as outlined in Section 2.3. Where engineering requirements do not require grubbing (e.g., within the buffer zone of a stream crossing, see Section 2.6), filling will occur without any disturbance of the vegetation mat or the upper soil horizons;
 - ii. filling in the vicinity of stream crossings will be done in a manner which ensures that erosion and sedimentation of watercourses and water bodies is minimized and done in strict compliance with the required watercourse alteration permits;
 - iii. the infilling of watercourses and water bodies will not be permitted except where it is necessary at an approved stream crossing, or where the road alignment cannot avoid some infilling. Newfoundland LNG Ltd., will ensure that the work is completed in strict compliance with the required watercourse alteration permits from the NLDEC and the Authorization for Works or Undertakings Affecting Fish Habitat from DFO, if required;
 - a minimum buffer of 30 m of undisturbed natural vegetation will be between the roads and the bank of any watercourse they parallel. In instances where steep slopes are encountered, the buffer zone will be increased using the following formula: Buffer Zone + (1.5 x slope(%)); and
 - v. road fill will be dry and ice-free. On areas of sensitive terrain, the fill will be end-dumped from the established road bed.
- n) Culverts will be installed to maintain natural cross-drainage and to prevent ponding.
- o) The number of stream crossings will be minimized. Where the road must cross a stream, the environmental protection procedures detailed in Section 2.6 will be followed.
- *p)* Right-of-ways will avoid known archaeological sites. If any archaeological sites are encountered, the environmental protection procedures detailed in Section 3.4 of this EPP will be followed.

Pipeline Development

Pipelines such as those for town water will be constructed above ground and follow the access roads. All exterior surface pipelines with the potential to freeze will be gravity self-draining to a containment or employ other protection measures to prevent spillage to the environment. The environmental protection procedures for road construction as outlined above will be used for pipeline construction where applicable.

Drainage

Drainage discharge locations will be determined in consultation with the HS&E Manager.

a) Roads will be adequately ditched so as to allow for good drainage.



- b) Roadside ditches will discharge onto vegetated or forested areas, never directly into a watercourse.
- c) Wherever possible, ditches will be kept at the same gradient as the road.
- d) The location of all culverts will be marked with a post so they can be located during snow removal operations or if they become covered from debris accumulation.

2.14 Vehicular Traffic

2.14.1 Environmental Concerns

Direct physical disturbances from vehicular movements can adversely affect both terrestrial and aquatic environments, as well as historic resources. During any construction-related operation, the level of activity involving equipment movement, types of equipment and supply, requires various infrastructures such as roads, to conduct the work efficiently and in an environmentally acceptable manner. Typically, vehicles ranging in size from ATVs to heavy equipment, all of which can result in ground disturbance, may be used during access road construction. Newfoundland LNG Ltd. is committed to the proper development of access roads in order to minimize environmental damage resulting from equipment movement and supply of operations.

2.14.2 Environmental Protection Procedures

- a) ATVs will not be allowed on the site except as required by the Contractor in the performance of the work.
- b) Where possible, the use of ATVs will be restricted to designated trails, thus minimizing ground disturbance. ATV use will comply with *All-Terrain Vehicle Use Regulations* and the *Environmental Guidelines for Stream Crossings by All-Terrain Vehicles*.
- c) Vehicle movements will be restricted to developed areas such as access roads.
- d) Appropriate speed limits and road signage will be established and enforced to minimize environmental disturbance and accidents.
- e) During winter when the ground is covered with snow, snowmachines and track-heavy equipment (dozers), whether equipped with low-impact tread or not, will not be used for equipment movement and supply outside of established roadways, pathways or trailways. Where possible, this equipment will use established pathways, also minimizing disturbances to vegetation.
- f) Equipment and vehicles will yield the right-of-way to wildlife. Any attempt to interfere with the natural movement of wildlife will be considered harassment and dealt with accordingly.
- g) All Project vehicles, including ATVs, will be properly inspected and maintained in good working order including all exhaust systems, mufflers and any other pollution control devices.

2.15 Storage Handling and Transfer of Fuel and Other Hazardous Substances

A variety of fuels and potentially hazardous materials will be used during Project construction activities. Gasoline, diesel fuel, grease, motor oil and hydraulic fluids are all needed for equipment. Other potentially hazardous materials that may be used routinely include:



- propane;
- explosives;
- acetylene;
- paints;
- epoxies;
- concrete additives;
- antifreeze; and
- cleaners and solvents.

2.15.1 Environmental Concerns

The primary concern regarding the use of fuel and hazardous materials is their uncontrolled release to the environment through spillage, and subsequent adverse effects on human health and safety, terrestrial, aquatic and marine habitat and species, soil and groundwater quality.

2.15.2 Environmental Protection Procedures

The following protection procedures will be implemented:

Transport of Fuel and Other Hazardous Materials

The transport of fuel and other hazardous materials will be undertaken in compliance with the *Transportation of Dangerous Goods Act*. All goods entering the site will be inspected to ensure that the appropriate placards or labels and manifest are in place and the security of the product is assured. All persons handling dangerous goods must show proof of certification of training in the transportation of dangerous goods as required under the *Act*. Contractor staff and the HS&E Manager will be trained in the requirements of the *Act*.

Storage of Fuel and Other Hazardous Materials

All bulk storage of fuel products and other hazardous materials on land will be stored in above-ground, self-dyked tanks in compliance with the Storage and Handling of Gasoline and Associated Products Regulations (Newfoundland Regulation CNR 775/96).

The following conditions will apply to the storage of fuels and other hazardous materials.

- a) Before installing fuel storage tanks, the necessary approvals under *The Storage and Handling* of *Gasoline and Associated Products Regulations* will be obtained from the NLDGS.
- b) Drums of petroleum products or chemicals should be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry, water-tight building or shed with an impermeable floor.
- c) Fuels and other hazardous materials will only be handled by persons who are trained and qualified in handling these materials. WHMIS will be implemented to ensure proper handling and storage are achieved.
- d) Oils, grease, gasoline, diesel or other fuels or any material deemed to be hazardous will be stored at least 100 m from any surface water.



- e) Fuels will be stored inside dykes or self-dyked units and will be clearly marked to ensure they are not damaged by moving vehicles. The markers will be visible under all weather conditions.
- f) Storage areas will be equipped with suitable firefighting equipment.
- g) Any above-ground fuel tank will be positioned over an impervious mat and will be surrounded by an impervious dyke of sufficient height (minimum height 0.6 m) to contain:
 - i. where a dyked area contains only one storage tank, the dyked area will retain not less than 110% of the capacity of the tank; and
 - ii. where a dyked area contains more than one storage tank, the dyked area will retain not less than 110% of the capacity of the largest tank or 100% of the capacity of the largest tank plus 10% of the aggregate capacity of all the other tanks, whichever is greater. Otherwise approved self-dyked storage tanks will be used where required.
- h) Any dykes of earthwork construction will have a flat top not less than 0.6 m wide, and be constructed and maintained to be liquid-tight to a permeability of 25 L/m²/day. The distance between a storage tank shell and the center line of a dyke will be at least one half the tank height. Dykes will be fenced.
- *i*) Fuel storage areas and non-portable transfer lines will be clearly marked or barricaded to ensure they are not damaged by moving vehicles. The markers will be visible under all weather conditions. Barriers will be constructed in compliance with the provincial *Storage and Handling of Gasoline and Associated Product Regulations.*
- j) Waste oils, and lubricants are to be disposed of by an approved used oil collector. If used oil is to be stored on site, the storage must be approved by the Government Service Centre.
- k) All storage tank systems will be inspected on a regular basis as per Sections 20 and 21 of the Storage and Handling of Gasoline and Associated Products Regulations. This involves, but is not limited to, gauging or dipping and the keeping of reconciliation records for the duration of the program.
- I) Smoking will be prohibited within 10 m of a fuel storage area.
- m) Hot Work Permits will be required before undertaking welding or torch cutting at a fuel storage area.
- n) Temporary fueling or servicing of mobile equipment in areas other than the main fuel storage site will not be allowed within 100 m of a watercourse.
- o) Under the Storage and Handling of Gasoline and Associated Products Regulations 2003, a tank that is to be decommissioned must be purged of all hydrocarbons and vapours by a certified contractor, be verified gas free by a gas detection metre, be rendered unfit for further use by cutting holes in it, and be disposed of in a manner approved by the department.
- p) Any soil contaminated by small leaks of fuel, oil or grease from equipment will be disposed of in accordance with the provincial *Environmental Protection Act* and *Used Oil Control Regulation*, (*Draft*). The *Used Oil Control Regulation* will be used as a guideline to the NLDEC requirements for such disposal.
- q) A fuel and other hazardous materials spill contingency plan, and appropriate emergency spill equipment, will be in place on site (see Section 3.3 of this EPP, in addition to contingency plans required by fuel suppliers). A copy of contigency plan is to be forwarded to the Government Services Centre.



r) Bulk fuel storage facilities will be dipped on a weekly basis in order to accurately gauge fuel consumption. These consumption rates will allow for visually undetectable sources of contamination to be identified and corrected.

Fuel Transfer

The following procedures will apply to the transfer of fuel or hazardous material:

- a) In all cases, transfer to storage tanks will be attended by a qualified person for the duration of the operation. This person will be trained in proper fuel handling procedures to minimize the risk of an unattended spill. The attendant will be trained in the requirements of the spill contingency plan and WHMIS.
- b) Hoses or pipes used for fuel transfer will be equipped with properly functioning and approved check valves, spaced to prevent backflow of fuel in the case of failures.
- c) Fuel transfers between ship and shore or between ships will be conducted in accordance with the Canada Shipping Act (CSA), Oil Pollution Prevention Regulations.
- d) Exposed pipelines will be protected from vehicular collision damage by the installation of guard rails.

Equipment Fuelling

The following procedures will apply to the fuelling of heavy construction equipment:

- a) When refuelling equipment, operators will:
 - i. use leak-free containers and reinforced rip-and puncture-proof hoses and nozzles;
 - ii. be in attendance for the duration of the operation; and
 - iii. seal all storage container outlets except the outlet currently in use.
- b) Regular inspections will be made of hydraulic and fuel systems on machinery. Leaks will be repaired immediately.
- c) Fuelling or servicing of mobile equipment on land will not be allowed within 100 m of watercourses, water bodies or ecologically sensitive areas.
- d) Fuelling attendants will be trained in the requirements under the spill contingency plan (see Section 3.3, Fuel and Hazardous Materials Spills).
- e) Refueling and maintenance activities will be undertaken on level terrain, at least 30 m from any surface water, on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter surface waters. Waste oil should be disposed of in an approved manner.

Hazardous Materials

The following procedures will apply to the use of hazardous materials:

a) Hazardous materials will be only used by personnel who are trained and qualified in the handling of these materials and only in accordance with manufacturers' instructions and government regulations. WHMIS and the provisions of the *Transportation of Dangerous Goods Act (TDGA)* (Transport Canada) will be implemented throughout the job site. All employees involved with hazardous materials will be appropriately trained.



- b) All hazardous materials will be removed and disposed of in an acceptable manner in accordance with government regulations and, requirements.
- c) Material Safety Data Sheets (MSDS) must be available on-site prior to receipt of any hazardous materials.
- d) A hazardous waste storage area will be constructed.

Spills of Fuel and Hazardous Materials

- a) All necessary precautions will be implemented to prevent the spillage of fuels and other hazardous materials used during the construction phase.
- b) All spills of fuel and hazardous materials will be reported immediately to the HS&E Manager and the Contractor. Any spill to the marine environment and any spills of 70 L or more on land is to be reported to the Canadian Coast Guard Environmental Emergencies Reporting line at 709-772-2083 or 1-800-563-9089.
- c) There will be appropriate emergency spill response equipment on site for all phases of the Project.
- d) A complete list of the emergency spill response equipment will be available on site and kept up to date.
- e) In order to ensure that a quick and effective response to a spill event is possible, spill response equipment should be readily available on-site. Response equipment, such as absorbents and open-ended barrels for collection of cleanup debris, should be stored in an accessible location on-site. Personnel working on the project should be knowledgeable about response procedures.

The use of chemical dispersants to treat oil slicks will take place only under the authorization of Environment Canada, Environmental Protection Branch (Newfoundland).

2.16 Waste Management Plan

Solid waste will be generated during construction and preparation of the Grassy Point LNG facility. Waste streams will be identified as domestic waste, paper, cardboard, wood and scrap steel and metals. This section contains procedures for waste minimization, recycling and disposal.

2.16.1 Environmental Concerns

Solid waste, if not properly controlled and disposed of, can be unsightly and cause human safety and health concerns. Disposal of solid waste in the marine environment has potential to harm marine life. Uncontrolled hazardous waste can contaminate soils, surface and groundwater, and can be toxic to vegetation, fish and wildlife if ingested in sufficient quantities.

2.16.2 Environmental Protection Procedures

All waste material to be disposed of at an approved waste disposal site is to be done with the permission of the owner/operator.



Non-hazardous Waste

Waste generated during construction will be handled, stored, transported and disposed of in accordance with all applicable acts, regulations and guidelines. Solid wastes will be sorted at the facility and material not deemed acceptable for re-use will be disposed of in an acceptable manner at an approved landfill site. Certified contractors will be retained for safe transport of solid waste to the approved facility.

Contractors will be responsible for developing a waste management plan for non-hazardous wastes. They will ensure that non-hazardous waste management procedures are implemented as follows:

- a) Waste management procedures will comply with federal, provincial and municipal waste management regulations, as well as additional municipal and disposal facility requirements.
- b) All construction waste and any other refuse associated with the Project will be segregated as recyclable and non-recyclable.
- c) Recyclable material will be collected and transported to a licensed recycling facility using local services authorized by Newfoundland LNG Ltd.
- d) An effort will be made to minimize the amount of waste generated by application of the 4-R principals (reduce, reuse, recycle, recover) to the extent practical.
- e) Non-recyclable wastes will be transported offsite to an approved landfill.
- f) Domestic waste will be gathered daily and stored in closed containers until disposed of at an approved waste disposal site.
- g) Food waste will be stored in a manner that ensures that wildlife will not be attracted.
- h) Waste containers will be covered to prevent the escape of windblown debris and will be clearly labelled.
- i) Garbage Pollution Prevention Regulations under Part XV of the CSA prohibit the discharge of garbage including solid galley waste, food waste, paper, rags, plastics, glass, metal, bottles, crockery, junk or similar refuse.
- j) Dredged materials from marine construction activities must be tested and disposed of in accordance with NLDOEC Guidance Documents titled *Dredge Spoils Disposal GD-PPD-028-1* and Leachable Toxic Waste, Testing and Disposal GD-PPD-026-1. The removal and disposal of dredge spoils from within the marine/freshwater environment requires testing as per GD-PPD-026-1 and approval from the Government Service Centre.

Hazardous Waste

All Contractors will develop a waste management plan for hazardous wastes. The Contractor will be responsible for ensuring hazardous waste management procedures are implemented as follows:

- a) Waste oils and lubricants storage tanks are to be approved by Government Services Centre.
- b) All used oil, petroleum products and other hazardous materials will be removed and disposed of in an acceptable manner in accordance with federal and provincial regulations and requirements. Waste oil will be collected separately and offered for recycling or stored for collection by an approved special waste collection and disposal company.



- c) Greasy or oily rags or materials subject to spontaneous combustion will be deposited and kept in an appropriate receptacle. This material will be removed from the work site on a regular basis and will be disposed of in approved waste disposal facilities.
- d) The *Transportation of Dangerous Goods Act* (TDGA) and *Regulations* place certain restrictions on the transportation of dangerous goods. The *Act* and *Regulations* require: clear identification of dangerous goods under one of nine categories; proper containers and packaging; and training for employees shipping, receiving and transporting dangerous goods. Schedule II of the *Regulations* lists materials and products that are hazardous for transport. Part III of the *Regulations* contain the classification procedure for hazardous materials not listed in Schedule II.
- e) The *Hazardous Products Act* is the basis for WHMIS, which promotes proper labelling of controlled products and requires workers to receive education and training regarding safe storage, use and handling of controlled products.
- f) Oil Pollution Prevention Regulations under Part XV of the CSA stipulate the requirement for installations capable of retaining oil residues on board for subsequent discharge to a reception facility and equipment that meets oily mixture discharge requirements set out in Sections 31 and 33.
- g) Section 35 of the *Migratory Birds Regulations* under the *Migratory Birds Convention Act* prohibits the deposit of oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.
- h) Section 36 of the federal *Fisheries Act* prohibits the discharge of deleterious substances into any type of water frequented by fish.

2.17 Access Management Plan

Project construction will result in a significant increase in passenger vehicles as well as heavy truck traffic on the site access road. This access management plan contains procedures to help minimize dust, noise, potential effects to wildlife and socio-economic effects associated with construction traffic.

2.17.1 Environmental Concerns

Project construction will result in a temporary increase of passenger and heavy vehicle traffic. Construction traffic can also affect surrounding land uses through noise and dust emissions.

2.17.2 Environmental Protection Procedures

Noise

The following measures are recommended to mitigate construction traffic related noise impacts:

- a) Construction vehicles will be advised not to use engine brakes within the local community.
- b) If noise issues arise due to Project-related construction truck traffic in the area, noise levels will be monitored during a typical time of the day as requested.



Dust

The following measures are recommended to mitigate dust problems related to construction vehicles moving on the public road system:

- a) If dust tracking from the construction site becomes a problem, a tire wash down or vehicle wet down area will be established for vehicles exiting the site.
- b) Fine-grained soils and granular materials will be transported in covered trailers or trucks to reduce air borne particulates.

Wildlife Protection

Project traffic will adhere to posted speed limits to reduce potential for collisions with wildlife such as mammals and birds.

Socio-economic Effects

Although road traffic generated during construction of the Terminal is not expected to cause any significant effects to existing traffic movement, the following measures will be taken to mitigate potential impacts:

- a) Trucks that will be used to transport materials on the public road system will be of a type normally used to transport materials throughout Newfoundland and Labrador.
- b) Trucks will operate only with registered allowable loads, unless over size and over weight permits are obtained from applicable regulatory agencies.
- c) All loads will be secured in accordance with the Securing of Loads on Vehicles Regulations.
- d) Car pooling will be encouraged to reduce the number of workers' vehicles using the road system.
- e) Newfoundland LNG Ltd. will consult with municipality and government regulatory officials and local RCMP, prior to construction, and will address any complaints.
- f) Movement of vessels to be subject to the *Practices and Procedures for Public Ports* under the *Canada Marine Act*.
- g) Vessels to follow existing protocols within Placentia Bay.
- h) Navigation aids to be used as required.
- i) Automatic Idenification System (AIS) and verbal communications are accessible to vessels.
- j) "The Normal Practice of Seamen" gives the expectation of the Master making the decision to get underway in good time.
- k) All vessels participating in construction activities to maintain speeds of less than 10 knots.
- I) Construction vessels and barges to follow designated routes to and from the construction sites.

2.18 Marine and Migratory Bird Protection

2.18.1 Environmental Concerns

Lighting, noise and Project construction activities can potentially interfere with the migratory patterns of



birds and the behaviour of transient or resident marine birds.

2.18.2 Environmental Protection Procedures

The following mitigative measures are designed to reduce the interference that site activities will have on birds as well as reduce the effect of site construction will have on local bird populations.

- a) Survey of nesting birds to be completed before any clearing or site preparation begins. If nesting bird species at risk are discovered, operations in the immediate area of the nest are to be suspended until the young have fledged.
- b) Directional and fully shielded light fixtures will be employed, depending on safety and navigational requirements. This type of light fixture would illuminate only the immediate working area below the lamp, with little or no diffusion of light laterally and above the lamp.
- c) Workers should be instructed to report any collisions of birds with structures and if collisions occur frequently, a plan to address further mitigative measures will be established.
- d) If work is suspended during rough weather or foggy conditions, construction lighting should be extinguished during these periods to reduce the attraction of birds.
- e) A combination of scaring tactics, including visual and acoustic deterrent devices may be used. If measures such as the use of firearms or aircraft are considered, a scare permit is required from the CWS. Please contact Donna Johnson, CWS Permits Administrator at (506)-364-5017 for more information on obtaining this permit.
- f) The vegetation along the shorelines of water bodies and the coast will be maintained except where access to the coast is required. A minimum 30 m buffer from the high water mark of any water body (1:100 year Flood Zone) in order to maintain movement corridors for migratory birds.
- g) If a raptor nest is observed during construction it will be reported to the Forest Resources Office at Paddys Pond and the NLDEC Wildlife Division.
- h) Any migratory bird nests or colonies found on site will be "buffered" during breeding season until young have fledged, and nests will be left intact and undisturbed in compliance with the *Migratory Birds Convention Act* and Regulations.
- i) Boat activity and human presence will be restricted near colony-nesting birds where possible.
- j) Blasting activities will be coordinated and scheduled to minimize the number of blasts required. In order to minimize the seismic effect, blasting patterns and procedures will be used to reduce the shock wave and noise.
- k) Mature balsam fir forests are to be retained where possible along the shoreline, which may provide potential habitat for Red Crossbill in the future.
- I) Project access roads to have reasonable speed limits to minimize potential mortality of bird species at risk from road kills.
- m) No personnel will approach, feed or harass wildlife if encountered.
- n) Firearms will not be permitted on or near the work site. Hunting by Project employees on site will be forbidden.
- o) All food waste will be properly contained and disposed of on a regular basis at an approved facility.



- p) The NLDEC Wildlife Division and Environment Canada's CWS should be contacted with regards to any rare or endangered wildlife species encountered. Other wildlife encounters will be reported to the Regional Conservation Officer at Paddys Pond. Guidance as to the appropriate action to take will be given by these authorities.
- q) All personnel shall be advised of rare or endangered species potentially occurring in the Project area. Field surveys conducted during the environmental assessment process determined limited potential for rare or endangered wildlife species in the Project area.
- r) Crew will always yield the territory to the animal.
- s) Crew will be alert to the signs of animal presence (e.g., nests.) and report to the HS&E Manager.
- t) The CWS handling protocol for stranded Leach's Storm-petrels will be followed on the Project site and on board Project vessels.

As part of the Environmental Emergency Plan, Newfoundland LNG Ltd. will prepare a spill response plan which specifically addresses concerns related to birds which will include the following elements:

- measures to be taken to contain a spill and clean up an area during any phase of the project;
- a clear accounting of who would be responsible for cleanup and what response and containment equipment would be available;
- measures that would be taken to keep birds away from a spilled substance; and,
- for dealing with accidents where birds are oiled and/or sensitive habitats are contaminated and for handling oiled birds.

2.19 Archaeological Protection

2.19.1 Environmental Concerns

Desktop and field research was conducted to determine the likelihood of archaeological and heritage resources presence within the Project site. The Project footprint is considered to have limited potential for historic resources. Due to the recent date and commonplace nature of the site, the PAO has permitted work to proceed in the area with no further assessment requirements.

2.19.2 Environmental Protection Procedures

In the event of the discovery of a historic or prehistoric artifact or archaeological site, the procedures outlined below will apply.

- a) Work in the immediate area will be suspended and the Construction Manager and Environmental Monitor will be notified immediately.
- b) The Environmental Monitor will contact the PAO.
- c) The site area will be flagged for protection and avoidance, with an appropriate buffer zone determined in consultation with the PAO.
- d) An Incident Report Form will be filed with the Newfoundland LNG Ltd. HS&E Manager.
- e) Newfoundland LNG Ltd. will take all reasonable precautions to prevent employees or other



persons from removing or damaging any such articles or sites until they have been assessed.

f) A qualified archaeologist will conduct an archaeological assessment of the resource and report the resource to the PAO. No work at that particular location will continue until the qualified archaeologist, in consultation with the PAO, authorizes renewal of the work.

2.20 Works In/Around Marine Environment

2.20.1 Environmental Concerns

Works required in the marine environment include infilling and dredging to construct the tug basin causeway and the construction of the port facility. The principle environmental concerns from marine construction include noise and the disturbance to fish and fish habitat. Marine construction activities can also disturb nearshore terrestrial habitat and cause seabirds, waterfowl and marine mammals to avoid the area. As well, there may be some potential for historic resources to be disturbed.

2.20.2 Environmental Protection Procedures

- a) Clean quarried rock having a minimum of fines (<5%) will be used for infilling. Armour stone protection will be placed progressively to minimize erosion and to prevent the loss of infill material.
- b) Infilling will be conducted in strict compliance with the Authorization for Works Undertakings Affecting Fish Habitat, issued by DFO under the Fisheries Act, and the Permit for the Alternation of a Waterbody under the Newfoundland and Labrador Environment Act.
- c) Infilling will be done in compliance with the Navigable Waters Protection Act authorization.
- d) All equipment will have muffled exhausts to minimize noise.
- e) All equipment will be serviced and fuelled on land at least 100 m from the marine environment or in designated areas designed for spill containment.
- f) Daily mechanical inspections for leaks on all equipment will be made and repairs undertaken immediately.
- g) A Fuel and Other Hazardous Material Spill Contingency Plan (Section 3.3) will be in place and appropriate emergency spill equipment available onsite.
- h) During dredging for the tug basin, the dredge bucket will be enclosed clamshell type, which has the top covered with a steel plate to minimize overflow of the dredged material. Most of the turbidity occurs when the bucket hits the bottom so ideally, only a single bite will occur on every cycle.
- i) Dredged materials from marine construction activities must be tested and disposed of in accordance with the NLDEC Guidance Documents titled *Dredge Spoils Disposal GD-PPD-028-1* and *Leachable Toxic Waste, Testing and Disposal GD-PPD-026-1*. The removal and disposal of dredge spoils from within the marine/freshwater environment requires testing as per GD-PPD-026-1 and approval from the Government Service Centre.
- j) There will be no side-casting of dredged materials. Material will be removed from the marine environment.
- k) Immediately stabilize any disturbed areas along the shoreline to prevent erosion.
- I) Monitor water quality to ensure total suspended solid levels and contaminant concentrations in



the water column are within limits prescribed by the Canadian Council of Ministers of the Environment (CCME) *Environmental Quality Guidelines* for the protection of aquatic life (<u>http://www.ccme.ca/publications/ceqg_rcqe.html</u>) when considered in conjunction with existing ambient water quality and site-specific factors.

- m) Take further mitigative actions as necessary based on monitoring results.
- n) Historic resources and features will not be disturbed during grubbing. Any historic resource discoveries will be reported to the PAO.
- o) Construction activities will be scheduled to avoid periods of heavy precipitation.
- p) Placement of floating booms during construction activities in the marine environment.

2.21 Marine Construction

2.21.1 Environmental Concerns

Project vessel traffic may interfere with local fishing boats and other vessel traffic. The potential exists for vessels to collide, run aground and/or sink. Such events may lead to the accidental release of fuel and other hazardous materials to the marine environment.

2.21.2 Environmental Protection Procedures

Mitigative measures will be implemented to reduce effects on the local fisheries and to ensure that no lasting damage to fishing stocks occur.

- a) Scheduling of construction activities will occur outside of fishing seasons where possible.
- b) For the safety of the work crews and commercial fishers in the area, fishing inside the Construction Safety Zone (CSZ) will be restricted during construction activities.
- c) Newfoundland LNG Ltd. will handle compensation claims for damaged equipment outside of the CSZ on a case-by-case basis.
- d) All vessel activities will be governed in accordance with Garbage Pollution Prevention Regulations, Pollutant Substance Regulations, Pollutant Discharge Reporting Regulations and Oil Pollution Prevention Regulations as required by the CSA.
- e) To minimize interference with other marine traffic, Notices to Shipping/Mariners will be issued by the Canadian Coast Guard (CCG) regarding Project vessel traffic.
- f) Project vessel masters will observe the following basic rules:
 - i. implement best management practices designed to achieve zero discharge of oily waste while at the site and along the Project shipping route; and
 - ii. notify the HS&E Manager of any releases or spills of substances (emergencies) immediately.
- g) No Project-related vessels will discharge wastes or bilge water into surrounding waters. The discharge of garbage from ships into Canadian waters and the waters of the Fishing Zones of Canada is prohibited.
- h) All crew members will be familiar with emergency procedures for both life threatening and potentially polluting situations.



i) All stationary hazards, such as moored platforms or vessels, will be clearly marked according to CCG *Regulations*.

2.22 Hydrostatic Testing

During commissioning of the LNG storage tanks, seawater will be used for hydrostatic testing, followed by a wash down of a small quantity of freshwater. No additives or other chemicals (e.g., biocides, tracer dyes) will be introduced into the test water. The hydrostatic test water will be discharged to the ocean. This will be a onetime only test of each tank. The primary source of water for hydrostatic testing will be from Placentia Bay and there will be no withdrawals from non-marine surface water bodies.

2.22.1 Environmental Concerns

There is potential for entrainment of marine organisms during water intake and for benthic scour during discharge. Because marine water will be used for the hydrostatic test without chemical additives or other likely sources of contamination, the concern with water quality upon discharge is relatively low.

2.22.2 Environmental Protection Procedures

The following environmental protection procedures will be implemented regarding the discharge of hydrostatic test water into the marine environment:

- a) Hydrostatic test water will be sourced from and discharged into Placentia Bay.
- b) The marine water intake will be screened to reduce entrainment of marine organisms.
- c) The discharge pipe will be placed so as to minimize scour (i.e., along relatively hard bottom) to reduce the plume of any sediments suspended due to the turbulence of discharge. Additional scour protection (e.g., small amount of rock fill) will be provided if necessary.
- d) During tank construction, all reasonable efforts will be made to prevent the introduction of potential contaminants (e.g., welding debris, spills) and to clean the tanks of such contaminants prior to the introduction of the test water.
- e) The Contractor will be responsible for testing of the water prior to discharge, in accordance with the *Water and Sewer Regulations* for waste water discharge.
- f) In addition, if particular criteria are required by the manufacturer, hydrostatic test water may be analyzed prior to hydrostatic testing and/or discharge.
- g) The marine water intake will be screened in accordance with the DFO *Freshwater Intake End-Of-Pipe Fish Screen Fact Sheet* to reduce entrainment of marine organisms.

2.23 Greenhouse Gas Emissions

Newfoundland LNG Ltd. has recently retained Jacques Whitford to perform a baseline assessment of their greenhouse gas (GHG) emission inventory (also referred to as its Carbon Footprint) and to provide recommendations with respect to a climate policy for the company, and the development of a GHG management plan.

The GHG emissions inventory will include all direct and indirect GHG emissions (as Scope 1, 2 and 3 emissions where appropriate) resulting from shipment (limited to docking activities only), natural gas



ENVIRONMENTAL PROTECTION PLAN

transfer and electricity requirements for storage. This will allow for the identification of major GHG sources, sinks and reservoirs and will provide the baseline for the development of a GHG management plan.

This Carbon Footprint study will form the baseline for developing strategies to manage risks associated with the climate change issue generally, and specifically including approaches to managing public and regulatory risk, customer risk, supplier risk and competitor risk. This commitment to a Climate Change Policy and a GHG Management Plan, including options to reduce the company's Carbon Footprint, will be incorporated into Newfoundland LNG Ltd. policy for operations of potential projects. Ultimately, Newfoundland LNG Ltd. will explore the feasibility of becoming a "Carbon Neutral" facility.

2.23.1 Environmental Concerns

Greenhouse gas (GHG) emissions can affect weather patterns with associated adverse effects on global and local scales. GHG emissions such as carbon dioxide (CO_2) and methane (CH_4) are typically associated with fuel distribution, processing and combustion. Given the nature and scale of this Project, it is not expected to measurably contribute to GHG emissions in the area. However, an effort will be made by Newfoundland LNG Ltd. to reduce GHG emissions at each stage of the Project.

2.23.2 Environmental Protection Procedures

During the construction and operations phase of the Project, GHG emissions will be reduced by:

- a) Ensuring construction vehicles and vessels are well maintained.
- b) Using liquid nitrogen for the commissioning systems cool down as much as possible instead of LNG.
- c) Strict compliance with all applicable GHG emissions standards.
- d) Vehicle idling will be minimized.
- e) Existing vegetation and trees will be no be cleared outside the Project footprint.

3.0 CONTINGENCY PLANS

Contingency plans to deal with accidents and unplanned situations will be implemented and modified as required throughout the Project.

The objectives of these contingency plans are to avoid/minimize the following:

- danger to persons;
- area affected by a spill or fire;
- degree of disturbance to the area during clean-up; and
- degree of disturbance to wildlife.

Newfoundland LNG Ltd. has established a series of contingency plan processes that apply to this EPP. These are listed below and described in the following sections:



- Fire Contingency Plan;
- Spill Contingency Plan;
- Wildlife Encounters;
- Discovery of Historic Resources; and
- Vessels Accidents.

3.1 Key Project and Regulatory Personnel and Emergency Contact Information

Accurate information is crucial for the safe and efficient handling of emergencies and other incidents requiring immediate attention. Initial response to emergencies can help to minimize potential effects to health, safety and the environment. The Newfoundland LNG Ltd. HS&E Manager and the Construction Manager will provide Company employees, Contractors and the public with information about the emergency and potential consequences.

3.1.1 Incident Reporting Procedures

The following incident reporting procedures will be followed.

- All incidents involving personal injury, third-party liability, fire or explosions, or incidents that have the potential to cause serious bodily harm or major equipment damage, must be reported immediately to the Newfoundland LNG Ltd. HS&E Manager and Construction Manager.
- The HS&E manager will be responsible to ensure an Incident Report Form will be completed and submitted to the Newfoundland LNG Ltd. Project Manager and the Construction Manager. Incidents of a less severe nature must be reported to the HS&E manager within 24 hours of the incident.
- The paper copy of the report will be kept at the site and a computerized report will be forwarded to Newfoundland LNG Ltd. for review by appropriate personnel.
- Any communication of incidents to the media will be only conducted by the Newfoundland LNG Ltd. Project Manager or Construction Manager after consulting with representatives from the Company HS&E and Public Affairs departments. All information given to the media will be recorded and logged.

3.1.2 Communications Planning

Communication is an essential component of Project development. It will ensure that the appropriate information is distributed to those potentially affected by Project activities, including but not limited to local fishing groups, vessel traffic, local labour unions, emergency responders and the general public.

3.1.3 Contact List

The Newfoundland LNG Ltd. Project Manager will ensure that the Contact List is completed (internal contact information filled in) and posted in central, visible locations as appropriate. The Contact List will be kept up to date, and all contacts on the list will be made aware of their expected role in an emergency.



Contact names and numbers are provided in Table 1 to ensure that appropriate company personnel can be reached at any time. A list of government agencies, contact names and phone numbers are also provided for each area of responsibility should a need arise whereby an inspector or company personnel must contact the regulating agency.

Newfoundland LNG Ltd Management			
Grassy Point Project Manager	TBD*		
HS&E Manager	TBD		
Construction Manager SNC Lavalin	TBD		
Environmental Monitor	TBD		
	Emergency Contacts		
Fire Department	Arnold's Cove	463-8888	
Health Clinic/Ambulance	Arnold's Cove	463-2131	
Police	Clarenville	709-466-3211	
24 Hour Emergency Services	Clarenville Hospital	709-466-3411	
	Regulatory Contacts		
DFO Area Fisheries Office	Arnold's Cove	463-8005	
Marine Communications and Traffic	Placentia	772-2083	
Centre – Canadian Coast Guard			
Environment Canada	St. John's	709-772-5488	
Water Resources Management Division	St John's	729-2563	
Transport Canada	St. John's	772-5166	
Government Services Centre	Clarenville	709-466-4060	
Wildlife Division	Corner Brook	709-637-2026	
	Forest Fire Centers		
Forest Fire-NL Department of Natural	Gander	709-246-1466	
Resources			
Environmental Emergencies and Spills			
Marine Spill Reporting	St. John's	1-800-563-9089	
Environmental Emergencies	St. John's	772-2083	
Areas of Special Environmental Concerns			
Provincial Archaeology Office	St. John's	709-729-2462	
Canadian Wildlife Service	St. John's	709-772-5585	

Table 1 List of Contact Names and Numbers

*TBD- to be determined.

3.2 Fire Contingency Plan

Construction related activities could result in fire that could spread to the surrounding area. Alternatively, a forest fire started offsite could spread to the Project area. This contingency plan contains procedures for fire prevention as well as response action plans for non-forest fires (e.g., localized fires, such as equipment) and forest fires.

3.2.1 Environmental Concerns

Fires could result in terrestrial habitat alteration, wetland habitat loss and direct mortality of wildlife. Fire fighting chemicals and any spilled materials could enter the freshwater, wetland and marine environments and adversely affect biota and habitat if allowed to disperse and persist. Fires also have the potential for adverse effects on air quality and could pose risks to human health and safety.



3.2.2 Contingency Procedures

Prevention Measures

Newfoundland LNG Ltd. and contractors will take all precautionary measures to prevent fire hazards when working at the site. These include but are not limited to the following measures:

- a) All flammable waste will be disposed of on a regular basis.
- b) Smoking will be permitted in designated areas only.
- c) The Newfoundland LNG Ltd. and its contractors will be trained in fire prevention and response.
- d) Firefighting equipment, sufficient to suit onsite fire hazards will be maintained in proper operating condition and to the manufacturer's/national Fire Protection Association standards. The Newfoundland LNG Ltd will ensure that its personnel and contractors are trained in the use of such equipment.
- e) If burning brush is required as part of Project activities, the following procedures will be followed:
 - i. a Burning Permit and Operating Permit during fire season will be obtained from the District Forest Resources Office at Paddy's Pond. All fires will be burned in accordance with any conditions that may be imposed by the permit;
 - ii. brush will not be burned where there is the possibility of damage to property;
 - iii. brush will not be burned when conditions are such as to have the possibility of creating an out of control fire;
 - iv. smoke from such brush burning must not interfere with travel on roads or highways; and
 - v. fires must never be left unattended.

Non-forest Fires Response Action Plan

- a) Notify nearby personnel.
- b) On-site personnel will take immediate steps to extinguish the fire using appropriate equipment.
- c) Notify the Newfoundland LNG Ltd. Project Manager and the Construction Manager.
- d) If the fire cannot be contained, contact the Arnold's Cove fire department.
- e) In case of related medical emergencies, the Arnold's Cove RCMP detachment will be notified immediately.

Forest Fires Response Action Plan

- a) Fires will be reported immediately.
- b) Notify the Newfoundland LNG Ltd. Project Manager and the Construction Manager.
- c) In case of related medical emergencies, the Arnold's Cove RCMP detachment will be notified immediately.
- d) Contact the Forestry and Agrifoods Agency's Forest Fire Protection Center in Gander (Ph. 1-866-709-3473).

3.3 Spill Contingency Plan

This EPP addresses spill prevention and response for accidental spills of chemical and petroleum products (e.g., diesel and other fuels) that could occur during construction activities. Spills can include:



spills from containers, including drums and tanks; breaks in hydraulic or transfer hoses; and traffic/construction incidents and fire fighting.

3.3.1 Environmental Concerns

Fuels and lubricating oils will be the most common hazardous material associated with Project construction. Liquid hydrocarbons or other chemicals that are inadvertently spilled can contaminate soils, surface and groundwater, and can be toxic to fish and wildlife if consumed in sufficient quantities. To minimize potential effects on marine organisms, environmentally-friendly lubricants will be used in jetty construction equipment.

3.3.2 Contingency Procedures

Spill Prevention

The Contractor will be responsible for ensuring the following procedures are implemented to minimize the likelihood of a spill.

- a) A Spill Prevention Plan will be submitted by the Contractor for approval by the HS&E Manager.
- b) Ensure that equipment is in good working order and will inspect equipment periodically for fuel or hydraulic fluid leaks.
- c) All mechanics and outside service personnel are to ensure every precaution is taken to prevent spills from oil changes, antifreeze, hydraulic top ups, etc. Wherever practical, drip pans/ containers will be used.
- d) All empty oil, antifreeze and hydraulic containers are to be collected from the site of the maintenance and placed in approved containers or returned to the shop for disposal.
- e) Oils and lubricants will be stored on level terrain, inside an appropriately dyked area, in locations approved by the Construction Manager.
- f) Storage of potentially hazardous materials and equipment refuelling/servicing will be conducted in accordance with the procedures outlined in Section 2.15 of this EPP.

Environmental Emergency Regulations (E2 Regulations)

Under the *Canadian Environmental Protection Act* (CEPA), Newfoundland LNG Ltd. will be responsible for the management or control of, a substance list on Schedule 1 of the *Regulations* that is present in a quantity equal to or greater than that specified on the Schedule. The following notifications may be applicable:

- a) Notice of Identification of Substance and Place (within 90 days of acquiring scheduled substance/s, (based on quantities of chemicals identified in the Comprehensive Study Report).
- b) Notice of Preparation of an Environmental Emergency Plan (within 6 months).
- c) Notice of Implementation of the Environmental Emergency Plan (within 1 year)

Newfoundland LNG Ltd. will consider the following factors for scheduled substances storage at or above the specified threshold quantities.



- a) the properties and characteristics of substances;
- b) the maximum expected quantity of substance at place at any time during the calendar year;
- c) the characteristics of the place where the substance(s) is located and of the surrounding area that may increase the risk of harm to the environment or of danger to human life or health;
- d) the potential consequences from an environmental emergency on the environment or human health. Consequences are identified through the use of worst-probable case and alternative scenarios. More information can be found in the document Council for Reducing Major Industrial Accidents/Conseil pour la reduction des accidents industriels majeurs ("CRAIM") Risk Management Guide for Major Industrial Accidents (2002 edition) available on line at http://www.uneptie.org/pc/apell/publications/pdf_files/CRAIM_PDF_EN.pdf; and
- e) a description of roles and responsibilities of individuals during an environmental emergency

As well, the Environment Canada publication, *Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act, 1999-Environmental Emergency Plans*, provides direction on meeting these requirements. Environmental Emergency Plans are not required until listed substances are stored on site. However, recognition and discussion of the work that goes into preparation of such plans can inform project siting and design and can be an effective means of fulfilling the mandatory requirement under *Canadian Environmental Assessment Act* to assess the environmental effects of accidents and malfunctions.

Newfoundland LNG Ltd will also consult and use information from the 2004 Emergency Response Guidebook (ERG2004) available on line at http:// http://www.tc.gc.ca/canutec/en/guide/guide.htm

Initial Response and Reporting

In the event of a fuel or hazardous material spill, the following procedures will apply.

- a) Upon detection of a spill, the Environmental Monitor, Construction Manager and the HS&E Manager must be notified of the occurrence immediately
- b) Identify the spill and direction of flow.
- c) Attempt to identify the spilled material prior to handling the material and attempt to terminate the spill, if safe to do so. Materials can be identified using labels from containers, colour and odour. If unsure of the identification, assume the apilled material is dangerous.
- d) Extinguish all sources of open flame and cigarettes/cigars.
- e) Ensure health and safety of personnel in the immediate area of the spill. All personnel who are not involved in the spill containment or cleanup will be kept away from the spill area. Avoid the area and stay up wind if vapours are present.
- f) The HS&E Manager (or designate) can advise on additional human resources or equipment requirements necessary. Do not attempt to contain or terminate the spill without prior consultation with the Newfoundland LNG Ltd. Project Manager and the Construction Manager.
- g) Attempt to terminate the spill at its source, only if safe and practical to do so.
- h) Contain the spill.



Clean-Up Procedures

The Construction Manager will, in consultation with the Environmental Monitor, and regulatory authorities:

- a) Deploy on-site personnel to contain the spilled material using a dyke, pit, absorbent material or booms as appropriate.
- b) Assess site conditions and environmental effect of various clean-up procedures.
- c) Choose and implement an appropriate clean-up procedure.
- d) Deploy on-site personnel to mobilize pumps and empty drums (or other appropriate storage) to the spill site.
- e) Apply absorbents as necessary.
- f) Dispose of all contaminated debris, cleaning materials and absorbents at an approved facility.
- g) Take all necessary precautions to ensure the incident does not recur.
- h) Determine appropriate verification sampling procedure.

The Contractor will ensure the following resources are readily available to respond to incidental releases of fuels and/or hazardous materials:

- a) absorbent materials (i.e., sorbent pads, vermiculite);
- b) small equipment such as shovels, rakes, tool kit, sledgehammer, buckets, stakes and tarpaulins; and
- c) personal protection equipment.

Spills on Land

- a) Excavate a trench or construct a berm downhill of the spill. The trench or berm should be lined with plastic if available. Alternatively, absorbent booms can be placed downhill of the spill; however, the booms will need to be monitored closely for seepage.
- b) Once the spill is contained if quantities permit, the spilled product can be pumped to drums or to a tank. If the spilled product is in a quantity that cannot be pumped, loose absorbent material or absorbent pads should be placed on the product.
- c) Apply absorbent from the downhill portion of the spill and work up to the source. Loose absorbent should be mixed into the spill by shovels. Replace the absorbent as it is spent (usually indicated by a colour change in the absorbent).
- d) Spent absorbent should be placed in drums with removable lids and ring clamps until arrangements can be made for disposal in accordance with accepted regulated procedures.

Spills in Snow

- a) Excavate the contaminated snow and place the snow in salvage drums or in a lined lugger box.
- b) If the snow melts, apply absorbent material or pads to collect the spilled material.
- c) Contact the Construction Manager and Environmental Monitor for direction.

Spills into Water

All marine contractors will have a marine spill response program in place, which at a minimum will



include the following:

- a) An absorbent boom will be placed downstream of the entry point of the spill.
- b) Once a spill is contained by the boom, it can be pumped to 205-L drums or to a storage tank.
- c) In still or slow moving water, it may be possible to deploy absorbent pads to remove the spilled material as described for Spills On Land.
- d) Spent absorbent should be placed in 205-L drums with removable lids and ring clamps until arrangements can be made for disposal in accordance with accepted regulated procedures.

Spills In/On Ice-Covered Water

- a) All attempts will be made to prevent spills from entering ice-covered water.
- b) If a spill to ice-covered water occurs, a hazard assessment must be conducted to ensure the safety of the field crew.
- c) If a spill to ice-covered water does occur, attempt to cut slots, angled to the shore, downstream of the spill as required to collect the spilled product.
- d) Apply a boom(s) or absorbent pads as described for Spills On Land.
- e) If it is not safe to cut the ice, break up and remove the ice downstream of the spill and apply a boom(s) or absorbent pads as described for Spills On Land.
- f) Spent absorbent should be placed in drums with removable lids and ring clamps until arrangements can be made for disposal in accordance with accepted regulated procedures.

Storage Tanks and Drums

Storage tanks and drums containing spilled product and/or spent clean-up materials will be stored in a secure or restricted area until arrangements can be made for the disposal of the contents. Signs will be placed advising of contaminated materials.

Site Restoration

Following a spill event, the site may require restoration by the contractor responsible for the spill to return to its original use prior to the incident. Restoration will be approved by the Construction Manager. Restoration may involve replacing contaminated soil with clean fill or routing watercourses away from the contaminated site until it can be cleaned up. Newfoundland LNG Ltd. will consult with applicable regulatory agencies to determine appropriate site restoration requirements.

3.4 Wildlife encounters

The objective is to minimize interactions on-site personnel may have with wildlife during Project construction and to ensure compliance with applicable acts and regulations.

3.4.1 Environmental Concerns

Encounters with wildlife may result in distress for both the animal and the employee. Serious injury could result to site workers in some instances. Threats to personnel include encounters with bears, any animals with young, moose (when in rut) and rabid animals such as fox, wolf, beavers, etc. Bites from any animals are potentially dangerous. Wildlife encounters have the potential to distress animals to the



point of altering feeding and breeding behaviour. Physical injury or death to wildlife could also occur e.g. collision of vessels with marine mammals.

If the animal encountered is a species listed under the *Species at Risk Act* (*SARA*) or the Newfoundland and Labrador *Endangered Species Act*, the observation will be reported immediately to the CWS and the NLDEC. Section 32 of *SARA* prohibits killing, capturing and destruction of critical habitat for those species listed on Schedule 1 as extirpated, endangered and threatened. Critical habitat is defined as the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species.

3.4.2 Contingency Procedures

Encounters with Marine Mammals and Birds Species (at Risk or Not)

The following measures will be implemented by both Contractor and Company personnel in the event that marine mammals are observed in close proximity to Project vessels during construction activities:

- a) No personnel will approach, feed or harass wildlife if encountered.
- b) Take all normal precautions to avoid a collision.
- c) Concentrations of sea ducks, other waterfowl or shorebirds will not be approached when anchoring equipment, accessing wharves or ferrying supplies.
- d) Only vessels equipped with mufflers will be used.
- e) Food scraps that could attract birds will be collected and properly disposed of.
- f) Newfoundland LNG Ltd. will comply with the *Migratory Bird Convention Act, Species at Risk Act* and the *Endangered Species Act* and all applicaible *Regulations*.
- g) Marine vessel speed will be restricted to 10 knots to reduce the risk of collision.
- h) The CWS and Wildlife Division's regional Conservation Officer located at the Forest Resources Office at Paddy's Pond will be contacted with regard to wildlife encounters with rare or endangered wildlife species. Guidance as to the appropriate action to take will be given by these authorities.

Terrestrial Wildlife Species (at Risk or Not) Encounter Prevention Measures

The following measures will be implemented by both Contractor and Company personnel to minimize the likelihood of wildlife encounters.

- a) No personnel will approach, feed or harass wildlife if encountered.
- b) Firearms will not be permitted on or near the work site. Hunting by Project employees on site will be forbidden.
- c) All food waste will be properly contained and disposed of on a regular basis at an approved facility.
- d) The CWS and Wildlife Division's regional Conservation Officer located at the Forest Resources Office at Paddy's Pond will be contacted with regard to wildlife encounters with rare or endangered wildlife species. Guidance as to the appropriate action to take will be given by these authorities.



- e) Personnel will be advised of rare or endangered wildlife potentially occurring the Project area.
 Field surveys conducted during the environmental assessment process identified no rare wildlife species in the Project area.
- f) No pets will be allowed at the site.
- g) If large wildlife (e.g., moose) are struck with vehicles or equipment, the regional Conservation Officer located at the Forest Resources Office at Paddy's Pond will be notified.
- h) Always yield the territory to the animal.
- i) Be alert to the signs of animal presence (e.g., footprints, droppings, etc.) and report to the Construction Manager.

3.5 Discovery of Historic Resources

The Project site has been assessed as having a potential for archaeological or historic resources. Therefore, there is the possibility that such material could be discovered during Project construction. This contingency plan focuses on the procedures to be implemented in the case of a suspected archaeological or heritage resource discovery.

3.5.1 Environmental Concerns

Heritage and archaeological resources such as structures, tools, butchered animal bone, graves, pottery, shipwrecks or other features, may be disturbed or discovered during construction activity. These features represent a valuable cultural resource, and uncontrolled disturbance could result in loss or damage to these resources and the information represented by them.

3.5.2 Contingency Procedures

Prior to construction, all personnel working on the site will be informed of the historic resources potential of the area, of their responsibility to report any unusual findings, and to leave such findings undisturbed.

Archaeological Discovery

In the event of the discovery of a historic or prehistoric artifact or archaeological site, the procedures outlined below will apply.

- a) Work in the immediate area will be suspended and the Construction Manager and Environmental Monitor will be notified immediately.
- b) The HS&E Manager will contact the PAO.
- c) The site area will be flagged for protection and avoidance, with an appropriate buffer zone determined in consultation with the PAO.
- d) An Incident Report Form will be filed with the Project Manager.
- e) In the event that the PAO determines the find is an archaeological deposit, the Company and its contractors will take direction from the PAO regarding further contacts and required actions.
- f) The Company will take all reasonable precautions to prevent employees or other persons from removing or damaging any such articles or sites until they have been assessed.



g) A qualified archaeologist will conduct an archaeological assessment of the resource and report the resource to the PAO. No work at that particular location will continue until the qualified archaeologist, in consultation with the PAO authorizes renewal of the work.

In the event of the discovery of suspected human remains or a burial site, the procedures outlined below will apply.

- a) Work in the immediate area will be suspended and the Construction Manager and Newfoundland LNG Ltd. Project Manager will be notified immediately.
- b) If remains are found in association with heavy equipment, the equipment will not be moved by the Contractor as physical evidence may be destroyed.
- c) The site, including heavy equipment, if necessary, will be secured by the Contractor with flagging tape or some other appropriate means. The suspected remains will be covered with a tarp.
- d) The Company will contact the local RCMP detachment; the RCMP will contact the appropriate office of the Coroner.
- e) If the RCMP determines that the remains are associated with a historic burial, the Company will contact the PAO to obtain guidance on further actions.

3.6 Vessel Accidents

Proposed marine works include the construction of a jetty platform, ship berthing and trestle structure, dolphins and unloading facilities. Marine traffic at the site will be restricted during construction activities; however, the potential remains for a marine vessel incident. This section of the EPP contains contingency procedures to be implemented in the event of an incident to minimize environmental damage and risk to human safety.

3.6.1 Environmental Concerns

Marine vessels involved in construction activities could potentially run aground, collide with each other or with other vessels, or sink. Of particular concern are Project-related vessel collisions resulting in the release of oil or other deleterious substances. In the event of an accident, crew safety is the foremost concern.

3.6.2 Contingency Procedures

- a) All stationary hazards, such as moored platforms or vessels, will be marked in accordance with CCG regulations.
- b) Placentia Traffic will issue Notices to Shipping in the area and Notices to Mariners, giving information about all aspects of safety in the harbour including notice of construction at the Terminal Site.
- c) All vessels will be subject to the standards and regulations made under the CSA, the Labour Code, and the *Oceans Act* and will have the necessary safety equipment.
- d) All crew members will be familiar with emergency procedures for both life-threatening and potentially polluting situations.



- e) If a ship is in distress, it is the Captain's duty to do whatever possible to save the crew and passengers and to protect vessel and cargo. The order of priority of action will be for the protection of human life, prevention of pollution of the environment, and prevention of shipping lane impediment.
- f) When ships collide, it is the Captain's responsibility to do the utmost to rescue, help and/or assist the other vessel if this can be done without putting own ship, crew or cargo into further danger.
- g) The ship's Captain will immediately contact the CCG, Marine Emergencies, 24-hour Report Line for vessels in distress (1-800-565-1633), through which the appropriate agencies will be notified and specific action taken.

4.0 SITE-SPECIFIC APPROACH TO EPP DEVELOPMENT

In addition to the general environmental protection procedures provided in Section 2, this EPP also provides stage-/site-specific EPPs in relation to primary work areas and components associated with Project construction. As detailed Project engineering design, work methods and overall schedule progress information becomes available, stage-/site-specific EPPs will be developed and modified for the following principal areas of the construction phase:

- marine facilities;
- LNG storage tanks
- access and service roads; and
- site utilities (water supply, firewater, power)

These stage-/site-specific EPPs provide information on: planned Project components and activities; general environmental issues and concerns; sensitive areas and periods; an overview of planned work activities during the 2008 construction season; general environmental protection procedures applicable to that site/stage; site-specific environmental protection measures; relevant drawings and documents; a listing of applicable permits, approvals and authorizations; and associated compliance monitoring requirements.

5.0 PERMITS, APPROVALS AND AUTHORIZATIONS

Compliance monitoring requirements in the form of permits, approvals and authorizations, are listed in Table 2.

Permits, Authorization, Approval	Agency
Release under CEAA	Various Federal Departments
Authorization for Works or Undertakings Affecting Fish Habitat (HADD)	Fisheries and Oceans Canada
Formal Approval for Works Located in Navigable Waters	Transport Canada
Application for water Release	Transport Canada
Notification to Handle or Transport Dangerous Goods	Transport Canada
Transportation of Dangerous Goods	Transport Canada
Approval for Vessel Admission	Canada Customs and National Revenue
Temporary Magazine License	Natural Resources Canada
Radio Station License	Industry Canada Communications

Table 2 Permits, Approvals and Authorizations



Permits, Authorization, Approval	Agency
Application to import Natural Gas/LNG	National Energy Board
Release under the Newfoundland and Labrador	NLDEC- Environmental Assessment Division
Environmental Protection Act	
Certificate of Approval for any Industrial Processing Facility	NLDEC- Pollution Prevention Division
Certificate for Environmental Approval for any Alteration to a	NLDEC- Water Resources Division
Body of Water	
Application for Water Lot Lease	NLDEC- Water Resources Division
Shoreline Reservation	NLDEC- Lands Division
Letter of Advice of New Construction Project or Industrial	NLDGS- Occupational Health and Safety Services
Enterprise	
Application for Water and Sewage Works	NLDEC- Water Resources Division
Permit for Access off any Highway	Newfoundland and Labrador Department of Municipal
	Affairs (NLDMA)
Authorization to Handle or Transport Dangerous Goods	Transportation Regulation Enforcement
Borrow and Quarry Permit	NLDNR- Mines Branch
Authorization to Control Nuisance Animals	NLDNR- Forest and Agrifoods Agency
Permit to Burn	NLDNR- Forest and Agrifoods Agency
Commercial Cutting Permit	NLDNR- Forest and Agrifoods Agency
Operating Permit/Fire Season	NLDNR- Forest and Agrifoods Agency
Certificate of Approval for Storage and Handling of Gasoline	NLDEC
and Associated Products	
Certificate of Approval- Septic System (>4,500 L/day)	Newfoundland and Labrador Department of Health and
	Community Services
Review of Building/Fire/Life Safety	NLDMA – Office of the Fire Commissioner
Fuel storage tank registrations and waste oil storage	NLDGS - Government Services Centre
Building Accessibility	NLDGS – Occupational Health and Safety Division
Permit for Archaeological Investigations	Newfoundland and Labrador Department of Tourism,
	Culture and Recreation (NLDTCR) - PAO
Approval for Waste Disposal	Arnold's Cove Town Council

6.0 REFERENCE MATERIAL

- Appleby, J.P. and D.J. Scarratt. 1989. Physical effects of suspended solids on marine and estuarine fish and shellfish with special reference to ocean dumping: A literature review. Canadian Technical Report of Fisheries and Aquatic Sciences, 168: v +33p.
- Authorization for Works or Undertakings Affecting Fish Habitat from the Department of Fisheries and Oceans.
- Canadian Environment Assessment Agency. CEAR reference number 07-01-28936. Available online at: http://www.ceaa-acee.gc.ca/010/screeningsactive_e.cfm?yyyy=2007&m=5
- Canadian Environmental Assessment (CEA) Agency. 1999. Cumulative Effects Assessment Practitioners Guide. Prepared by Canadian Environmental Assessment Working Group and AXYS Environmental Consulting.
- Canadian Environmental Assessment Agency. 2006. Available online at: http://www.ceaa-acee.gc.ca/index_e.htm.
- Canadian Hydrographic Services. 2007. 2007 Tide Tables. Available online at: http://www.waterlevels.gc.ca/english/DataAvailable.shtml

Canadian Ice Service. 2007. Available online at: http://ice-glaces.ec.gc.ca/App/WsvPageDsp.cfm.

Coastal Resource Inventory. 2007. http://geoportal.gc.ca/index_en.html accessed June 2007.



- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2003a. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada. 43 pp.
- CWS (Canadian Wildlife Service). 2004. Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada. Environment Canada. Gatineau, QC. 63 pp.
- Department Of Justice Canada, Fisheries Act, 2007. Available on line at: http://laws.justice.gc.ca/en/ShowFullDoc/cs/F-14///en
- Department of Justice Canada, Migratory Birds Convention Act, 1994. Available on Line at: http://laws.justice.gc.ca/en/M-7.01/
- DFO (Fisheries and Oceans Canada) 1992. Land Development Guidelines for Protection of Aquatic Habitat, Available online at: http://www.dfo-mpo.gc.ca/Library/165353.pdf
- DFO (Fisheries and Oceans Canada). 1995. Freshwater Intake End-to Pipe Fish Screen Guideline. Communications Directorate, Department of Fisheries and Oceans. Available online at: http://www.dfo-mpo.gc.ca/Library/223669.pdf
- Environment and Conservation Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Guidelines for Culverts, 1992. Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/chapter5.pdf
- Environment and Conservation Government of Newfoundland and Labrador-Canada, Water Resource Management, Acts Regulations and Policies, Available online at: http://www.env.gov.nl.ca/Env/env/waterres/Policies/PolicyList.asp
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Permits, Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp
- Environment and Conservation, Government of Newfoundland and Labrador-Canada Water Resource Management, Available online at: http://www.env.gov.nl.ca/env/Env/water_resources.asp
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Guidelines for Fording, 1992. Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/chapter6.pdf
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Guidelines for Stream Crossing by All Terrain Vehicles, 1994. Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/CHAPTER3A-2.pdf
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Guidelines for General Construction Practices, 1997. Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/chapter13-2.pdf
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Water Resource Management, Environmental Guidelines for Watercourse Crossings, 1992. Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/CHAPTER3-2.pdf
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Guide to Environmental Protection Act, 2008. Available online at: http://www.env.gov.nl.ca/env/ActsReg/epaguide.pdf



- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Guide to Water Resources Act, 2002. Available online at: http://www.env.gov.nl.ca/env/ActsReg/wraguide.pdf
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Environmental and Control and Sewage Regulations, 2003. Available online at: http://assembly.nl.ca/Legislation/sr/regulations/rc030065.htm
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Storage and Handling of Gasoline and Associated Products Regulations, 2003. Available online at: http://assembly.nl.ca/Legislation/sr/regulations/rc030058.htm
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Used Oil Control Regulations, 2002. Available online at: http://assembly.nl.ca/Legislation/sr/regulations/rc020082.htm
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Air Pollution Control Regulations, 2004. Available online at: http://assembly.nl.ca/Legislation/sr/regulations/rc040039.htm
- Environment and Conservation, Government of Newfoundland and Labrador-Canada, Environmental Guidelines for Diversions, New Channels, Major Alterations Available online at: http://www.env.gov.nl.ca/env/Env/waterres/Investigations/pdf/CHAPTER7-2.pdf
- Environment Canada, CEPA Environment Registry, Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act Environmental Emergency Plans, 1999. Available online at: http://www.ec.gc.ca/CEPARegistry/guidelines/impl_guid/impl_guide_e.pdf
- Environment Canada. 2004. Clean Air Online. Website: http://www.ec.gc.ca/cleanair-airpur/Home-WS8C3F7D55-1_En.htm.
- Environment Canada. 2007. Canadian Climate Normals; Arnolds Cove and Come By Chance, Newfoundland. Available online at: http://climate.weatheroffice.ec.gc.ca/climate_normals/ stnselect_e.html.
- The Environmental Protection Guidelines for Ecologically Based Forest Resource Management (DFRA 1998) will be adhered to.
- Gosse, M.M., A.S. Power, D.E. Hyslop and S.L. Pierce. 1998. Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador. Fisheries and Oceans, St. John's, NL. Pg. 105 + 2 App.
- Government of Canada. 1991. The Federal Policy on Wetland Conservation. Minister of Supply and Services Canada. Ottawa, ON.
- Government of Canada. 1994a. Migratory Birds Convention Act. Queen's Printer for Canada.
- Government of Canada. 1994b. Migratory Bird Sanctuary Regulations. Queen's Printer for Canada. 1994.
- Government of Canada. 2003. Species at Risk Act. Canada Gazette Part III. Queen's Printer for Canada.
- Government of Newfoundland and Labrador. Hunting and Trapping Guide 2007-2008. Newfoundland and Labrador Department of Environment and Conservation. Wildlife Division. 59 pp.



- Government of Newfoundland and Labrador. 1989. Archaeological Investigation Permit Regulations. Copy on file with the Provincial Archaeology Office, Newfoundland and Labrador Department of Tourism, Culture and Recreation. St. John's, NL.
- Government of Newfoundland and Labrador. 1992. Historic Resources Assessment and Impact Management Summary. Copy on file at the Provincial Archaeology Office, Newfoundland and Labrador Department of Tourism, Culture and Recreation. St. John's, NL.
- Government of Newfoundland and Labrador. 2003. Newfoundland and Labrador Sustainable Forest Management Strategy 2003.
- Government of Newfoundland and Labrador. 2006. Endangered Species Act. Newfoundland and Labrador Regulation 57/02. Queen's Printer. St. John's, NL.
- ICF International 2007. Risk Assessment Grassy Point LNG. A report for Newfoundland LNG Ltd. 30 pp. +appendices.
- Important Bird Areas of Canada. 2007. Important Bird Areas of Canada. Available online at: www.ibacanada.com.
- International Ice Patrol Archived Data. 2007. Available online at: http://www.uscg.mil/LANTAREA/IIP/ General/data_archive.shtml.
- International Union for Conservation of Nature and Natural Resources (IUCN). 2006. Red List. Available online at: www.iucnredlist.org.
- Jacques Whitford. 2004. ANEI Bear Head LNG Terminal Environmental Assessment, May 2004.
- Jacques Whitford. 2006. Geotechnical Site Investigation Grassy Point LNG Project. A report to Newfoundland LNG Ltd. 10 pp + app.
- Jacques Whitford. 2007a. Freshwater Fish and Fish Habitat Survey at Grassy Point. A report submitted to Fisheries and Ocean Canada on behalf of Newfoundland LNG Ltd. 22 pp + app.
- Jacques Whitford. 2007b. Marine Fish and Fish Habitat in the Grassy Point Area of Placentia Bay. A report submitted to Fisheries and Ocean Canada on behalf of Newfoundland LNG Ltd. 37 pp + app.
- Jacques Whitford. 2007c. Stage 1 Historical Resources Assessment Grassy Point, Placentia Bay. A report submitted to Newfoundland and Labrador Provincial Archaeology Office on behalf of Newfoundland LNG Ltd. 14 pp.
- Natural Resources, Government of Newfoundland and Labrador-Canada, Forest Fire Protection Centre. Available online at: http://www.nr.gov.nl.ca/forestry/protection_centre/
- Newfoundland and Labrador Heritage. 2002. Website: http://www.heritage.nf.ca/environment/ ecoregions_nfld.html.
- Newfoundland and Labrador Heritage. 2007. Website: http://www.heritage.nf.ca/environment/ climate.html.
- Newfoundland and Labrador Tourism. 2007. Travel Guide. Government of Newfoundland and Labrador. Available online at: http://www.newfoundlandandlabradortourism.com.
- NLDEC (Newfoundland and Labrador Department of Environment and Conservation). 2007a. Newfoundland and Labrador Hunting and Trapping Guide 2007-08. 59 pp.



- NLDEC (Newfoundland and Labrador Department of Environment and Conservation). 2007b. Stewardship Zones: Come by Chance. Available online at http://www.env.gov.nl.ca/env/wildlife/ComProfiles/ComeByChance.htm
- NLDFRA (Newfoundland and Labrador Department of Forest Resources and Agrifoods). 2002. Five Year Operating Plan for Forest Management District 1 (Avalon Peninsula).
- PAA (Protected Areas Association of Newfoundland and Labrador). 2000. Maritime Barrens South Coast Barrens Subregion 6c. Ecoregions Brochures prepared by Government of Newfoundland and Labrador Department of Environment and Conservation.
- Richardson, W.J., C.R. Greene, Jr., C.I. Malme and D.H. Thomson. 1995. Marine Mammals and Noise. Academic Press, New York, NY.
- Sooley, D.R., E.A. Luiker and M.A. Barnes. 1998. Standard Methods Guide for Freshwater Fish and Fish Habitat Surveys in Newfoundland and Labrador: Rivers & Streams. Fisheries and Oceans, St. John's, NF. iii + 50 pp.
- TERMPOL Review Committee. 1999. TERMPOL Review Process Report on Whiffen Head. Canadian Coast Guard, Fisheries and Oceans Canada, Newfoundland and Labrador Region, St. John's, NL. 73 pp.
- Tourism Culture and Recreation, Government of Newfoundland and Labrador-Canada, Historic Resources Act, 2007. Available online at: http://www.assembly.nl.ca/legislation/sr/statutes/h04.htm
- Town of Arnold's Cove. 1992. Town of Arnold's Cove Municipal Plan and Development Regulations. Developed by Newfoundland and Labrador Department of Municipal and Provincial Affairs, Urban and Rural Planning Division.
- Town of Arnold's Cove. 2007a. Municipal Plan and Development Regulations Amendment Industrial General Designation and Zone Whiffen Head and Grassy Point New Industrial General Designation and Zone. March 2007.
- Town of Arnold's Cove. 2007b. Website. http://www.townofarnoldscove.com. Accessed on July 15, 2007.
- Transport Canada, Airport and Port Programs, 2003. Practices and Procedures for Public Ports. Available on Line at: http://www.tc.gc.ca/programs/ports/practproc.htm
- Transport Canada, Canada Shipping Act 2001, Reporting Discharge Reporting Regulations, 1995. Available on Line: http://www.tc.gc.ca/actsregulations/GENERAL/C/csa/regulations/070/csa078/csa78.html
- Transport Canada, Transportation of Dangerous Goods Act, 1992. Available online at: http://www.tc.gc.ca/acts-regulations/GENERAL/t/tdg/act/tdg.htm
- Transport Canada, Transportation of Dangerous Goods Regulations, 1992. Available online at: http://www.tc.gc.ca/tdg/clear/tofc.htm
- Wright, D.G. and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Canadian Technical Report of Fisheries and Aquatic Sciences, 2107.

