Golden Gullies Access Road
Environmental Assessment Registration

May 30, 2006

NAME OF UNDERTAKING: Golden Gullies Access Road

PROPONENT:

(i) Ramsay and Marcella Smallwood

(ii) P.O. Box 1 Site 4
Roaches Line, NL
A0A 1W0

(iii) **Chief Executive Officer**

Ramsay Smallwood
Land Owner
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Marcella Smallwood
Land Owner
528-1454

(iv) **Principal Contact Person**

Marcella Smallwood
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528-1454
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1.0 THE UNDERTAKING

(i) Nature of Undertaking

To extend a secondary gravel road in the area surrounding the Golden Gullies.

(ii) Purpose/Rationale/Need for Undertaking

The road will provide access to an estimated thirty unserviced cottage lots along the north and west shores of Golden Gullies which will then be offered for sale.

2.0 DESCRIPTION OF THE UNDERTAKING:

(i) Geographic Location

The property is located approximately 65 km from St. John's and straddles the Trans Canada Highway between Roaches Line and the Hodgewater Line. The access road extends from an existing road and lies to the west of the TCH. Golden Gullies (47^0 24.3' N and 53^0 21.6' W) is located approximately 1 km southwest of the TCH between Highway 70 and 71 exchanges and about 2 km north of Mahers. The Project area is shown on NTS map Holyrood (1N/6 grid reference 54, 22). Figure 1 shows the Site Location.

(ii) Physical features

The undertaking will essentially consist of the extension of an existing gravel access road by constructing 2.25km of new road to the Standards of a Class "D" resource road as classified by the Department of Natural Resources. The proposed route is shown on the enclosed Figure 2.

The route selected was based on location of stream crossings, avoiding wetland areas, limiting the amount of tree removal required, and minimal intrusion into the cottage lots.

Golden Gullies is part of the Goulds River watershed which drains to the Northeast crossing the TCH and flowing to South River, Conception Bay. The river is a scheduled salmon river. Golden Gullies itself is a modest sized pond (approximately 50 ha.). It has a highly developed shoreline, is relatively shallow and includes several shoal areas and a small island.

The project site is located in the Avalon forest ecoregion, which is a sheltered area within the more open and exposed Maratimes Barrens

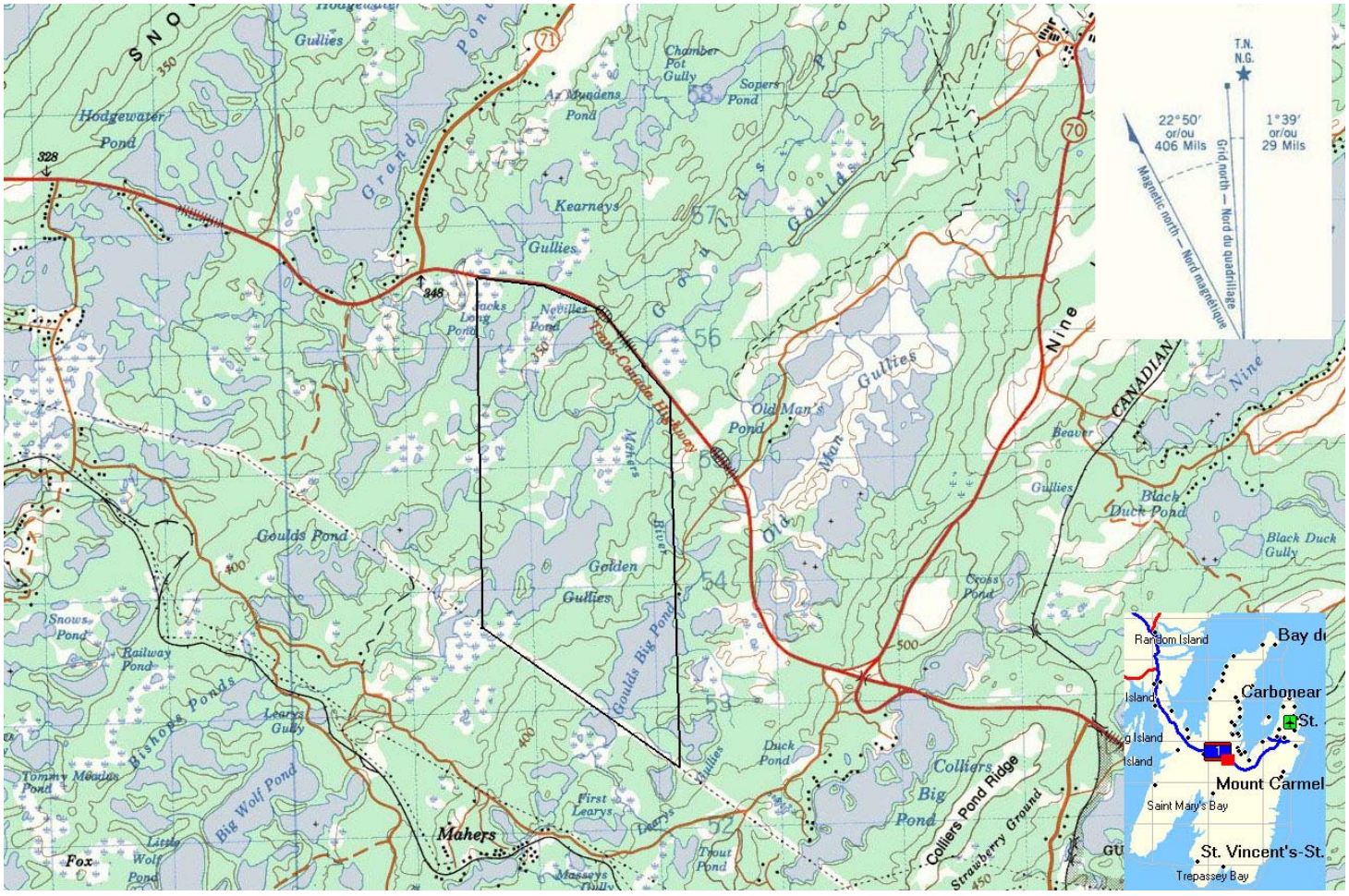

Figure 1: Site Location, showing Property Boundary (Outlined in Black)

ecoregion that characterizes most of the Avalon Peninsula. The Avalon Forest Ecoregion contains pure stands of Balsam fir with a significant mixture of white birch and yellow birch. Black spruce are limited to wet sites. The ecoregion is characterized and defined by the excessively moist climate and ribbed moraine topography.

The terrain in the region consists of relatively thick glacial till overburden that lies on Precambrian sedimentary rock. Topography varies from 80 to 100 m ASL. Vegetation consists of scrub forest (balsam fir with scattered birch and other deciduous trees), with intermittent localized peat bogs and fens.

Characteristic wildlife include moose, lynx, red fox, caribou and coyotes. The Goulds River watershed contains salmonid species (Brook trout, anadromous and land-locked Atlantic salmon) as well as sticklebacks.

The predominant land use in the area is recreational as reflected in the extensive network of cabins, gravel roads and ATV trails.

(iii) Construction

The selected route is shown in Figure 2. There are three water crossings:

- Golden Gullies Neck – a narrow, 10m wide section of the water body;
- A boggy area immediately north of a small pond that drains into Golden Gullies; and
- An intermittent stream (0.8m wide) draining a small (approximately 4 ha.) pond to the north and west of Golden Gullies

The work will be conducted during Summer. Work will commence by late July and construction will be completed in four weeks. The sequence of work will be planned to reduce the period of exposure of erosion prone soils. Site access will be achieved by fording the outflow stream at a suitable, approved location. This will enable road and bridge construction to proceed simultaneously.

The work will comprise the following tasks:
Survey and flag the route
Vegetation removal
Grubbing
Ditching and Surface preparation
Culvert installations
Bridge construction

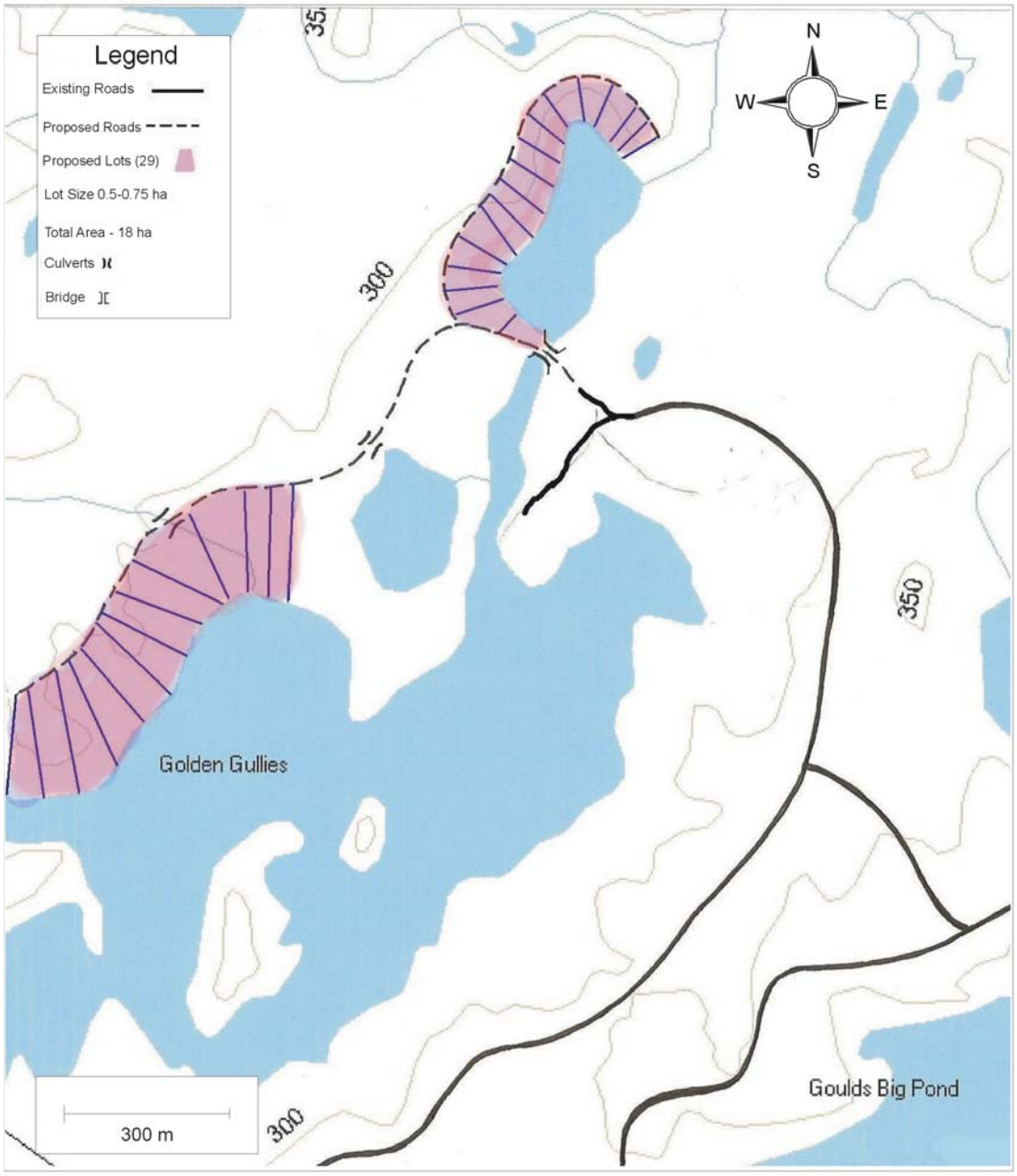

Figure 2. Proposed Road Route

Survey and Flag – Using hand-held GPS, the road route will be walked and centre-line flagged along a blazed trail. Detailed routing will be dictated by terrain conditions (vegetation cover, grade and side slope). The limits for clearing a 12m wide right of way will be flagged.

Vegetation Removal -Within the flagged limits, all vegetation will be removed to 15 cm from surface. All useful wood will be limbed, piled and stacked on the side of the cleared route. The wood will be made available for local use. Slash will be piled and burned.

Grubbing - Surface layers of roots and organic soil will be removed and placed in carefully located push lanes. Topsoil will be separated wherever possible and stockpiled to use as capping over the side piles. This will encourage re-vegetation.

Ditching and Surface Preparation -The road surface will be formed through cut and fill along the road route. Drainage ditches will be excavated along each side of the road and the excavated material used as capping on the road.

Culverts will be required to provide flow from a small bog and across a small intermittent stream. Precautions will be taken to avoid siltation. Where possible, work will be done in the dry. At the stream crossing, the culvert will be placed as per DFO Guidelines so that no obstruction is created to fish passage.

Bridge construction involves preparation of two abutments. A single span bridge will be constructed across a narrow neck (Approx. 8m wide; water depth 0.3m) in the pond. Abutments will be constructed above the shoreline so that there is no constriction in the water flow. The southeast bank comprises competent bedrock with step slope. The northwest bank is a low gradient till area. Concrete abutments will be constructed in the dry. Ready-mix will be delivered to site and poured into the wooden form works. No on-site mixing will be required. Two 10m beams will form the base of the bridge. Timber decking and side rails will complete the construction.

The potential sources of pollutants include:

- Silt from disturbance to the vegetative mat and excavation for culvert installation.
- Fuel and lubricants associated with heavy equipment (excavator, bulldozer) operation
- Noise from chainsaws and heavy equipment operations
- Slash and grubbing as removed from the road right-of-way
- Minor construction debris, including lumber used in bridge abutment form works,

The area is predominately used for recreational. The site of the undertaking is not readily accessible at present (except on foot or by ATVs . Provided the work is completed in an environmentally responsible manner, no resource conflicts are anticipated.

In order to ensure that the construction work is carried out in an appropriate manner, an Environmental Protection Plan (appended) has been developed and will apply as a condition of the contract for this work.

(iv) Operation

Maintenance of the road will be the responsibility of adjacent property owners. A Road Committee is currently being established by the existing cabin owners in the area. Maintenance activities may include snow clearing, dust control, grading and occasional fill placement.

(v) Occupations

The construction workforce is estimated to include the following:

1. 1 - Owners Representative
2. 1 - Construction Superintendent
3. 1 – Surveyor
4. 1 – general labourer
5. 2 – heavy equipment operators.

(vi) Project-Related Documents

A geotechnical study has been completed to describe the soil characteristics of the cottage lots. This investigation was for the purpose of determining their suitability for servicing through individual wells and septic systems, as per the *Private Sewage Disposal and Water Supply Standards* of the Department of Government Services. The Study may be cited as :

Preliminary Site Characterization Proposed Golden Gullies Cottage Lot Development Avalon Peninsula Newfoundland, prepared by Calixte Environmental Management Inc. May 2006.

An Environmental Protection Plan for Construction has been developed and will be applied in the conduct of the proposed work program. Copy of the EPP is appended.

APPROVAL OF THE UNDERTAKING

Prior to commencement of the construction of the access road, approval from the following regulatory bodies may be required:

Permit, Authorization & Approval	Governing Body
FEDERAL	
Letter of Advice	Department of Fisheries and Oceans
Permit for Construction within Navigable Waters	Transport Canada
PROVINCIAL	
Release from The Environmental Assessment Process	Department of Environment and Conservation
Certificate of Environmental Approval for any alteration to a water body	Department of Environment and Conservation
Permit to Alter a Body of Water (fording)	Department of Environment and Conservation
Permit to Burn	Department of Forest Resources and Agrifoods

SCHEDULE

Construction could commence by early August and within one week following receipt of a Release from the Environmental Assessment process, provided other regulatory approvals are in place. This start will enable the construction to be completed in 2006, and enable the family to place lots for sale. The latest reasonable date to commence work in 2006 would be early September.

FUNDING

All funding for this development is private. The estimated capital cost of this undertaking is less than $50,000.

30/5/2006
Date

Signature of Chief Executive Officer

ENVIRONMENTAL PROTECTION PLAN
ACCESS ROAD CONSTRUCTION
GOLDEN GULLIES

Prepared May 12, 2006

1.0 INTRODUCTION

This Environmental Protection Plan contains the general environmental protection procedures for the construction of a routine gravel road for the development of cabin lots in the Golden Gullies area.

It is anticipated that the road construction, including water crossings, will be completed during open water season, and that the work will be carried out through a contractor. An Owner's Representative will oversee the operation to ensure that contract conditions have been adhered to and that the work has been conducted according to specifications. As part of the selection process for the contractor, bidders will be required to demonstrate that they have a good record in environmental management, that they have a trained and experienced labour force, and that their equipment is well maintained. The Contractor will be advised that adherence to the EPP is a condition of the contract.

Because the intention is to provide an attractive area for cottage occupancy, it is intended that the completed access road be seen as environmentally appropriate and a positive feature in making the area attractive to potential purchasers.

2.0 ENVIRONMENTAL PROTECTION PROCEDURES

2.1 General

A set of standard procedures have been examined and adapted as appropriate to the nature and timing of the work associated with this undertaking. In general, the extent and scale of protection measures have been designed to be practical and appropriate to the nature of construction activities, and the environmental sensitivities of the terrestrial and aquatic environment.

2.2 Clearing of Vegetation

Environmental Concerns

Vegetation clearing (e.g., trees, and shrubs) will be required for site preparation activities for access roads to develop recreational cabins. Potential environmental concerns associated with vegetation clearing include the loss of habitat and the sedimentation of watercourses.

Environmental Protection Procedures

Measures will be implemented to reduce the potential effects of vegetation removal. Clearing activities will be limited to those areas that are required for construction of the road, and will comply with the requirements of all applicable permits, including the Commercial Cutting Permit, the Operating Permit and the Permit to Burn.

a) A cutting permit shall be obtained prior to the start of any site clearing. Clearing or removal of trees shall be restricted to the minimum areas needed for the site. Under no circumstances will any merchantable timber be bulldozed.

b) Clearing shall consist of cutting to within 15 cm of the ground and disposing of all standing trees, as well as the removal of all shrubs, debris and other perishable materials from the area.

c) All slash shall be piled for subsequent disposal.

d) Limits of clearing must be shown on all drawings Issued for Construction. Only those areas designated on drawings shall be cleared. Trees shall be blazed at intervals in advance of clearing to demarcate the limits of the work. Blazed trees shall not be felled. Clearing activities shall not remove any trees outside the authorized clearing widths.

e) All merchantable or forest product timber within the specified clearing limits shall be located so as not to obstruct the access or work of others. All trees in the cutting area which are greater than 9 cm dbh must be felled and removed from the

cutting area. All trees must be utilized to a top diameter of 8 cm.

f) All merchantable or forest product timber shall be salvaged for use as firewood or saw logs.

g) Disposal of cleared un-merchantable timber, slashing and cuttings by burning shall be in compliance with the *Forest Fire Regulations*, Environmental Code of Practice for Open Burning and the Permit to Burn. At no time shall a fire be left unattended.

h) Slash and any other construction material or debris shall not be permitted to enter any watercourse and shall be piled above spring flood levels.

i) Chain saws or other hand-held equipment shall be used in clearing vegetation except where alternative methods or equipment are approved. The use of mechanical clearing methods, such as heavy equipment, shall 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 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.

j) A buffer zone of undisturbed vegetation shall be maintained between construction areas and all water bodies (Section 2.8). Also, where feasible, a buffer zone of 100 m from the high water mark will be established in areas where clearing of vegetation is an activity within the vicinity of a water body, watercourse or sensitive areas. Buffer zones features will be key elements of the environmental review of drawings prior to construction.

k) Where possible timber shall be felled inward toward the work area to avoid damaging any standing trees within the immediate work area.

l) Burning:

i) All fires shall be in compliance with the Forest Fire Regulations, Environmental Coda of Practice for Open Burning and the Permit to Burn.

ii) No more than two fires are to be burning at any one time; each fire shall not exceed 9 square meters.

iii) No burning during periods of high or extreme Fire Weather Index, or in winds over 15 km/h. When practical, burning shall be scheduled on days of drizzle, rain or wet conditions.

iv) Adequate supervision is required until fires and ashes are completely burned out and at no time shall a fire be left unattended.

2.3 Grubbing and Disposal of Related Debris

Environmental Concerns

The principal concerns associated with grubbing and disposal of related debris are the potential effects of erosion on freshwater ecosystems and water quality.

Environmental Protection Procedures

All grubbing and disposal of related debris near watercourses shall adhere to relevant regulatory requirements, including the permits from the Department of Environment and the formal "Letters of Advice" and/or Authorizations for Works or Undertakings Affecting Fish Habitat from the Department of Fisheries and Oceans.

Other specific measures to be undertaken to minimize potential effects on aquatic habitat and resources are as follows:

a) Grubbing of the organic vegetation mat and/or the upper soil horizons shall be minimized. These shall be left in place where possible. Limits of stripping and/or grubbing must be shown on all drawings issued for construction.

b) The organic vegetation mat and upper soil horizon material which has been grubbed shall be spread in a manner which attempts to cover exposed areas. Any surplus material shall be stored or stockpiled for use in covering push lanes. Topsoil and peat shall be stockpiled at a minimum distance of 100 m from any water bodies, watercourse or ecologically sensitive areas.

c) Measures shall be implemented to minimize 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 shall be left on the ground surface to maintain soil cohesion, to dissipate the energy of runoff, and promote natural re-vegetation. Erosion control measures

shall be implemented in areas prone to soil loss; these measures could include brush cover, settling ponds, and drainage channels. The length of time that grubbed areas are left exposed to the natural elements shall be minimized to prevent unnecessary erosion.

d) During grubbing, care shall be taken to ensure that grubbed material will not be pushed into areas which are to be left undisturbed.

e) Grubbing activities shall be avoided in areas of high slope(s) near watercourses. Wherever possible, a buffer zone of 100 m shall be maintained between grubbed areas and watercourses, water bodies and ecologically sensitive areas. Grubbing limits adjacent to watercourses will be flagged in the field prior to undertaking grubbing/stripping activities. (see Gosse et al 1998 - Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador).

2.4 Storage, Handling and Transfer of Fuel

. A variety of fuels and lubricants will be used during Project construction activities. Gasoline, diesel fuel, grease, motor oil and hydraulic fluids are all needed for equipment.

Environmental Concerns

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

Environmental Protection Procedures

The following protection procedures will be implemented:

Transport of Fuel and Other Hazardous Materials

All fuel products will be transported to the site on a daily or as required basis and bulk storage of fuel will not be required for this project.

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

a) Before handling fuel, the necessary approvals under *The Storage and Handling of Gasoline and Associated Products Regulations* shall be obtained from the Department of Government Services and Lands.

b) Fuels and lubricants shall only be handled by persons who are trained and qualified in handling these materials.

c) Oils, grease, gasoline, diesel or other fuels shall be stored at least 100 m from any surface water.

d) Storage areas will be equipped with suitable fire fighting equipment.

e) Smoking shall be prohibited within 10 m of a fuel storage area.

Equipment Fueling

The following procedures shall apply to the fueling of construction equipment:

a) Fueling and lubrication of equipment shall occur in such a manner as to minimize the possibility of contamination to soil or water.

b) When refueling equipment, operators shall:

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.

c) Regular inspections shall be made of hydraulic and fuel systems on machinery. Leaks shall be repaired immediately.

d) Fueling or servicing of mobile equipment on land shall not be allowed within 100 meters of watercourses, water bodies or ecologically sensitive areas.

Spills of Fuel and Hazardous Materials

a) All necessary precautions shall be implemented to prevent the spillage of fuels and other hazardous materials used during the construction work.

b) All spills of fuel and hazardous materials shall be reported immediately. Any spill to the aquatic environment and spills of 70 L or more on land shall be reported

immediately to the Canadian Coast Guard at 709-772-2083.

c) There shall be appropriate emergency spill response equipment (sorbents) on site.

2.5 Buffer Zones

Environmental Concerns

The potential for erosion/sedimentation and resulting effects damage to water quality and fish and fish habitat is a key environmental concern associated with construction activities.

Buffer zones of natural vegetation or undisturbed areas adjacent to construction areas help mitigate adverse environmental effects such as erosion and run-off of sediment laden water to streams, water bodies and other ecologically sensitive areas.

Environmental Protection Procedures

a) A buffer zone of undisturbed natural vegetation shall to be maintained between construction areas and all water bodies, watercourses and ecologically sensitive areas.

b) Silt runoff control fences shall 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 contractor shall inspect silt fences and buffer strips on a regular basis. Any accumulations of silt observed shall 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 shall be addressed immediately.

c) A minimum buffer zone of natural vegetation of 30 m from the high water mark of water bodies, watercourses and ecologically sensitive areas shall be maintained around work areas where available space poses a constraint. If the available space allows, then wider buffer zones of 100 m shall be maintained between construction areas and watercourses, water bodies and ecologically sensitive areas. Buffer zone widths shall be developed in consultation with the Owners Representative.

d) Fish habitat protection guidelines recommend the minimum width of the buffer zone between construction areas or roads running parallel to water bodies shall be calculated

by the following formula:

Buffer Width (m) = 20 m + 1.5 x slope (%);

but, a minimum buffer zone of 30 m shall be maintained at all times, except where specified otherwise (see Gosse, et. al. 1998 - Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador).

2.6 Erosion Prevention

Environmental Concerns

The potential for erosion and resulting effects to water quality and fish and fish habitat is a key environmental concern associated with construction activities.

Environmental Protection Procedures

Erosion prevention practices shall be applied throughout all work areas on exposed or erodible materials. The application of erosion control measures is found throughout the EPP but reiterated here to provide a more thorough evaluation of site specific activities by project personnel.

General

Primary means of erosion control are the avoidance of activities contributing to erosion. All areas of exposed erodible soils are to be stabilized by back-blading or grading to meet engineered slope requirements. Where erosion along exposed erodible slopes is a potential concern and a natural vegetation buffer of less than 15 m from the high water mark exists between erodible areas and water bodies, a silt fence may need to be constructed to control silt runoff. Requirements will vary depending on the locations of the silt fence and will take such factors into consideration as drainage/surface area of exposed soils and time of year the silt fence is employed.

Specific erosion and sedimentation control measures have been designed to minimize the effects of construction activities on the environment. They could include: site drainage ditching system, culverts, temporary run-off interceptor ditches and check sediment dam traps to provide both energy dissipation and siltation control. Regardless of these protection measures, if an environmental inspection reveals that silt is entering a watercourse, further mitigative measures may be identified and are to be implemented.

Streams

All stream bank sections that contain loose or erodible materials shall be stabilized. No material shall be deposited within the watercourse. Sloping shall be accomplished by back-blading and the material removed is to be deposited above the high water mark of any watercourse. A field survey shall be conducted at each stream crossing prior to construction to determine sensitivity. At the bridge approaches, the side banks will be graded and sodded. Topsoil will be placed on the slopes and grass sod staked in place to provide a root mat for slope stability and to reduce erosion.

2.7 Excavations, Embankment and Grading

Excavation, embankment and grading of common rock and other materials may be required for the access road.

Environmental Concerns

The principal environmental concerns associated with excavation, embankment and grading are potential effects on water quality, fish and fish habitat, and terrestrial habitat resources due to ground disturbance.

Environmental Protection Procedures

All work shall be conducted in a manner which controls potential sedimentation of watercourses and water bodies in or adjacent to the work areas as outlined in the following procedures:

a) Excavation, embankment and grading shall be done only upon completion of grubbing and stripping. Where there is no requirement for grubbing and stripping (e.g., within the buffer zone of a stream crossing), filling shall occur without any disturbance of the vegetation mat or the upper soil horizons.

b) Excavation, embankment and grading in the vicinity of stream crossings shall be done in a manner which ensures that erosion and sedimentation of watercourses and water bodies is minimized.

c) A buffer zone of undisturbed vegetation shall be maintained between construction areas and all watercourses, water bodies and ecologically sensitive areas .

2.8 Stream Crossings

Environmental Concerns

The environmental concerns associated with stream 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.

Environmental Protection Procedures

Stream crossings shall be constructed in compliance with the required Culvert Approval from the Department of Environment and the Letter of Advice for Works and Undertakings Affecting Fish Habitat from the Department of Fisheries and Oceans.

The following measures shall be implemented to minimize the potential effects of stream crossings:

a) Stream crossing construction activities, in areas of fish habitat, will be undertaken during low flow periods.

b) Work shall be performed in such a way as to ensure that materials such as sediment, fuel and oil do not enter watercourses and water bodies.

c) The banks and flood plains of watercourses must be adequately protected from erosion by seeding or placing of riprap.

d) A minimum buffer zone of undisturbed natural vegetation shall be left between the access road and the bank of any watercourse which it parallels. The buffer width shall be determined through the formula:

Buffer width (m) = 20 m + 1.5 x slope (%)

e) In the location where a culvert is required, application shall be made to the Department of Environment. The culverts used shall be sized to handle the 1-in-25 year return period flood and they will be constructed in accordance with the Environmental Guidelines for Culverts from the Department of Environment (Water Resources Division 1992). The following measures shall also be implemented:

i) install culvert(s) in accordance with good engineering and environmental practices;

ii) unless otherwise indicated, all work shall take place in dry conditions, either by the use of cofferdams or by diverting the stream. All work involving major alterations to stream channels must be carried out at a time of low flow, in a manner that prevents downstream siltation;

iii) cylindrical culverts shall 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 shall be installed a minimum of 300 mm below the streambed;

iv) ensure that the natural low flow regime of the watercourse is not altered. Culverts must not disrupt flow of water or cause ponding at the upstream side of the installation;

v) a culvert shall not be installed before site specific information such as localized stream gradient, fish habitat type and species present have been evaluated;

vi) Inlet and outlet areas will be adequately protected from erosion by placing riprap, or filter stone against slopes.

vii) use culverts of sufficient length to extend a short distance beyond the toe of the fill material;

viii) use backfill material which is of texture that shall support the culvert and limit seepage and subsequent washing out;

ix) align culverts such that the original direction of stream flow is not significantly altered and the gradient at the culvert follows the stream channel gradient to the extent possible. Infilling or reduction of the natural cross-sectional area of the watercourse is not permitted;

x) remove fill and construction debris from the culvert area to a location above the peak flow level to prevent its entry into the stream;

xi) confine construction activity to the immediate area of the culvert;

xii) fill material shall not be removed from streambeds or banks except when removal of material is necessary to ensure a flat foundation for installing a culvert;

xiii) the use of heavy equipment in streams or bodies of water is not permitted (see Department of Environment - Environmental Guidelines for Watercourse Crossings; Environmental Guidelines for Bridges; Environmental Guidelines for Culverts; Environmental Guidelines for Fording and Department of Fisheries and Oceans - Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador (Gosse, M.M., *et al.* 1998), and Factsheets in Section 3.0).

xiv) as required, cofferdams of non-erodible material shall be installed above and below work areas used to separate the 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.

xv) cofferdams shall be removed upon completion of construction and the streambed returned as closely as possible to its original condition.

xvi) water pumped from work areas or other runoff must have silt and turbidity

removed by settling ponds, filtration, or other suitable means before discharging to a water body.

f) When fording any watercourse, the Environmental Guidelines for Fording from the Department of Environment, Water Resources Division and the guidelines outlined in the Department of Fisheries and Oceans' Fact Sheet No. 4 shall be applied in conjunction with the following:

i) areas of spawning habitat shall be avoided;

ii) where feasible crossings shall be restricted to a single location and crossings made at right angles to the watercourse;

iii) equipment activity within the watercourse shall be minimized by limiting the number of crossings;

iv) all equipment shall be clean and mechanically sound to avoid the introduction leaks of oil, gasoline and hydraulic fluids to water bodies;

v) no servicing or washing of heavy equipment shall occur adjacent to watercourses; temporary fueling, services or washing of equipment in areas other than the main fuel storage site shall not be allowed within 100 guidance m of a watercourse.

vi) the entire fording area shall 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

vii) fording activities shall not decrease the depth of the watercourses to less than 20 cm; where the existing depth is less than 20 cm, that depth shall be maintained;

viii) fording activities shall be halted during high flow periods;

ix) all bank sections which contain loose or erodible materials shall be stabilized or avoided if possible; if banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse; and

x) the flow of water shall be diverted around the work area during the installation of a culvert to ensure dry conditions are prevalent for construction activities.

g) Bridge:

i) Environmental protection measures outlined in a) to f) above which are applicable to bridge construction and maintenance will be adhered to.

ii) During bridge construction all applicable guidelines outlined in DFO Factsheets shall be adhered to (e.g, Factsheet No. 11, Streambank Stabilization; No. 18, Bridge Construction/Demolition).

iii) To safely convey peak flows, bridges must be designed for a 25 year return period stream flow and meet all the requirements of the Navigable Waters Protection Act (NWPA).

iv) Bridge abutments must be set back 0.5 metres from the normal edge of the watercourse to prevent constriction during high flow conditions.

v) The upstream and downstream sides of abutments must be protected with rip-rap, concrete or heavy timber to prevent erosion and scouring. As noted (Sec. 2.6) the approaches to the abutments will be sloped and sodded to reduce erosion.

vi) Roadside embankments near the watercourse must be adequately protected from erosion by placing of rip-rap.

vii) Adequate erosion protection must be provided where roadside ditches discharge into the watercourse near the bridge.

viii) Abutments must be constructed in the dry and during times of low flow.

ix) During construction at concrete components, formwork will be constructed to prevent any fresh concrete from entering beds of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.

x) Wood preservatives such as penta, CCA or creosote or treated wood products will not be used for bridgework.

xi) All waste materials must be disposed of offsite and at an approved landfill.

h) All areas affected must be returned to a state that resembles local natural conditions.

2.9 Concrete Production

Environmental Concerns

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

Cement is very alkaline and wash water 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 wash water 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 wash water. Uncontrolled release of such wash water, chemicals and sediments could adversely affect aquatic life and aquatic habitat.

Environmental Protection Procedures

a) Wash water from the cleaning of mixers, mixer trucks and concrete delivery systems shall be directed to a settling basin.

c) The settling basin shall be cleaned on an as required basis to ensure that the retention capacity is maintained at all times.

2.10 Equipment Operations

Equipment which will be used during construction represent potential sources of noise, air emissions, and potential leaks or spills.

Environmental Concerns

Noises associated with construction activity may negatively affect wildlife. Air emissions may have air quality implications. Accidental leaks or spills of fuel or other hazardous materials may affect water, fish, vegetation and wildlife.

Environmental Protection Procedures

a) All approvals, authorizations and permits for project activities will be followed.
b) All equipment will have exhaust systems regularly inspected and mufflers will be operating properly.
c) All equipment (e.g., diesel generators, etc.) will meet the requirements of the provincial *Air Pollution Control Regulations* under the *Environment Act.*
d) All equipment use during construction will follow the environmental protection procedures outlined in this EPP.

3.0 RESOURCE MATERIAL

Information documents referenced in this Environmental Protection Plan can be obtained from Federal and Provincial government departments in St. John's having jurisdiction over various aspects of the job.

Provincial/Federal Government Publications:

- Environmental Code of Practice for Open Burning, 1995
- Environmental Guidelines for Watercourse Crossings (Water Resources Division, Newfoundland and Labrador Department of Environment)
- Environmental Guidelines for Bridges (Water Resources Division, Newfoundland and Labrador Department of Environment)
- Environmental Guidelines for Culverts (Water Resources Division, Newfoundland and Labrador Department of Environment)
- Environmental Guidelines for Fording (Water Resources Division, Newfoundland and Labrador Department of Environment)
- Gosse, M.M., *et. al.* 1998. Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador. Department of Fisheries and Oceans, St. John's, NF. x + 105 pp., 2 appendices.