



GOVERNMENT OF  
NEWFOUNDLAND AND LABRADOR

Department of Environment and Labour

# **GUIDELINES**

for the

**Duck Pond (Millertown Area) Copper-Zinc Mine**  
**ENVIRONMENTAL IMPACT STATEMENT**

(Proponent: Thundermin Resources Inc./Queenston Mining Inc.)

December, 2000

Environmental Assessment Division  
Department of Environment and Labour  
Government of Newfoundland and Labrador

## **PREFACE**

These EIS Guidelines are intended to assist the proponent, Thundermin Resources Inc./Queenston Mining Inc., with the preparation of the Environmental Impact Statement (EIS) for the proposed Duck Pond (Millertown Area) Copper-Zinc Mine.

The Guidelines outline the format for the organization of the EIS and highlight the major items that should be included in the various sections of the EIS.

The purpose of the EIS is to identify the potential environmental effects associated with the proposed undertaking and to identify appropriate mitigative measures. The EIS is expected to contain a review of available pertinent information as well as additional new information the proponent obtains to meet the requirements of these Guidelines. The EIS will be used by the Minister of Environment and Labour and Cabinet to determine the environmental acceptability of the proposed project. This will be based on the anticipated environmental effects, proposed mitigations and severity of remaining unmitigable residual effects. The EIS should be as concise as possible while presenting the information necessary for making an informed decision.

The Federal Department of Fisheries and Oceans has been identified as a Responsible Authority under the Canadian Environmental Assessment Act (CEAA). A federal screening of the project will be completed.

As more specific information is provided and as additional baseline information is gathered, more specific concerns and potential impacts may be identified. The proponent is required to hold public information meetings in the towns of Buchans and Botwood (or alternate port ). Appendix A outlines the requirements for public information meetings.

## **1. SUMMARY**

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As a minimum, the summary must contain the following information: identification of the proponent; a detailed project description; predicted environmental impacts; mitigative measures; residual impacts, monitoring programs and a summary of the fundamental conclusions of the EIS. The summary must allow reviewers to focus immediately on items of concern.

**The summary should be written in terms understandable to the general public.**

## **2. INTRODUCTION**

### ***2.1 Identification of Proponent***

### ***2.2 Purpose of the Environmental Impact Statement***

## **3. THE PROPOSED UNDERTAKING**

### ***3.1 The Prospective Site and Study Area***

A precise description of the boundary of the prospective site should be presented, accompanied by map(s) of appropriate scale showing the entire project area with principal structures and appurtenant works.

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

### ***3.2 Rationale/Need/Purpose of the Project***

The proponent must provide a statement of the need for the proposed undertaking.

### ***3.3 Alternative Methods***

A detailed discussion of alternative means of carrying out the project that are technically and economically feasible, and the environmental effects of such alternative means must be provided with supporting argument.

A detailed summary is required of the possible alternatives to the project and/or individual project components which were or could have been considered. If only one alternative is viable or possible, a statement should be made to this effect with supporting argument.

### **3.4 Relationship to Legislation, Permitting, Regulatory Agencies and Policies.**

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

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

Federal permits, and permits needed for the construction and operation phases of the project must be documented in the report.

Following is a list of some of the permits that will be required:

The proponent will require a *Certificate of Approval* from the Water Resources Division of the Department of Environment and Labour under Section 11 of the *Environment Act* for dams, settling pond and discharge for the tailings containment area; for the processing water supply intake; for any new or upgraded bridges or culverts along the access route; for any fording or stream crossings required for the power transmission line; and for any construction within 15 metres of the high water mark at the mine site, or at the marine terminal site. A *Water Use Authorization* will be required for the withdrawal of water for processing, or for other non-domestic purposes.

As per the Waste Material Disposal Act all waste materials shall be disposed of at an approved waste disposal site with the permission of the site owner/operator. A "landfill" is shown on the site plan but all domestic wastes are supposedly going to the Millertown Waste Disposal site. The purpose of the on-site landfill should be clarified, but we would prefer that the Millertown site be used with the owner/operator's permission for general domestic wastes only. No hazardous wastes are to be sent to the Millertown landfill or to the on-site landfill, unless the on-site landfill is designed to accept those wastes.

Any open burning during site clearing or clearing of the hydro corridor must abide by the guidelines stipulated in the Environmental Code of Practice for Open Burning issued by this Division. Topsoil must be stockpiled and secured to prevent scavenging and erosion and be reused where possible.

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Storage of gasoline and associated products must be in compliance with the *Storage and Handling of Gasoline and Associated Products Regulations (O.C. 96-160)*. Oils, greases, diesel, hydraulic and transmission fluids should be stored at least 100 m from any water body. Waste oils and lubricants shall be retained in a tank or closed container, and disposed of by a company licensed for handling and disposal of waste oil products.

All waters discharged from the proposed site, during construction and operation, are subject to compliance with the *Environmental Control Water and Sewage Regulations, CNR 1078/96*.

All activities associated with the construction and operation of this project are subject to the *Environment Act (Chapter E-13.1)*.

Approval under sections 8 and 11.1 of the *Environment Act* will be required for taking of a bulk sample, and is also required to operate the mine and concentrator.

All construction and maintenance work shall be conducted in compliance with the Mines Safety of Workers Regulations, Occupational Health and Safety Act and its Regulations. All workers must utilize Personal Protective Equipment appropriate to the duties being performed.

All underground mobile diesel equipment and all explosive/detonator magazines at surface and underground, require approvals from the Workplace Health & Safety Inspections Division of the Department of Environment and Labour.

The proponent must obtain the necessary approvals, licences and certificates of approval from the Government Service Centre for the operation of a food premises and for the on-site disposal of sewage waste.

Regulations under the Forestry Act and regulations under the Wildlife Act.

Any proposed alterations to this Project involving ground disturbance should be referred to the Provincial Archaeology Office for approval.

Under the Crown Lands Act a Crown Land application will be required prior to erection of any structures or easements.

Under the Mining Act quarry material for construction purposes will require an application for a quarry permit.

It is recommended that the proponent contact DFO regarding project related activities which may affect fish or fish habitat (i.e., stream crossings, siltation control, buffer zones, right-of-way clearing and grubbing, water withdrawal, blasting, site rehabilitation, etc.) and contact Navigable Waters Section, Canadian Coast Guard, regarding appropriate approvals pursuant to the Navigable Waters Protection Act.

The proposed project will require an Authorization under Section 35(2) of the Fisheries Act and development of a plan to compensate for losses of productive fish habitat if the project proceeds. Further, the proponent should be advised that before issuing a Section 35(2) Fisheries Act Authorization, DFO will be obligated to conduct a review of the proposed project pursuant

to the Canadian Environmental Assessment Act (CEAA).

The proponent should be aware of the general applicability of Section 36(3) of the federal *Fisheries Act* to the proposed undertaking. Deleterious substances (e.g. mining effluent and mine drainage, and toxic chemicals etc.) cannot be deposited into water frequented by fish. Drainage from construction and operational drainage must not be harmful to fish.

Under the *Migratory Birds Convention Act* and Regulations no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds. In addition, no person shall disturb, destroy, or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird.

The proponent should be aware of the potential applicability of the *Canadian Environmental Protection Act* (CEPA).

The proponent should be aware of the Metal Mining Liquid Effluent Regulations and Guidelines (MMLERG), pursuant to the *Fisheries Act*. The MMLERG limit the discharge of deleterious substances from mines. The proponent should identify the method and frequency with which effluent will be monitored. There are guidelines and explanatory notes associated with the MMLER, which detail the compliance requirements. In addition, an authorization may have to be issued under Section 5(2) of the MMLERG for the tailings impoundment area.

An ocean disposal permit under the *Canadian Environmental Protection Act* is required for disposal, including side casting, of dredged spoils at sea

Under the Federal Policy on Wetland Conservation (1991), which applies to federal lands and/or when federal funding is involved, the federal government has a goal of no net loss of wetland function. It is recommended that the goals of this policy be considered in areas where the project could impact wetland habitat.

### **3.5 General Layout**

The EIS must describe the scope of the project for which an assessment is being conducted.

The EIS must provide a written description and graphically describe (eg. maps and drawings) the physical features of the undertaking (including, but not be limited to):

- S roads (existing up to date)
- S transmission lines
- S right-of-way
- S stream crossings
- S temporary stream diversions
- S temporary construction camp(s), laydown areas
- S borrow pits and major excavations
- S temporary sewage and waste disposal facilities
- S concentrator unloading/loading facility (Preferred site plus alternative)
- S underground mine workings (shaft, ramp, headframe, ventilation system etc.)
- S buildings (crushing, grinding, milling, concentrating facilities, maintenance, storage)
- S open pits
- S ore and waste rock stockpiles

- S tailings storage area and pipeline
- S settling pond(s) (location, natural or man-made, direction of flow from the tailings containment area)
- S storm water pond(s) (intended function, location, whether it is natural or man-made and where water from the pond will be discharged)
- S water supply systems (potable and process)
- S hydrocarbon/chemical storage areas
- S marine facilities including requirements for upgrading

### **3.6 Construction**

The details, materials, methods, schedule, and location of all planned construction activities related to the features in Section 3.5 must be presented. This should include the following:

- S site preparation (ie., grubbing/clearing of right-of-way, etc.)
- S subgrade construction
- S stream crossing structures
  - The details of any stream crossings (ie., number, location, type of crossing - fording, culvert or bridge, design, etc.) required for proposed access roads or transmission line should be provided.
- S fish screens
  - Fish screens will be required at water intake structures to protect fish against entrainment or impingement. Design details of the intake structure and mesh size of the fish screens should be provided.
- S instream activities
- S excavations
- S personnel requirements
- S blasting operations
- S shaft, ramp, headframe and ventilation system
- S transport, storage and use of hazardous materials, fuels, chemicals, lubricants and explosives
- S establishment, operation and removal of construction camp and yard areas
- S removal of temporary operations
- S tailings pond and associated dams design criteria
- S groundwater flow direction and monitoring
- S dredging of the sea floor (if required) at the marine loading facility to accommodate ocean-going concentrate carriers
  - If dredging activities are planned, the proponent should also indicate the method of disposal of the dredged spoils.

### **3.7 Operation and Maintenance**

All aspects of the operation and maintenance of the proposed development should be presented in detail. This should include, but not be limited to the following:

- S detailed process description (flow sheet, major process steps, chemical use etc.)
- S water balance for the mine, mill and surface runoff
  - The basis for the evaporation rate of 51 m<sup>3</sup>/hr and the precipitation rate of 135 m<sup>3</sup>/hr should be provided. A water balance should be provided that considers the hydrology of the area and water withdrawal requirements.

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- S water withdrawal requirements, including rate of water withdrawal, throughout the year should be identified with consideration of varying flow regimes.
  - S groundwater flow regime in the area should also be considered with respect to surface water recharge and discharge relationships and potential implications on surface and groundwater flows.
  - S tailings management system
    - The effluent from the sewage treatment plant shall not be pumped into the tailings containment area as proposed. The proponent has proposed to use the tailings backfill underground therefore they must not contain contaminants to be introduced to the underground workplace. It is indicated that the retention time for the tailings pond has been estimated to be 260 days based on water usage of 3.5 m<sup>3</sup>/tonne of ore. This number should be revised. The proponent has projected that retention time will be sufficient to oxidize any produced thiosalts to an acceptable level and if not additional treatments are available (biological, chemical). Natural degradation is not sufficient for extremely high levels of thiosalts. High levels of acid would be generated. Data should be provided that shows these additional treatments to be effective and economical. It is proposed that effluent from the Open Pits will be collected and treated if necessary prior to discharge. Water discharges have also been identified to be from surface runoff, tailings impoundment area and groundwater. All discharge points should be determined as they may be subject to regulations. Approximately 2.2 millions tonnes of tailings is to be backfilled underground. Information on acid reduction methods should be provided. It is indicated that 1.2 millions tonnes will be stored under a water cover to reduce acid generation. Sufficient information on water cover technology must be provided. For example the depth of water cover; wave action; seepage; placement strategy, if any; metal leaching, especially Zn.
  - S waste water treatment and effluent
  - S concentrate handling/trucking
  - S personnel requirements
  - S marine terminal
  - S marine shipping plan (i.e., shipping frequency, any ice-breaking requirements, etc.).
  - S details of the size, drainage treatment and duration of the ore stockpiling which occurs prior to the commissioning of the concentrator
  - S details of the waste rock stockpiling, such as duration of stockpiling, pad permeability and drainage collection
    - Where mixed sulphides occur in waste rock, metal leaching (e.g. Zn and Pb) can be effected by galvanic interaction even though the ABA analysis may indicate the samples tested non potentially acid-generating. Further analysis on nonpotentially acid-generating material is needed.
  - S pH and metals are identified as the contaminants in the pit dewatering.
    - Nitrate, nitrite and nitrogen (ammoniacal) from the explosives will also be present. Provide levels of these contaminants to show they are within limits and/or the effluent will be nonacutely lethal.
  - S details on the process for backfilling mine with tailings and the chemical stability of the back filled tailings.
  - S a possible leak is referred to in the discussion of the tailings containment area. Indicate whether or not the dams will be impermeable. Provide details of the long term disposal plan for the tailings.
  - S details of the type of containers that will be used for shipping reagents/chemicals to site.

### **3.8 Abandonment**



The predicted lifespan of the mine must be indicated. Details regarding progressive rehabilitation, decommissioning, and abandonment must be presented.

## 4. ENVIRONMENT

### 4.1 Existing

The EIS must include a description of the existing biophysical and socioeconomic environment of the study area, and the resources within it, emphasizing Valued Ecosystem Components (VEC's) (as defined by Beanlands and Duinker, 1983). The identification of known data gaps is imperative. A qualitative and quantitative description of the present environment including but not limited to:

- **climate**
- **hydrological conditions**

Details of the hydrology within the project area (i.e., both Harpoon Brook and Noel Pauls Brook watersheds) should be provided. Monthly, daily and mean annual flows should be identified for each system. Water withdrawal requirements, including rate of water withdrawal, throughout the year should be identified with consideration of varying flow regimes. A water balance should be provided that considers the hydrology of the area and water withdrawal requirements. The potential impacts of water withdrawal on downstream dewatering and draw down in Tally Pond should be identified. The groundwater flow regime in the area should also be considered with respect to surface water recharge and discharge relationships and potential implications on surface and groundwater flows.
- **topography and terrain (soils, vegetation)**
- **geology, hydrogeology and geomorphology**

Include information concerning acid bearing rocks. The results of the acid generation potential testing should be supplied to provide for complete understanding of the impact of the testing, since 3 of the 11 core material samples were found to be acid generating. Information on the remaining 8 samples with regard to the potential to generate/consume acid. The locations of the samples and verification of their statistical relevance is also required. It does not appear that the open pit deposits (Boundary) have been sampled. It is concluded that segregation of acid-generating and non-acid generating material will be necessary. It is critical that all acid generating material be identified in order to develop proper waste management plans. One key to achieving this is sufficient samples representing all the geological types that will be impacted as a result of the mining activity. It cannot be determined if this has been done. Additionally there is no information on how this segregation will be accomplished. This information should be provided. The calculations performed for determination of thiosalt generation, degradation and tailings containment retention time should be provided.
- **wildlife** ( including but not limited to rare or endangered species)

Discussions of the description of the existing environment must draw specific reference to the VECs. Data collected during baseline studies should be presented in the Appendices. Detailed discussions must be developed for the following VECs:

- **Resource uses and users (eg. forestry)**
- **Aquatic furbearers**

- **Water quality**
- **Raptors**
- **Passerines, Waterfowl and waterfowl habitat**

Migratory birds were not identified as a VEC in the 1991 EIS. As a result, there is little information provided in either the 1991 EIS or the registration document regarding avian species, numbers, location or temporal distribution. It is known, however, that Noel Paul's Steady is an important breeding and staging area for geese and ducks, and incidental waterfowl observations were reported at Harpoon Brook near East Pond and Burnt Pond during earlier field studies (Section 4.2.8 Wildlife and Birds). Fifty-eight species of forest avifauna were also identified incidentally during other field work for the 1991 EIS, although the relative abundance, significance and dominant habitat types of individual species were not indicated (Section 4.2.8 Wildlife and Birds).

Generally speaking, mining activities that involve clearing vegetation will cause disturbance to migratory birds and their habitat. Many species use brush, deadfalls and other low-lying vegetation for nesting, feeding, shelter and cover. This would apply to songbirds throughout the region, as well as songbirds and waterfowl in wetland areas.

Given the ten year interim and the potential importance of the project area to waterfowl, surveys should be conducted in the two drainage sub-basins of the project, to address these data gaps.

#### Waterfowl Surveys

There are two types of aerial water fowl surveys that are recommended: (i) A survey block of approximately 15km X 10km over wetland which may be affected within the drainage area of the project; and (ii) stream surveys of waterways downstream of and including Tally Pond and Duck Pond, as far as and including Noel Paul's Brook and steadies; and for 5 km upstream and downstream of the stream crossing at Harpoon Brook.

The timing of the surveys should be as follows:

Brood and molting surveys could both be conducted between the July 15 - 25.

Staging surveys would best be conducted in early September before the hunting season opens.

#### Songbird Surveys

Song bird surveys should also be conducted in all major habitat types in the area of influence of the project, including (but not limited to) forests and wetlands.

The survey design should be appropriate to the area of disturbance, and the presence of species should be documented for each habitat type. (The point count method of P. Drapeau et al. (1999) is a recent and useful reference.) The details of survey methods and results should be provided in the EIS for review.

Variables to be noted would include: site type / productivity; stand age; tree species composition including deciduous tree component; forest interior or riparian zone; migratory bird species occurrence, distribution and activity.

Discuss: the proportion of habitat types to be directly impacted by mining activity on a landscape basis; the status of migratory bird species found to occur in the area on a local and regional basis, using any existing data from other surveys and bird counts; the scheduling of construction / operation activities and proposed mitigation with respect to clearing of vegetation.

Present: a site map showing the geographic location of various habitat types; a description of study methodology; survey results and analyses; and impact predictions / recommendations.

The optimal timing for surveys is between dawn and 8:00 am, commencing in mid June but may be conducted up until mid-July.

One year of data would be sufficient for both waterfowl and songbirds, provided that they are conducted at the appropriate times.

Disturbance would be most critical for songbirds during the nesting period; from May to around mid July in this region.

To help reduce impacts on migratory birds, it is recommended that if a nest is found:

- the nest site and neighbouring vegetation should be left undisturbed until nesting is completed; and
- construction activities be minimized in the immediate area until nesting is completed.

- **Fish and fish habitat** (freshwater systems and marine loading site).

This should include but is not limited to the following:

- In the freshwater environment the project area (adopting a precautionary approach) should include Trout Pond and Trout Pond Brook downstream to its confluence with Harpoon Brook, as well as Tally Pond and Tally Pond Brook downstream to its confluence with Noel Paul's Brook. However, based on information contained within the registration document, specifically with respect to hydrology and potential zone(s) of impact, it is not possible to determine whether the project will likely result in impacts further downstream than the areas highlighted above. As such, the proponent will also be required to demonstrate the extent to which

downstream hydrological effects may impact upon fish and fish habitat as a result of the proposed project.

A detailed description of available fish habitat in the project area outlined above should be provided to allow quantification of fish habitat to be impacted. Utilization of these potentially impacted areas by resident and anadromous fish should also be provided.

- For the marine shipping terminal, if the plan is to construct a wharf, or undertake any modifications to an existing wharf (e.g. extension, upgrading, restoration, etc) then a detailed description of fish, fish habitat and any fisheries that could be potentially impacted by these activities should be provided.
- A more accurate determination of the study area can only be determined once DFO has had an opportunity to review a finalized project description, including any additional information that was requested through the provincial environmental assessment process.
- Fish species directly or indirectly supporting fisheries should be identified including the type, location and magnitude/extent of existing, past and potential commercial, recreational and aboriginal fisheries within freshwater and marine environments of the proposed project area. The extent to which these fishing activities will be disrupted during construction and operation phases of the proposed project should be addressed.
- The quality (i.e., water depth, flows, substrate type, etc.) and quantity of fish habitat at each stream crossing should be identified.

#### **4.2 Data Gaps**

Information gaps resulting from a lack of previous research or practise must be described.

#### **4.3 Future**

The predicted future condition of the environment described under 4.1 within the expected life span of the undertaking, if the undertaking were not approved. This information is required when attempting to distinguish project-related environmental effects from environmental change due to natural processes.

### **5. ENVIRONMENTAL EFFECTS**

The EIS must contain a comprehensive analysis of the predicted environmental effects of each project alternative for the VEC's. If the impacts are attributable to a particular phase

of the project (construction, operation or maintenance) then they should be designated as such.

Predicted environmental effects (positive and negative, direct and indirect, short and long-term) must be defined quantitatively and qualitatively for each project alternative and for each VEC. In this regard, the EIS should offer an impact assessment methodology which includes the following considerations:

- definition of the spatial and temporal study boundaries for the interactions of the project with VECs;
- definition of impact significance criteria against which to evaluate the potential impact of interactions;
- description of potential interactions;
- discussion of issues and concerns which relate to specific interactions;
- discussion of the existing knowledge on information related to the interactions;
- analysis of potential impacts (significance, positive or negative, etc.).

In this latter regard, it is expected that the proponent will offer a definition of significance for each impact category examined.

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

The environmental effects of accidents that may occur in connection with the project and impacts from accidental events should be discussed with respect to risk, severity and significance.

Consequences of low probability, high impact events, including design failure, should also be described.

Potential impacts of the proposed project on fish and fish habitat should be addressed in accordance with and the No Net Loss guiding principle of DFO's Policy for the Management of Fish Habitat.

Potential impacts of the proposed project on lake habitat (i.e., tailings deposition, lake drawdown, etc) should be addressed in conjunction with DFO using a draft Guideline developed by MEHM staff (Power Draft 2000).

Implications of the construction and operation of the tailings management system on downstream flows (reduced flows) should be described with respect to potential impacts on fish and fish habitat as well as up downstream fish passage. The provision of minimum flows, especially during critical times of the year (i.e., periods, migration, overwintering, etc.) should be discussed. Detailed information (i.e., the spatial extent, duration and timing of dewatering and stream flow alteration) should be provided to allow quantification of impacted fish habitat.

The potential impacts of water withdrawal on downstream dewatering and drawdown in Tally Pond should be identified.

The potential impacts of water withdrawal on fish entrainment and impingement with respect to the water should be addressed.

The potential impacts, if any, of open pit and underground mining, tailings containment, etc. on inter-basin contaminated water also needs to be addressed.

The potential impact on water quality from the project on the portion of the watershed that leads to Noel I what measures will be undertaken to protect the watershed needs to be addressed.

The potential implications of the proposed project on fish and fish habitat within the vicinity of the marine should be provided.

The extent to which fishing activities will be disrupted during construction and operation phases of the proposed project should be addressed.

### ***Cumulative Environmental Effects***

Consideration of any cumulative effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out must be discussed in the report.

Addressing cumulative environmental effects involves considering:

- time and geographic boundaries;
- interactions among the project's environmental effects;
- interactions between the project's environmental effects and those of existing projects and activities: and
- interactions between the project's environmental effects and those of planned projects and activities.

## **6. ENVIRONMENTAL PROTECTION**

### **6.1 *Mitigation***

Mitigative measures proposed to minimize or eliminate the negative and enhance the positive impacts of the project should be described and discussed. Proposed mitigative strategies integral to the phases of the project (construction, operation, modification and decommissioning) must be clearly identified and addressed. The effectiveness of the proposed mitigative measures should be discussed and evaluated. Where possible and appropriate, compensation for losses that cannot be mitigated should be examined such as in the case for forest habitat. Any harmful alteration, disruption or destruction (HADD) of fish habitat and associated fish habitat compensation should be addressed in accordance with DFO's Policy for the Management of Fish Habitat.

Where the federal environmental assessment process is "triggered", then all potential environmental effects of the project may be considered. Conservation of wetlands through

voluntary and cooperative means, such as conservation partnerships, in support of the net loss goal of the Federal Policy on Wetland Conservation is suggested. Where possible destruction of wetlands within the project area should be avoided and conservation / enhancement of remaining adjacent wetlands promoted.

Appropriate mitigative measures to address potential impacts on fish and fish habitat (i.e., stream crossings, siltation control, buffer zones, right-of-way clearing, water withdrawal, intake screens, downstream flows/provision of minimum flows, blasting, site rehabilitation, etc.) should be addressed.

Mitigation failure should be discussed with respect to risk and severity of consequence.

Mitigation measures in the event of an accidental release of toxic effluent should also be identified. This is of interest, as Harpoon Brook, and other potentially important waterfowl areas are located downstream of the discharge site.

## **6.2 *Environmental Monitoring and Follow-up Programs***

Environmental compliance and effects monitoring programs for construction, operation, maintenance, and modification phases of the project must be described. Program descriptions should include detailed statements of objectives, sampling design, methodology, duration of the program and reporting procedures. The monitoring program should also include changes that occur as a result of accidents or malfunctions as well as those resulting from cumulative effects. There must be consideration for monitoring indicator species to verify impact predictions concerning biological contaminant receptors.

The issuance of a Section 35(2) Fisheries Act authorization or a Navigable Water Protection Act (NWPA) approval triggers an environmental assessment under the Canadian Environmental Assessment Act (CEAA). A key requirement under CEAA is that the proponent must conduct a follow-up monitoring program. An EEM program for fish (freshwater systems and marine site) which includes body burden surveys must be conducted. Existing baseline information (e.g., water and sediment quality, benthic invertebrate structure and composition, fish composition and abundance, biotic contamination levels, etc.) that was collected as a result of the pre-assessment environmental assessment in 1991 may be included as part of the EEM program. This information, however, should be supplemented with more recent baseline field studies in order to reflect any potential changes that may have occurred in fish or fish habitat over recent years (i.e., specifically since 1989 when these studies were conducted). For instance, changes in habitat quality due to cessation of log driving activities or possible increases in fish abundance due to various enhancement activities that have been carried out within the Exploits River watershed.

Also, the EEM program must include a water quality study.

EEM programs should be developed in consultation with regulatory agencies and be reviewed by these agencies prior to the initiation of construction activities. Monitoring reports should be submitted to regulatory agencies on a regular basis.

## **6.3 *Rehabilitation***

A plan of proposed rehabilitation measures is required with an explanation of how the measures will reduce or eliminate various negative impacts during construction, operation and decommissioning. Also a description of the mine closure plan.

It is recommended that the use of native vegetation (seed) that is natural to the area be used in all revegetation efforts.

## **7. RESIDUAL IMPACTS AND SELECTION CRITERIA FOR PREFERRED OPTION**

### **7.1 *Residual Impacts***

All remaining impacts after mitigation has been applied should be presented. The residual impacts should be defined in terms of nature, spatial extent, frequency, duration, magnitude (qualitative and quantitative), significance, and level of certainty. Irreversible impacts should be clearly identified.

### **7.2 *Impact Evaluation and Selection of Preferred Alternative***

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

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

## **8. PUBLIC PARTICIPATION**

A program of public information must be undertaken. Public meetings will be required to present the proposal and to record public concerns. At a minimum the proponent is required to hold public information meetings in the towns of Buchans and Botwood (or alternate port) Public concerns must be addressed in a separate section of the EIS. Protocol for this meeting shall comply with Section 10 of *The Environmental Assessment Regulations, 2000* (Newfoundland and Labrador). Public notification specifications are outlined in Appendix A.



## 9. ENVIRONMENTAL PROTECTION PLAN

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

**The EPP should not include any analysis of impact prediction or mitigation. The EPP is intended to summarize all of the environmental protection commitments outlined in an acceptable EIS, in a concise, formatted document for primary use in the field.**

Following are some general concerns noted with respect to EPP information contained in the registration document:

There is need for clarification of a statement within the registration document that the measures within the EPP will be implemented "where feasible".

**Buffers:** There appears to be a conflict concerning buffers. It is acknowledged that permits are required under the Forestry Act, however, this is not referenced in the associated text for **section 2.1, Clearing of Vegetation; Section 2.2, Grubbing and Disposal of Related Debris; Section 2.10, Buffer Zones** and other references to buffers near waterways. Guidelines that are attached to Forestry Permits require a minimum 20m treed buffer maintained near waterways, therefore, the document should reference 20m as the minimum buffer to be maintained related to this project.

**Section 2.5 Solid Waste Disposal:** There is a commitment to the use of "bear proof" containers for waste accumulated on site. The proponent should provide a description and diagram of the "bear proof" container to allow the reviewer to determine its adequacy.

## 10. REFERENCES CITED

## **11. PERSONNEL**

Brief descriptions of expertise and qualifications of personnel involved in the completion of the EIS are required.

## **12. COPIES OF REPORTS**

Copies of reports produced for any studies undertaken specifically in connection with this Environmental Impact Statement should be submitted.

## APPENDIX A - PUBLIC NOTICES

Under the provisions of the *Environmental Assessment Regulations 2000*, Section 10, and where the approved Assessment Guidelines require public information meeting(s), the following specified public notification requirements must be met by the proponent prior to each meeting:

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

<p style="text-align: center;"><b>PUBLIC NOTICE</b></p> <p style="text-align: center;">Public Information Meeting on the Proposed <i>NAME OF PROPOSED UNDERTAKING</i> <i>LOCATION OF PROPOSED UNDERTAKING</i></p> <p style="text-align: center;">Will be held at <i>DATE AND TIME</i> <i>LOCATION</i></p> <p style="text-align: center;">This meeting will be conducted by the proponent <i>PROPONENT NAME AND CONTACT PHONE NUMBER</i></p> <p style="text-align: center;">as part of the required Environmental Assessment process for this project. The purpose of this meeting is to describe all aspects of the proposed project, the activities associated with it, and to provide an opportunity for all interested persons to request information or state their concerns.</p> <p style="text-align: center;"><b>ALL ARE WELCOME</b></p>
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Minimum newspaper ad size: 2 column widths.

Minimum posted ad size: 7" x 5"

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

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

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