REACTIVATION OF THE ST. LAWRENCE FLUORSPAR MINE

ENVIRONMENTAL PREVIEW REPORT

(Pursuant to Part X of the Newfoundland and Labrador *Environmental Protection Act)*

and the

FEDERAL ENVIRONMENTAL ASSESSMENT SCREENING REPORT

(Pursuant to the *Canadian Environmental Assessment Act*)

Submitted by

CANADA FLUORSPAR (NL) INC.

November 6, 2009

PREFACE

Canada Fluorspar (NL) Inc. (formerly Burin Minerals Ltd.) proposes to reactive the fluorspar mines in St. Lawrence, Burin Peninsula, Newfoundland and Labrador. As required under the Provincial *Environmental Assessment Regulations 2003* and the *Canadian Environmental Assessment Act*, the project was registered with both levels of government on April 14, 2009.

This document was prepared by Canada Fluorspar (NL) Inc. (the Proponent), for the St. Lawrence Fluorspar Mine Reactivation. It represents the ***Environmental Preview Report (EPR)*** and the ***Federal Environmental Assessment Screening Report (FEASR)*** for the proposed St. Lawrence Fluorspar Mine Reactivation (the Project).

The proponent was advised that an EPR is required for the project under the Newfoundland and Labrador *Environmental Protection Act (EPA)*. The project is also subject to a screening report in accordance with the *Canadian Environmental Assessment Act (CEAA)*. Both governments have agreed that a single set of guidelines (***The Guidelines)*** is the most effective and efficient way to guide the proponent in preparing an environmental assessment and to produce one report to satisfy both processes. The Guidelines were issued by the Government of Canada and the Government of Newfoundland and Labrador on September 10, 2009.

This undertaking is also subject to an Environmental Assessment in accordance with the *CEAA* since this project requires a Formal Approval under Part 1, Section 5 of the *Navigable Waters Protection Act* and authorization under Section 35(2) of the *Fisheries Act.* Transport Canada (TC) and Fisheries and Oceans Canada (DFO) are Responsible Authorities (RA's) for this CEAA assessment and the Canadian Environmental Assessment Agency will act as the Federal Environmental Assessment Coordinator (FEAC). Environment Canada, Health Canada and Natural Resources Canada are Expert Federal Authorities (FA's) under CEAA and will provide expert advice to TC and DFO during the assessment process.

The EPR presents the report of an investigation based upon readily available information which supplements that already provided by the proponent in the registration of the undertaking (April 9, 2009) and additional information/site investigations, public input and other studies that followed. It describes the project's environmental effects, mitigation measures, and assessment of residual impacts on the receiving natural environment and human receptors.

The Federal Environmental Screening Report includes consideration of the following: (1) the environmental effects of the project, including: malfunctions or accidents and cumulative environmental effects that are likely to result, (2) significance of those environmental effects, (3) comments from the public, (4) mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects, and (5) any other matter relevant to the screening such as the need for the project and alternatives to the project, has also been considered.

The Proponent's commitments and guiding principles for the proposed reactivation of the St. Lawrence Fluorspar Mine Project are provided below.

CANADA FLUORSPAR (NL) INC.

Safety and the Environment
Our Top Priority

Supplying the world with Fluorspar!

Health, Safety, Environmental and Social Responsibilities

We live here.... We work here

Canada Fluorspar (NL) Inc. (CFI) intends to become a leader within the global fluorspar industry setting standards of excellence in mining, processing and the marketing of our products. We will maintain the highest standards with respect to health and safety, environmental protection and community awareness and benefits.

All mining comes with an inherent risk for environmental damage but CFI is committed to minimizing the impact by keeping abreast of current technology and will remain interactive with its workforce, local residents and regional communities. We will strive to be environmentally and socially responsible in our undertakings.

CFI is committed to stewardship of the environment in which it is privileged to operate, and will design and execute the Project in a manner that will eliminate or minimize the potential adverse effect on the environment in all areas of the Project. CFI will ensure the Project activities are carried out in full compliance with applicable environmental, health and safety laws and regulations in addition to corporate governance and accountability.

The company commits to treating its employees with respect and dignity, and to encouraging, measuring and rewarding exceptional performance. We commit to providing adequate worker training along with a safe and healthy work environment in which all employees have opportunities to accomplish their full potential.

CFI is committed to being an exceptional corporate citizen, embracing the community spirit by supporting community initiatives and providing a firm foundation to ensure the well-being of its employees and their families.

Lindsay Gorrill
President
Canada Fluorspar (NL) Inc.

DESIGN, CONSTRUCTION AND OPERATIONS GUIDING PRINCIPLES

Health & Safety

As our commitment states: **We live here…. We work here**.

CFI understands the concerns and deficiencies in past practices with mining in St. Lawrence. The health and safety issues connected to dry drilling and radon gas underground has been well researched and documented. Now that these problems are fully understood, CFI will ensure that problems of the past will remain in the past. To prevent silicosis, all drilling activities will be conducted wet – not only is this common sense it is the law. To prevent the build-up of radon gas carried by mine underground water, new flow-control techniques on each level will reduce the risk of spreading the gas and sufficient ventilation will provide adequate dilution and extraction. These techniques will also provide a drier working environment in the stopes and improve ground conditions.

In the mill the major concern was the crushing section. The crushers will be removed and housed in a new, purpose-built facility ensuring a dust-free working environment within the mill.

In the past problems associated with airborne dust during the storage and transport of product is recognized as a concern by local residents. CFI will ensure that dust emissions are kept to a minimum. The new wharf, to be built in the Greater St. Lawrence Harbour, will minimize vehicular traffic through the Town and eliminate the loading of vessels in the inner harbour. All product will remain under cover both during storage and transport whether in a truck or on a conveyor. Airborne dust is a loss of revenue to the company.

CFI will incorporate the highest health and safety standards in design, construction and operations. A detailed safety management system will be implemented to continuously identify, reduce and manage safety risks. All levels of the workforce will have a responsibility to safety. Safety procedures will be established, tracked and monitored. Regular safety audits will be carried out. This safety culture will be recognized as an integral part of every single employee's duties.

CFI is committed to a healthy and safe working environment both on surface and underground. The company's most valuable asset is its workforce.

Applying Best Available Technologies Economically Achievable

The design and construction of the Project facilities will incorporate the best available technologies economically available (BATEA) principle to provide a safe, robust and environmentally friendly company that complies with all national and provincial regulations and industry codes and standards. The principle of BATEA will be applied to all phases of the Project to ensure that the facilities are constructed and operated efficiently and with minimal impact on the environment. For example, mining and processing methods, new to the St. Lawrence area, will be used to address efficiency and maximize safety within the working environment. BATEA will also be used in the design and implementation of safety systems, security and emergency response.

Applying Best Environmental Protection Practices

CFI will apply the precautionary approach in the design and implementation of the Project. Where there is a potential threat or serious or irreversible damage to the environment all potential alternatives will be considered. Long-term data will be evaluated both from the immediate area and similar Projects globally.

CFI is committed to stewardship of the environment in which it seeks to operate, and will design and execute the Project in a manner that will eliminate or minimize the potential adverse effects on the environment in all phases of the Project. CFI is committed to prevent pollution and to continually improve the integration of environmental protection practices in all its activities and will ensure that Project activities are carried out in full compliance with all applicable environmental, health and safety laws and regulations by applying the best available technologies and highest standards.

The company has taken a proactive approach to environmental protection at an early stage of Project planning. Examples include the use of the north alternative in the construction of the wharf. This will be the more expensive option but will not impact the more favourable marine habitat adjacent to the shoreline that the south alternative would have done. The use of Shoal Cove Pond, used in the past by a previous operator for mill tailings, will not destroy virgin habitat such as the alternative of storing close to Director Mine would have done. A further discounted alternative was the construction of hillside berms since they would involve the destruction of huge areas of unspoiled land in the Shoal Cove Pond area. CFI has also adopted the "no net loss" principle for fish habitat compensation.

Commitment to Community Participation and Maximizing Local Benefits

CFI understands the importance of consultation with former workers, local residents and the community in general. It is only through discussion and understanding that past deficiencies can be eradicated and lessons learned. CFI understands the past health and safety issues and intends to provide a strong foundation to ensure the well-being of its employees and affiliates.

Not only is the company committed to local employment, it intends to be an exemplary corporate citizen embracing the community spirit. CFI wishes to become part of the local community and where possible will support community initiatives. CFI is committed to maximizing local benefits, both through direct employment, training and by giving assistance and preference to local suppliers.

Sustainable Development – Project Sustainability

Sustainable development is the principle whereby development meets the needs of the present without compromising the ability of future generations to meet their own needs. CFI intends to become established within the community and will grow along with it. In the past companies mining fluorspar in the area have not needed to commit to exploration since there has always been sufficient known ore to sustain their activities. CFI will not use this approach but will continue exploration to ensure long-term viability. The Project is incorporating the principle of sustainable development into Project design and operations through planned integration of environmental, social and economic considerations.

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Acronym / Unit	Definition
AG	Acid Grade
AMD	Acid Mine Drainage
ANFO	Ammonium Nitrate/Fuel Oil).
ATV	All Terrain Vehicle
BATEA	Best Available Technologies Economically Achievable
BBN	Blue Beach North
BH	Boreholes
BML	Burin Minerals Limited
BPHC	Burin Peninsula Health Centre
CBC	Canadian Broadcasting Corporation
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CCRI	Community-based Coastal Resource Inventory
CEAA	Canadian Environmental Assessment Act
CEA Agency	Canadian Environmental Assessment Agency
CEPA	Canadian Environmental Protection Agency
CFI	Canada Fluorspar (NL) Inc.
CFM	Cubic Feet per Minute
CNA	College of the North Atlantic
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPC	Rivera Capital Corporation
CPUE	Catch Per Unit Effort
CSA	Canadian Standards Association
CWS	Canadian Wildlife Service
dB	Decibels
CW	Carapace Width
DDT	Dichlorodiphenyltrichloroethane
DFA	Department of Fisheries and Aquaculture
DFO	Fisheries and Oceans Canada
DMS	Dense Media Separation
DNV	Det Norske Veritas
DOE&C	Department of Environment and Conservation
DOSCO	Dominion Steel and Coal Corporation
DWT	Dead Weight Tonnes
EA	Environmental Assessment
ECAREG	Eastern Canada Vessel Traffic Services Zone Regulations
EEM	Environmental Effects Monitoring
EHSMS	Environmental, Health and Safety Management System
EPA	Environmental Protection Act
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
ERP	Emergency Response Plan
ESA	Endangered Species Act

FA	Federal Authority
FAL	Freshwater Aquatic Life
FEAC	Federal Environmental Assessment Coordinator
FEASR	Federal Environmental Assessment Screening Report
FFAW	Fish, Food and Allied Workers
GHG	Greenhouse Gases
GPM	Gallons per Minute
HADD	Harmful Alteration, Disruption or Destruction
HEU	Habitat Equivalent Units
HF	Hydrofluoric Acid
HSEQ	Health, Safety, Environment & Quality
HVAC	Heating, Ventilating, and Air Conditioning
IBA	Important Bird Area
ICS	Incident Command System
IFC	Issued For Construction
IMO	International Maritime Organization
IUCN	International Union for Conservation of Nature
kHz	Kilohertz
kPa	Kilopascal
LEK	Local Ecological Knowledge
LFA	Lobster Fishing Area
LHD	Load-Haul-Dump
LNT	Low Normal Tide
MMER	Metal Mining Effluent Regulations
MPMO	Major Projects Management Office
MSDS	Material Safety Data Sheets
MW	Mega Watts
NAFO	North Atlantic Fisheries Organization
NFPA	National Fire Protection Agency
NL	Newfoundland
NOC	National Occupational Classification
NRCan	Natural Resources Canada
NTU	Nephelometric turbidity units
OH&S	Occupational Health & Safety
PMP	Probable Maximum Precipitation
PPV	Peak Particle Velocity
RA	Responsible Authority
ROM	Run-of-Mine
SAR	Species at Risk
SARA	Species at Risk Act
SCUBA	Self-Contained Underwater Breathing Apparatus
SEA	Strategic Environmental Assessment
SEL	Sound Exposure Level
SPL	Sound Pressure Level
SR	Screening Report
TAC	Total Allowable Catch
TBD	To Be Determined
TC	Transport Canada

TCH	Trans Canada Highway
TF	Tarefare
TIA	Tailings Impoundment Area
TMF	Tailings Management Facility
TSS	Total Suspended Solids
TSX	Toronto Stock Exchange
UK	United Kingdom
USM	Unusable Materials
VEC	Valued Ecosystem Component
WPO	Women's Policy Office
WRDC	Women in Resource Development Corporation
YOY	Young of Year

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Canada Fluorspar (NL) Inc. (formerly Burin Minerals Ltd.) - the ***Proponent***, proposes to reactivate the St. Lawrence Fluorspar Mines at St. Lawrence, Burin Peninsula, Newfoundland and Labrador. The Undertaking is subject to both Provincial and Federal Environmental Assessments, as required under the Provincial *Environmental Assessment Regulations* and the *Canadian Environmental Assessment Act*. The project was registered with both levels of government on April 14, 2009.

The proponent was advised that an Environmental Preview Report is required under the Newfoundland and Labrador *Environmental Protection Act (EPA)*, and also subject to a Federal Environmental Assessment Screening Report in accordance with the *Canadian Environmental Assessment Act (CEAA)*. Both governments have agreed that a single set of guidelines (***The Guidelines)*** is the most effective and efficient way to guide the Proponent in preparing an environmental assessment and to produce one report to satisfy both processes. The Guidelines were issued by the Government of Canada and the Government of Newfoundland and Labrador on September 10, 2009.

This document was prepared by Canada Fluorspar (NL) Inc. for the *St. Lawrence Fluorspar Mine Reactivation* (**the Project**). It represents the ***Environmental Preview Report (EPR)*** and the ***Federal Environmental Assessment Screening Report (EA)*** for the Project.

1.2 THE UNDERTAKING

Canada Fluorspar (NL) Inc. (CFI) proposes to reactivate existing underground fluorspar mines, expand an existing mill, construct new tailings facility within an area formerly used as a tailings lagoon, and build a new deep-water marine terminal at Blue Beach Cove for the export of fluorspar concentrate product. The mine/mill is anticipated to produce between 120,000 and 180,000 tonnes of fluorspar concentrate per year. The estimated life of the mine is between 15 and 20 years, depending on the size of the ore body and production rate. The Project is located within the municipality of St. Lawrence, on the southern tip of Burin Peninsula. The St. Lawrence harbour is ice-free year round.

The project area is a ***brownfield site***, on which mine and mill operations has occurred since the 1930s. It has undergone an environmental assessment (EPR for tailings pond), which was approved in 1997.

1.2.1 Project Rationale

The proposed reactivation of the St. Lawrence Fluorspar Mine presents a strategic window of opportunity for CFI and the community of St. Lawrence, the Burin Peninsula and for the Province. The project is justified due to the fact that:

- Fluorspar global demands and prices have continuously risen since 1990s. Fluorspar used to produce aluminum, stainless steel, Teflon, refrigeration components, etc.;
- Fluorspar market has not been significantly affected by the recent economic crisis;
- Few deposits in Canada and USA;
- St. Lawrence Fluorspar has higher grades than most other deposits worldwide;
- Newfoundland offers a strategic location (ice-free, deepwater harbour close to the North Atlantic major shipping lane, etc.);
- Significant benefits to local communities (traditionally mining community).
- Strong Community support for the Project;
- A window of opportunity is now.

1.2.2 Environmental Effects Assessment Methodology

The Canada Fluorspar (NL) Inc. project will require federal, provincial and municipal approvals and permits for various activities during construction, operation and decommissioning. Anticipated relevant legislation and associated permits required have been identified and listed in this document. The Proponent is ultimately responsible for the preparation, submission and receipt of all required regulatory permits, approvals and certifications. The Proponent is also responsible for ensuring compliance with all applicable permits, approvals and certifications by its own employees, contractors and consultants.

The approach used to develop the biophysical and socio-economic effects (or impact) assessment followed well-established methods of environmental impact assessment used in Canada. The technical scope and content of the assessment are consistent with the recommended methods promulgated by the Canadian Environmental Assessment Agency and the Newfoundland and Labrador Department of Environment and Conservation. Both levels of government have provided the requirements and technical guidance needed for the Proponent to develop the environmental assessment (i.e , the Guidelines).

In general, the key steps in developing the EA preparation (EPR/EA) include:

- Developing a detailed project description;
- Defining the geographic and temporal scope of the Project;
- Consulting with the public, subject matter experts and government agencies;
- Carrying out field and specific studies to collect site-specific data;
- Identifying and defining the Valued Ecosystem Components (VECs), against which the potential effects of the Project are evaluated;
- Characterizing and evaluating any potential environmental effects on VECs;
- Evaluating the nature and risk of accidental events;
- Developing mitigation methods, including rehabilitation and management methods;
- Determining the nature and significance of any residual effects;
- Determining potential cumulative effects over the life of the project; and
- Proposing an Environmental Management Plan and monitoring program to confirm compliance with regulatory and permitting requirements.

More specifically, the EA includes two components; the Bio-Physical and Socio-Economic Assessments, both were addressed in this document:

This EA is a *focused assessment* which addresses all public concerns and *followed closely the Guidelines* which was issued by the federal and provincial governments for this undertaking.

1.2.2.1 Issues Scoping and Public Consultations

An important step of the EA process includes scoping of issues and determining the spatial and temporal extent of the assessment, selecting which components (i.e., sensitive and/or representative species or species-groups and associated habitats) of the ecosystem to assess, including human receptor, and which project activities to analyze.

In preparation for the proposed development and the required EPR/EA, the Proponent and their consultants met with relevant government agencies, representatives of the local community leaders, municipal council, fishing industry and other stakeholders and interest groups as well as the general public in communities that may be affected by the Project. The purpose of these consultations was to describe the Project, identify any issues and concerns, and to gather additional information relevant to the EA.

1.2.2.2 What to Assess

The Valued Ecosystem Component (VEC) approach was used to focus the assessment on those biophysical or human resources of most potential concern and value to the communities most affected by the Project and to the society at large.

The *Guidelines* specifically listed the following VEC's that will require detailed assessment:

1. **Fish and Fish Habitat** (both freshwater and marine including commercial fisheries);
2. **Migratory Birds** (including seabirds, shorebirds, waterfowl, songbirds and other land birds within the footprint of the Project);
3. **Species at Risk** (those included in federal *Species at Risk Act (SARA*), those listed by COSEWIC, and those listed by provincial *Endangered Species Act* (ESA); and
4. **Human Receptors** (including social and economical parameters)

It should be noted that as requested by the Guidelines specifically, the Marine Traffic was considered in the assessment (as an activity not as a VEC).

The Socio-Economic Assessment addresses Human Health, Employment (job creation and training), Business Opportunities, Community, Infrastructure and Services, Quality of Life, Commercial Fisheries and Aquaculture, Tourism, and other aspects listed in the Guidelines (as well as others added by the Proponent such as Historic Resources).

1.2.3 Public Consultations

Canada Fluorspar (NL) Inc. values and encourages the involvement of the local community in all stages of the Project, and considers public consultations an effective method by which to communicate with the community, businesses, regulatory bodies, and other organizations and stakeholders. Significant effort has been spent to date to provide stakeholders with information on the project, to hear their questions, and to address their concerns. Two public open houses were hosted by the proponent in the St. Lawrence, which were attended by local and nearby communities. Strong support for the project was expressed by the local community.

1.2.4 Project Schedule & Timelines

The Project will be undertaken in four specific stages:

- Pre-construction: (metallurgical test work, feasibility study, design and engineering, environmental assessment, etc) – started in the third quarter of 2008, currently underway and expected to be essentially completed early next year (2010).
- Construction: Planned to start 2nd quarter of 2010 and continues until third quarter 2011;
- Operations: Mine/Mill start-up is expected to commence April of 2012 and will continue for approx. 15 to 20 years (depending on production rate and the reserve size).
- Decommissioning & Closure & Abandonment: – estimated one to two years

It is assumed that the site development will start as soon the snow is cleared (early May 2010). It is estimated the construction (including the mine pre-production work and commissioning of the mill and marine terminal) will take approximately 18 to 24 months to complete.

1.3 PROJECT DESCRIPTION AND ALTERNATIVES

Canada Fluorspar (NL) Inc. has carried out a Feasibility Study, which included mine development, process review and testing, engineering design of project facilities and infrastructures; and evaluation of Project alternatives for their technical, economic and environmental viability. The feasibility study included evaluation of various project options and alternatives as related to:

- Mining methodology and mine development;
- Processing technologies & metallurgical testing;
- Tailings Management & Disposal;
- Marine Terminal location, structural design and materials handling; and
- Site infrastructures and Services.

CFI has also carried out site investigations and studies to support the above engineering and environmental requirements, including but not necessarily limited to: topographical and bathymetric surveys; geotechnical investigations both land and marine; fish and fish habitat both freshwater and marine; water quality; archaeological & historic resources study; human health and employment and other related socio-economic surveys; and extensive public consultations.

Production is expected to be between 120,000 and 180,000 tonnes per year of filtercake (Fluorspar concentrate) at between 8 and 10% moisture and at standard AG specification. For the purpose of this assessment, it is assumed that the nominal (base case) production rate is 120,000 t/year. This is based on 24 hours per day, 7 days per week for approximately 350 days per year production. The mine ore production is assumed to be about 1000 tonnes per day (nominal) and the mill output (Fluorspar Concentrate) is 345 t/day. The concentrate storage design capacity at the port is assumed to be 20,000 tonnes. It is anticipated that the concentrate export will vary from 5,000 to 20,000 tonnes per shipload (nominal 10,000 tonnes), which would require one shipment per month (12 ships per year at10,000 tonnes per ship).

It should be noted that the proposed deepwater wharf is designed to handle large Panamax ships (up to 65,000 DWT), this is to take advantage of topping-up bulk carriers that passes nearby the St. Lawrence area, and to accommodate future aggregate export (a by-product of this project).

A thorough evaluation of the above alternatives was carried out (with a focus on Tailings Management and the Marine Terminal). The assessment of alternatives included both short term and long term impacts of each alternative, from the construction and operation through out the closure and post-closure phases. The options were evaluated using a comparative matrix which included:

- Environmental considerations;
- Technical considerations; and
- Socio-Economic considerations.

1.4 OCCUPATIONS AND EMPLOYMENT PRINCIPLES

Canada Fluorspar (NL) Inc. is committed to maximizing local benefits and hiring locally or provincially as much as possible. As shown in the table below, the Project would directly create approximately 369 jobs (at peak) during construction. It is estimated that approximately 178 full-time jobs will be created in the community during operations. The indirect-to-direct labour ratio associated with this project is estimated to be 3 to 1 (i.e., for every (long-term) direct job on the Project there would be three indirect jobs created in the community).

Project Phase	***Estimated Number of Positions***
Design	81
Construction	369
Total – Short-term	**450**
Operation-Mine	125
Operation- Mill	44
Administration	9
Total permanent	**178**
Total overall employment	**620**

Canada Fluorspar (NL) Inc. is committed to being an equal opportunity employer. A Human Resources Plan, which will include Employment Equity and Women's Employment Plan will be developed upon the Project approved. This employment plan will be fully prepared in accordance with the provincial employment equity guidelines. .

1.5 PROJECT PHASES AND ACTIVITIES

1.5.1 Construction Phase

Construction activities on-site will be generally broken down into five components:

1. Mine development which will be on the critical path and will start as soon as possible after permits are available;
2. Mill refurbishment, expansion and upgrades;
3. Tailings Management Facility at Shoal Cove Pond and adjoining areas include construction of earth-filled dams;
4. Construction of the new deep-water marine terminal and associated infrastructure, including ore storage building and materials handling system;
5. General site infrastructure including access roads, power lines and substations, water supply, sewage system, warehouses and office building

Well-established and approved construction methods and practices will be used throughout the construction phase. Before any work commences, construction methodologies will be developed specific to the activities being undertaken. These will focus on reducing or eliminating the risk of negative effects on the environment. An Environmental Protection Plan (EPP) for construction will be developed prior to the start of construction. This document will describe these methodologies and highlighting important mitigation measures for various construction activities.

The various activities associated with Project construction and their interactions with the VECs have been identified and their effects have been assessed.

1.5.2 Operations

The Mine & Mill and associated marine terminal will be operated and maintained by trained, knowledgeable and experienced personnel following proven standard practices that result in a safe, efficient and environmentally responsive workplace. Management systems will be in place that complies with all regulatory requirements.

Tarefare Mine will be reactivated first followed by Blue Beach North. Mining will be a combination of sub level stoping and Alimak methods. For both methods, underground directional drilling followed by blasting using ANFO explosives will be carried out. In the case of Tarefare Mine, ore will be collected and hauled to the base of the shaft where it will be brought to surface by the mine's hoist, from where it will be transported to the Mill. A deepened, existing ramp will be used to bring ore to surface at Blue Beach North Mine.

Ore will be transported by haul trucks or by load-haul-dump (LHD) vehicles from the mine to the mill site, where it will be stockpiled ahead of processing. The existing mill building will be extended to include the thickener and concentrate product storage shed.

The main product will be a damp (10% moisture) filtercake (or AG concentrate) of 97.5% calcium fluoride purity. It will be trucked, conveyed or piped as slurry, to the new wharf storage building at Blue Beach Marine Terminal, where it will be loaded using a mobile shiploader.

Tailings from the milling operation will be slurried and pumped via HDPE pipeline to the TMF for disposal. The tailings will be spigotted around the basin to maximize storage capacity. Shoal Cove Pond has sufficient tailings capacity for the estimated 20 year mine life.

The various activities associated with Project operations and their interactions with the VECs have been identified and their effects have been assessed.

Occupational Health and Safety Plan, Environmental Protection Plan, Emergency Response Plan, Environmental Monitoring and all other plans will be developed and implemented during the operations phase of the Project.

1.5.3 Decommissioning

Once the Operations phase of the mine has ended, the facilities will be properly closed and rehabilitative measures will be taken to ensure that the site and surrounding area are returned to an environmentally appropriate condition. Decommissioning is anticipated to take up to two years, with the exception of the TMF and associated infrastructure (dams and berms), which will be subject to ongoing long-term environmental monitoring, inspection and maintenance.

The various activities associated with Project decommissioning & closure and their interactions with the VECs have been identified and their effects have been assessed.

The decommissioning and closure of project facilities will be in accordance with the EPP for the phase and all applicable government regulations.

1.5.4 Accidents and Malfunctions

CFI has a goal of zero accidents. This requires that accident prevention be given priority within CFI's Environmental Health and Safety Management System. Anticipating potential problems and implementing corrective measures before accidents occur will be a guiding principle in CFI's EHSMS. As well, this system will require a high level of response capability be maintained throughout the Project phases. Mine personnel will maintain constant vigilance, undergo regular safety training, and be thoroughly familiar with the Environmental Protection Plan, the Occupational Health and Safety Plan, and all Emergency Response Plans. Third-party contractors will be screened for compatibility with CFI policies and procedures.

1.6 OCCUPATIONAL HEALTH AND SAFETY

Workplace health and safety is a priority of management, employees and unions. While almost all physical activities associated with mining production involve some element of risk, CFI will ensure that the design, construction, and operation will be carried out with health & safety in mind. CFI will continually improve its safety regime by application of hazard analysis and other procedures to all aspects of its operations.

Canada Fluorspar (NL) Inc. recognizes that a good occupational health and safety program is the basis for all health and safety activities in the proposed Project and that an effective health and safety program benefits all workplaces. Canada Fluorspar (NL) Inc. will strive for a ZERO INCIDENT safety target.

1.7 ENVIRONMENTAL MANAGEMENT

CFI is committed to implementing appropriate environmental management in all facets of the Project. To ensure minimum impacts during daily operations of the mine, mill and marine terminal, the Best Available Technology that is Economically Achievable (BATEA) will be integrated into the project at all phases. All measures will be taken to ensure that project-related activities have as few adverse impacts on the environment as possible.

Environmental Management planning provides Canada Fluorspar (NL) Inc. with the tools to ensure environmental protection measures are implemented and appropriate monitoring is conducted. A sound environmental management strategy and suitable mitigation measures can minimize or eliminate adverse effects to the environment.

CFI is committed to prevent pollution and to continually improve the integration of environmental protection practices in all its activities. CFI will ensure that project activities are carried out in full compliance with all applicable environmental, health and safety laws and regulations by applying the best available technologies and highest standards

1.8 ENVIRONMENTAL ASSESSMENT

1.8.1 Bio-Physical Environmental Assessment

A description of the existing bio-physical environment is provided as related to the following components: Freshwater Fish and Fish Habitat (including surface water and groundwater hydrology); Marine Fish and Fish Habitat including Fisheries and Aquaculture; Marine Traffic (and associated VEC's); Migratory Birds; and Species At Risk (SAR).

<u>Effects Assessment</u>

The construction and operation of the St Lawrence Fluorspar Mining Project and associated facilities carries with it risks for the environment. This EPR/EA documents and evaluates the potential effects of the Project on the receiving environment. Effects on the terrestrial and marine environments to be affected by the Project are discussed as are the risks and potential effects of accidental events.

The assessment focuses on the potential effects of project construction and operation on valued ecosystem components (VECs) within the Study Area. For this Project the valued ecosystem components defined for the purposes of the biophysical assessment portion of the EA are listed above.

The Study Area defined for the biophysical assessment of the Project was established based on the footprint of the Project facilities and the area of the greater St. Lawrence harbour and its approaches that most likely to be affected by marine traffic en route to and from the proposed marine terminal.

The assessment predicts effects and their significance (positive and negative, direct and indirect, short and long term, residual, and cumulative) and the mitigation measures necessary for each Valued Ecosystem Component (VEC) selected for the assessment.

The effects assessment also considered the implications of accidental events as the cumulative effects on the study area from considering the Fluorspar Project in the context of existing and anticipated projects planned for this region.

1.8.2 Human Receptors & Socio-Economic Assessment

The human environment encompasses the people affected by the project, and the things that enrich and support their lives – their work, the roads they drive on, the schools their children attend, emergency services, health and community services, and the natural environment – everything that contributes to the quality of life. The Project has the potential to make a significant contribution to this human environment in the study area.

CFI has studied the social and economic factors likely to be affected, and examined the potential effects with the objective of achieving the best possible outcome as the Project moves through construction to operation.

CFI has developed the socio-economic assessment in compliance with federal and provincial environmental assessment guidelines. This includes a description of the socio-economic environment, and various mitigation measures to enhance the benefits of the project. Public consultation has played a major role in this study.

The Socio-Economic Assessment included: human health, employment, job creation and training, community and business opportunities, infrastructure and services, quality of life, commercial fisheries and aquaculture, tourism, and historical resources.

Additional environmental, heath and safety concerns were addressed, such as the Occupational Health and Safety Management, Environmental Management, Environmental Protection Plan, Emergency Response Plan, and Environmental Monitoring, as described in detail in this document.

1.9 SUMMARY OF ENVIRONMENTAL EFFECTS

1.9.1 Residual Effects

The predicted residual environmental effects of the proposed Fluorspar Mine Reactivation Project, including possible accidental events, on marine fish, fish habitat, and the commercial fishery during construction, operations, and decommissioning are assessed as *negative*, but *not significant,* provided that CFI and DFO have entered into a formal marine fish habitat compensation agreement prior to the start of construction, and that a compensation plan is developed and implemented by CFI in accordance with this agreement.

The predicted residual effects, including those resulting from accidental events, of the Project on freshwater fish and fish habitat are assessed to be *negative*, but *not significant,* provided that the freshwater fish habitat compensation agreement executed in 1996 by CFI and DFO is complied with, including implementation of the compensation plan forming part of this agreement.

The predicted residual environmental effects on migratory birds of the Project's routine activities during construction, operations, and decommissioning are assessed to be *negative*, but *not significant*. The predicted residual environmental effect of an accidental event, such as a tailings dam failure, on migratory birds is also assessed to be *negative*, but *not significant*.

The predicted residual effects, including those resulting from accidental events, of the Project on Species At Risk are assessed as *negative*, but *not significant*.

The predicted effects of the Project on the socio-economic environment are generally assessed as *positive.* The predicted positive effects on local communities in form of job creation and employment, training, business opportunities and community development are assessed as *significant* benefits The predicted residual effects of the Project on human health, including those resulting from accidental events, are assessed as *negative*, but *not significant.*

1.9.2 Cumulative Effects

The within-the Project itself cumulative effects are integrated into the effects assessment of the individual activities that comprise the various phases of the Project. The residual effects of all routine activities with potential to interact with freshwater and marine fish and fish habitat (including fisheries), migratory birds, species at risk, and human environment were predicted to be *not significant*, the within-project cumulative effects are also predicted to be *not significant*.

Other projects and activities within the region, including Placentia Bay and the Burin Peninsula, have been considered in the cumulative effects assessment for the Project. These include:

- St Lawrence Wind Power Project;
- Burin Peninsula ship yards;
- Whiffen Head Oil transhipment facility;
- Come By Chance oil refinery;
- Vale Inco’s Long Harbour Commercial Nickel Processing Plant;
- Proposed Southern Head Oil Refinery;
- Shipping and Fisheries Activities

With the exception of marine shipping and commercial fisheries, there is essentially no overlap or interaction with the various activities and projects identified for cumulative effects assessment with respect to marine and freshwater fish and fish habitat, migratory birds, species at risk, and human environment.

It should be noted that the proposed mine reactivation project is very small undertaking when compared with the above listed projects, and therefore will not contribute significantly to other projects' impact. Any added effects on the ecosystem from routine activities associated with the proposed Project will likely not change the effects predictions when viewed on a cumulative basis. Therefore, the cumulative effect of the Project, in association with the effects of other projects and activities in the region, including marine shipping and commercial fisheries, is predicted to be *not significant*.

1.9.3 Monitoring and Follow-up

Predictions of environmental effects of the Project on identified VECs are based on available literature and professional judgment. An Environmental Effects Monitoring (EEM) program will be required throughout the various stages of the project in order to confirm predictions made in this environmental assessment, and CFI commits to preparing such a plan, having it approved by regulatory agencies, and implementing throughout various phases of site/mine development, operations, and decommissioning.

1.10 CONCLUSIONS

The Biophysical Assessment has concluded that there is no significant adverse impacts from the construction, operation and decommissioning of the proposed reactivation of the St. Lawrence Fluorspar Mine, based on the assessment presented in this EPR/EA. All residual effects after mitigation are determined to be ***not significant***.

The Socio-economic Assessment has concluded that the Socio-economic impact of the proposed Project can be a ***significant positive*** contribution to the Study Area and to the Province as a whole.

2 NAME OF UNDERTAKING

The undertaking has been given the name "***St. Lawrence Fluorspar Mine Reactivation***".

3 PROPONENT

Name of Proponent / Corporate Body:

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4 THE UNDERTAKING

On April 15, 2009, Burin Minerals Limited (BML) parent company, Burin Fluorspar Ltd. (Burin), and Rivera Capital Corp. (CPC) entered into an Amalgamation Agreement, and completed a business combination by way of amalgamation, which constitutes CPC's "Qualifying Transaction" for the purpose of Policy 2.4 of the TSX-V. The company is now called Canada Fluorspar (NL) Inc., and is listed on the TSX-V exchange. CFI-NL's assets, through its wholly owned subsidiary BML, consist of the St. Lawrence Fluorspar Project (the Project) which comprises:

- An underground mine with past production from three mineralized structures (Tarefare, Blue Beach North, and Director Veins). From 1933 to 1990, previous operators, including Aluminum Company of Canada (Alcan), extracted some 4.6 million tonnes of fluorspar ore with average grades ranging from 40% CaF_2 to 58% CaF_2. Currently, the mines are shut down.
- A conventional flotation mill, with a capacity of 80,000 tonnes per year. Currently, the mill is shut down.
- Mine and mill infrastructure including office buildings, shops, and equipment.
- Permission was received in 1997 to use Shoal Cove Pond for tailings impoundment.

Currently, CFI is completing a detailed Feasibility Study for the Project. The Study is carried out by Scott Wilson Roscoe Postle Associates Inc. (Scott Wilson) and BAE-Newplan Group/SNC-Lavalin (with the latter responsible for site development, infrastructures, marine terminal and tailings facility).

The Environmental Assessment for this project and the preparation of this document was carried out and lead by BAE-Newplan/SNC-Lavalin Environmental division. Input from the following specialized Consultants:

- LGL: Marine Fish and Fish Habitat, Fisheries; Migratory Birds and Species at Risk
- AMEC: Freshwater Fish and Fish Habitat
- The Institute for the Advancement of Public Policy, Inc. : Socio-Economic Assessment

4.1 NATURE OF THE UNDERTAKING

4.1.1 Project Overview

Canada Fluorspar (NL) Inc. (formerly Burin Minerals Ltd.) proposes to reactivate existing underground fluorspar mines, expand an existing mill, construct a new Tailings Management Facility (TMF) within an area formerly used as a tailings lagoon, and build a new deep-water marine terminal at the nearby Blue Beach for the export of fluorspar concentrate product. The mine is anticipated to produce between 120,000 and 180,000 tonnes of fluorspar concentrate per year.

Canada Fluorspar (NL) Inc. proposes to:

- Reactivate existing underground fluorspar mines (Tarefare and Blue Beach North Veins);
- Upgrade and expand the existing mill;
- Design and construct a new Tailings Management Facility (TMF) within an area historically used for tailings deposition (within the Shoal Cove Pond); and
- Design and construct a new deep-water marine terminal at nearby Blue Beach for the export of fluorspar concentrate product.

The proposed Project is located within the municipality of St. Lawrence, Newfoundland on the southern tip of the Burin Peninsula, in the Province of Newfoundland and Labrador (Figures 4.1-1, 4.1-2). The site is close to St. Lawrence harbour, which is ice-free year round.

The coastline within the project area consists of a number of bold headlands, bordering open coves to the south of Great St. Lawrence Harbour. West-to-east, prominent natural features include Salt Cove, Hares Ears, Shoal Cove, Red Head, Ferryland Head, Deadmans Cove and Cape Chapeau Rouge. This is a rugged shoreline that is open to the sea.

As previously mentioned, the project area is a brownfield site, on which mine and mill operations has occurred since the 1930s. Several structures and buildings remain on site from previous operators.

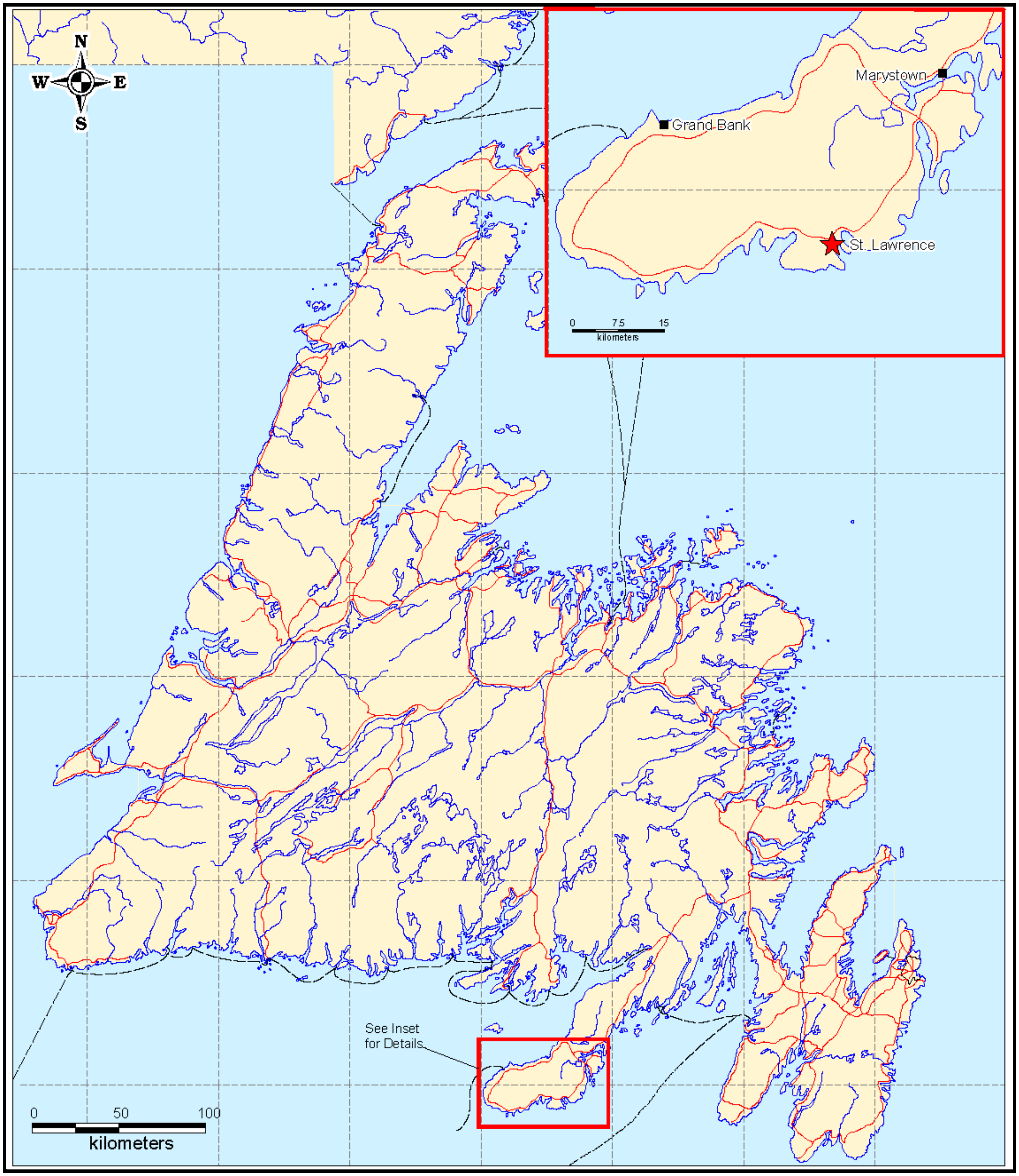


Figure 4.1-1: Site Location Map

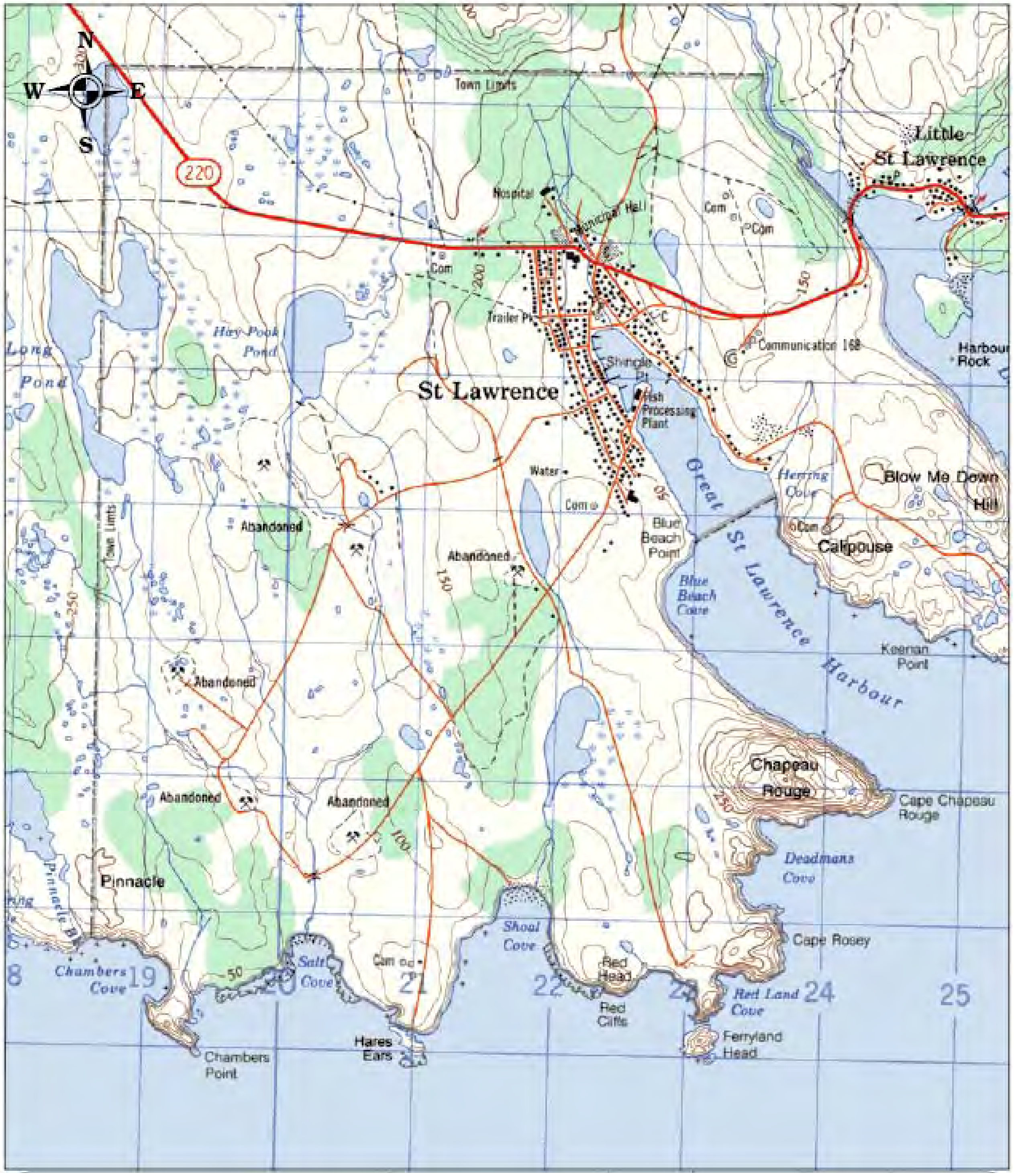


Figure 4.1-2: The Project / Study Area

4.2 PROJECT HISTORY

Figure 4.2-1 provides a brief summary of the Fluorspar Mining history and important dates for the Project.

Figure 4.2-1: St. Lawrence Fluorspar Mining History

The following sub-sections provide more details on the project history.

4.2.1 Prior to 1957

Although a few of the area's fluorspar (CaF_2, also referred to as fluorite) veins were mined for their lead ore content in the seventeenth or eighteenth century, the first reference to fluorspar was made by Jukes who first noted a small vein (Island Rock Vein) containing "flurate of lime" in Great St. Lawrence Harbour in the early 1840's. In his geological notes of 1843 Jukes states that the quantity of mineral was "very trifling and did not promise to lead to anything more abundant".

In 1928 the Black Duck vein was rediscovered (artefacts at the bottom of an unearthed shaft proved mining had occurred prior to 1825) and in 1933 became the first producing fluorspar mine, employing about 20 men. About 2,000 tonnes of fluorspar were mined and sent to the Dominion Steel and Coal Corporation's Sydney steel plant, to be used during smelting of the iron ore from Bell Island; but the miners had to wait for their wages until the DOSCO metallurgists approved the quality of the ore as a fluxing agent.

At last, approval was forthcoming and one year later, during the summer of 1934, the Black Duck mine became the first commercial fluorspar mining venture in the area. By 1935 eight workable veins had been discovered and development of the mines became dominated by two companies, The St. Lawrence Corporation (1930) and Newfoundland Fluorspar Ltd. (1937), both eventually coming under the control of Alcan. Newfoundland Fluorspar was taken over in 1942 and "The Corporation" in 1965 and operated under the name of Alcan, Newfluor Works.

The St. Lawrence Corporation was the first company to produce a flotation, or Acid Grade (AG[1]), concentrate at St. Lawrence. Tailings generated by this operation were deposited directly into the Shoal Cove Pond system via Clarke's Pond Brook from the mid-1930s until 1957 when the St. Lawrence Corporation discontinued its mining activities (see Figure 4.2-2).

4.2.2 1957 - 1986

After the takeover, Alcan continued to produce a Dense Media (gravel) concentrate, from Tarefare and Director Mines, which was shipped to Quebec for further processing. The St. Lawrence operations crushed, screened, and passed the raw ore through a Heavy (Dense) Media Unit to produce a minus 1 ¼" by 3/16" gravel product. All tailings were mixed back with this gravel and everything shipped to Alcan's plant in Quebec for further processing into an AG fluorspar concentrate. As a consequence, Alcan deposited no tailings into Shoal Cove Pond during its tenure in St Lawrence. Nevertheless, its plant at the Director Mine routinely discharged tailings water and mine water into Salt Cove Brook.

The Second World War increased demand for fluorspar and by 1944 some forty veins had been discovered. At its peak, between 400 and 500 people were employed in fluorspar mining, the

[1] Consisting of > 97.5% fluorspar, and used primarily to manufacture hydrofluoric acid, hence the name.

only industry in the area after the destruction of the fishing grounds by the tsunami caused by the Grand Banks Earthquake of 1929.

Figure 4.2-2: Aerial Photograph of the Shoal Cove Pond Area in 1949[2]

Lower priced Mexican fluorspar and a long labour dispute forced Alcan to close its mines in February 1978 after 44 years of mining, by which time some 4.2 million tonnes of ore had been produced. Associated with the labour dispute were the health problems experienced by many miners of the area. In a 1969 royal commission report (Report of Royal Commission Respecting Radiation, Compensation & Safety at the Fluorspar Mines, St. Lawrence, Nfld) these health issues were attributed to the miners' inhalation exposure to silica dust (generated by the dry drilling methods used prior to 1945), elevated radon gas levels of the area's groundwater, and lack of suitable mine ventilation. The report indicated that wet drilling and adequate mine ventilation would have effectively mitigated these health risks. Indeed, during Alcan's operations of the 1960's and 1970's, and Minworth's operations of the 1980s,

[2] Note that Clarke's Pond Brook, Shoal Cove Pond, Shoal Cove Pond Brook, and the beach of Shoal Cove are white in relation to nearby water bodies and bog holes. The white material is interpreted as tailings disposed of by previous operators.

appropriate drilling methods and mine ventilation was provided and these risks were reduced to acceptable levels.

4.2.3 1986 - Onward

Production resumed in 1986 when St. Lawrence Fluorspar Limited, a subsidiary of Minworth Ltd. (UK), reopened the Blue Beach North mine and built a new processing mill and a hillside TMF at the head of Shoal Cove Pond (see Figure 4.2-3). The TMF included a polishing pond that discharged its effluent into Shoal Cove Pond. Unfortunately, due to initial under-funding and stiff competition from China, the company was placed into receivership in 1991. A further 440,000 tonnes of ore were mined during this period, and this generated roughly 286,000 tonnes of tailings, mostly during the company's last 32 months of operation. St. Lawrence Fluorspar Limited produced a wet, AG filter cake product, which was sold into both the North American and European markets. At the time of the company's demise, the full storage capacity of its tailings facility had been reached after only four years of use.

As shown in Figure 4.2-3 Minworth's hillside TMF is visible at the centre of the frame (white area) and to the north of Shoal Cove Pond. Note that this facility was filled in only 4 years, but accounts for an area approximately ½ of the area of Shoal Cove Pond. Old tailings deposited by St. Lawrence Corporation are noticeable at the northern part of Shoal Cove Pond where the water is shallow.

Figure 4.2-3: Aerial Photograph of the Shoal Cove Pond Area in 2004

4.2.4 Acquisition by Canada Fluorspar (NL) Inc.

Canada Fluorspar (NL) Inc. acquired Minworth's former assets from the government of Newfoundland and Labrador in 1994/95. Since then, Canada Fluorspar (NL) Inc. has carried out an extensive diamond drilling program in 1999 and 2008. This focused on the Blue Beach North and Tarefare Deposits in an effort to extend the parameters of the deposits, upgrade the previous mineral resources from inferred into measured and indicated resource categories suitable for compliance with various standards (such as the NI 43-101), and provide material suitable for metallurgical test work to determine a reliable and efficient processing circuit, all of which are prerequisites for producing a feasibility study for the project.

4.2.5 Historical Health Issues Associated with Work in the Mine

4.2.5.1 History of Health Issues

During the mid-1940's, people in the St. Lawrence area began to notice a high death rate in the community amongst members who worked underground in the fluorspar mines. While dust levels explained the occurrence of silicosis, it did not explain the high incidence of lung and other respiratory cancers that began to surface during the 1950's (Rennie, 2005).

Radiation surveys were completed in November 1959. The results of these surveys indicated that levels of silica and fluoride dust concentrations were normal; however levels of radon and radon decay products (radon daughters) were much in excess of permissible limits. Although new mine safety legislation and an inspection service had been established following Confederation (1949), measures to protect the health of workers were ineffective because they were simply not enforced (Rennie, 2005).

It was determined that the source of radon was the naturally occurring uranium of the region, and that groundwater was flowing through these deposits, picking up radon (i.e. radioactive daughters of uranium) as a dissolved constituent, and transporting this over some distance through bedrock fractures and into the underground mine openings of St Lawrence, where the pressurized radon gas escaped from the water into the mine air. The mine water of St. Lawrence was found to have radon levels at or above those found in uranium mines themselves (Report of the Royal Commission, 1969).

4.2.5.2 Modern Protective and Mitigative Measures

The factors that contributed to the health issues of many St. Lawrence's miners during the 1930s, 1940s, and 1950s have been fully understood for about 50 years. Appropriate ventilation and mitigation measures were put into place in the early 1960's by Alcan, and proper ventilation was provided in subsequent years by Alcan and Minworth (1980s). Canada Fluorspar (NL) Inc. will ensure proper ventilation by putting state-of-the-art mitigation measures into effect for the proposed Project. Increased awareness in both the public and private sector will help to address any remaining Health & Safety concerns and current regulations and standards will be strictly adhered to so that occupational Health & Safety risks are effectively reduced to acceptable levels.

New developments in underground drilling and blasting techniques, automated mining technologies, communication systems, computerized process control, and worker safety monitoring (gas detection and ventilation systems) will ensure that accidents are minimized and workers are not exposed to harmful substances in the atmosphere. Control systems will be properly maintained to ensure a safe work environment. Underground lighting standards will be upgraded, using recent developments in high-efficiency portable lighting sources, and Canada Fluorspar (NL) Inc. will review and adopt available technologies to ensure all regulations are complied with.

Personal protective equipment, such as respirators, will be used in areas where airborne dust levels are high, and appropriate engineering controls will be in effect. With respect to radon, the primary emphasis will be to always maintain atmospheric concentrations in the working environment within, and generally below, permissible limits. Respirators or breathing apparatus are necessary in some, usually exceptional, circumstances such as during failure of the ventilation system or during a maintenance task for which adequate ventilation is not available.

Monitoring systems will include continuous monitors with warning lights and area/time monitoring. Efficient dust-suppression techniques will be used at each stage of the project. Workers will be instructed on how to properly operate equipment and the importance of all health and safety policies and procedures. Job rotation may be recommended for some occupations. Canada Fluorspar (NL) Inc. will have specific protocols coupled with practiced emergency planning, including specially-trained mine rescue personnel, for use in the event of an emergency.

Strict industrial hygiene standards for workers will be enforced. Lunchrooms, rest rooms, and changing rooms will be isolated from working areas, and workers will be provided with convenient access to washing facilities. Washing before eating or smoking, and showering at the end of each work shift will be mandatory. Personal Protective Equipment will be used whenever required.

4.2.6 Zoning Designations

The land-based portion of the Project is encompassed within the "Mineral Workings" designated area of the Town of St. Lawrence Municipal Plan.

In 2002, the Town of St. Lawrence adopted Municipal Plan amendments (Numbers 1 and 2) in the Blue Beach and Blue Beach Point areas. Amendments included:

- The rezoning a portion of land west of Blue Beach Point from "Conservation" to "Mineral Workings"; and
- Rewording of the Mineral Working Policy designation to include "general industry and transportation", which allows for "the development of the Blue Beach area as a future major deep water port".

As required by the Provincial Government's *Urban and Rural Planning Act*, opportunities for public consultations were provided to the public. Notices were placed in The Southern Gazette (January 7 and January 14, 2003) clearly stating that the purpose of the amendments was to "allow the development of the Blue Beach Area as a future major deep water port by allowing transportation uses in the minerals working designation and by redesigning a portion of the conservation area west of Blue Beach Point to Minerals Working."

4.2.7 Current Land Ownership

Burin Minerals Ltd. (now Canada Fluorspar (NL) Inc.) acquired the assets of the former Minworth operations from the government of Newfoundland and Labrador in 1994/95. As a result, Canada Fluorspar (NL) Inc. is the current owner/operator of the parcel of land designated as 'Minerals Workings' by the Town of St. Lawrence (approximately 30 km^2). (Figure 4.2-4 shows the CFI concession area (BML Licence # 011590M)).

BML (now CFI) holds mineral rights to the Tarefare, Blue Beach and Grebe's Nest Vein structures through mining leases. In addition, CFI holds 118 mineral claims under license 011590M covering an area of 2950 hectares. In 1997, the company was granted Surface Rights through a 50-year Lease (original license E-110124) to the Blue Beach North Mine portal area (23.304 hectares) adjacent to Director Road and to the Process Mill Site (20.0074 hectares) adjacent to Clarke's Pond as part of the Call for Proposal Agreement 1994. CFI also was granted (in 1996) a 25-year Permit to Occupy (E-110278) the Shoal Cove Pond area for use as a tailings management facility. This permit does not take precedent over the fact that further environmental assessment is required prior to occupying the site.

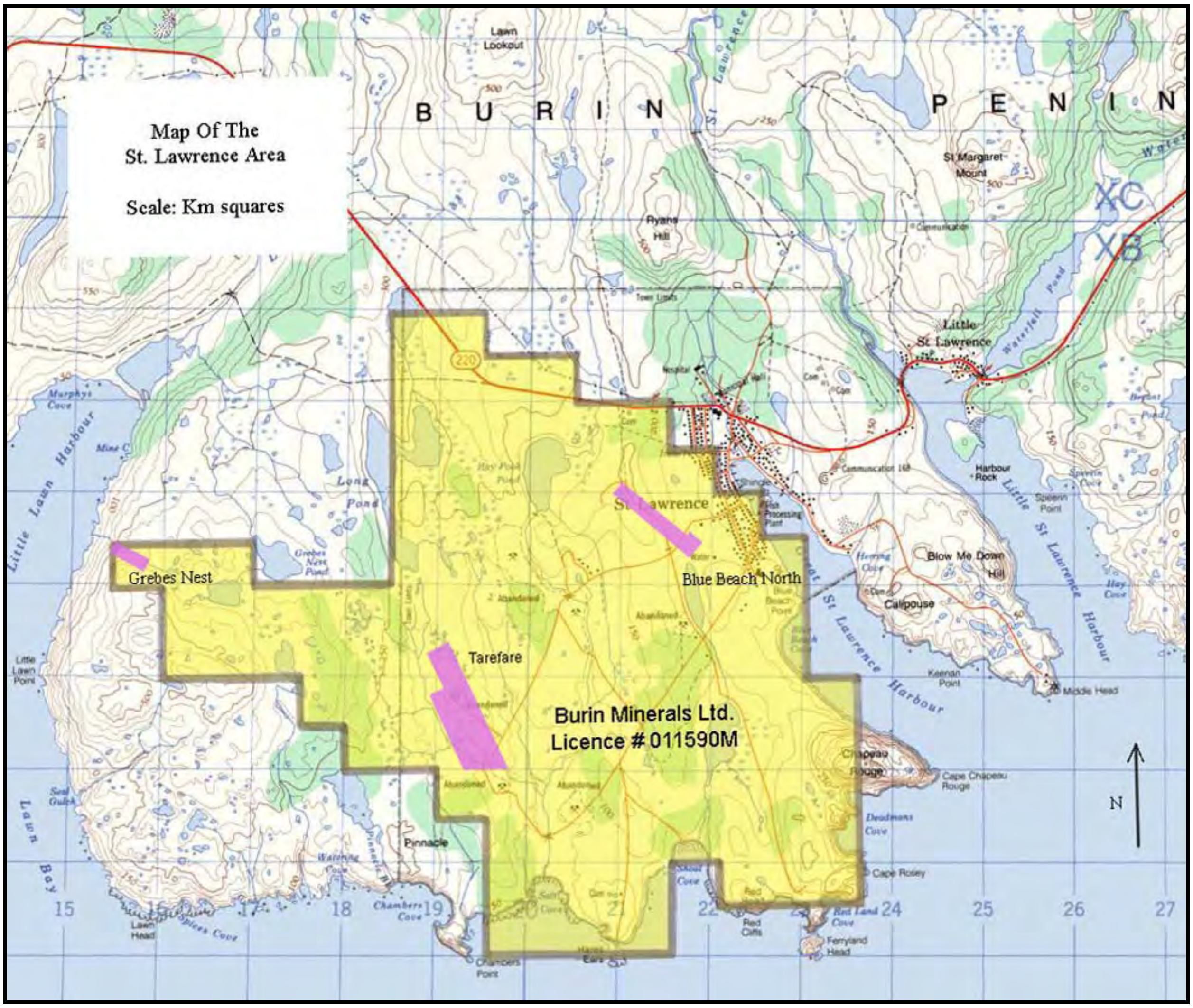


Figure 4.2-4: Current Canada Fluorspar (NL) Inc. Mineral Rights

There are no designated Aboriginal lands in the St. Lawrence region. Project activities will not impact Aboriginal or First Nations groups within the province.

4.2.7.1 Current Land Use

The Project area is currently unoccupied, with the exception of CPI offices located near the mill facility and two homes located off the Blue Beach South road between Clarke's Pond and Blue

Beach. These homes are on privately owned property and draw their water from the municipal system. Four other homes are occupied off Director Drive (leading from St. Lawrence to the old Alcan Director mine site) in the vicinity of Hay Pook Brook/Canal and located about 2 km from the existing mill site to the southeast, 3 km from Tarefare No. 2 shaft to the southwest, and 1 km from the Blue Beach North mine site to the east.

The "Mineral working" zone allows for "mining, quarrying and associated processing and manufacturing, general industry and transportation are permitted within areas designated for this purpose…".

As described above, the area of coastline extending east from Blue Beach Point into Great St. Lawrence Harbour has been zoned "Conservation Urban" (V) by the Town of St. Lawrence. Activities associated with the construction or operation phase of the Project are not anticipated to have an impact on this zone or the residents living in this area.

The shore of Blue Beach is currently not being utilized. There is no infrastructure in place along this portion of coastline. Shoal Cove, just west of Blue Beach, is known for its sandy beach and is often used by recreational users.

There are no National Parks or National Historic Sites located near the project area. There are also no designated aboriginal lands near the project area.

The wreck sites of the USS Truxtun and USS Pollux (located in Chambers Cove and off Lawn Head, respectively) have been designated as municipal historic sites by the Heritage Foundation of Newfoundland (a non-profit organization). The Iron Springs Mine site (located about 3 km from the existing mill/office site) is also classified as a municipal heritage site.

There is a Provincial park located in Frenchman's Cove and privately owned park facilities in Lewin's Cove (which is approximately 28 km from the project area). The Fortune Head Ecological Reserve is located in Fortune, approximately 70 km away.

4.3 RATIONALE OF THE UNDERTAKING

As mentioned earlier, the proposed project is to reactivate an existing mine operation which lasted for many decades in the St. Lawrence area. The rationale for this undertaking is rooted in current market conditions for fluorspar. Global demand for fluorspar has increased since the early to mid-1990s. As shown below (Figures 4.3-1 to 4.3-5), the price of fluorspar has also seen a similar trend over this period. The current global economic situation appears to have had little impact on the global consumption and price of this mineral. This Project represents a window of opportunity for reactivating the St. Lawrence mine, provided that it becomes operational by late-2011.

The world consumption of Fluorspar and its use are illustrated below:

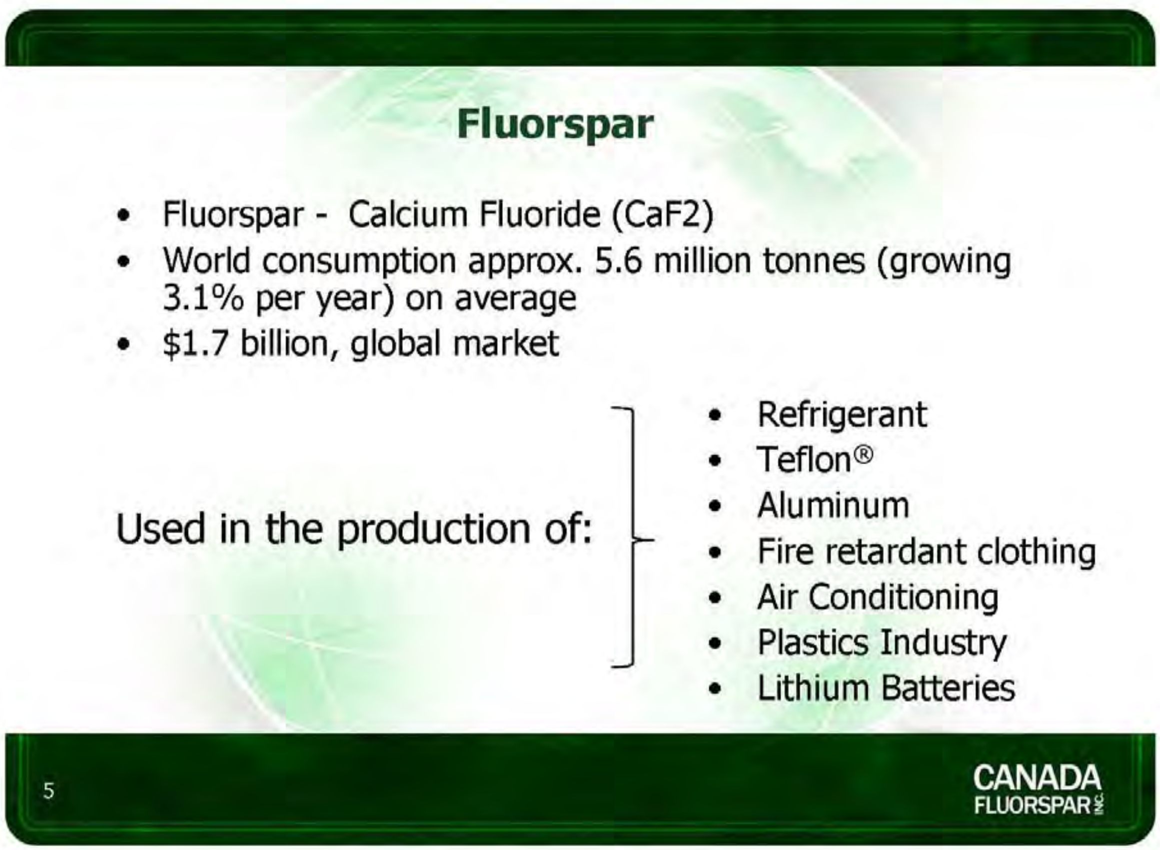


Figure 4.3-1: Fluorspar World Consumption and Use

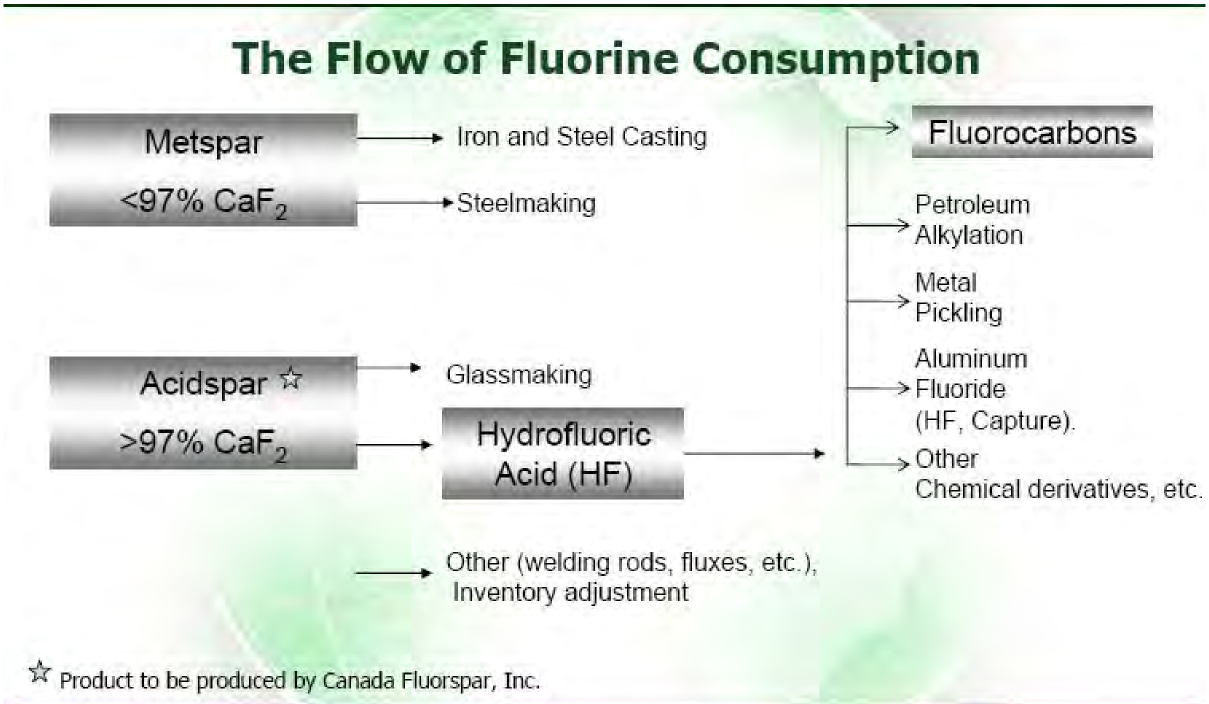


Figure 4.3-2: Flow of Fluorine Consumption

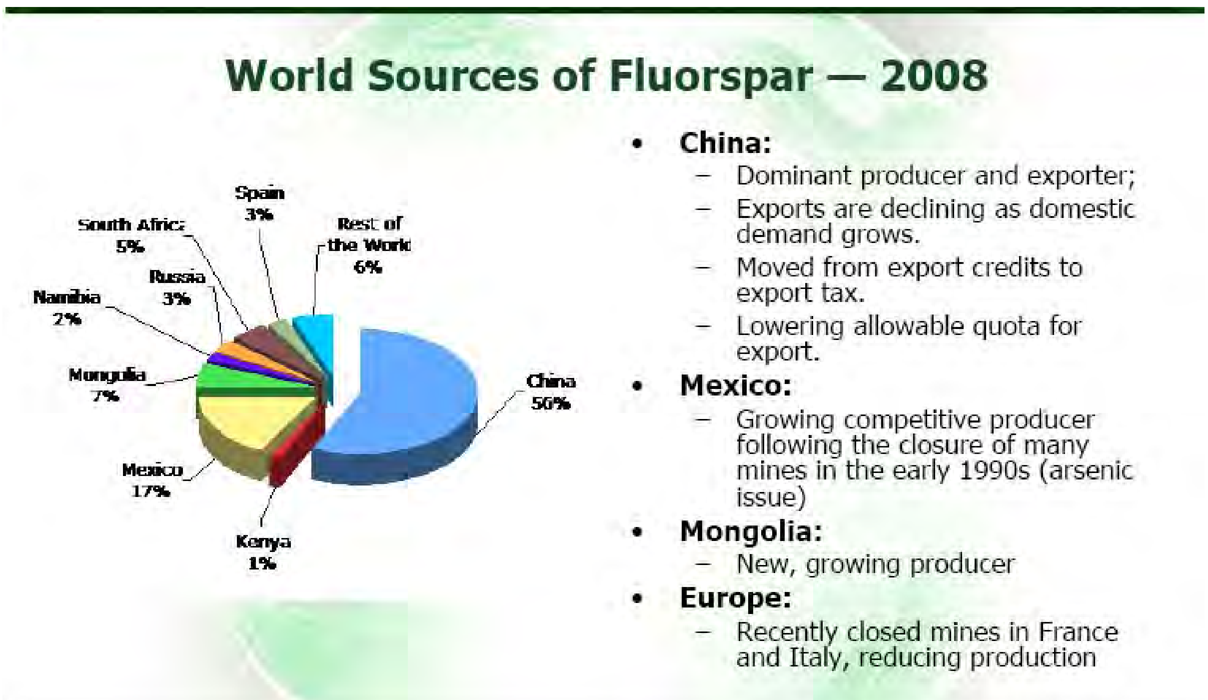


Figure 4.3-3: World Main Sources of Fluorspar in 2008

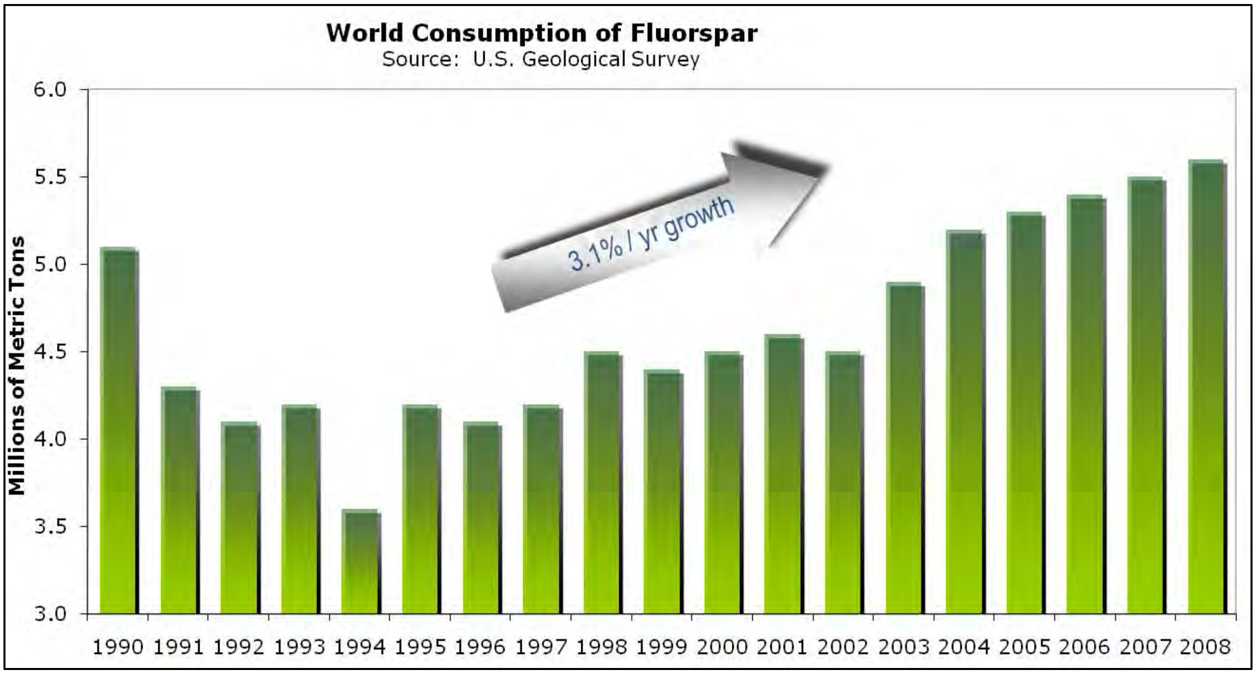


Figure 4.3-4: World Consumption of Fluorspar

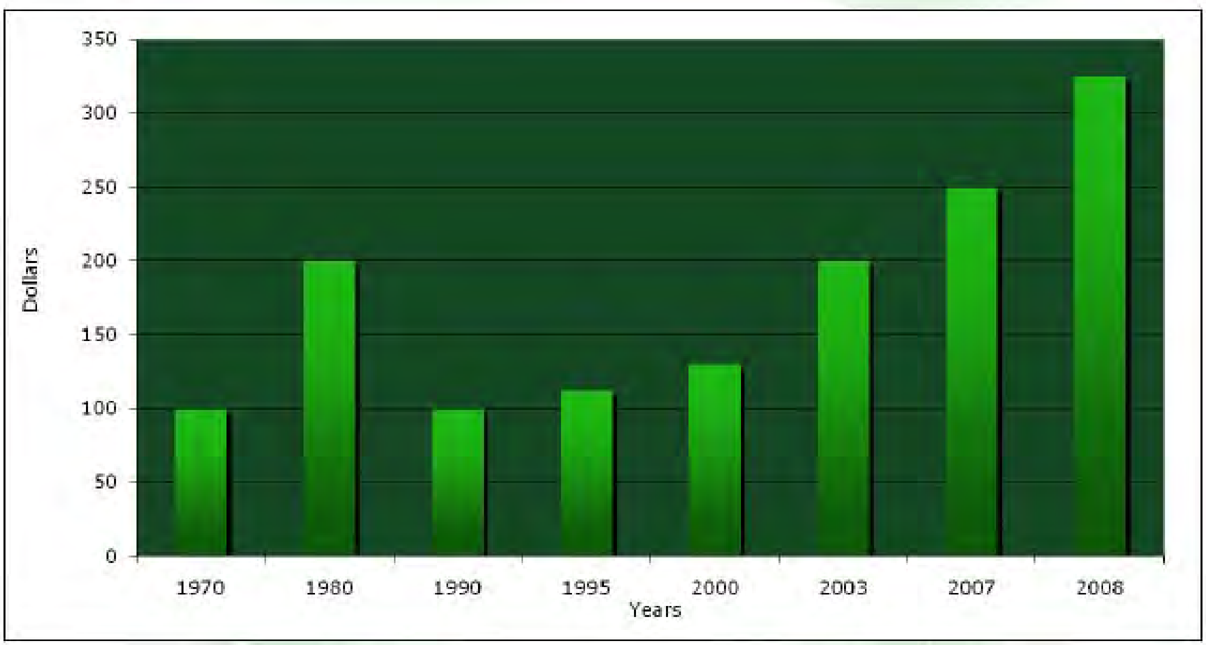


Figure 4.3-5: Fluorspar Price Growth (US Dollars per Tonne)

The recent total estimated mineralised resources (both indicated and inferred) is shown in Figure 4.3-6 (Scott Wilson 43-101 Report, (2009).

Mineral Resources

Source: Scott Wilson 43-101 report

Vein	Category	July 2008 Tonnes	April 2009 Tonnes	%CaF_2
Blue Beach North	Indicated	3,310,000	4,390,000	39.0
Tarefare	Indicated	2,480,000	4,700,000	44.8
Total Blue Beach North, Tarefare and Blowout Veins	**Total Indicated**	**5,790,000**	**9,090,000**	**42.0**
Blue Beach North	Inferred	N/a	355,000	30.0
Blowout	Inferred	N/a	595,000	31.8
Total Blue Beach North and Blowout Veins	**Total Inferred**	**N/a**	**950,000**	**31.1**

NOTES:
1. CIM definitions were followed for the resource estimate.
2. Mineral Resources are estimated at a cut-off grade of 20% CaF_2 and a minimum horizontal width of 2.0 m.
3. Average density of mineralized rock is 2.9 t/m^3 .
4. Tonnage and average grade numbers are rounded.
5. Mineral Resources exclude mined out areas from historical mining.

Figure 4.3-6: Estimated St. Lawrence Fluorspar Mineral Resources (2009)

Due to the recent downturn in the economy, the need for infrastructure projects and economic development is much needed in the St. Lawrence area. The proposed project would directly create approximately 369 jobs (at peak) during construction and approximately 178 full-time jobs during operations. The indirect-to-direct labour ratio associated with this project is estimated to be 3:1 which means that for every direct job created for this project, there will be three indirect jobs created in the project area. Further details on anticipated employment and project impact can be found in Sections 5.6 and 6.5.

In summary, the proposed reactivation of the St. Lawrence Fluorspar Mine presents a strategic window of opportunity for CFI and the community of St. Lawrence and Burin Peninsula and will present significant economic benefits to local communities. The project is justified due to the fact that:

- Fluorspar global demands and prices have continuously risen since 1990s; as a source of fluorine, Fluorspar used to produce aluminum, stainless steel, Teflon, refrigeration components, lithium batteries, etc.;

- Fluorspar market has not been significantly affected by the recent economic crisis;
- Few deposits in Canada and USA;
- St. Lawrence Fluorspar has higher grades than most other deposits worldwide;
- Newfoundland offers a strategic location (ice-free, deepwater harbour close to the North Atlantic major shipping lane, etc.);
- Strong Community support; and
- Significant benefits to local communities (traditionally miming community).
- A window of opportunity is now.

4.4 AUTHORIZATIONS & APPROVALS OF THE UNDERTAKING

An Environmental Assessment (EA) was previously completed by Burin Minerals Ltd. in 1995-1996, consisting of an Environmental Preview Report (EPR) that focused on the proposed TMF. This was submitted to the provincial Department of Environment. Following the EA review process, the project was released from further Environmental Assessment in January 1996.

The federal government also authorized a harmful alteration, disruption or destruction (HADD) of fish habitat associated with the proposed TMF, and a "No-Net Loss Compensation Agreement" was signed between Burin Minerals and the Department of Fisheries and Oceans (DFO) in 1997. DFO has confirmed that this agreement is still in effect, (provided that, as stated in the Guidelines "*verification that the information provided on fish habitat, fish species, and any fisheries that occur in the freshwater bodies in the proposed location for the project, including any streams or rivers connected to these water bodies, which was submitted in the 1995 EPR, is still accurate"* (or still valid).

The Canada Fluorspar (NL) Inc. project will require federal, provincial and municipal approvals and permits for various activities during construction, operation and decommissioning. Anticipated relevant legislation and associated permits required are listed in Section 8. This list will be revised as detail design advances and additional project requirements are identified.

Upon project approval, a Permit Registry will be developed at an early stage of implementation to address all construction activities.

The Proponent is ultimately responsible for the preparation, submission and receipt of all required regulatory permits, approvals and certifications. The Proponent is also responsible for ensuring compliance with all applicable permits, approvals and certifications by its own employees, contractors and consultants.

Canada Fluorspar (NL) Inc. has identified two "triggers" which would prompt a federal EA: the *Fisheries Act*, and the *Navigable Waters Protection Act*. CFI and its environmental consultants have worked closely with CEAA, the Responsible Authorities (RAs) and other Federal Authorities (FAs), and various stakeholders throughout the EA process.

Environment Canada has also confirmed that *Metal Mining Effluent Regulations* (MMER) is not applicable to this project as extraction of fluorspar does not qualify as metal mining.

Provincial legislation requires approval for activities associated with site preparation, mine development, and construction and operations. Socio-economic aspects of this project (such as potential impacts on the community, employees' health and safety, and local employment and benefits, etc.) should also be taken into consideration throughout the EA process. Although not requested in the Guidelines, a historic resources impact assessment has been carried by the proponent, as required by the provincial *Historic Resources Act*.

Project components are located within the municipal limits of the Town of St. Lawrence. Municipal Bylaws will be abided by throughout all stages of the project.

In 2002, the Town of St. Lawrence amended its Municipal Plan (Amendment Nos. 1 and 2) to support the construction of a deep-water marine terminal in the Blue Beach and Blue Beach Point areas. These amendments were the subject of a public consultation process several years ago.

4.4.1 Regulatory Framework

As stated in the Guidelines, "the proponent was advised that an Environmental Preview Report (EPR) is required for the project under the Newfoundland and Labrador *Environmental Protection Act* (*EPA*). The project is also subject to a Federal Environmental Screening Report in accordance with the *Canadian Environmental Assessment Act* (*CEAA*). Both governments have agreed that a single set of guidelines is the most effective and efficient way to guide the proponent in preparing an environmental assessment and to produce one report to satisfy both processes".

The NL Department of Environment and Conservation (DOE&C) oversees the provincial process and development of the Environmental Preview Report.

This undertaking is also subject to Federal Environmental Assessment in accordance with the *CEAA* since this project requires a Formal Approval under Part 1, Section 5 of the *Navigable Waters Protection Act* and authorization under Section 35(2) of the *Fisheries Act*. Transport Canada (TC) and Fisheries and Oceans Canada (DFO) are Responsible Authorities (RA's) for this assessment and the Canadian Environmental Assessment Agency will act as the Federal Environmental Assessment Coordinator (FEAC). Environment Canada, Health Canada and Natural Resources Canada are Expert Federal Authorities (FA's) under CEAA and will provide expert advice to TC and DFO during the assessment process.

Both levels of government contributed personnel to the provincially-chaired Assessment Committee, and provided input into the Guidelines for the assessment requirements.

It should be noted that this is not a greenfield project, rather re-activation of existing mine, using as much as possible and/or modifying the existing infrastructures and utilities. As mentioned earlier, an EPR and CEAA Screening Report for the Shoal Pond Tailings Disposal was submitted and approved in 1996. A Fish Habitat Compensation Agreement – Shoal Cove Tailings Project was issued by DFO, January 1997. Authorization for Works or Undertakings affecting Fish Habitat was approved by DFO in February 1997.

4.4.2 Effects Assessment Methodology

The approach used to develop the biophysical and socio-economic effects or impact assessment followed well-established methods of environmental impact assessment used in Canada. The technical scope and content of the assessment are consistent with the recommended methods promulgated by the Canadian Environmental Assessment Agency and the Newfoundland and Labrador Department of Environment and Conservation. Both levels of government have provided the requirements and technical guidance needed by the Proponent to develop the environmental assessment (the Guidelines, September 10, 2009).

In general, the key steps in developing the EA preparation (EPR/EA) include:

- Developing a detailed project description;
- Defining the geographic and temporal scope of the Project;
- Consulting with the public, subject matter experts and government agencies;
- Carrying out field and specific studies to collect site-specific data;
- Identifying and defining the Valued Ecosystem Components (VECs), both Biophysical and socio-economic, against which the potential effects of the Project are evaluated;
- Characterizing and evaluating any potential environmental effects on VECs;
- Evaluating the nature and risk of accidental events;
- Developing mitigation methods, including rehabilitation and management methods;
- Determining the nature and significance of any residual effects;
- Determining potential cumulative effects over the life of the project; and
- Proposing an Environmental Management Plan and monitoring program to confirm compliance with regulatory and permitting requirements.

More specifically, the EA includes two components; the Bio-Physical and Socio-Economic Assessments:

Biophysical Assessment

- Description of the Existing Biophysical Environment (terrestrial and marine), protected areas and species at risk;
- Identification of Valued Ecosystem Components (VECs);
- Evaluation of Effects on the Valued Ecosystem Components;
- Mitigation Measures to minimize significant impacts;
- Evaluation of Residual Effects;
- Cumulative Effects;
- Environmental Management Plans;

- Prevention and Emergency Response plans; and
- Environmental Monitoring and follow-up.

<u>Socio-Economic Assessment</u>

- Human Health and Safety ;
- Employment and Job Creation and Training;
- Business Opportunities and Impacts;
- Community Business Development ;
- Infrastructures and Services;
- Other Industrial Impacts (Fisheries and Aquaculture, Tourism and Recreation, etc.); and
- Quality of Life.

4.4.2.1 Issues Scoping, Guidelines and Public Consultations

Scoping of an assessment mainly includes scoping of issues and determining the spatial and temporal extent of the assessment, selecting which components (i.e., sensitive and/or representative species or species-groups and associated habitats) of the ecosystem to assess, and which project activities to analyze.

Scoping was conducted according to the following steps, not necessarily in chronological order.

- Review of relevant information on Project past activities, relevant studies, field work and literature as related to this project and other recent relevant projects and previous EAs for Newfoundland and Labrador;
- Consultations with the stakeholders, key groups and the public at various stages of the assessment;
- Consultations with provincial and federal agencies; and
- The EA Guidelines prepared by the Newfoundland and Labrador Department of Environment and Conservation and Canadian Environmental Assessment Agency with input from relevant government agencies such as Transport Canada and Fisheries and

Oceans Canada (as RA's), and Environment Canada, Health Canada and Natural Resources Canada (as FA's). and other government departments and the interested public.

In preparation for the proposed development and the required EPR/EA, the Proponent and their consultants met with relevant government agencies, representatives of the local community leaders, municipal council, fishing industry and other stakeholders and interest groups as well as the general public in communities that may be affected by the Project. The purpose of these consultations was to describe the Project, identify any issues and concerns, and to gather additional information relevant to the EA.

At each consultation meeting, the Proponent provided maps and drawings showing the proposed project components and activities, information available at the time on the proposed development. Details on public consultations and public Participation is provided in Section 10 of this report.

Both the Project Registration and the EPR/EA Guidelines are available for public review as well as the proponent's public and stakeholder information and consultation sessions. All relevant information on Project activities and available literature on the effects of activities associated with the construction and operation of the fluorspar mine (with emphasis on previous environmental assessments for Newfoundland and Labrador) were reviewed in order to assist in issue scoping.

4.4.2.2 Information Base and Supporting Studies

A wide variety of databases and existing information were used in this EPR/EA, including government databases, empirical survey data, peer reviewed primary literature, and grey literature such as consultants' reports and government reports. Specific data/information sources are indicated in the various Valued Ecosystem Component (VEC) subsections of the document.

4.4.2.3 Valued Ecosystem Components (VECs)

In applying environmental assessment over the years, agencies and the public have found it useful to focus the assessment of a project through identifying Valued Ecosystem Components, referred to as VECs, which is defined as "environmental components of concern that will be affected by the project and are of legal, scientific, ecological, cultural or economic value".

The Valued Ecosystem Component (VEC) approach was used to focus the assessment on those biophysical resources of most potential concern and value to the communities most affected by the Project and to the society at large.

By original definition, VECs include the following groups:

- Rare or threatened species or habitats (e.g., now as defined by COSEWIC and SARA);
- Species or habitats that are unique to an area, or are valued for their aesthetic properties;
- Species that are harvested by people (e.g., commercial fish species); and
- Species that have at least some potential to be affected by the Project.

Identification and selection of the biophysical VECs for the Project was accomplished through a series of actions including: issues scoping through regulatory and public consultation; workshops and discussions amongst Project engineering and environmental team and Proponent's representatives; and consideration of recent environmental assessments currently taking place in the province; and most importantly the EA Guidelines.

The Guidelines specifically listed the following VEC's that will require detailed assessment:

- **Fish and Fish Habitat** (both freshwater and marine) including fisheries;
- **Marine Traffic** (although this is not a VEC but an activity), rather we will consider the VEC's that are affected by the Marine Traffic (e.g., Marine Mammals, Seabirds, and Fisheries);
- **Migratory Birds** (including seabirds, shorebirds, waterfowl, songbirds and other land birds within the footprint of the Project, with emphasis on species at risk);

- **Species at Risk** (those listed on Schedule 1 of the federal *Species at Risk Act (SARA*), those listed by COSEWIC, and those listed by provincial *Endangered Species Act* (ESA); and
- **Human Receptors** (including social and economical (socio-economic) parameters)

The Socio-Economic Assessment addresses Human Health, Employment (job creation and training), Business Opportunities, Community, Infrastructure and Services, Quality of Life, Commercial Fisheries and Aquaculture, Tourism, and other aspects listed in the Guidelines (as well as others added by the Proponent such as Historic Resources).

4.4.2.4 Boundaries

Temporal and spatial boundaries have been defined using the federal/provincial EPR/EA Guidelines as guidance.

The scope of the assessment includes both temporal and geographic or spatial considerations. The considerations include the entire project schedule (three phases) from construction through operations and decommissioning. The geographic area considered in the assessment includes not just the mining concession and project footprint but also the area within which environmental components could be affected.

The Affected Area is the geographic extent of a specific potential effect on a species or species group (VEC) considered in the assessment. It varies according to the timing and type of project activity in question and the sensitivities of the species; these are defined in details in section 6 of this report.

a) Temporal Boundaries

The temporal boundaries of the Project run from the start of construction through decommissioning. The temporal boundaries of the different Project phases include:

- Construction from early spring of 2010 to late 2011 (approx. 2 years);
- Operation and Maintenance – estimated 15 to 20 years (based on current estimate of the reserve and annual production), which could be extended as a result of continuous exploration and expansions;

- Decommissioning and rehabilitation (estimated one to two years).

b) Spatial Boundaries

The geographic extent of a specific potential effect on a VEC varies according to the timing and type of project activity in question and the sensitivities of the species. Thus, there are levels of geographic extents discussed in this EA. The following spatial boundaries were used.

Project Area

The Project Area is considered to be the footprint of the Project's infrastructure and major activities (e.g., mine site, tailings area, marine terminal and any exclusion zones that may be set up during construction for safety reasons (Figure 4.1-2 and 4.2-4)). On land, the Project Area boundary is defined by the property boundaries, although the actual physical footprint of the Project's facilities will be smaller. In the marine environment, the Project Area is defined as the wharf and a shipping corridor from the shipping lane and harbour approaches to the wharf side.

Study Area

The Study Area has been defined to encompass the farthest extent of Project potential influence (e.g., offshore marine access).

Regional Area

The Regional Area is defined as Placentia Bay and Bruin Peninsula. The Regional Area definition is useful in focusing broad-scale environmental variables such as currents, climate and fisheries. It is also useful in the discussion of cumulative effects, especially in cases where there is uncertainty in the geographic scope of effects.

Other Boundaries

Other boundaries include administrative boundaries, such as the commercial fisheries statistical boundaries, development zones, municipal, and provincial boundaries.

4.4.2.5 Effects Assessment Procedure and Rating

The systematic assessment of the potential effects of the Project phases involved the following main steps:

1. Preparation of interaction matrices (Project activities and the VESs);
2. Identification and evaluation of potential effects of project activities on VECs including description of mitigation measures and residual effects;
3. Preparation of residual effects summary tables; and
4. Evaluation of cumulative effects.

The assessment is based on a thorough and up-to-date description and understanding of the biophysical and human environment. Essentially the effects assessment proceeds through the following considerations:

- Is there an interaction between the Project and the VEC?
- Is the interaction adverse?
- Is it significant?
- Is it likely?

Interaction matrices identifying all possible Project activities that could interact with any of the VECs are prepared. The interaction matrices are used only to identify potential interactions; they make no assumptions about the potential effects of the interactions. Interactions during decommissioning and rehabilitation would be similar to those for construction and a specific interaction matrix for this phase has not been prepared at this point in the Project. The evaluation of the environmental effects due to decommissioning and rehabilitation is provided in Section 6.0 of this volume.

Interactions were then evaluated for their potential to cause effects, and the various effects or factors identified in the interaction matrix were grouped into the various VECs for further assessment. In instances where the potential for an effect of an interaction was deemed impossible or extremely remote, these interactions were not considered further. In this way, the assessment is focused on key issues and the more substantive environmental effects.

The concept of classifying environmental effects simply means determining whether they are negative or positive. The following includes some of the key factors that are considered for determining negative environmental effects, as per the CEA Agency guidelines (CEA Agency 1994):

Negative effects on the health of biota:

- Loss of rare or endangered species;
- Reductions in biological diversity;
- Loss or avoidance of critical/productive habitat;
- Fragmentation of habitat or interruption of movement and migration routes;
- Transformation of natural landscapes;
- Discharge of persistent and/or toxic chemicals;
- Toxicity effects on human health;
- Loss of, or detrimental change in, current use of lands and resources for traditional purposes;
- Foreclosure of future resource use or production; and
- Negative effects on human health or well-being.

Positive effects or benefits are also identified and assessed in the EA.

4.4.2.6 Mitigation

Many potential effects can be moderated, reduced or eliminated through the application of appropriate mitigation measures, many of which have become standardized into operating procedures and regulatory requirements. In some cases, project or interaction – specific measures are developed, including changes in equipment, procedures or timing of activities. As an important stage of effects prediction, mitigation measures are identified, committed to, and their effectiveness taken into account in considering the "residual effects" or remaining potential effects of Project activities. Note that many of these mitigation measures have been incorporated into the Project Design. The "designed-in" approach to mitigation means that most of these measures are described in the Project Description and already committed to by CFI.

Under CEAA Fish habitat compensation is considered a form of mitigation.

4.4.2.7 Residual Effects

Once potential effects have been identified and characterized, mitigation measures are described and, based on an evaluation of effectiveness; the residual environmental effects are identified and noted for significance with respect to:

- Each Project activity or accident scenario;
- Cumulative effects of project activities within the Project; and
- Cumulative effects of combined projects within the Regional Area, with emphasis on the Study Area.

These ratings are presented in summary tables of residual environmental effects. The last of these points considers all residual environmental effects, including Project and other-project cumulative environmental effects. The analysis and prediction of the significance of environmental effects, including cumulative environmental effects, encompasses the following:

- Determination of the significance of residual environmental effects;
- Establishment of the level of confidence for the prediction; and
- Evaluation of the likelihood of a predicted significant effect occurring and the scientific certainty and probability of occurrence of the residual impact prediction.

Ratings for level of confidence, probability of occurrence, and determination of scientific certainty associated with each prediction are presented in the tables of residual environmental effects. The guidelines used to assess these ratings are discussed in detail in the sections below (see Table 4.4-1).

Significant environmental effects are those that are considered to be of sufficient magnitude, duration, frequency, geographic extent, and/or reversibility to cause a change in the VEC that will alter its status or integrity beyond an acceptable level. Establishment of the criteria is based on professional judgment, but is transparent and repeatable.

The prediction of residual environmental effects can be based on different prediction mechanisms, e.g., relevant literature, consultation with experts, mathematical models, or professional judgment. Different levels of certainty or reliability may apply, especially where there are limitations of available data. Ratings are therefore provided to indicate, qualitatively, the level of confidence for each prediction.

4.4.2.8 Evaluation Criteria for Assessing Environmental Effects

The criteria used when evaluating the nature and extent of environmental effects includes:

- Magnitude;
- Geographic extent;
- Duration;
- Frequency;
- Reversibility; and
- Ecological, socio-cultural and economic context.

Magnitude

Magnitude describes the nature and extent of the environmental effect for each activity. For biological VECs the following definitions apply:

Negligible	An interaction that may create a measureable adverse effect on individuals but would never approach the 10% value of the 'low' rating. Rating = 0.
Low	Affects >*negligible* to 10 percent of individuals in the affected area (e.g., geographic extent). Effects can be outright mortality, sublethal adverse effects or exclusion due to disturbance. Rating = 1.

Medium — Affects >10 to 25 percent of individuals in the affected area (e.g., geographic extent). Effects can be outright mortality, sublethal adverse effects or exclusion due to disturbance. Rating = 2.

High — Affects more than 25 percent of individuals in the affected area (e.g., geographic extent). Effects can be outright mortality, sublethal adverse effects or exclusion due to disturbance. Rating = 3.

Geographic Extent

Geographical extent refers to the area over which the effect is likely to occur or be noticeable. The geographic extent can be described according to specific study areas (i.e., site, site vicinity/local study area, regional), or more specifically in term of distance form the site or source of disturbance.

Duration

Duration refers to the length of time the effects of a project will last. The duration of an effect can be described qualitatively as either short, moderate or long term, or by listing the project phases (i.e. construction, operations, decommissioning) during which the effect is likely to occur.

More quantitative descriptions are also possible by specifying time frames (days, months, years) for the duration of the effect. One should remember that the duration of an effect might be longer than the duration of the project activities that cause it. Therefore, one should not assume that once a project activity has ceased, its effects on the environment are no longer of concern. Short duration can be considered 12 months or less and medium duration can be defined as 13 to 36 months.

Frequency

Frequency refers to the rate of re-occurrence of the effect and /or the phenomenon or event causing the effect. The frequency of an effect can be described qualitatively as rare, sporadic and frequent; or using more quantitative terms such as daily, weekly or number of times per year.

Reversibility

Reversibility refers to the ability of a VEC to return to an equal or improved condition, at the end of the Project or after the source of the disturbance is removed or ceased. It should be noted that a biological effect may be irreversible at the individual level (e.g., mortality of an individual animal) but reversible at the population level. The reversibility of the effect can be either described in general terms as reversible or not reversible; or more quantitatively (e.g., less than one year or growing season, or between XX and YY years).

Ecological Context

Ecological context refers to the sensitivity of the environment (e.g., wildlife habitat, terrestrial habitat, aquatic habitat, ecological reserves, etc.) that would be affected by the project. Typical indictors for this criterion include percentage of population affected, importance of population and number of generations to recovery.

Significance

Significance is an overall measure of the effect on the receptor or VEC. It is either ***significant*** or ***insignificant*** (CEAA definition).

Likelihood of Occurrence of Significant Effects

The two criteria for the evaluation of the likelihood of significant effects were:

1. Probability of occurrence; and
2. Scientific certainty.

Note that likelihood criteria only apply where the prediction is for a significant effect.

In the assessment, a table is developed for each VEC, indicating the results of the effects analysis. Effects predictions for accidental events are also provided.

Careful assessment of residual effects is critical to the determination of their significance, especially in the absence of threshold values with respect to bio-physical impacts specified in standards, legislation or regulations.

The following table presents assessment ratings for each of the effects or attributes used in the Project EA.

Table 4.4-1: Effects Ratings Used for Assembling the Bio-physical Environmental Effects

Direction		**Definition / Rating**	
Adverse		Effect is worsening or is not desirable. (-)	
Neutral		There is no effect. (zero)	
Positive		Effect is improving or is desirable. (+)	
Magnitude /Rating			
Negligible	0	Does not have a measurable effect on the VEC.	
Low	1	Has a measurable effect on VEC but is of short-term duration or extent.	
Medium	2	Has a measurable effect on VEC but is of medium duration or extent.	
High	3	Has a measurable and sustained effect on VEC.	
Spatial/Geographic Extent Rating			
1		< 1 km^2	
2		1-10 km^2	
3		11-100 km^2	
4		101-1000 km^2	
5		1001-10,000 km^2	
6		>10,000 km^2	
Duration / Rating			
1		< 1 month	very short term
2		1 – 12 months	short term
3		13 – 36 months	medium term
4		37 – 72 months	medium to long term
5		> 72 months	long term
Frequency			
1		< 11 events/y	
2		11-50 events/yr	
3		51-100 events/yr	
4		101-200 events/yr	
5		> 200 events/yr	
6		Continuous	
Reversibility		**(refers to population)**	
R = Reversible		VEC is capable of returning to an equal, or improved, condition once the disturbance has ended.	
I = Irreversible		VEC is not capable of returning to an equal, or improved, condition once the disturbance has ended.	

Ecological Context	
1	Relatively pristine area or area not adversely affected by human activity
2	Evidence of existing adverse effects
Level of Confidence	
Low	Information provided considered as having a low probability of being absolutely accurate.
Medium	Information provided considered as having a medium probability of being accurate.
High	Information provided should be considered as having a high probability of being accurate.
Certainty	
Low	The effect can be considered to have a low probability of occurring.
Medium	The effect can be considered to have a medium probability of occurring.
High	The effect can be considered to have a high probability of occurring.
Significance *	
Negligible or none	No effects.
Minor	Low-level effects are distinguishable. These are usually limited to the short-term and are geographically circumscribed but are not considered disruptive even if widespread and sustained.
Moderate	Effects are clearly distinguishable and result in elevated awareness or concern among stakeholders or materially affect the well-being of defined populations/communities. Usually are short- to medium- term in duration and are amenable to management if they occur over the longer term.
High	Effects are highly distinguishable and result in strong concern or support among stakeholders or result in substantive changes in the well-being of defined populations/communities.
* The CEAA definition of Significance is either *Significant* (S) or *Insignificant* (IS). In this assessment: "Negligible" and "Minor" will be rated as *Insignificant* (or *not significant*), "Moderate" may be rated as Insignificant or Significant depending on the duration and extent, etc. "High" will be rated as "*Significant*"	

4.4.2.9 Accidental Events Assessment

Accidental events can lead to damage to the biophysical environment as well as direct or indirect effects on the socio-economic environment, and human health and safety. The severity of effects from accidental events depends on the magnitude of the event, location of the event, and time of year. Accidental events can be generally defined as unplanned releases to the environment of such materials as petroleum hydrocarbons, hazardous chemicals or wastewater.

The effect on each VEC is described, followed by an assessment of the effect using the criteria and rating system described above.

4.4.2.10 Follow-up and Monitoring

Environmental effects monitoring (EEM) or follow-up monitoring are designed to confirm effects predictions and to establish the effectiveness of mitigation measures. The process of effects predictions will, therefore provide a basis for the development of appropriate and focused monitoring programs which will be developed and implemented as part of all Project phase. More information on follow-up and monitoring is provided in Section 5.9.4.

4.4.2.11 Cumulative Effects

Cumulative effects must be assessed for within-project activities as well as for external projects. Other projects and activities within Placentia Bay considered in the cumulative effects assessments are listed below.

- Wind Power Project;
- Burin Peninsula ship yards;
- Commercial fishing industry;
- Recreation, hunting and trapping;
- Oil transhipment facility;
- Come By Chance oil refinery;
- Vale Inco nickel processing facility;
- Marine transportation; and
- Forestry.

4.5 PUBLIC CONSULTATIONS

Canada Fluorspar (NL) Inc. values and encourages the involvement of the local community in all stages of the Project, and considers public consultations an effective method by which to communicate with the community, businesses, regulatory bodies, and other organizations and stakeholders. Significant effort has been spent to date to provide stakeholders with information on the project, to hear their questions, and to address their concerns. Two public open houses were hosted by the proponent in the St. Lawrence, which were attended by local and nearby communities.

For more information regarding public consultations undertaken during the environmental assessment process, please see Section 10.

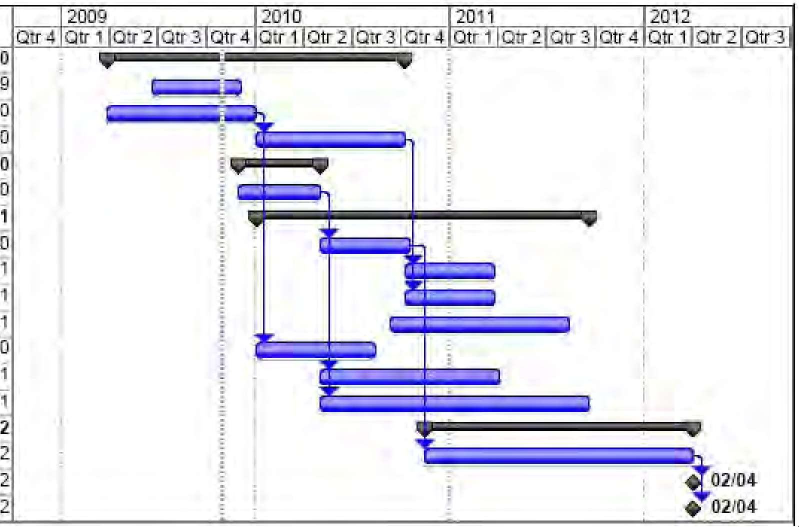
4.6 SCHEDULING & TIMELINES

The project will be undertaken in four specific stages:

- Pre-construction (metallurgical test work, feasibility study, design and engineering, environmental assessment, etc) – currently underway and are expected to be completed by the second quarter of 2010.
- Construction: Planned to start 2nd quarter of 2010 and continues until third quarter 2011;
- Operations; Mine/Mill start-up is expected to commence April of 2012 and will continue for approx. 15 to 20 years (depending on production rate and the reserve size).
- Decommissioning & Closure & Abandonment. – estimated one to two years

It is assumed that the site development will start as soon the snow is cleared (say early May 2010). It is estimated the construction (including the mine pre-production work and commissioning of the mill and marine terminal) will take approximately 18 months (best case scenario) to 24 months (worst case scenario) to complete. The Project schedule is provided in Figure 4.6-1.

ID		Task Name	Duration	Start	Finish
1		**Pre-Construction**	**400 days**	**Mon 30/03/09**	**Fri 08/10/10**
2		Metallurgical Testwork	6 mons	Mon 22/06/09	Fri 04/12/09
3		20% Study	10 mons	Mon 30/03/09	Fri 01/01/10
4		Detailed Design & Engineering	10 mons	Mon 04/01/10	Fri 08/10/10
5		**Environmental Permitting**	**110 days**	**Tue 01/12/09**	**Mon 03/05/10**
6		Permit	5.5 mons	Tue 01/12/09	Mon 03/05/10
7		**Construction**	**446 days**	**Mon 04/01/10**	**Mon 19/09/11**
8		Tarefare Mining Area	6 mons	Tue 04/05/10	Mon 18/10/10
9		New Crusher Facilities	6 mons	Mon 11/10/10	Fri 25/03/11
10		New Heavy Media Facilities	6 mons	Mon 11/10/10	Fri 25/03/11
11		Mill Refurbishment	12 mons	Mon 13/09/10	Fri 12/08/11
12		Site Infrastructure	8 mons	Mon 04/01/10	Fri 13/08/10
13		Tailings	12 mons	Tue 04/05/10	Mon 04/04/11
14		Wharf	18 mons	Tue 04/05/10	Mon 19/09/11
15		**Operations**	**360 days**	**Tue 16/11/10**	**Mon 02/04/12**
16		Mining Pre-Production	18 mons	Tue 16/11/10	Mon 02/04/12
17		Mining Start-up	0 days	Mon 02/04/12	Mon 02/04/12
18		Milling Start-up	0 days	Mon 02/04/12	Mon 02/04/12



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Date: Thu 29/10/09

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

Figure 4.6-1: Project Schedule

5 DESCRIPTION OF THE UNDERTAKING & ALTERNATIVES

Canada Fluorspar (NL) Inc. has carried out a Feasibility Study, which included mine development, process review and testing, engineering design of project facilities and infrastructures; and evaluation of Project alternatives and Project technical, economic and environmental viability. The feasibility study included evaluation of various project options and alternatives as related to:

- Mining methodology and mine development;
- Processing technologies & metallurgical testing;
- Tailings Management & Disposal;
- Marine Terminal location and materials handling; and
- Site infrastructures and Services.

CFI has also carried out site investigations and studies to support the above engineering and environmental requirements, including but not necessarily limited to: topographical and bathymetric surveys; geotechnical investigations both land and marine; fish and fish habitat both freshwater and marine; water quality; archaeological & historic resources study; human health and employment and other related socio-economic surveys; and extensive public consultations.

This Chapter presents detailed description of the proposed Project components, and presents and evaluate the various alternatives, with focus on Tailings Management Facility (TMF) and Marine Terminal alternatives. It also describes the technically and economically feasible alternatives that meet the project need and their biophysical and socio-economic selection criteria. It provides complete details regarding the preferred choice of location and the methods of carrying out the undertaking. This Chapter also includes section on employment as related to required occupations for all stages of the undertaking as well as occupational health, safety and environmental management plans. The final part of this chapter describes the interactions between the Project activities and the receiving environment and associated VEC's (both biophysical and socio-economic).

5.1 GEOGRAPHIC LOCATION AND PROJECT DESCRIPTION

As previously mentioned, the project area is a **brownfield site**, on which mining/milling has occurred since the 1930s. Several structures and buildings remain on site from previous operators.

The proposed Project is located within the municipality of St. Lawrence, on the southern tip of the Burin Peninsula, at the western edge of Placentia Bay. It is approximately 350 km by road from St. John's, Newfoundland and Labrador. Access is by Provincial Highway 220 to St. Lawrence, followed by one to three km by gravel road to the Blue Beach and Tarefare Veins. The existing mill is situated near the Blue Beach North Vein, about one km from the community (see Figure 5.1-1, 5.1-2). The topography is moderate and the site is close to St. Lawrence harbour, which is ice-free year round. The coastline within the project area consists of a number of bold headlands, bordering open coves to the south of Great St. Lawrence Harbour. West-to-east, prominent natural features include Salt Cove, Hares Ears, Shoal Cove, Red Head, Ferryland Head, Deadmans Cove and Cape Chapeau Rouge. This is a rugged shoreline that is open to the sea from the south.

Figure 5.1-1: Aerial Image of the Town of St. Lawrence and the Project Site

Figure 5.1-2: Site Location Map showing Project Components

5.1.1 Project Components and Production Capacity

The Project main components are (Figure 5.1-3):

1. The Mine - Tarefare and Blue Beach North (Figure 5.1-4 and 5.1-5)
2. Ore processing facilities (crusher, the mill, ore storage and associated facilities (Figure 5.1-6))
3. Tailings Management Facility (Figure 5.1-7)
4. Marine Terminal (wharf, concentrate handling equipment and storage – Figure 5.1-8)
5. Infrastructures and Buildings

The general site location map and project components site plans and layouts are shown in Figures 5.1-3 to 5.1-8. These are described in more details in the following sections.

It is assumed that the site development will start as soon the snow is cleared (early May 2010). It is estimated the construction (including the mine pre-production work and decommissioning the mill and marine terminal) will take approximately 18 months (best case scenario) to 24 months (worst case scenario) to complete.

5.1.1.1 Production Capacity

Production is expected to be between 120,000 and 180,000 tonnes per year of filtercake (Fluorspar concentrate) at between 8 and 10% moisture and at standard AG specification. For the purpose of this assessment, it is assumed that the nominal (base case) production rate is 120,000 t/year. This is based on 24 hours per day, 7 days per week for approximately 350 days per year production. The mine ore production is assumed to be about 1000 tonnes per day (nominal) and the mill output (Fluorspar Concentrate) is 345 t/day. The concentrate storage design capacity at the port is assumed to be 20,000 tonnes. It is anticipated that the concentrate export will vary from 5,000 to 20,000 tonnes per shipload (nominal 10,000 tonnes), which would require one shipment per month (12 ships per year @10,000 tonnes). It should be noted that the proposed deepwater wharf is designed to handle large Panamax ships (up to 65,000 DWT), this is to take advantage of topping-up bulk carriers that pass nearby the St. Lawrence area.

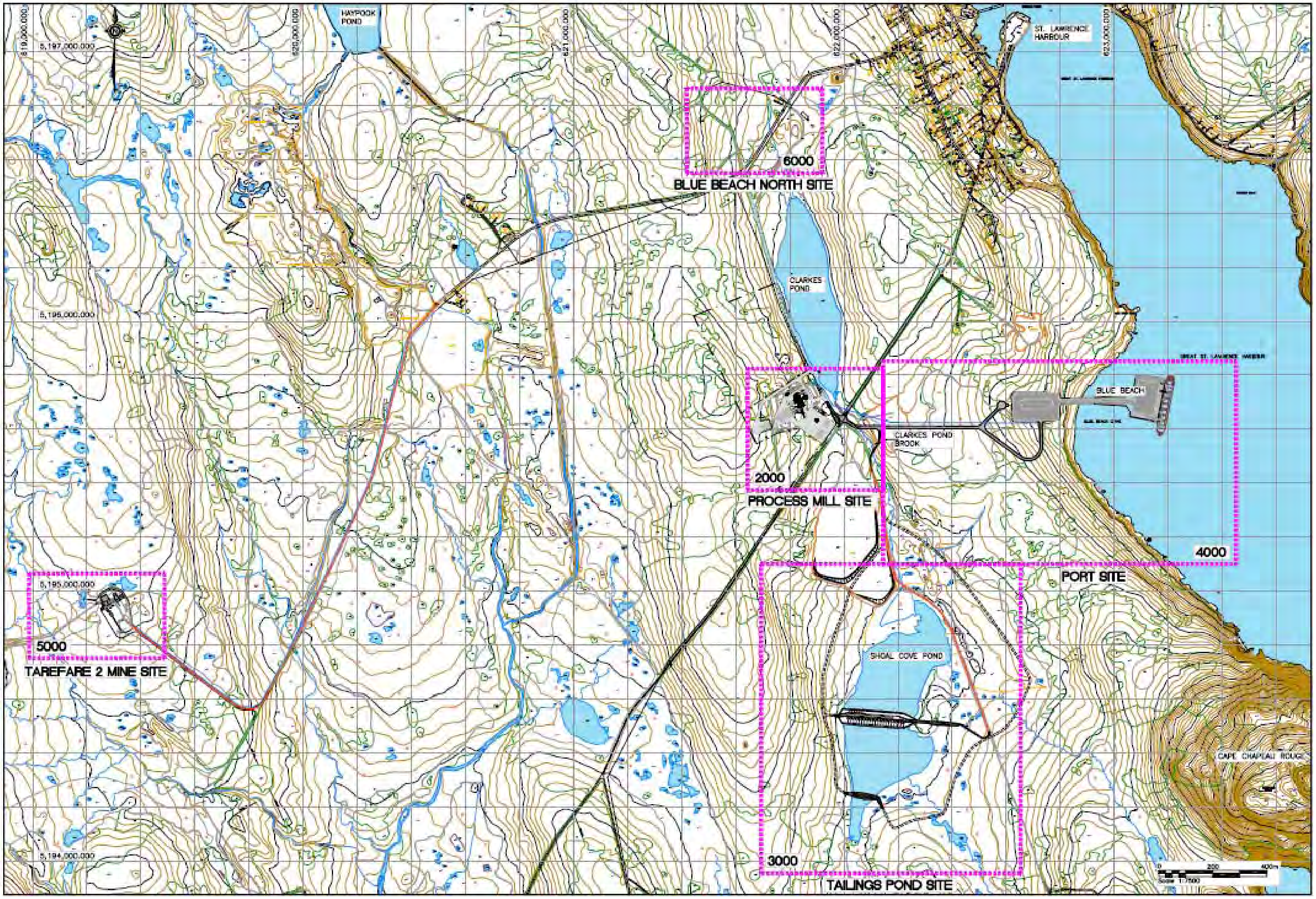


Figure 5.1-3: Project Components and Associated Infrastructures Site Location Map

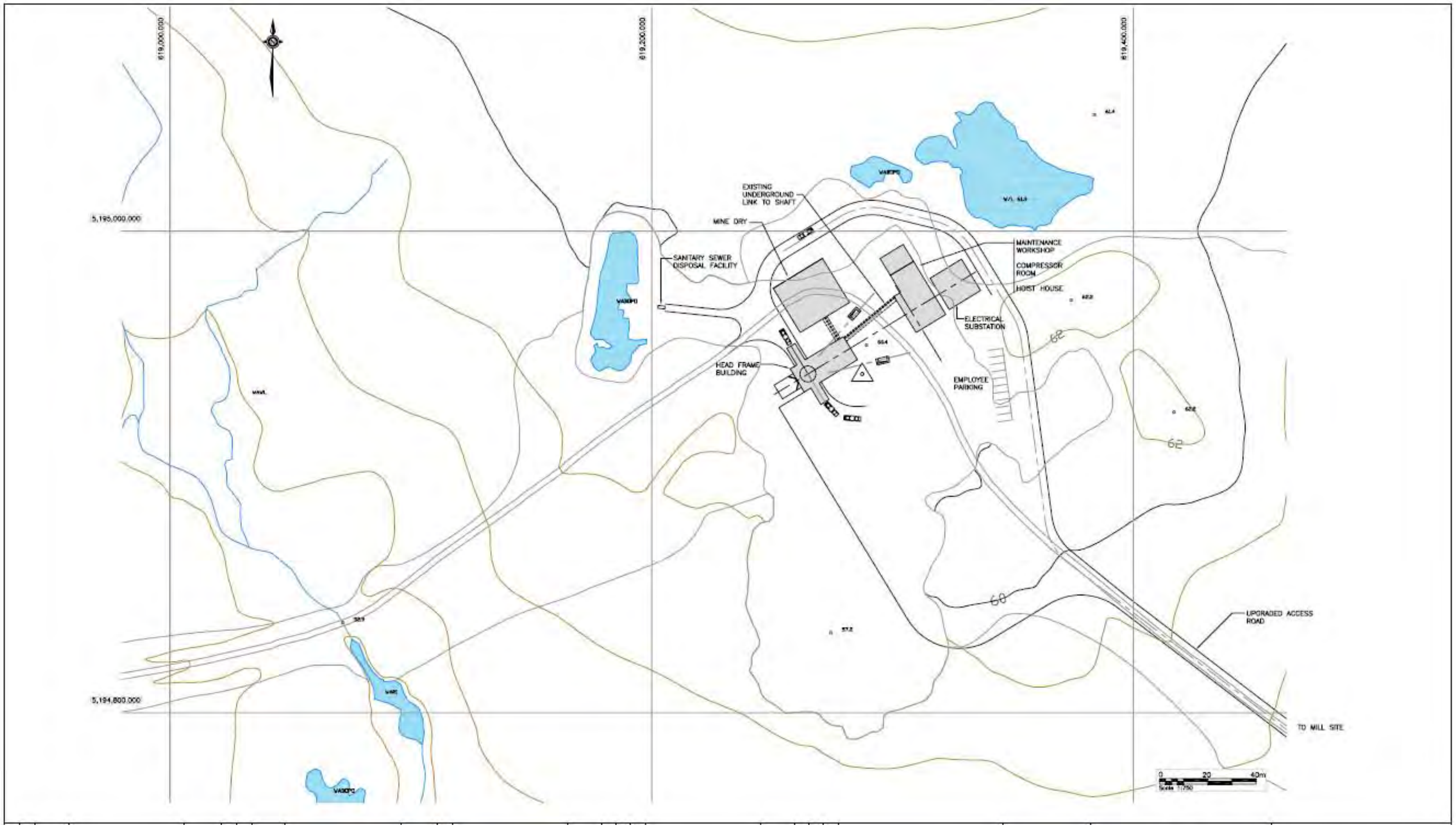


Figure 5.1-4: Tarefare 2 Mine Site Location Plan

Figure 5.1-5: Blue Beach North Mine Site Location Plan

Figure 5.1-6: Existing Mill Site Location Plan / Layout

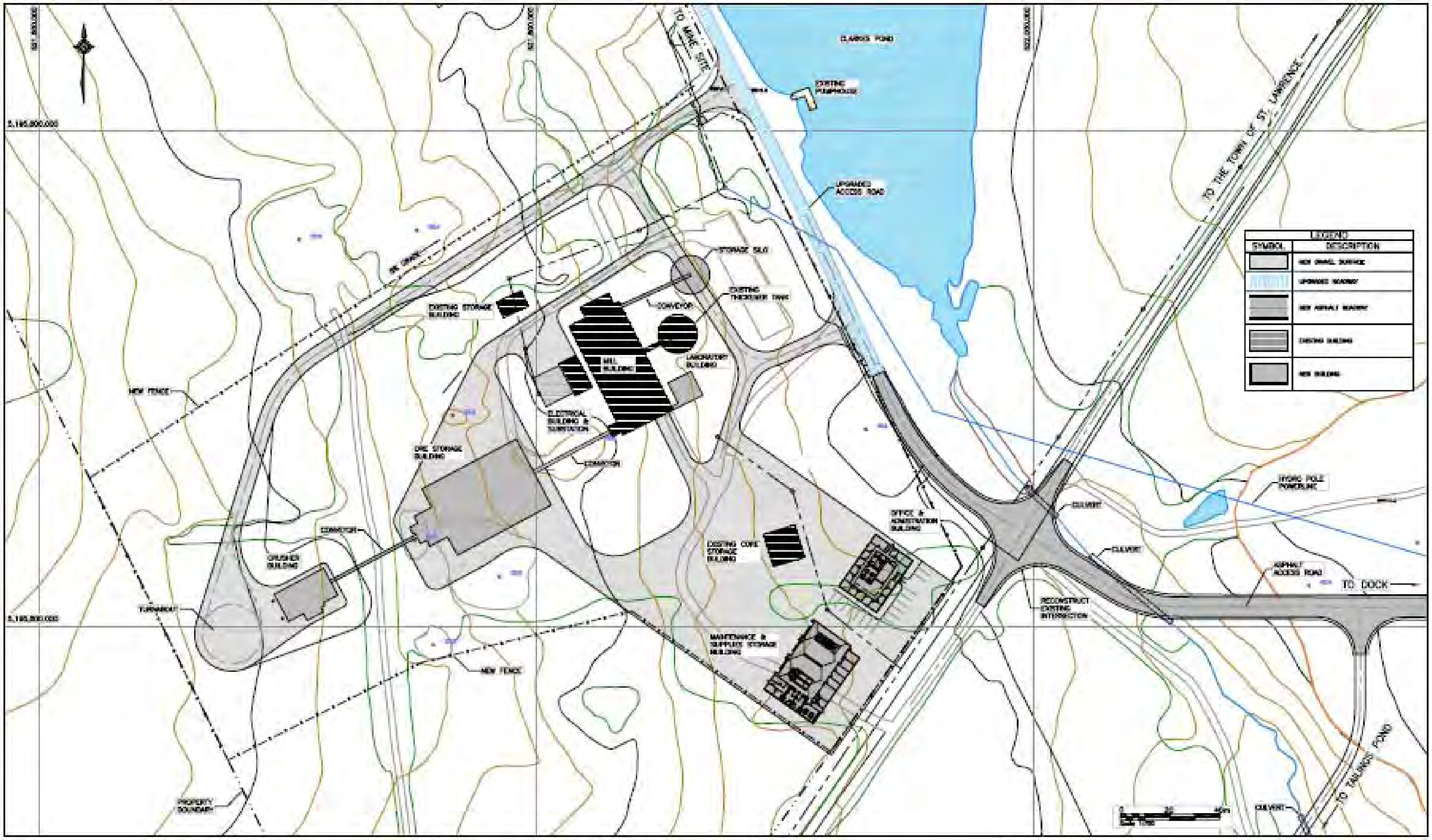


Figure 5.1-7: Proposed New Mill Site Location Plan

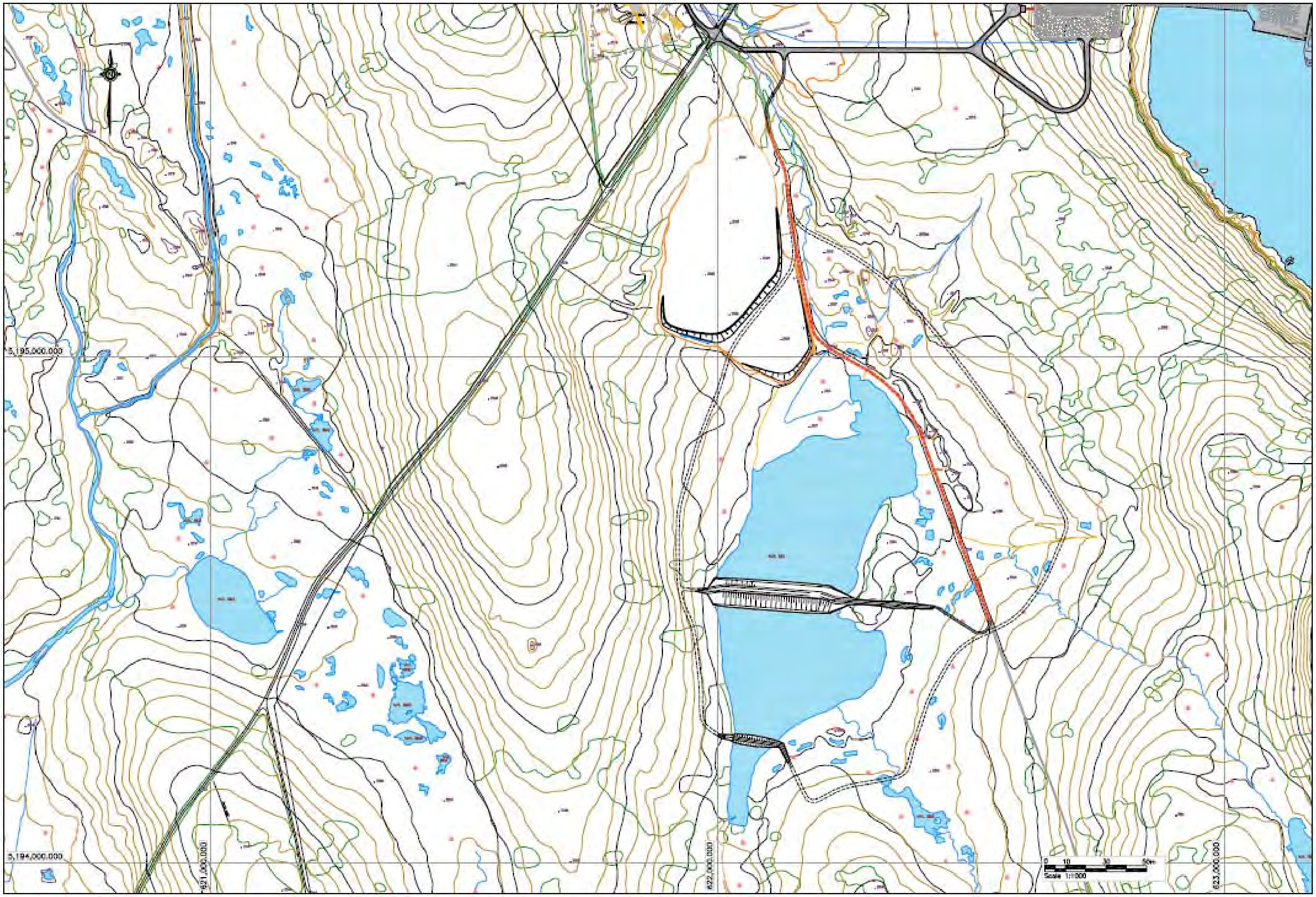


Figure 5.1-8: Proposed Tailings Impoundment and Associated Facilities Site Location Plan

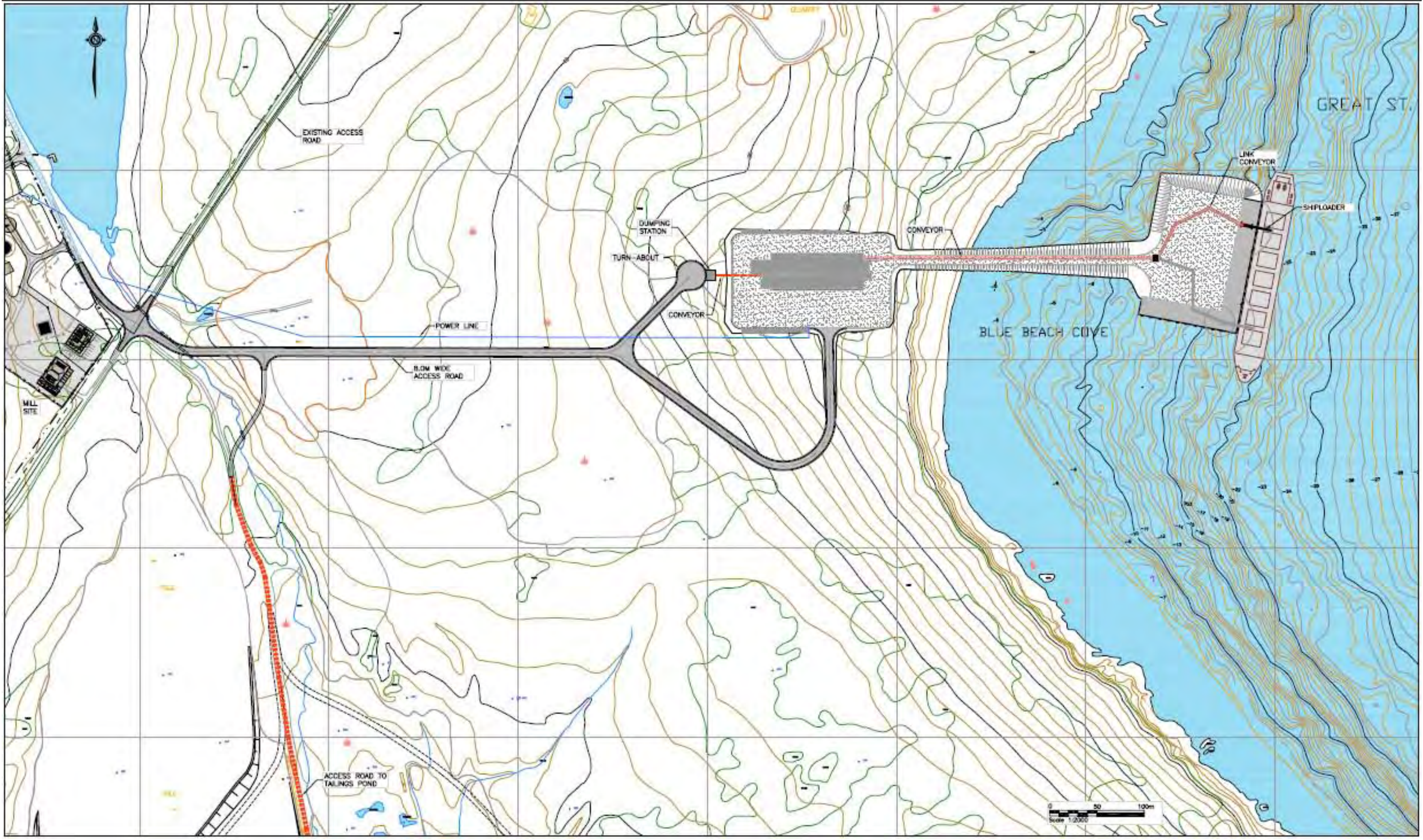


Figure 5.1-9: Marine Terminal Site Location Plan

5.1.2 Buildings - Existing & Proposed

5.1.2.1 Existing Buildings

Much of the infrastructure associated with the previous mining operations, specifically at the mineshaft locations (i.e. head frames etc.), has been demolished. Similarly, electrical equipment, power lines, and other mechanical equipment have been removed.

Apart from some smaller facilities that remain, such as the old pumphouse, the majority of the existing buildings are located at the mill site. These existing buildings include:

Mill Site (Figure 5.1-6)

- Process building;
- Administration building;
- Assay Laboratory;
- Warehouses;
- Electrical sub-station; and
- Ore storage silo.

Tarefare Mine Site (Figure 5.1-4)

- All that remains at Tarefare is the mine shaft.

Blue Beach North Mine Site (Figure 5.1-5)

- Maintenance warehouse/office; and
- Compressor building.

All of this infrastructure will be either upgraded or replaced as part of the proposed mine re-activation program.

5.1.2.2 Proposed Buildings

Several support buildings will be constructed on-site. With the exception of the storage warehouse, all buildings will be equipped with water, power and associated Heating, Ventilating, and Air Conditioning (HVAC) installations. The main buildings to be constructed or renovated include the following:

Mill Site (Figure 5.1-7)

- Administration building;
- Assay lab;
- Maintenance and service building;
- Ore crushing facility;
- Ore storage facility; and
- The mill building will be upgraded including a new fluorspar flitercake storage building.

Tarefare Mine and Blue Beach North sites (Figures 5.1-4 and 5.1-5)

- Headframe building;
- Mine dry facility;
- Hoist /compressor building;
- Electrical sub-station; and
- Maintenance/storage warehouse.

Port Site (Figure 5.1-9)

- Fluorspar Concentrate (Flitercake) receiving station; and
- Fluorspar Concentrate (Flitercake) storage building.

Additional small buildings may be required (such as pump stations, etc.); however, the need for and location of these buildings will be determined as the detailed design progresses.

Administrative Office

The administrative building will be a single story structure constructed to house administrative staff. The building will include general offices, washrooms, common areas, a document control room, engineering room, lunchroom facilities, and a file storage area.

The building will be constructed of concrete foundations in combination with a timber frame structural system. Cladding will consist of metal siding and roofing.

The final dimensions of the building will be based on the project requirements determined during the design phase of the project. Approximate building dimensions are 15 m x 30 m x 4 m.

Warehouse and Maintenance Building

The warehouse and maintenance building will be constructed of concrete foundations in combination with a steel frame structural system. Cladding will consist of metal siding and roofing supported on a secondary structural system of girts and purlins.

The building will be sized to meet the needs of the facility including the storage of spare parts and consumables. A workshop complete with a small tool inventory will be provided.

The final dimensions of the building will be based on the project requirements determined during the design phase of the project. Approximate building dimensions are 40 m x 20 m x 8 m.

Security Building

A small building will be constructed at the entrance of the site to house site security and provide controlled site access. This building will be constructed of concrete foundations in combination with a timber framing structural system. Cladding will consist of metal siding.

The final dimensions of the building will be based on the project requirements determined during the design phase of the project. Estimated building dimensions are 5 m x 4 m x 3 m.

Mill and Crusher Buildings

A new building will be provided at the mill site to house the ore crushing operations. The building will be constructed of concrete foundations in combination with a steel frame structural system. Cladding will consist of metal siding and roofing supported on a secondary structural system of girts and purlins. The building will contain an overhead gantry crane with no less than a 10 tonne rating. The approximate dimensions of the building are 20 m x 30 m x 12 m.

The existing mill building will be modified as required to allow for additional new equipment and will be extended to winterize an existing adjacent ore storage bin. Other expansions may be necessary to accommodate extra flotation equipment depending on the final production capacity of the mill.

Mine Dry Facility

This building will house the worker facilities such as change rooms, showers and lunchrooms. It will consist of concrete foundations in combination with a timber frame structural system. Cladding will consist of metal siding and roofing.

The final dimensions of the building will be based on the project requirements determined during the design phase of the project. Estimated building dimensions are 30 m x 30 m x 4 m.

Bulk Storage

A bulk storage warehouse will be provided on site to store the finished filtercake product. The building will be constructed of concrete foundations in combination with a steel frame structural system. Cladding will consist of metal siding and roofing supported on a secondary structural system of girts and purlins. The building will be outfitted with conveyors and reclaim equipment to facilitate the movement of filtercake product. The approximate dimensions of the building are 160 m x 30 m x 22 m.

5.1.3 Mine Reactivation - Mining Methods and Operation

5.1.3.1 Mining Methods

CFI proposes to reactivate the Tarefare (TF) and the Blue Beach North (BBN) mines, which have both been operated in the past. They are hosted by the Carboniferous St. Lawrence Granite and are steeply dipping (or sub-vertical) vein-type deposits varying in width from 2 m to 16 m (average 3.4 m to 5.5 m), and approximately 1.5 km in length.

Scott Wilson Roscoe Postle Associates Inc. (Scott Wilson RPA) has been engaged to complete the mine design, planning, and optimization. The mine design was completed using longitudinal projections and level plans from past designs, with consideration for existing underground infrastructure at TF and BBN.

Sublevel open stoping and Alimak stoping are currently being evaluated for the TF and BBN mines. Both methods will utilize rib and sill pillars between stopes and main production levels to ensure ground stability and safe working conditions. For additional control of underground rock stresses, stoping at BBN and TF will be sequenced from the bottom upward and progressing away from major underground infrastructure, such as the shaft. Empirical stability analyses have been completed to determine the optimal stope and pillar sizing for both deposits. Itasca Consulting Canada Inc. was retained to complete the geotechnical analysis.

Sublevel stoping will require development in ore, a parallel drift in the footwall for ore haulage, and draw point drifts to muck the ore. Sublevels will be developed in ore from an Alimak access raise driven in the rib pillar, and will provide a platform for production down-hole and up-hole drilling. Sublevels will be spaced appropriately to ensure accurate production drilling and minimal dilution.

Alimak stoping will require similar development to sublevel stoping. However, Alimak stopes can be larger and do not require the use of sublevels, reducing the overall development quantities and potentially resulting in a lower-cost mining scenario. For this stoping method, an Alimak raise will initially be driven in ore between main levels, and ground support will be installed to ensure the integrity of the raise. Production holes will be drilled horizontally from the Alimak, and loaded and blasted from bottom to top. Blasted ore will be left in the stope and mucked from the draw points. The stope can be fully emptied once drilling, loading and blasting are complete. The Alimak stoping applied to TF and BBN will be similar to a Modified Shrinkage stope as the ore is left in the stope for support during the mining, with only the swell being initially removed. Alimak stoping will require an experienced workforce. If implemented, initial production years will be completed by contractor while mine employees undergo training.

Figures 5.1-10, 5.1-11 and 5.1-12 are schematics of the proposed mining methods that may be potentially applied to the TF and BBN mines.

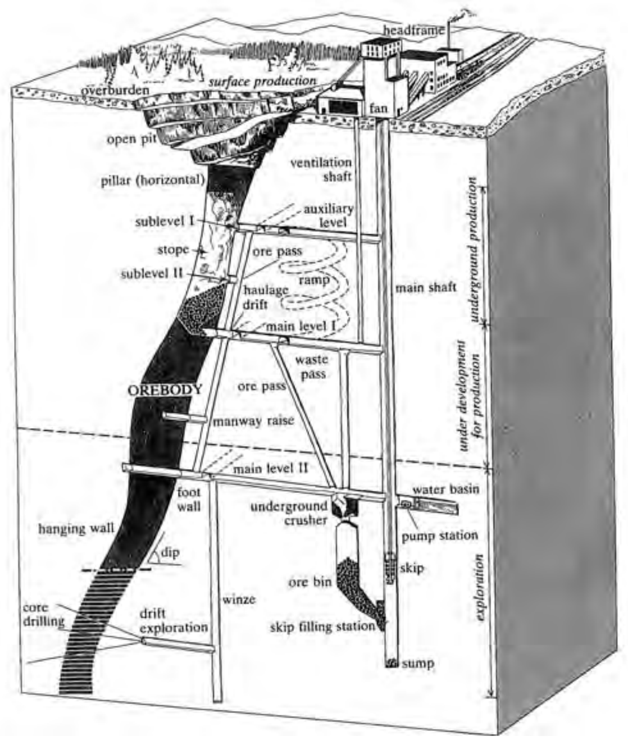


Figure 5.1-10: Schematic of an Underground Mine Showing Typical Features

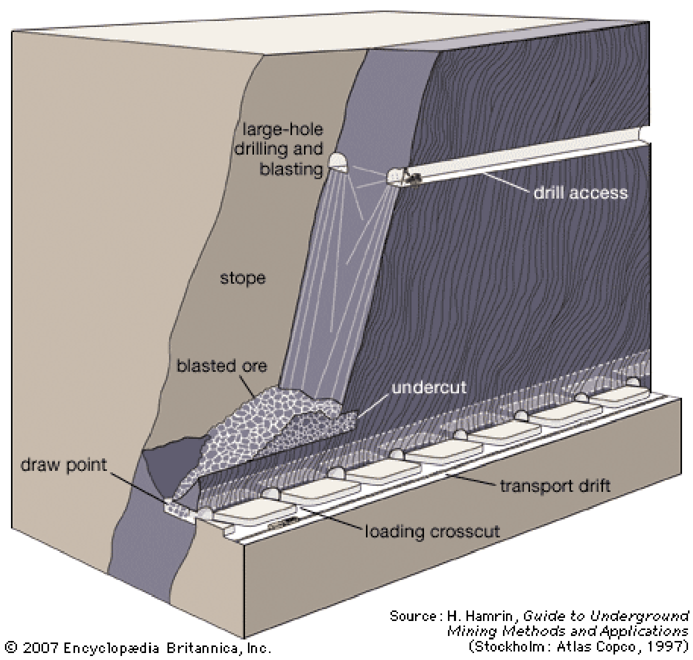


Figure 5.1-11: Schematic Showing Typical Stoping Method

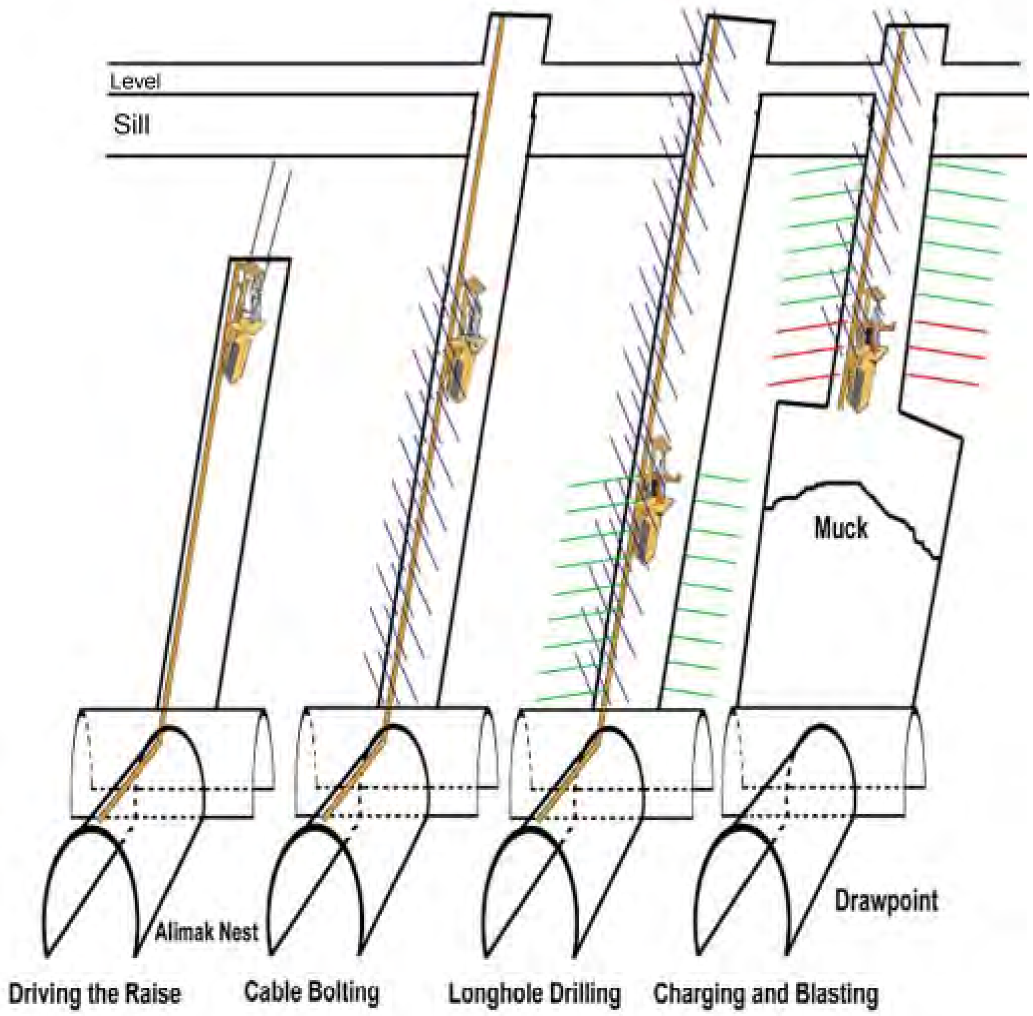


Figure 5.1-12: Schematic Showing Typical Alimak Mining Method

5.1.3.2 Existing Mine Infrastructure

BBN has two shafts, with the No. 2 and No. 3 shaft reaching depths of 65 m and 100 m, respectively (See Figure 5.1-4). At the east end of the deposit, Blue Beach North also has an existing ramp which covers a vertical extent of approximately 130 m.

The TF mine has two shafts, with the No. 1 and No. 2 shafts reaching depths of 168 m and 450 m, respectively (See Figures 5.1-5.). Shaft stations spaced at 60 m intervals were cut during the sinking of the No. 2 shaft. The existing station spacing was used as the basis for the 60 m level spacing in the mine design.

5.1.3.3 Pre-production Development

Pre-production development at TF will include a ramp between the 1200 ft. (382 m) and 1560 ft. (492 m) levels, a ventilation raise from the 1200 ft. (382 m) level, a transfer drift, an ore pass, a waste pass, main water sump, and level development on the 1200 ft. and 1560 ft. levels. The ramp will also provide a breakthrough access to the shaft bottom at 1460 ft. (445 m) for mucking of the shaft bottom. The pre-production period for TF#2 is estimated to be approximately 24 months.

At BBN, pre-production development will include a ramp driven from the existing ramp face, which is at approximately 130 m below the ramp portal elevation. The ramp will be extended to the 340 m level to provide access to the complete vertical extent of the deposit. Development in ore and waste will be completed on the two lowest levels, along with Alimak raising to prepare the initial stopes for production. The ventilation raise will also be completed to provide for ventilation air supply and emergency egress in case of an underground emergency. The pre-production period for BBN is estimated to be approximately 22 months.

5.1.3.4 Mine Operation

Primary access for people, materials and equipment for the Tarefare Mine will be via a three compartment shaft. The existing No. 2 shaft will be equipped with a new headframe and hoist to transport ore and waste rock from underground to surface. A system of ore and waste rock passes will be developed to facilitate material transport to the loading pocket prior to skipping up the shaft. The ore will be trucked approximately 5 km on surface to the mill near Clarke's Pond. Mine development waste rock will be left underground by placing it in mined out workings and stopes wherever possible. The existing No. 1 shaft, located one kilometre to the south of the No. 2 shaft, will be used as an emergency second exit as well as a ventilation shaft. Ventilation raises in the mine will also be equipped to provide for additional emergency escape routes. Mechanized mobile mucking equipment will be dedicated to the main mine levels.

Primary access for the BBN mine will be via an existing ramp. The ramp will be deepened to the current depth of the ore body, and will give total mobility throughout the mine for mechanized mobile equipment. A secondary egress point will be made via a raise to surface, which will also facilitate ventilation through the mine. The ore will be trucked in low profile mine trucks and/or load-haul-dump (LHD) vehicles from the stope directly to the mill. As with TF, mine development waste rock will be left underground wherever possible. The existing surface buildings (mine dry, compressor house and maintenance buildings) will be refurbished. Power is already available at the mine but will require upgrading. Surface fans and heaters utilizing existing vertical shafts and the access ramp will provide adequate ventilation.

5.1.3.5 Mine Equipment

Trackless mining will be used for both potential mining methods at each operation. The required underground equipment fleet at the TF and BBN mines will include the following units:

- LHD, ranging in size from 2 yd. to 5 yd.
- Haul truck, ranging in size from 15 ton to 30 ton
- Electric/hydraulic jumbo
- Longhole drill
- Airleg drill
- Alimak
- Explosives loader
- Rockbreaker
- Scissor Lift
- Jacklegs
- Service vehicles

The surface mobile fleet will consist of front end loaders, haul trucks, a grader for road maintenance, a small bulldozer for site preparation and tailings work, and other smaller equipment. The current plan is to commence mining at TF, followed by mining at BBN, and where possible equipment will be transferred between the sites to help minimize capital spending. There is no existing equipment fleet for the TF and BBN mines.

5.1.3.6 Mine Infrastructure and Services

There is currently no surface mine infrastructure at TF. At BBN, there is a building, housing the office/dry and maintenance shop complex (Figures 5.1-4 and 5.1-5).

<u>Headframe</u>

A 120 foot high headframe will be installed at TF along with an 8 foot diameter double drum hoist. A hoistroom, compressor room, and shafthouse will be required as well as an office/dry/garage/warehouse complex. The backleg and shafthouse foundations will need to be re-done. It is anticipated that a portable headframe and pumping installation can be set up to initiate the dewatering and potentially save time in the pre-production phase.

<u>Hoist Room</u>

A hoist room measuring 50 feet wide by 60 feet long by 30 feet high will be required to house the hoist and required electrics. An overhead crane with 10 ton capacity will be installed to service the double drum hoist.

<u>Ore and Waste Pass Systems</u>

Ore and waste passes at TF will be constructed using Alimak raises driven up from the 382 m level (1200 ft). The passes will be broken into each level via finger raises off of the Alimak raises. To avoid hang-ups, a small grizzly will be required on each level to control the muck size dumped into the passes. Ore and waste will pass via the system into the transfer level located below the 382 m level, where the muck will pass over a grizzly and the rockbreaker will serve to reduce any oversize. The muck will then flow into the measuring pocket, and then into the loading pocket for skipping to surface.

At BBN, all waste and ore will be handled from each level via LHD’s and haul trucks. The stopes will be mucked via drawpoints driven approximately 10 m apart. Haulage to surface will be facilitated by the main access ramp, which will also be upcasting ventilation air. The fresh air ventilation raise will be accessed on each operating level providing a fresh air source and also an emergency egress from the underground workings.

Ventilation

Ventilation at TF will be supplied through Alimak raises and a six foot diameter bored raise. The main bored ventilation raise will be a fresh air source, and will extend from the 283 m level up to surface, with breakthroughs on each level. A manway will be installed in this raise, and will provide an emergency exit to surface from each level. The main production shaft and Alimak raises positioned at the lateral extents of the deposit will provide an exhaust route.

At BBN, ventilation will be provided by Alimak raises and the ramp. Fresh air will flow down the ramp in ventilation ducting until the ventilation raises are driven from the levels to surface. Prior to production, the ventilation raises will be prepared to downcast fresh air to the work areas and upcast the ramp to surface. A main fresh air downcast raise will be equipped with a manway to serve as an escapeway.

Mine Air Volume

The ventilation air volumes for TF and BBN are estimated to be approximately 120,000 cfm and 250,000 cfm, respectively, based on the equipment horsepower and minimum flow rates required to satisfy the mining regulations. A number of auxiliary fans will be required at both operations to maintain adequate ventilation in the development headings and stoping areas.

Ventilation Installation

Ventilation will be provided by fans installed on surface, with heating systems that will be necessary during the winter months. Three 250 HP fans are scheduled to be upgraded. There is an allowance for 50 HP auxiliary fans for both mine operations. The main surface fans will be equipped with the required regulator starters and safety monitors. The required refuge stations will also be installed at the necessary strategic locations underground to ensure worker safety in case of emergencies.

Dewatering

Dewatering of both TF and BBN mines will be a major operation. Based on the experience at the TF No. 1 shaft and BBN mine, anticipated steady state water flows are 2,000 gpm with peak flows of 3,000 gpm.

At TF, dirty and clean water sumps will be excavated near the shaft bottom at the 440 m level. Two 900 HP multi-stage pumps will be able to handle 1,500 gpm each, pumping straight up to the surface sedimentation basin via ten inch diameter pumplines installed in the shaft. A third pump will serve for backup during maintenance and for emergency use during any increased inflow.

The ground water primarily comes in from the ore body. Therefore, it will be necessary to drill drain holes between levels during ore development to aid in dewatering the ore body as much as possible before stoping operations begin. Water will be collected in the main drainage ditches on the levels and drain holes between levels. Where possible, drain water will be collected and transported in pipelines. The shaft will have a normal drain line installed.

At the BBN mine, dirty and clean water sumps will be required at the bottom of the main ramp. Another sump system will be necessary on the south side where mining will begin at the 210 m level. During development, the water will be pumped via a six inch pump line installed in the ramp. For dewatering during production, a pump line will be installed in the ventilation raises, thereby reducing both the length of line and the line resistance. For more details on dewatering and discharge of mine water, see Section 6.1.1.

Maintenance Facilities

The main maintenance facilities will be located on surface at both mine sites. At the TF mine, an underground service garage will be necessary as the haul trucks and LHD's will be captive on the lower level. Smaller service areas will be cut for the LHD's located on the other levels. A small service building will also be provided for equipment and tool repairs on surface.

For the BBN mine, a service garage area for the north and south sectors will be cut to provide for sufficient equipment maintenance and servicing. Major overhauls will be completed on surface.

5.1.3.7 Auxiliary Services

Power

Power will be sourced from the provincial power grid. Major power items will include the hoist, compressors, the main and auxiliary ventilation fans located underground, and the processing plant. The average connected load is estimated to be approximately 4 MW.

Communications

Communications for the mine operations will be provided locally given the close proximity of the services. For the underground operations, the Leaky Feeder communication system will be installed at both mines, providing for a reliable communications and monitoring system.

Water Supply

While mining at TF, process water will be extracted from a BBN mine raise. While mining at BBN, the process water supply will be provided via mine dewatering, with 2.7 m^3/min expected to satisfy the mill and mine process water requirements. Water supply is not expected to be a problem, as the anticipated average underground flow rate is in excess of 9 m^3/min. Excess water will be diverted to the tailings ponds or nearby streams if it meets water quality standards for discharge to the environment.

Stationary Equipment

Stationary equipment on surface will include the double drum hoist for TF, and common to both mines will be the surface compressors, generators, main fans and other minor items.

Refuge Stations

Refuge stations will be excavated at strategic locations underground. These stations will contain an independent air line, water line and rescue apparatus. Communications will also be supplied via the Leaky Feeder system. The station will also contain adequate drinking water and an amount of non-perishable food items.

Explosives and Cap Magazines

Magazines will be excavated at strategic places with the required quantity of explosives and detonators to ensure efficient mining operations. A magazine for surface storage of explosives and detonators will also be built to service both mines.

Compressed Air

Compressed air will be supplied via compressors installed on surface. For initial development, the compressed air will pass into air receivers on surface and then via compressed air pipelines that feed the mine by way of the shaft access at TF and the ramp access at BBN.

The main compressed air consumption underground will be the longhole drills, the airleg drills, and miscellaneous items such as door cylinders (for ventilation control), chutes where required, and others. The development jumbo drills will be electric/hydraulic. Underground air receivers may be required to improve air distribution and line pressure underground, particularly over longer distances.

Dry House

Dry houses will be necessary at both sites for mine personnel. A dry man will be assigned on the day shift for necessary upkeep and maintenance.

5.1.3.8 Waste Rock Storage

Waste rock will be stored south-east of the shaft at TF. Development waste rock from pre-production years will potentially be used to develop a new road from the existing Director Mine to the mill, which will provide a more direct travel path, minimize the use of public highways to truck ore, and allow for additional security through isolation from the public. During ongoing production, some waste rock will likely be placed into excavated stopes to minimize material transfer to surface and the size of the waste rock dump.

Waste rock at BBN will be stored south-west of the portal location. As with TF, some ongoing waste rock production will be stored in excavated stopes to minimize haulage costs, in addition to minimizing the footprint of the waste rock storage site.

5.1.4 Ore Processing

Depending on which mine is in operation, Tarefare or Blue Beach North, the ore will be transported by trucks or LHD to the mill site and stockpiled. A new crusher building will be erected to the west of the existing mill to house the crusher and screening equipment. The new crusher building will be heated and have capacity for storing approximately 1,000 tonnes of ROM (run-of-mine) ore. This arrangement reduces freezing of the ore and controls high moisture content in the feed.

The existing mill building, originally designed for a capacity of 85,000 tpa of concentrate ore, will be extended to include the existing ore bin to counteract freezing of the ore during winter. A building will house and winterize the existing thickener and a new concentrate product storage shed will be built onsite.

The processing route is likely to be crushing, screening, intermediate storage, dense media pre-concentration, grinding and froth flotation followed by concentrate thickening, filtration and storage. An intermediate product of washed gravel will be produced from the dense media separation (DMS) process. The main product will be a damp filtercake (or AG concentrate) of 97.5% calcium fluoride purity. It will be trucked or conveyed, at approximately 10% moisture content, to the new wharf storage building at Blue Beach in the outer Great St. Lawrence Harbour.

An option of transporting the processed ore via slurry pipe from the mill to the marine terminal, where thickening and filtering will take place at the marine terminal has been studied. The dewatered water will be pumped back to the mill, where it will be discharged with the tailings into the tailings impoundment. The slurry option is believed to provide an economically and environmentally superior alternative. The pipeline will follow the road route which is already shown in Figure 5.1-9. For now we have assumed the thickener, filtering, etc. will be placed inside the concentrate storage building, or in a separate building adjacent to the storage building. No changes are required to the wharf to accommodate the slurry pipeline option.

The process water balance and process flow diagrams are schematically shown on Figure 5.1-13 and 5.1-14). At this time, it is assumed that DMS equipment will be used to pre-concentrate the ore ahead of grinding. This represents a new system to be added to the existing mill in St Lawrence.

As mentioned previously, metallurgical testing and engineering feasibility study are currently underway. This will clarify the quantity and quality of process water required by the proposed mill and the optimum route for discharge of mine water. Once completed an appropriate source of mill water will be identified. Currently, there are several potential options that are being evaluated. These include mine water (BBN or Director), and/or freshwater bodies within the Clarke's Pond-Shoal Cove Pond and Salt Cove Brook watersheds. The withdrawl of water from sources other than mine water will be assumed in light of and compliance with the existing HADD compensation strategy.

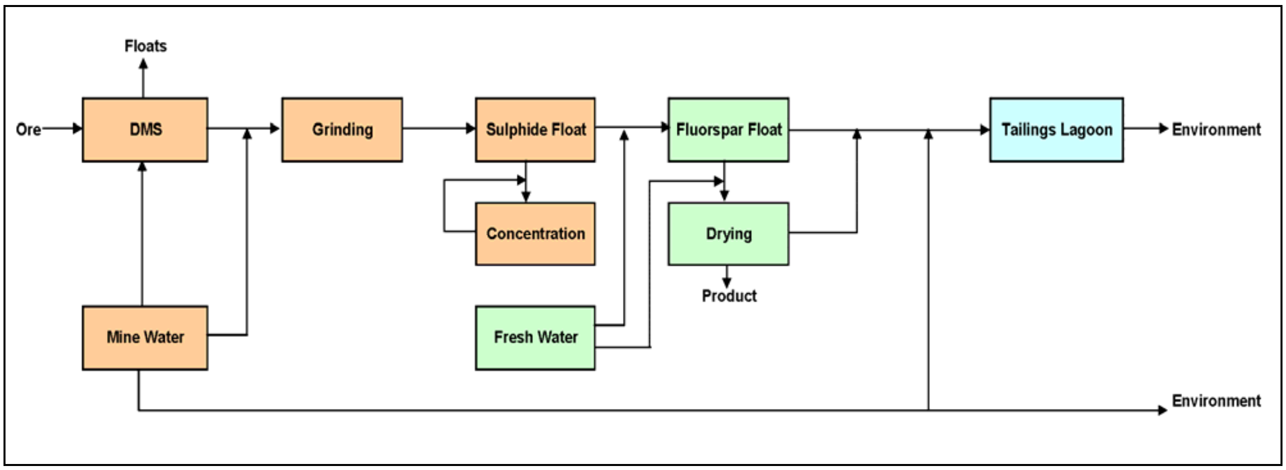


Figure 5.1-13: Water Balance Diagram

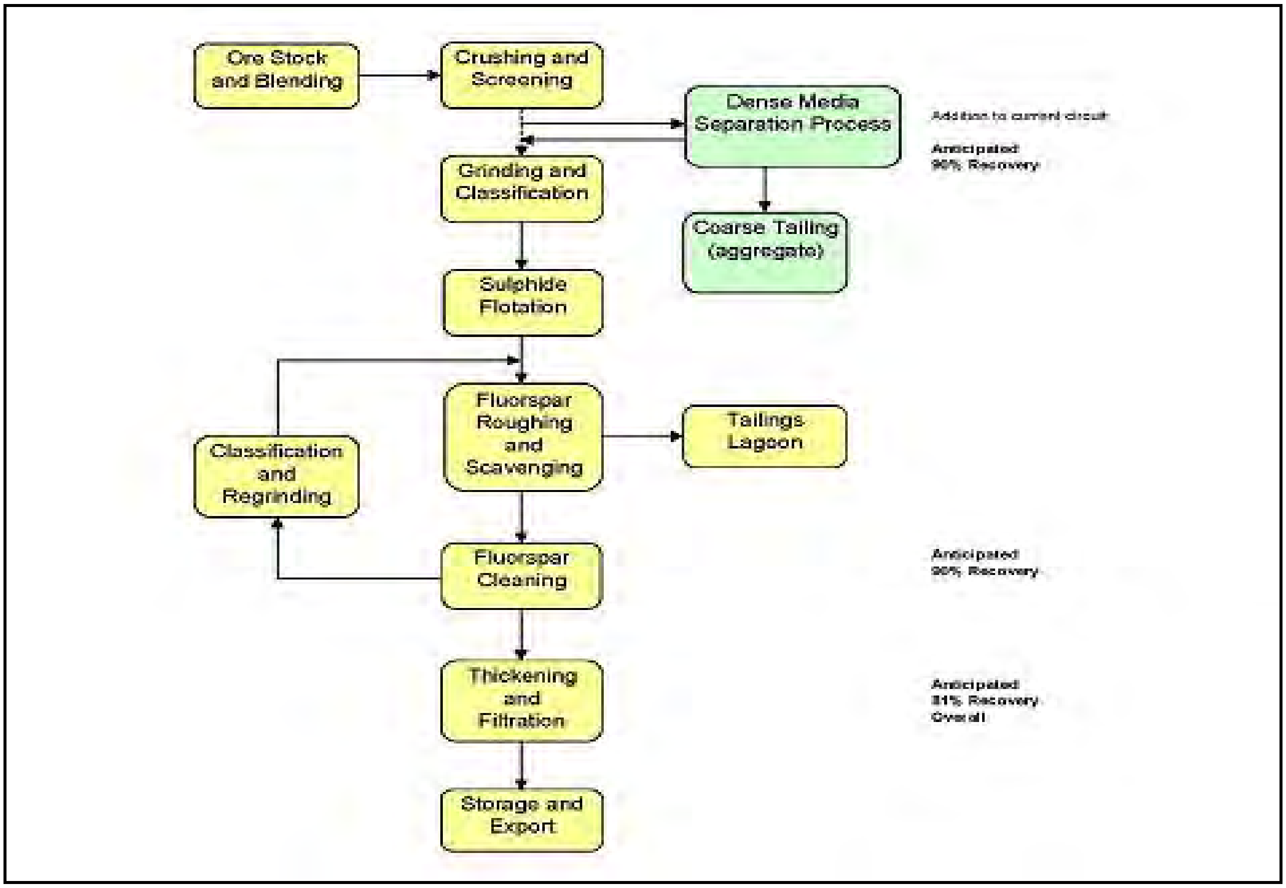


Figure 5.1-14: Preliminary Mill Process Flow Diagram

It should be noted that when Minworth operated out of BBN, mine water was discharged into Clarke's Pond, which in turn was pumped to feed the mill. This resulted in a noticeable drawdown of the pond, of about 30 cm. To date, it has not been confirmed whether or not there is a hydraulic connection between the pond and groundwater of BBN. It is also worth mentioning that water being pumped from the operating BBN mine caused fluorspar selectivity problems on the mill. This is believed due to the increase in water hardness as a result of mining.

For reasons such as this, process water requirements will be thoroughly evaluated and various stakeholders (e.g. the public, DFO, and DOEC) will be consulted before selecting a preferred mill water source. The following sections elaborate on the ore processing to be carried out.

5.1.4.1 Crushing

Primary Jaw Crusher

ROM ore will be delivered to an indoor 1,000 tonne stockpile from which blended material will be fed onto an apron feeder (or similar) by a front-end loader. This feeder will discharge, at a controlled rate, into a primary jaw crusher. Since the ore will be damp, dust suppression will not be required at this point. Surplus ROM will be stockpiled outside the crusher building.

Inclined Vibrating Screen

After crushing, the ore will be conveyed to an inclined vibrating screen with two screen decks. The ore will be fed to the upper deck, which will have the coarsest openings. Material of larger size than the openings will pass down the screen while finer particles fall through to the second deck where they will be subjected to even finer screening. The ore leaving the screening equipment will have been sized into three fractions. The finest of all, which falls through the lower screen, will be conveyed to a storage bin while the coarser fractions will receive further crushing.

Secondary Crushers

These pieces of equipment comprise a steel cone (mantle) eccentrically driven within a steel bowl. Two types of cone crushers are likely to be used: a standard cone accepting coarse ore from the upper screen; and a short head cone, which will be fed from the surface of the lower screen. After these units have crushed the ore the resulting material will be recycled to the inclined screen for re-sizing. Dust control, including bag filtration, will likely to be required at this point and advice on appropriate equipment will be taken from crushing equipment manufacturers. Filtered fines will be passed to milling and treated air meeting regulatory requirements will be exhausted to the outside.

Fine Ore Storage Bin

It will be necessary to have an intermediate storage facility since crushing and screening (estimated to be operational 16 hours per day) will have a greater capacity than milling. Storage allows time for work on the high maintenance crushing section without adversely affecting the down stream processes, which work around the clock. Material from the fine ore storage bin will be passed along a conveyor and over a belt scale to the Dense Media Separation (DMS) process.

5.1.4.2 Pre-Concentration

Pre-concentration by DMS is based on the difference in specific gravity of the valuable mineral (fluorspar) and of other minerals (referred to as gangue minerals). Feed to the section will be separated into floats (or lighter than medium operating density minerals) and sinks (or heavier than operating density minerals). The floats stream will comprise a washed gravel of about 12.5 ± 0.5 mm that can be used as mine backfill or sold on the market as high quality granite aggregate. It should be noted here that the previous operator, St. Lawrence Fluorspar who operated the existing 85,000 tpa mill in the 1980s, did not use a pre-concentrator circuit in their original design but planned to install such a unit prior to bankruptcy in 1990.

The Tri-Flo Separator

The Tri-Flo vessel consists of a fixed cylinder laying on its side, inclined at an angle of 15 degrees to the horizontal. A separating medium of fine ferro-silicon, and perhaps magnetite in water, will be pumped tangentially into the vessel through two inlets at a pressure of 15 psi, creating a rotating mass with an open vortex throughout the length of the tube. Medium leaves through the two sinks tangential outlets and the floats outlet tube. A density gradient is formed across the radius of the liquid within the tube similar to that in a hydrocyclone where the greatest density is adjacent to the vessel wall.

Prior to being fed into the separating vessel, ore from the fine ore storage bin will pass along a horizontal vibrating screen to remove all material of less than ½ mm, which would otherwise adversely affect the separating medium. The remaining raw feed (approximately 80 % of the ore) entering the upper tube inlet will be combined with a small quantity of medium. On entering the vessel, particles that are denser than the medium are pressed outwards against the wall and exits via the first sinks tangential outlet. Lower density mineral grains pass into the second chamber of the vessel where once again the heavier fraction is removed in a similar manner. Low-density material quickly enters the central open vortex where it is carried downwards, exiting via the floats outlet tube. The two combined dense sinks fractions, and the light floats fraction, on leaving the Tri-Flo will pass across horizontal vibrating screens where any adhering medium will be removed by spraying with water. Medium is constantly recycled to the system after having surplus water removed by magnetic separators.

Washed Floats, consisting essentially of gravel-size granite, quartz and calcite, will be conveyed from the building to a stockpile. As indicated before, this material will be used as mine backfill and/or sold as a washed aggregate. The remainder of the ore (i.e. the sinks fraction), having been pre-concentrated, will pass to the grinding section for further processing.

5.1.4.3 Grinding & Classification

Grinding (Ball Mill)

This consists of a rotating, rubber-lined cylinder containing steel grinding balls into which water and the sinks fractions from the Tri-Flo are fed. Fine grinding occurs by the tumbling action of the balls (termed media). This produces wet, sand-like slurry, which overflows from the discharge end of the mill. Grinding rate is dependant upon the energy imparted to the charge of grinding balls by the rotation of the mill; the amps drawn by the motor being a measure of the energy available to grind the ore. Slurry leaves the mill and flows through a trommel (rotating screen fixed to the end of the mill) into a discharge sump. Ore, pre-screened ahead of the DMS unit, will enter the milling circuit via this sump. Any coarse material leaving the trommel will be recycled back to the crushing section.

Classification (Hydrocyclone)

Slurry from the ball mill will be classified (sized) by pumping through a hydrocyclone to ensure the mineral particles are liberated. The hydrocyclone separates the slurry particles into fine and coarse fractions at a predetermined cut point by the action of centrifugal force. Slurry will be pumped under pressure into the cyclone’s tangential inlet causing a rotating action. Large or heavy particles move outwards and migrate down the side of the cyclone exiting at the lower (apex) discharge point. Fine or lighter particles are less influenced and are carried upwards, leaving the unit via the upper (vortex finder) outlet.

The fine-grained hydrocyclone overflow (consisting of ~30% solids by weight in water) becomes the flotation feed whilst the coarser hydrocyclone underflow will be recycled to be re-ground along with incoming new feed.

5.1.4.4 Concentration

Froth Flotation

Flotation is a process whereby the surface tension of a mineral is altered so that the target mineral is generally rendered hydrophobic (by a reagent termed a collector or promoter) and the other minerals (essentially carbonate and silicate minerals in the case of fluorspar) are given a hydrophillic coating (by a depressant). In the presence of air bubbles, the target mineral will be floated (transported to the tank surface) while the other minerals will remain in the liquid phase.

The resulting mineral-rich froth can then be skimmed from the surface of the tank (termed a cell) in which flotation has taken place. Some gangue (unwanted minerals) will have been collected along with the target mineral so the froth is subjected to several stages of cleaning where, by washing with water (sometimes in the presence of additional reagents), increasingly pure concentrate results.

In the fluorspar cleaning circuit, any depressed or locked fluorspar particles remaining in the slurry (termed a middling) flow by counter-current back through the cell circuit to the regrind mill. This ball mill further liberates minerals, which are then returned to the flotation circuit for upgrading. Slurry (tailings) consisting primarily of carbonate and silicate gangue minerals, but which exclude recovered sulphides (see below), will be pumped to the TMF for disposal.

Associated with fluorspar are minor amounts of naturally occurring sulphide minerals. These must be removed before producing a high quality AG fluorspar concentrate. Galena (PbS) and sphalerite ((Zn,Fe)S), and to a lesser extent pyrite (FeS2) and chalcopyrite (CuFeS2), commonly account for less than 1% of the area's vein minerals (DME, 1983). While some of these sulphides have market potential they would nevertheless be considered "impurities" if found in the final fluorspar concentrate. Therefore, these will be selectively removed as a first step in the flotation circuit. After initial flotation, the sulphide-enriched material will pass to a yet undetermined gravity separation process to further concentrate the sulphides.

This sulphide-rich material will be stored in drums for shipment off site, in contrast with the historical practice of mixing it with tailings for on-site disposal. Water from the process will be recycled back to the circuit.

The actual reagents to be used in the flotation process will be determined by metallurgical test work. However, Table 5.1-1 provides a list of likely reagents that would be used and the reason for their addition. Very preliminary estimates of annual consumption are also given.

Table 5.1-1: Preliminary Estimate of Reagent Usage

Reagent	Container	Reagent Consumption		Country of Origin	Probable Quantity in Storage (tonnes)	Comments
		$kg_{reagent}$ per $tonne_{ore}$	tonne per year			
Ferro-Silicon	powder in drums	0.50	188	South Africa	20	Only used if metallurgical testwork confirms that DMS is applicable. This may be replaced with less expensive magnetite (Fe_3O_4) if applicable (i.e. testwork dependant).
Bentonite (clay)	powder paper sacks	0.01	4	USA	1	Only used if metallurgical testwork confirms that DMS is applicable.
Soda Ash	bulk powder?	1.80	675	Canada	20	This is often used in grinding to prevent erosion/corrosion of media by raising the pH of the system. It is also used in fluorspar flotation to aid in saponification.
Xanthate	powder in drums	0.02	8	USA	4	Used as a collector for sulphides ahead of fluorspar flotation.
Frother (e.g. methyl isobutyl alcohol)	liquid in steel drums	0.03	11	USA	5	Used as a frother to stablize bubble formation in sulphide flotation.
Sodium Silicate	liquid in steel drums	1.80	675	USA	10	Used as a dispersant and iron-stained quartz dispersant. (Unsure if this will be used at all. The need for this will be defined by the metallurgical testwork.)
Quebracho (e.g. polyphenolic polymers and carbohydrates	powder in paper sacks	0.10	38	Argentina	20	Used as a carbonate mineral (e.g. calcite ($CaCO_3$), dolomite ($CaMg(CO_{3)2})$, etc) depressant. This is an organic material of vegetable origin.
Dextrine (or starch)	powder in paper sacks	0.70	263	Canada	10	Used as a depressant for barite ($BaSO_4$) and some carbonate minerals.
Oleic acid	bulk liquid?	0.35	131	Canada	20	Used as a collector for fluorspar.
Emulsifier	liquid in plastic drums	0.03	11	UK	5	Used to aid in emulsification of oleic acid in winter.
Sulphuric Acid	liquid in plastic drums	1.60	600	Canada	10	Only used if pH adjustment of tailings is required, as determined by metallurgical testwork. To be used ahead ahead of flocculant addition.
Poly-electrolyte Flocculant	powder in plastic sacks	0.04	15	USA	2	Used to promote settling of tailings in the storage facility. May also be added, when needed, to supernatant to promote further settling in the polishing pond.
Defoaming Agent	liquid in steel drums	0.03	11	USA	5	Added to the sulphide concentrate launder (to alter the mineral surface tension properties) ahead of any gravity concentration process. A typical reagent would be Texofor D4 hydrophilic anti-foaming surfactant.

5.1.4.5 Dewatering

Thickening

Concentrate which leaves the final fluorspar cleaner cell does so accompanied by water which may be as much as 75% of the total volume. To further concentrate the solids, the pulp will be pumped to a large diameter holding tank called a thickener. Due to the large volume of the tank compared to the small stream of pulp entering it, quiescent settling is gained. Solids fall to the tank bottom where they are transported to a lower central outlet by slowly revolving rakes. The clarified water meanwhile overflows a lip at the surface and is discharged to the tailings pump box and so to the TMF. The solids content of the pulp raked to the center of the thickener has now increased from about 25% to 65% solids by weight and is pumped to a filter.

Filtration

Further water removal is needed to render a transportable and saleable product. This is accomplished by vacuum filtration. The equipment consists of a hollow drum, covered by a fine cloth, slowly rotating in a bath of constantly agitated pulp. Panels under the cloth are evacuated causing pulp to be sucked onto the surface where the solids remain while water is drawn through. This water is passed to the tailings pump box. As the panels rise from the bath the attached solids, still under vacuum, begin to dry. Eventually the panels return to the bath but just prior to doing so the vacuum is replaced by compression. This causes the solid cake to become detached and fall over a knife-edge into a transfer chute from which it is conveyed over a belt scale, to stock at about 10% moisture.

Slurry Transport to Wharf

This option has been studied. It is the company's intention to pump the fluorspar concentrate slurry from the mill approximately ¾ km to a thickening and filtration section adjacent to the storage building at the wharf site.

The pulp will leave the cells at approximately:

Dry weight:	15 tph
% Solids:	45
SG Solids:	3.18

Water:	18.5 cu m/hr
Slurry:	23 cu m/hr
Slurry SG:	1.45

The slurry will be pumped from a holding tank at mill via a 150 or 200 mm pipeline to an 18 m diameter thickener adjacent to the storage building at the wharf site. The underflow will be pumped to a drum vacuum filter of approximately 2.5m diameter by 3.6m long. Concentrate will leave the filter at between 8 and 10% moisture via a conveyor leading to a tripper conveyor in the storage building. Filtrate (liquid) from the filter will be returned to the thickener. The thickener overflow will be pumped approximately ¾ km back to the mill through a 100 mm (Ray to calculate?) pipeline to be either recycled within the mill or sent directly to the TMF.

All pipelines will be sufficiently buried and the thickener, filter, and conveyor will be fully enclosed to prevent freezing in winter.

5.1.5 Tailings Impoundment Area

A number of alternatives have been considered and evaluated for the proposed Tailings Management Facility (TMF), as shown in detail in Section 5.4. The following section describes the preferred option, namely the Shoal Cove Pond area.

Throughout its estimated 20-year project life, the mines will produce an estimated total of 2.04 million tonnes of AG concentrate (at > 97.5% CaF_2) and 1.5 million tonnes of high quality construction aggregate from 5.04 million tonnes of ore[3]. An estimated 2.0 million tonnes of flotation tailings would be generated during this period.

Canada Fluorspar (NL) Inc. proposes to construct an engineered TMF within Shoal Cove Pond, a body of water whose poor quality reflects historic mining activity. As mentioned in previous sections, during the last century[4], the St. Lawrence Corporation used this pond as a lagoon for its tailings, and at one point, these tailings occupied most of the pond's area (see Figure 4.2-1 and 4.2-2). Although it never disposed of its tailings directly into the pond, Minworth constructed a hillside TMF at the head of Shoal Cove Pond, and filled it to capacity in less than 4 years. The effluent from this facility continues to flow directly into Shoal Cove Pond.

[3] Run-of-Mine ore averaging between 40 - 50% grade CaF_2.
[4] From the mid-1930s until 1957.

The pond's water quality has reported levels of fluoride and lead that are high (i.e. above Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, 2009), and the predominantly silty substrate may give rise to elevated levels of suspended sediment in the water column. This water flows, uncontrolled, through Shoal Cove Brook and discharges into the receiving marine environment of Shoal Cove.

A survey undertaken in the 1990's reported a high length to weight ratio for the pond's fish, suggesting that the aquatic ecosystem is currently in a stressed state relative to other freshwater bodies of the area. It is unknown to what extent the old tailings contribute to elevated concentrations of F and Pb in the pond's water, as there are outcropping veins of fluorspar with trace levels of associated sulphides within the Shoal Cove Pond watershed, and these natural sources may also be contributing to the existing background levels. Recent surveys by CFI (AMEC 2009) confirmed the above (see sections 6.1.1 and 6.1.2).

To help address these environmental issues, the proposed TMF will include two cells separated by two retaining structures (Figure 5.1-15). Cell 1 will be retained by a Separator Berm and Cell 2 will be retained by the Tailings Dam. Cell 1 will act as the initial receiver for tailings for the first 3.5 yrs of operation. Flotation tailings will be flocculated, possibly adjusted for pH. The Separator Berm which is a pervious rockfill structure will retain the tailings solids but allow the surface and porewater to report to Cell 2. Cell 2 will act as a settling pond during the first 3.5 years of operation. The Tailings Dam will be constructed as a low permeability structure. All runoff will be discharged through a concrete spillway at the abutment of the Tailings Dam. Prior to tailings deposition in Cell 2, a polishing pond will be constructed downstream of the Tailings Dam (Figures 5.1-16 and 5.1-17).

Water quality monitoring/treatment stations will be included in the final design. This engineered TMF will introduce a new level of environmental control to ensure that all effluent discharging to the receiving environment is of acceptable quality.

A gravel road to the east of Shoal Cove Pond will be re-routed because the water level in the pond will rise and inundate the road (Figure 5.1-8)

In order to compensate for the loss of fish habitat in Shoal Cove Pond, BML (now CFI) previously entered into a freshwater fish habitat compensation agreement with the Federal government (DFO) in 1997. Through recent discussions with DFO (December 2008 – March

2009), it has been determined that this previously signed agreement is still in effect, provided that there are no significant changes to the proposed undertaking. See Section 6.1.2 for further details on Freshwater Fish Habitat Compensation associated with this project.

5.1.5.1 Materials Take-off

The definitions of the required earthwork, rockfill, and other construction materials, and estimated quantities of earthwork, rock, rockfill, geotextile, concrete, etc. (i.e., materials take-off) are provided in the following tables (Table 5.1-2 and 5.1-3)

Table 5.1-2: Description of Materials Take-off Measurement

TAILINGS MANAGEMENT FACILITY
DESCRIPTION OF UNIT PRICE MEASUREMENT

Item No.	Description	Basis of Calculation
1	**Topsoil Stripping** - Remove topsoil from within the toe limits of the tailings dam, and access road areas, and transport, dump and spread in the designated stockpile area.	Per m^3 measured according to neat lines shown on drawings
2	**Earth Excavation** - Excavate native earth material (till) from the access road, tailings dam and cutoff trench, and borrow areas, and transport, dump and spread in the designated stockpile or construction area.	Per m^3 measured according to neat lines shown on drawings
3	**Fill Material Type 1 - Glacial Till** - Spread and compact type 1 material for the tailings starter dam from borrow areas. This item also includes remove all remaining disturbed soils after earth excavation, and regrade and recompact base in preparation for fill placement and shaping and trimming to design lines.	Per m^3 measured compacted in place according to neat lines shown on drawings
4	**Fill Material Type 2 - Filter Sand and Gravel**- Load, haul, dump and place type 2 material in the tailings starter dam from the sand and gravel source to be defined. This item also includes moisture conditioning and compaction.	Per m^3 measured compacted in place according to neat lines shown on drawings
5	**Fill Material Type 3 - Fine Rock fill** - Load, haul, dump and spread type 3 material for the separator starter berm from the fine rock fill source to be defined. This item also includes shaping and trimming to design lines.	Per m^3 measured compacted in place according to neat lines shown on drawings
6	**Fill Material Type 4 - Quarry Rock fill** - Load, haul, dump and spread type 4 material for the separator starter berm from the rock fill source to be defined. This item also includes shaping and trimming to design lines.	Per m^3 measured compacted in place according to neat lines shown on drawings

TAILINGS MANAGEMENT FACILITY
DESCRIPTION OF UNIT PRICE MEASUREMENT

Item No.	Description	Basis of Calculation
7	**Fill Material Type 5 - Road Topping** - Load, haul, dump and spread type 5 material for the access road from the source to be defined. This item also includes remove all remaining disturbed soils after earth excavation, and regrade and recompact the base in preparation for fill placement, shaping and trimming to design lines and moisture, conditioning and compaction.	Per m^3 measured compacted in place according to neat lines shown on drawings
8	**Fill Material Type 6 - Rip Rap** - Load, haul, dump and spread type 6 material on the Tailings starter dam upstream slope and spillway from the source to be defined. This item also includes shaping and trimming to design lines.	Per m^3 measured compacted in place according to neat lines shown on drawings
9	**Survey Monuments** - Fabricate, transport and install survey monuments along the starter dams crests including weekly readings and reporting during construction.	Each for survey monuments as identified on the drawings
11	**Geotextile** - Supply and install HDPE 1 mm on the prepared tailings starter dam slopes.	Per m^2 for area detailed on drawings
12	**Reinforced Concrete -** Supply 20 MPa concrete and steel reinforce bars for overflow spillway of tailings starter dam. This item also includes bars placement, concrete pouring, forms and strip.	Per m^3 measured according to neat lines shown on drawings
13	**Cofferdam** - Supply and construct an embankment cofferdam to allow water to be displaced during tailings starter dam construction. This item also includes permanent water pumping system to keep dry the area during works.	Lump Sum
14	**Temporary Diversion Dewatering** - Supply, construct, install and maintain all temporary dewatering control measures, where required.	Lump Sum

Table 5.1-3: List of Unit and Lump Sum Quantities

Item No.	Directs	Areas	Unit	Total
1	Topsoil Stripping	Access road and Cell 2 dam	m^2	30,000.00
2	Earth Excavation	Access road and Cell 2 dam	m^3	17,000.00
3	Fill Material Type 1 - Glacial Till	Cell 2 dam	m^3	11,000.00
4	Fill Material Type 2 - Filter Sand Gravel	Cell 2 dam	m^3	150.00
5	Fill Material Type 3 - Fine Rock fill	Cell 1 dam	m^3	7,000.00
6	Fill Material Type 4 - Quarry Rock fill	Cell 1 dam	m^3	57,000.00
7	Fill Material Type 5 - Road Topping	Access road	m^3	2,500.00
8	Fill Material Type 6 - Rip Rap	Cell 2 dam	m^3	2,000.00
9	Survey Monuments	Cell 1 dam	each	20.00
10	Anchor Trenches	Cell 2 dam	m	350.00
11	Geotextile	Cell 2 dam	m^2	8,000.00
12	Reinforced Concrete	Cell 2 dam	m^3	50.00
13	Cofferdam	Cell 2 dam	L.S	1.00
14	Temporary Diversion Dewatering	Cell 1 and Cell 2 dams	L.S	1.00

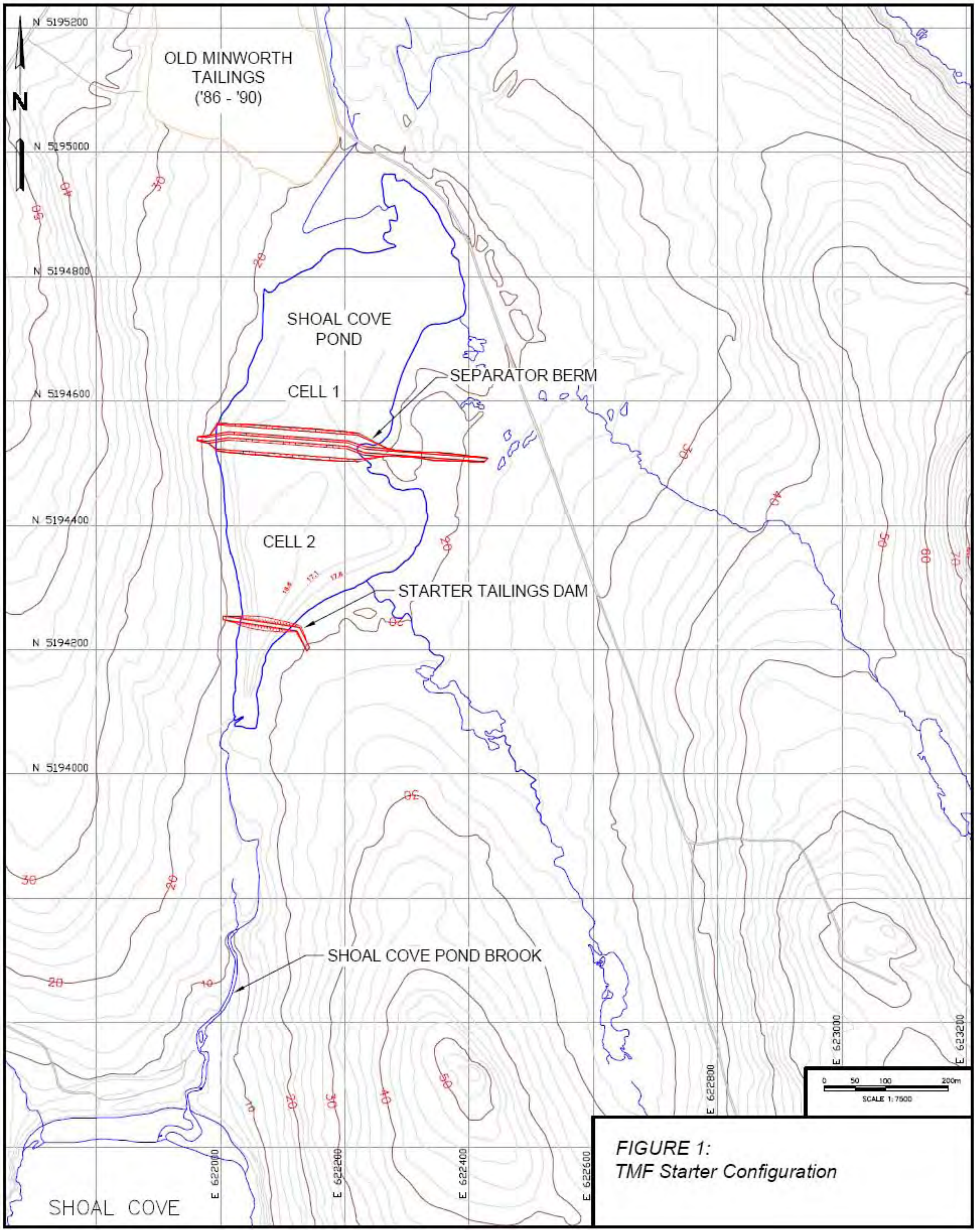
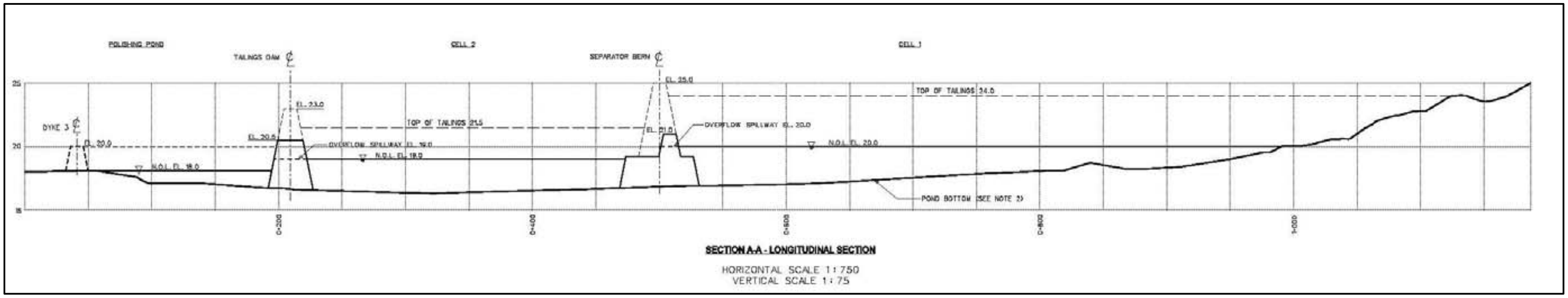


Figure 5.1-15: Shoal Cove Tailings Management Facility Layout



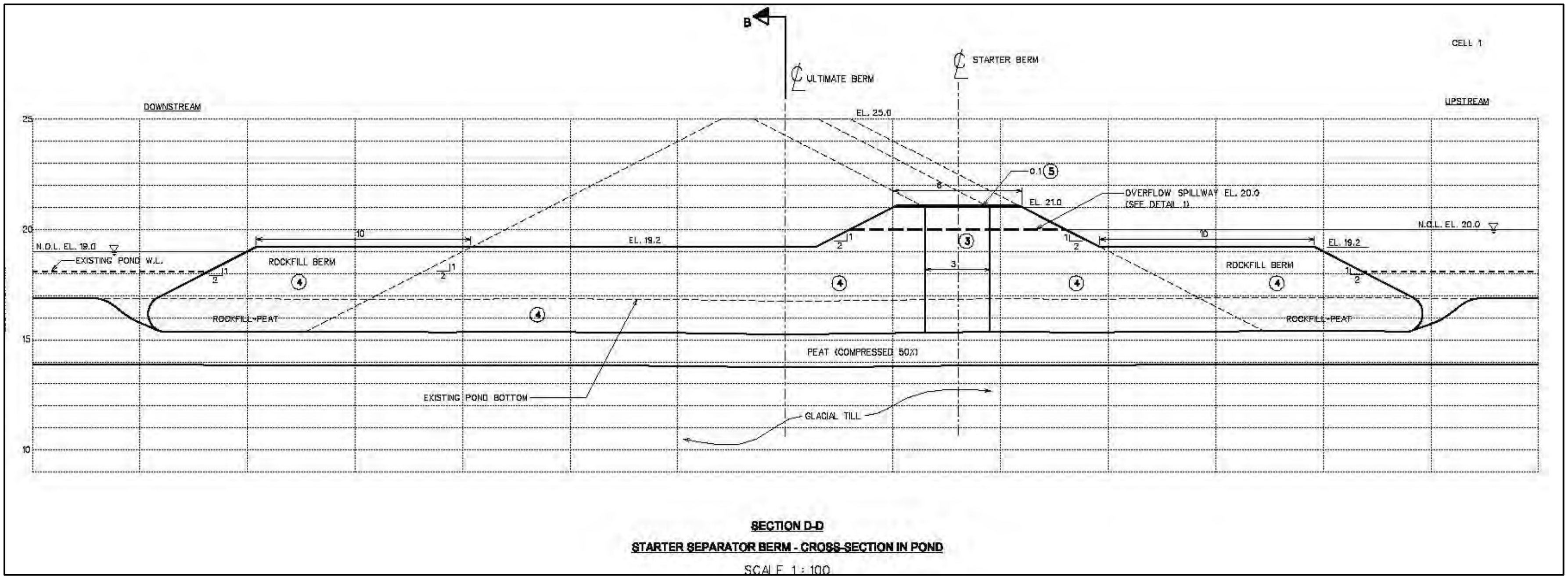


Figure 5.1-16: Tailings Management Facility – Cross Section Details

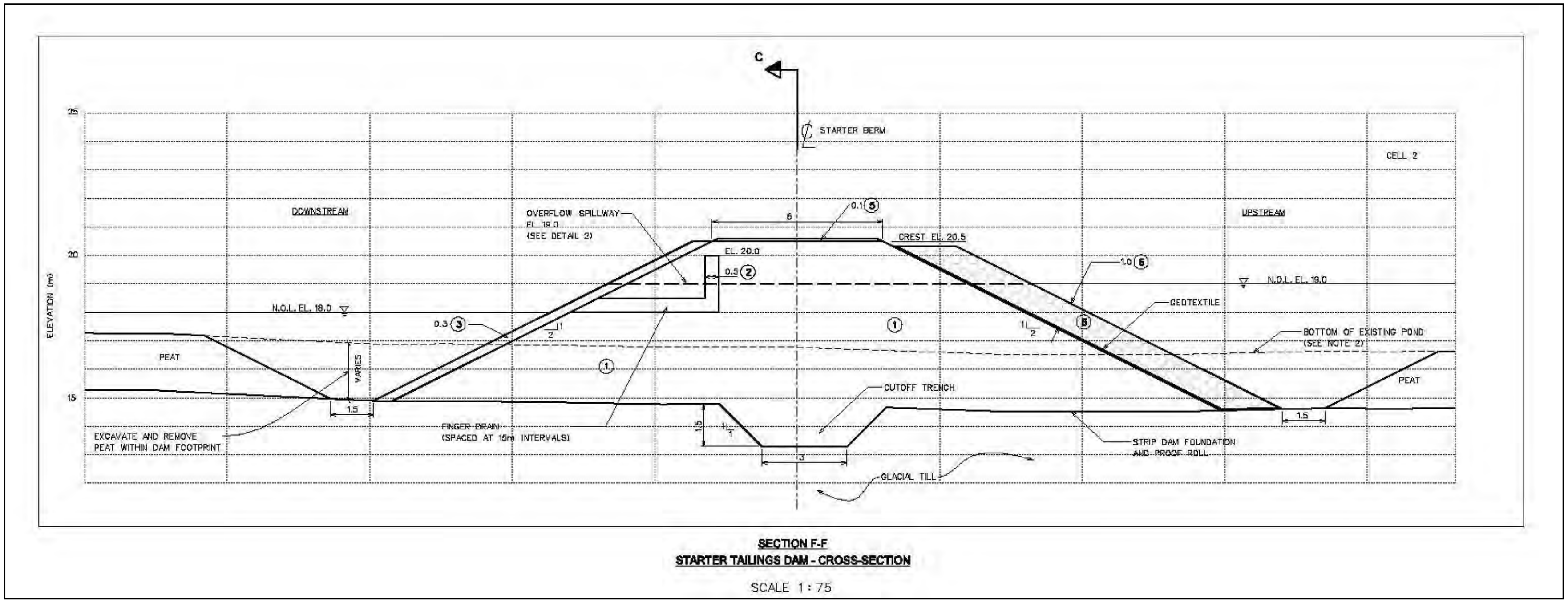


Figure 5.1-17: Tailings Management Facility – Dam Cross Section Details

5.1.6 Marine Terminal and Associated Infrastructure

5.1.6.1 Marine Facilities

Based on current project plans, the proposed marine terminal will be located in an area known as Blue Beach (46^{o} 54.0' 11.96" N, 55^{o} 23.0' 2.08" W). Although the main function of the wharf will be for the export of AG fluorspar concentrate (also referred to as flitercake), it will also be able to receive general cargo associated with mining operations. The port will be used in all seasons and thus all equipment will be suitable for cold weather operations. The Blue Beach site picture is shown below.

Figure 5.1-18: Blue Beach Cove

The facility will be designed for an initial operating period of 25 years. National and international standards will be incorporated into the design and all applicable federal and provincial regulations will be adhered to. The core principles governing the operation of the facility will be safety, environmental protection and efficiency.

The marine facilities will consist of an approach causeway, wharf, marine and shiploading topside equipment. A working/laydown area will be incorporated into the wharf structure directly behind the berth face. The general marine terminal site location plan showing the access/ore transfer road, concentrate storage and marine facilities are shown in Figure 5.1-9 in a previous section. Figure 5.1-19 provides detailed drawings of the site layout and cross-sections of the proposed marine structures.

The wharf structure is likely to be constructed as an "L"-shaped (or 'hockey-stick') structure to take advantage of the existing water depths to accommodate the berthing of the design ship (up to 65,000 DWT vessels) without the need for dredging. The wharf will be orientated and designed to accommodate an additional side berth if this requirement is determined to be a feasible option for supporting other users. Specifics of the construction sequencing will be established in the detailed design phase.

A 180 m long rock filled causeway will join the wharf with the onshore portion of the facility. The berth face of the wharf will be located approximately 300 m from the shoreline in close proximity to the 15 m depth contour. Two design options have been considered, and evaluated. The first option may consist of five (5) rock-filled, 19.2 m diameter, steel sheet pile cells interconnected by steel sheet pile arcs for an overall wharf length of 126.3 m. The second option is a concrete caisson which has also been considered (same length and water depth). These options will be further reviewed during the detailed design, however, the preliminary analysis have shown the caisson option as the preferred option (Figure 5.1-19 & 5.1-20). Both structural options will occupy similar footprints. The wharf deck elevation will be +5.0 m above low normal tide (LNT).

Bollards will be equally spaced along the wharf face for breasting and spring lines. The wharf will be outfitted with the usual arrangement of marine hardware including fenders, ladders, lighting and power supply, fire protection and environmental emergency response equipment. Minimum water depths at the berth face will be will be 14.5 m. The wharf will be capable of handling vessels from 10,000 DWT to 65,000 DWT.

Navigation aids will be provided as per Department of Fisheries and Oceans and Transport Canada, Canadian Coast Guard requirements.

5.1.6.2 Onshore Facilities

The onshore portion of the marine terminal will consist of a storage/laydown area, fluorspar concentrate storage building, access roadways and conveyor or slurry pipe right of way. If the slurry pipe option is selected, the thickening and filtration (i.e., Fluorspar slurry dewatering) process will be carried out at the marine terminal in a building adjacent to the concentrate storage building, which will feed directly to the concentrate storage via belt conveyor.

The fluorspar concentrate storage building will be a stick-built conventional steel frame, metal clad structure. The building will be approximately 180 m long x 40 m wide. The building will be outfitted with various materials handling equipment such as a tripper conveyor, mobile equipment, reclaimer, reclaim hoppers and shiploader feed conveyors.

During the study execution the feasibility of locating the storage building at the mill site and/or the location of the thickening/filtering process at the port are being examined.

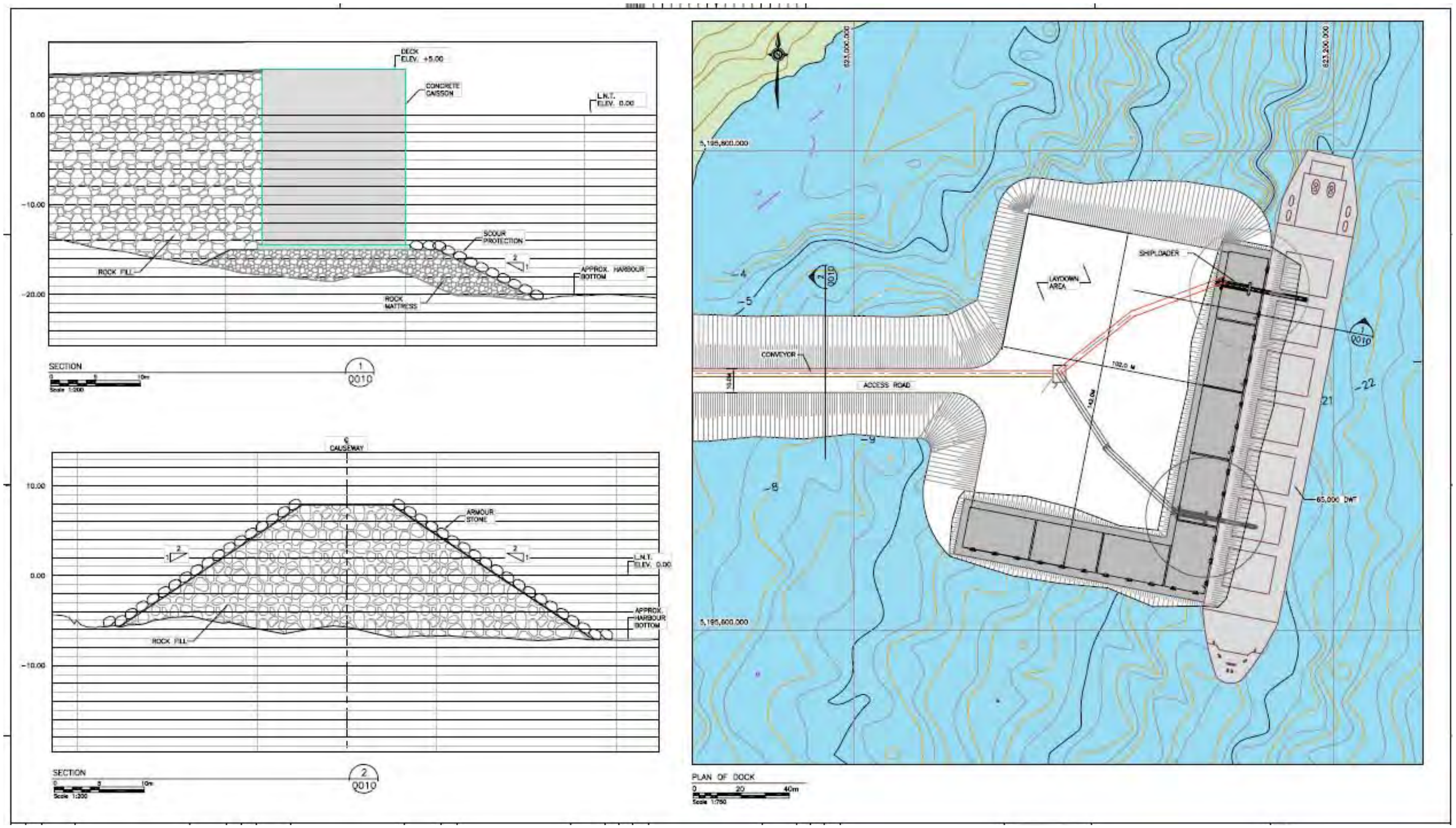


Figure 5.1-19: Marine Terminal Layout and Cross-Sections Details

5.2 PROJECT PHASES: CONSTRUCTION, OPERATIONS & CLOSURE

The estimated Project schedule and activities timeline are presented previously in Section 4.6. The construction is expected to start in the spring of 2010 (once the site is clear of snow) and will continue until the fall of 2011. As stated in the previous section, the Blue Beach North Mine and the Tarefare Mine pre-production is estimated to take 22 to 24 months, respectively, with the first ore expected in early April 2012.

The mine operation is estimated to last for a period between 15 to 20 years depending on the ore reserve and production rate.

The following sections describe in detail the project activities and timeline during each phase of the project.

5.2.1 Pre-Construction

In 2008, over 18,000 m of drilling was conducted to firm up fluorspar resources in the Tarefare and BBN mines. In November of the same year, work on the environmental assessment began. This work also included several studies to support the EA process, including a Historic Resources Impact Assessment, freshwater quality assessment, and marine and freshwater habitat assessments, geotechnical investigations, metallurgical tastings, open houses and public consultations, and preliminary engineering design.

Also late in 2008 the engineering feasibility study was commenced. This study is still in progress and is expected to be completed shortly after submission of the EA document.

These are described in respective sections of the report.

5.2.2 Construction

5.2.2.1 Construction Activities & Timelines

Provided all environmental approvals have been obtained, construction of the marine terminal will likely begin in the spring of 2010 and continue until late in the fall of the following year.

Pre-construction activities will commence immediately upon receipt of the environmental approvals and necessary permits. Clearing and grubbing of the access road and site would begin as soon as possible. Other early site preparation activities include levelling/infilling and installation of temporary offices with associated services (power, potable water cooler/storage systems, and temporary sanitary facilities) will commence as soon as the access road is completed sufficiently for equipment and personnel to access the site.

Construction of all required support buildings on site will begin during the summer of 2010. Buildings will be enclosed before the fall of 2010 to ensure further work (i.e.: electrical, mechanical) can continue through the fall and winter, and be completed by mid-2011.

Work to develop the mineshafts will begin immediately following environmental approval, given that approximately 24 months will be required to upgrade the Tarefare mine shaft and start the pre-production. Blue Beach North will require approximately 22 months for pre-production work.

Construction activities on-site will be generally broken down into five components:

1. Mine development which will be on the critical path and will start as soon as possible after permits are available;
2. Mill refurbishment, expansion and upgrades;
3. Tailings Management Facility at Shoal Cove Pond and adjoining areas include construction of three earth-filled dams;
4. Construction of the new deep-water marine terminal and associated infrastructure;
5. General site infrastructure including access roads, power lines and substations, domestic water supply, domestic sewage system, new main office building, and the following:
    - Clearing, grubbing, and levelling on the project site where necessary;
    - Construction of support buildings and on-shore laydown areas;
    - Development of roads within the project area (such as between the mill site and marine terminal area);

- Installation of temporary offices with associated services (potable water, washroom services, etc).

In general, the Construction Activities will cover the following main project areas:

Mine Development

As described in previous section (5.1.3), the mine development during construction will essentially involve re-opening of the Tarefare and Blue Beach North mines, mine shafts, drilling and blasting, and dewatering, etc.

Mill Refurbishment and Upgrades

Section 5.1.4 described the various activities related to the mill site construction activities, including access road from the mines to the plant, additional buildings and utilities. It also described the planned mill refurbishing/expansion, etc.

Tailings Management Facility

A detailed description of the proposed tailings management facilities is provided in section 5.1.4.

The tailings disposal and impoundment area (starter configuration) will consist of a pervious separator berm and an impervious tailings dam. About 47,000 m3 of earth excavation will be needed to construct these. It is envisaged that the aggregate and rock fill needed for these structures will be derived from one or two quarries developed nearby on the Project site. Approximately 64,000 m3 of rock fill will be required for the separator berm, and over 13,000 m3 of glacial till, filter sand gravel, and rip rap will be needed for the tailings dam.

Marine Terminal

Section 5.1.6 provides detailed description of the proposed marine terminal structure and associated facilities.

The construction and operation of the marine terminal will be in accordance with the EPP for construction and operation and other relevant acts, regulations and permits. No dredging or underwater blasting will be required. Silt control will be in place to prevent sediments from entering marine waters. See below for more details.

General Site Infrastructure

See sections 5.1.2 and 5.1.3 and 5.11.4 for description of site infrastructures.

5.2.2.2 Description of Activities

General Construction Practices

Well established, approved construction methods and practices will be used throughout the construction phase. Before any work commences, construction methodologies will be developed specific to the activities being undertaken. These will focus on reducing/eliminating the risk of negative impacts to the environment. An Environmental Protection Plan (EPP) for construction will be developed prior to the start of construction. This document will describe these methodologies and "EPP notations" will be included on construction drawings, highlighting important mitigation measures for various construction activities (i.e. buffer zones, stream crossings, etc.). EPP notations provide a vital link between the EPP and construction documents, and helps ensure proper procedures are met during construction.

During construction, excavated surfaces that are at risk of erosion will be protected by using adequate slopes and diverting surface runoff. After precipitation events, slopes will be inspected and corrective measures will be taken to prevent soil transport to other areas, in particular silt/clay particle transport to nearby water bodies. Slopes for finished-grade surfaces will be in accordance with engineering recommendations and will be surface-finished to provide long-term stability.

Mine dewatering and mine water discharge will be undertaken in accordance with approved practices and with the objective of reducing/eliminating effects on nearby surface water bodies. Protective measures such as the use of silt screens and settling ponds will be considered to prevent siltation of natural water bodies.

Storm water runoff will be diverted away from work sites by using perimeter ditching to redirect the flow. Velocity controls such as check dams will be used to assist in the removal of sediment mobilized by drainage water. Diverted runoff will be directed to settling ponds to promote settling of particles and clarification of water prior to discharge into the receiving environment, in compliance with all applicable regulations.

Dust generated during construction will be controlled by water spraying, wind breaks, spray-on adhesives and vegetative coverings. Chemical-based solutions, such as calcium chloride, may not be used.

Structures, tanks, and process equipment that impose heavy loads or produce unusual vibratory or dynamic loadings will be supported by adequately engineered foundations. Conventional shallow foundations and footings will be designed and constructed for other non-critical structures.

To protect watercourses and water bodies around the project site, concrete will be prevented from contact with the water until it has adequately cured. No tools or equipment used in the production or placement of concrete will be washed in or adjacent to natural water bodies. Formwork and procedures for concrete placement will be such that they will prevent spillage into any water body. Water course crossings (by bridge or culvert) will be in accordance with permit requirements. Fish bearing streams will be crossed in accordance with DFO guidelines and standards.

During the construction period, all activities will comply with the Construction EPP. All contractors will be required to provide Environment, Health and Safety advisors at the site to ensure that project activities are conducted in accordance with the EPP and Health & Safety Plan. All required permits from regulatory agencies will be obtained prior to the start of any construction. Emergency response to oil or chemical spills and clean up will be in accordance with the Emergency Response Plan (ERP) approved of by DOEC.

Site Preparation

Following release from the environmental assessment process, and once all the required government permits have been received, the construction team will mobilize, establish a presence at site and begin constructing access roads. An existing building will be retained and will serve as headquarters for the construction management team. Mobile offices will be added as the team grows, if required. As part of the earthworks, space near the proposed tailings facility and at Blue Beach will be levelled to provide laydown areas for the staging and storage of construction-related equipment and material. Access to the underground mine at BBN or Tarefare, whichever is to be developed first, will be opened and new infrastructure provided to allow mine development to begin.

Pre-Stripping

Grubbing of the organic vegetation mat and/or the upper soil horizons, although they will be kept to a minimum, will be necessary in some areas within the Project footprint. Erosion control techniques and devices will be used to stabilize easily eroded areas. Topsoil and excavated overburden will be stored in separate stockpiles for later use. Any unsuitable material will be placed in an approved stockpile area. Runoff of sediment-laden water during grubbing will be minimized by using measures such as settling ponds, ditch blocks, interception ditches and filter fabrics. Erosion control measures such as rip-rap, filter fabrics, drainage channels, and gravel or wood chip mulches will be implemented in areas prone to soil loss.

Construction Accommodations

There will be no requirement for construction accommodations as all workers involved during the construction phase will travel daily from their homes in nearby communities.

Borrow Pits and Quarries

Engineered fill required for various Project components will originate partly from cut/fill operations. Crushers will be used to crush the excavated rock into required dimensions. Supplemental granular material for road construction or concrete production will be obtained from existing quarries in the project area and/or those that may be developed on site. Blast rock generated during mine development may be used to support development of various Project components, including the marine terminal structures.

Stockpiling of all aggregate and rock fill will be in approved locations with provision for control of silt laden run-off water.

Buildings

Buildings will be constructed for a variety of purposes, including material storage and preparation, milling/ore processing, mine related structures, offices, warehouses, workshops, security, etc. The general arrangement of buildings is shown in Figures 5.1-1 to 5.1-9.

Lighting

All buildings will include proper perimeter lighting. Exterior lighting will be timer- or photocell-controlled. Lighting will also be provided at doorways and overhead doors. Street lighting will be provided along the main access road to the office/mill site as well as the marine terminal, but not to the Tarefare and BBN mine sites and TMF. Lighting will illuminate the marine terminal to allow for safe operation of vessels, passage of crew and company personnel, and ship loading operations, in accordance with Transport Canada regulations and standards. The marine terminal will use high mast poles and lighting covering the entire area.

Marshalling and Equipment Storage Areas

Given the relatively small scale of the construction operations associated with this Project, there will not be the need to use large equipment lay down areas during construction. Areas disturbed by previous operations will be used as much as possible. Marshalling and lay down areas will be at least 30 m from any water body. Vehicles and equipment will follow established routes to these. The site for equipment marshalling will be located to minimize potential traffic hazards and ensure that incoming and outgoing vehicles can merge safely.

Power Supply

There will be no new power plants required for this Project: all power will be provided by Nalcor Energy's system, and new substations will be built at Tarefare and BBN to avail of this through proposed electrical transmission lines linking into Nalcor Energy's grid. The office/mill site currently has a substation from previous operations that will be used for the new facilities in the area. Backup diesel generators will be provided for various Project components.

Waste Management

All domestic solid waste will be collected, properly stored, removed and disposed of in the approved waste disposal site that services the community. The Project site and working area will be kept clean of all debris and garbage. Materials such as paper, cardboard, wood, scrap steel and metal, and tires will be collected and offered for recycling. All materials not recycled will be disposed of in an approved facility, with permission of the facility operator. Waste accumulated on site prior to disposal will be placed in a secured location, and construction and demolition debris will be covered to prevent blowing dust and debris.

Stream Crossings

Stream crossings will generally be across existing roadways with existing culverts and bridges. New stream crossings may be required when constructing new access roads and Project infrastructure. All such stream crossings will be constructed in accordance with the procedures outlined in the Environmental Protection Plan and will meet requirements of the Department of Environment and Conservation, the Department of Fisheries and Oceans and Transport Canada pursuant to the Navigable Waters Protection Act.

Electrical power lines for the project site will be accessed for construction wherever possible from access roads and service roads. Where this is not practical, watercourses may be forded for temporary access only for pole and cable installation. The immediate area will be stabilized by the use of brush mats, corduroy, or coarse clean gravel fill. When fording any watercourse, the Environmental Guidelines for Fording as published by the Newfoundland and Labrador Department of Environment and Conservation, Water Resources Division, will be applied.

Water Body Alterations

Shoal Cove Pond will be impacted by construction, and will be effectively incorporated as part of the Tailings Management Facility. The fish in this water body will be removed prior to the start of any construction and relocated into another habitat within the same watershed. Work will then proceed by end dumping rock fill into one side of the pond to construct the separation berm, and then proceed in this fashion until the structure is completed. Coffer dams will be required around the downstream impervious tailings dam to allow construction in the dry. Appropriate control measures will be put in place to ensure silt sized particles are removed from the water column before discharge to the upstream reaches of Shoal Cove Pond Brook. Unusable material from the tailings dam footprint will be excavated and removed to the USM waste site previously described. Construction of the tailings dam will then proceed

Temporary Sewage Facilities

Sewage generated during site preparation and construction will be collected and transported off-site for treatment and disposal. Portable washrooms and toilets will be used on-site until permanent facilities are completed. Permanent sewage systems will be installed and maintained to prevent the release of hazardous substances, pathogens and excess nutrients to the environment. All sewage and other wastewaters will be adequately treated prior to release to the environment.

Sewage will be managed in accordance with all applicable legislation and guidelines throughout all phases of the project. All sewage facilities will be designed, constructed and operated following the Provincial Guidelines for the Design, Construction and Operation of Water and Sewerage Systems (2005). Facilities will be permitted as required by Section 38 of the Water Resources Act. Discharge effluent from the Project works will be in accordance with the requirements of the *Environmental Control Water and Sewage Regulations* of the *Water Resources Act.*

Storm-Water Management

Storm-water of affected areas within the Project boundaries will be directed towards containment/settling ponds and treated as necessary prior to discharge; storm water outside the boundaries will be diverted away from the work site. During construction, focus will be to minimize and control the release of sediment-laden water to natural water bodies. Such water will be controlled through the use of filtration, erosion control devices, settling ponds, straw bales, geotextiles or other devices. The construction of storm-water management control facilities such as sedimentation ponds, site drainage ditches, and diversion structures and channels will be completed prior to site grading and pre-stripping.

Hazardous Materials Management

All contractors will be required to observe strict compliance with the requirements of Workplace Hazardous Materials Information System (WHMIS) Regulations regarding employee training, use, handling, storage, disposal, labeling, and provision of Material Safety Data Sheets (MSDS), which will be required on delivery of materials. Transportation, storage, and use of hazardous materials will be conducted in compliance with government regulations. Hazardous materials will be packaged and shipped in strict compliance with regulations. All vehicles entering the site will be inspected at the gate to ensure that appropriate placards are in place and the security of the product is assured. All drivers will be required to show proof of certification.

Fuel Management

Transportation, storage and use of fuels at the construction site will be conducted in compliance with all relevant laws and regulations. Before transporting or storing fuel at the project site, contracted fuel suppliers will be required to provide a copy of a fuel spill contingency plan acceptable to CFI. Contractors are required to ensure that fuel and other hazardous materials are handled by persons who are trained and qualified in handling these materials, in accordance with government laws and regulations, and in conformance with the construction EPP. Refueling protocols include:

- Use of leak-free containers and reinforced rip and puncture-proof hoses and nozzles;
- Use of hoses that have a design pressure rating of at least 150 per cent of the maximum head of the system;
- Attendance for the duration of the fuelling operation;
- Sealing all storage container outlets except the outlet currently in use;
- Smoking permitted in designated areas only and prohibited within 10 m of designated fuel storage areas;
- Fuel unloading facilities equipped with drip pans to collect hose drainage and drips;
- Fuel transfer lines equipped with check valves to prevent spillage;
- Fuel tanks to be self-dyked or be positioned over an impervious mat surrounded by an impervious dyke; located in areas where spills, should they occur, are least likely to flow towards water courses, water bodies, feeder streams, ditches or the ocean; fuel storage at least 100 m from any water body;

- Drums of fuel oil, if required at site, to be tightly sealed to prevent corrosion and rust; quantities on site during construction to be limited to that required for the current activity and minor equipment maintenance; and
- All storage facilities to be located away from construction activity, with secondary containment and regular inspection for compliance with regulations.

Excavation and Blasting

Excavation and blasting related to mine and site development, access roads, and site preparation for the marine terminal will be carried out over approximately 6 months period commencing in spring of 2010. In addition, this activity may be required at quarries developed on site to produce sufficient rock fill material for the earthfill/rockfill structures of the tailings management facilities.

Standard earthmoving procedures will be employed at the site (in accordance with the EPP for construction), including drilling and blasting, and mechanical excavation. A large portion of the material to be moved on the site consists of rock. There are lesser amounts of till and USM that also need to be excavated. The rock is typically hard, sound sandstone that will require blasting and mechanical impact to free it for excavation. Till and USM can be excavated using conventional mechanical means including excavators, loaders and dozers.

Except for mining operation, blasting operations are only required during the site preparation work phase of the project and will not be required for any operational phase after construction is complete. Blasting will be undertaken only by contractors licensed to do so. They will be responsible for maintaining current permitting with the regulatory agencies for the duration of construction. Explosives and auxiliary materials will be stored by the contractor as stipulated in relevant legislation (e.g., NRCan under *Explosives Act* Section 7(1)(a)), CFI OH&S standards and in compliance with the operations permit. No blasting will take place in marine area.

Blasting will be undertaken in such a manner as to make secure any elements and features, designated to remain. Over blasting will not be permitted. In order to minimize the seismic impact, blasting patterns and procedures will be used to reduce the shock wave and noise. Blasting activities will be co-ordinated and scheduled to minimize the number of blasts required per week. Time-delay blasting may be used as necessary to control the debris scatter. Prior to any blast, the site will be surveyed to identify the presence of any sensitive wildlife. Presence of such animals will result in delay or cancellation of the blast until such time that the sensitive animals are no longer present.

Contractors will be required to minimize the footprint of the excavation to the minimum required for pipe trenches.

Earth Dam Construction

Two earth-filled structures will be constructed at Shoal Cove Pond to contain the tailings and to create a clarification pond TMF). The tailings facility plan and typical cross-sections are shown in Figure 5.1-15 to 5.1-17. Cofferdams required to keep work areas dry will be required around the proposed tailings dam footprint

All overburden materials and loose bedrock will be excavated from the dam foundation areas. The rock surfaces will be completely exposed using pressure washing or scraping and minor drilling techniques. Fracture patterns within the exposed rock surface will be mapped and evaluated. Conventional cement pressure grouting methods will be used to reduce the near-surface bedrock permeability, after which the bedrock surface will be prepared for placement of granular materials. The dam will be constructed in a series of lifts using conventional zoned embankment construction methods.

Access Roads

Existing site access roads will require upgrading using Class A and Class B granular material. These roads link the office/mill site to the provincial highway system, the Tarefare and BBN mines to the mill site, and the office/mill site to Shoal Cove Pond. A new access road will also be constructed from the office/mill site to the marine terminal, and this will involve cut and fill operation with significant blasting of bedrock to accommodate this road and the proposed concentrate storage building near the proposed marine terminal. The existing and proposed access roads are shown on Figures 5.1-3 to 5.1-9.

Dry material will be moisture-conditioned or covered to prevent blowing dust. Dust control will be provided for temporary roads and construction activities, primarily by using water when required.

Fish-bearing stream crossings will be designed and constructed to allow fish passage and to preserve aquatic habitat. All culvert installations will be sized to meet design flood conditions.

Transport of Workers and Equipment (vehicles and hours of operation)

Vehicles and equipment will follow established routes when traveling to or from the site. All entrances and exits will be designed so that incoming and outgoing vehicles may merge safely with other traffic, and oversized modules will be provided with escorts as required. Road traffic during construction will include commuting workers and deliveries of material such as steel, concrete and a variety of consumables.

During early construction, loaders, both tracked and wheeled as required, and excavators will be used for excavating USM, topsoil, till, and granular material and loading this material into haulage trucks. Drill rigs and related blasting equipment will be used to prepare bedrock for excavation. Crushing equipment will be used to generate required grades of engineered material from excavated rock. Material transport will be accomplished using large haulage trucks, primarily 40-tonne capacity and smaller as required. Haulage trucks used at the site and for access road construction will consist mainly of off-road vehicles.

Conventional fuel transport vehicles will be used to deliver fuel from the temporary on-site storage to the vehicles and equipment at worksites throughout the project area. Fuel will be routinely delivered to site by typical truck tankers.

Upon completion of the major earthworks, process and mine equipment and tank materials will be received by road and moved throughout the project area to the appropriate locations using flatbed trailers.

Site preparation for building construction will involve the use of compaction equipment including conventional and vibratory rollers. Final site levelling, and service and access road levelling will be done using graders. Concrete trucks will be used to transport concrete for use on the project site. Cranes will be used throughout the project site for assembling project components. Cranes may be barge mounted to be used at the marine terminal site for its construction.

Service roads will be maintained throughout construction using excavators and graders. Water trucks for dust control will also be used. Construction at the site will take place in two shifts per day. Consequently, construction vehicles could be operated 24 hours a day. To minimize project-related traffic on the TCH, wherever possible the delivery of materials and equipment coming overland will be distributed over the course of the construction phase of the project. Personnel will be transported to, from and around the Project site using passenger vehicles including light-duty trucks, vans, and buses.

Vessel Traffic

Vessel traffic during construction will consist of barges and tugs for the construction of the marine terminal. All vessels will meet Transport Canada regulations and standards, under the Canada Shipping Act, as well as international regulations established by the International Maritime Organization (IMO). Barges will be inspected and approved for use by a recognized classification society such as DNV, Lloyds or ABS. The project will retain the services of a Marine Warranty surveyor to verify that transportation procedures that are put into place for safe vessel operation and transportation of goods and materials to site are followed. Sea fastening of cargo will be designed to meet all requirements and follow recommended practice.

Removal of Temporary Operations

Temporary facilities required for construction will be removed upon the completion of the Project. Portable trailers for office space and for use by workers for shelter and dining will be removed from service and relocated by contractors for reuse at other project sites. Portable water supply equipment and portable sanitary toilets will be removed from service and relocated to other project sites by the respective contractors.

Temporary oil and fuel storage tanks will be decommissioned and relocated for use at other project sites. All product and vapours will be removed from the storage tanks, which will then be dismantled and removed from site by the supplier/contractor. Any contaminated material under or around the tanks will be excavated and removed for treatment and disposal. The site will then be returned to a condition acceptable to the Department of Environment and Conservation. This will be done in accordance with the Storage and Handling of Gasoline and Associated Products Regulations under the provincial Environmental Protection Act.

All construction equipment will be demobilized and removed from site by the respective contractors for storage or reuse on other projects.

Progressive Rehabilitation and Monitoring

Final grading will be undertaken immediately after completion of an activity rather than at the end of construction. As soon as possible following construction activities, CFI's Environment, Health and Safety coordinator will identify areas requiring planting or seeding for re-vegetation, these will include areas adjacent to watercourses where erodible soil has been exposed, and where mechanical stabilization techniques are not judged sufficient to guarantee stability or prevent uncontrolled introduction of sediment into watercourses. Re-vegetation will also be considered for areas adjacent to existing roads where erodible soil has been exposed. The work area will be cleaned up at the end of the construction phase according to applicable standards and regulations, so that any effects will be within acceptable limits. This will include proper disposal and/or recycling of all surplus construction materials.

5.2.2.3 Emissions, Discharges, Run-Off & Waste Management

Atmospheric Emissions

During the construction and mine development phase, air emissions will be mainly from diesel powered equipment and dust generated during site preparation and building construction.

All potential sources of air emissions will be identified and controlled through various means (e.g. engineered systems, operational and maintenance activities, and industry best practices that will form part of the Project's environmental management system) to ensure that all regulatory requirements are met. Mitigation measures will be identified during various design phases and noted in the Project's Environmental Protection Plan, which will be developed for both construction and operation. These measures may include such things as:

- Application of water or water-based dust suppressants on gravel roads;
- Use of manufacturer-recommended dust control equipment for the crushing plant;
- Closed-conveyor systems used to deliver crushed ore from the crusher building to the mill storage bin, concentrate from the mill to the storage building, and from the storage building to the shiploader and the ship. Where trucks are used to transport concentrate instead of conveyors covers will be on the trucks.

- Proper building ventilation systems, complete with appropriate filters to reduce exhaust emissions; and
- Indoor storage of fine AG concentrate to reduce dust dispersion by winds.

Greenhouse Gases (GHG)

With growing concern over climate change, CFI is committed to reducing its GHG footprint. Conceptual design of various Project components (mill, infrastructure, TMF, marine terminal, etc) is presently underway, and opportunities to reduce this footprint are being explored. Some of these include the following:

- Use of mine water for milling processes. Mine water would not have to be heated to the same extent as freshwater during winter months, thus reducing energy consumption and GHG emissions;
- A TMF centred on Shoal Cove Pond. This represents a natural topographic depression and would likely occupy far less area than a series of hillside storage areas. This alternative would leave more natural vegetation to function as a "carbon sink"; and
- Designing/constructing a marine terminal to handle 65,000 DWT vessels. Large ocean-going vessels that travel between North America and other parts of the globe typically carry ballast. A terminal such as is proposed by CFI would allow large ships to stop and replace some of their ballast with AG fluorspar concentrate, and thus increase their payload. This would reduce fuel consumption/GHG emissions associated with transporting the product to buyers, as the alternative of hiring dedicated, smaller ships would add appreciably to the cost of CFI's product and generate far more greenhouse gases per tonne of product delivered.

5.2.2.4 Environmental Protection Plan – Construction

An Environmental Protection Plan (EPP), which will be reviewed and approved by DOEC, will be finalized before all site preparation and construction activities begin. No blasting or dredging is planned within the marine environment. Mitigation measures will be developed to ensure minimal construction related impacts.

Silt curtains and other mitigation measures will be employed as necessary to ensure little or no impact on nearby water bodies. Canada Fluorspar (NL) Inc.. is familiar with DFO Fact Sheets specifying mitigation measures for construction activities such as the installation of culverts and bridge construction. Appropriate buffer zones will be respected near water bodies during site preparation and construction.

Health and Safety Plan, Emergency Response Plan (ERP), and Environmental Monitoring Plan will also be developed and approved before the start of construction. A Mine Rescue Team will be organized and properly trained in conjunction with the underground development plan. These plans are described in more details in Sections 5.7, 5.8 and 5.9.

5.2.2.5 Potential Causes of Resource Conflict

Potential interactions between the Project and the environment (both negative and positive) during construction may include those associated with:

- Fish and Fish Habitat (freshwater and marine);
- Resource Harvesting (fisheries, berry picking);
- Birds and Wildlife;
- Possible Species at Risk (if present in the general area of construction); and
- Socio-Economic Environment.

Terrestrial and Freshwater

As stated before, an EPP will be implemented during the Project's construction phase. This plan will help to mitigate negative effects that have the potential to negatively impact the environment.

As alluded to previously, impacts are expected on certain freshwater bodies. For example, the Project includes construction of a new TMF centred on Shoal Cove Pond. This facility will also affect the lower reaches of Clarke's Pond Brook. Accordingly, all requirements of the fish habitat compensation agreement will be respected by CFI to ensure affected fish habitat is properly compensated.

As was indicated by participants during public consultations (see Section 10), the area around Shoal Cove Pond is most frequently used by walkers who follow an undeveloped road/trail to the Chapeau Rouge area. This road/trail will be rerouted to replace the existing road/trail, which will be affected by the new TMF. The Cape Chapeau Rouge walking trail beginning near the top of the existing Blue Beach South road is likely to be infringed upon by a new road to the marine facility from the mill site however suitable arrangements (bypass, overpass or underpass) will be incorporated to provide an unrestricted and safe access to the Cape trail.

Currently, various people make use of the project area. Due to concerns for public safety and recognizing that the area is designated for mining, regular access to the Project site will be limited to employees during construction and operations. This impact on users (e.g. recreational berry pickers, hunters, anglers, etc) is unavoidable. However, the terrain of the surrounding St. Lawrence region offers many alternative areas to harvest berries, etc; therefore, this restriction is not expected to cause significant concern to users of the area.

The Environmental Protection Plan will also specify mitigation measures to be implemented during construction to minimize potential interactions with the environment.

Marine

During construction of the marine terminal, there may be impacts to the marine environment (fish habitat) and to the local fishery.

CFI is working closely with Fisheries and Ocean Canada to ensure that marine fish habitat is quantified and any lost habitat is properly compensated for before any construction begins.

The selected location and the design of the proposed marine infrastructures will avoid dredging or underwater rock blasting for the construction of the marine facilities.

5.2.3 Operations

5.2.3.1 Operation Activities & Timelines

The proposed mine is scheduled to be fully operational by the spring of 2012, and will continue for approximately 15 to 20 years (depending on production rate and the reserve size). This timeframe will allow mine development and construction of all support buildings, the marine terminal, TMF, and mill.

5.2.3.2 Mine Operation

Tarefare will be the first mine to be reactivated and this will be followed by Blue Beach North in the last part of the Project life. Mining will be a combination of sub level stoping and Alimak methods, as described in detail in section 5.1.3. For both methods, underground directional drilling followed by blasting using ANFO explosives will be carried out. Ore will be collected and hauled to the base of the shaft where it will be brought to surface by the mine's hoists, from where it will be transported in haul trucks or by LHD to the mill site, where it will be stockpiled for processing.

Mine water will be pumped from deep shafts in order to keep mine openings dry. The quality of this water will be monitored, and if required, treated prior to discharge at the surface into settling ponds before being released to the environment. Roughly 14,772 m3/day will be pumped from BBN during ore extraction from BBN; and 15,075 m3/day will be pumped from Tarefare and 4,488 m3/day from BBN (as process water) during mining of Tarefare.

Mine openings will be ventilated with fresh air during mining in order to minimize exposure of personnel. Stale mine air and underground vehicle emissions will be exhausted at the surface near the headframe structures.

5.2.3.3 Ore Processing

Ore will be transported by trucks or LHD from the mine to the mill site, where it will be stockpiled and fed to the crusher building, to the west of the existing mill. The crusher building will house the crusher and screening equipment. The new crusher building will be heated and have capacity for storing approximately 1,000 tonnes of ROM (run-of-mine) ore. This arrangement reduces freezing of the ore and controls high moisture content in the feed. The existing mill building will be extended to include the thickener and concentrate product storage shed.

The processing route will be crushing, screening, intermediate storage, dense media pre-concentration, grinding and froth flotation followed by concentrate thickening, filtration and storage. An intermediate product of washed gravel will be produced from the dense media separation (DMS) process. The main product will be a damp filtercake (or AG concentrate) of 97.5% calcium fluoride purity. It will be trucked or conveyed at approximately 10% moisture content, or piped as slurry, to the new wharf storage building at Blue Beach in the outer Great St. Lawrence Harbour.

Air Emissions

Depending on the location within the mill, there will be various components that produce gaseous and particulate emissions. Crushing of ore will obviously create dust. This will be filtered in a dedicated baghouse before being exhausted to the environment in conformance with all regulatory requirements.

Gaseous emissions will be generated by process water (derived underground from BBN), as well as fugitive emissions from various reagent storage reservoirs. These will be exhausted to the outside, also in conformance with all regulatory requirements.

Process Reagents

A list of the required reagents to be used in the mill is provided previously together with quantities used on an annual basis and maximum quantities stored on site at any particular time (Table 5.1.1). Storage of liquid reagents will be in approved reservoirs (tanks and/or drums). Dry chemicals will be stored in secure locations indoors, also in approved containers and within proper containment area in accordance with the relevant permits.

5.2.3.4 Water Management

Process Water

Mill process water will be pumped from deep shafts of BBN during the Project life. During initial development and mining of Tarefare, only water required for milling (about 4,488 m^3/day) will be taken from BBN. In later years when BBN is being mined, the same quantity of water will be used to feed the mill. In addition, roughly 10,300 m^3/day will be extracted from BBN to keep it dry, and this will be released to the environment after being treated, if required.

Water flow and process diagrams for the mine and mill are shown in Figures 5.1-13 and 5.1-14 (also see Section 6.1.1).

Storm Water

Storm water throughout the Project Area currently drains overland into a system of natural and man-made drainage channels into streams and ponds primarily within the Shoal Cove and Salt Cove water catchment areas, which are 5.1 and 24.7 km^2 in area, respectively.

Where mining activities and facilities are located, there will be a system of perimeter cut-off ditches to intercept and divert runoff so that impacts can be minimized or eliminated.

At various facilities, roof drainage will discharge onto the ground via splash pads or directly from eaves. Runoff from the site will be conveyed to main outlets through a combination of subsurface drainage and roadside ditches, and stored in the storm-water capture ponds for possible treatment prior to discharge to the environment.

5.2.3.5 Solid and Liquid Wastes Management

Tailings Management

Tailings from the mill will be discharged into the Shoal Cove Pond Tailings Management Facility (TMF). This will account for about 4,488 m^3/day of water mixed with solid tailings as a slurry. A flocculent will be added to the tailings stream to promote settling of solids. Water in the primary settling lagoon will report to the clarification pond where it will be monitored periodically. A flocculent will periodically be added to promote settling of solids, if/when required. Clarified water will pass over the spillway of the tailings dam into the receiving environment of Shoal Cove Pond Brook, provided that the monitoring data shows it is of acceptable quality that meets with regulatory requirements.

Sewage

New sanitary sewage systems will be constructed at the mine sites, office/mill site, and port facility in order to collect and treat sanitary wastes from site buildings. These systems will include septic tanks and leaching fields. The septic systems will be designed to handle sewage in quantities based on the projected numbers of project personnel using the various facilities.

Sewage sludge accumulating in the septic tanks will be removed periodically to an off-site landfill by an approved waste disposal contractor. The clarified liquid effluent from the septic tanks will be discharged to the septic fields for further aerobic treatment.

Solid Waste Management

Waste will be generated during all stages of the project. Potential characteristics of waste that will result from this project will be defined to generate a baseline for the design of a comprehensive Waste Management Plan. Legislation from the Provincial and Federal governments will establish the range of feasible management alternatives for anticipated waste streams. At all stages, waste management alternatives will be considered with a view to minimizing the waste generated by project activities. As the design process progresses, a detailed waste management plan will be established from feasible waste management alternatives.

5.2.3.6 Transportation

The Project will generate transport of goods, materials, products, and personnel by road or marine vessel during operations. This is described further below.

Road Transportation

Road traffic can be categorized as commuters, internal traffic and materials/supplies. Given the continuous nature of operations, site workers, contractors and visitors will create a moderate vehicular traffic into the site and within the project area. Internal traffic will include haul trucks and LHD that will haul ore from the mine sites to the mill. In addition, small trucks and rubber-tired machinery such as forklifts will be used at the mill. Underground operations will be supported by dedicated vehicles that will work and be serviced underground.

Materials delivery to site and waste/product shipments from site will be by various types of trucks operating on the provincial highway system.

Marine Transportation

During operations, there will be an annual maximum of 15 inbound and outbound ship movements of vessels of 10,000 to 65,000 DWT size. The marine terminal will be mainly used to export AG fluorspar concentrate, however, there may be other materials handled by other future potential users (e.g., aggregates, equipment, or materials associated with local users**).**

5.2.3.7 Maintenance

An effective maintenance program will allow CFI to realize decreased labour and equipment costs, on-time delivery of product, and overall improved efficiency. An effective maintenance program is an important tool for improving mining operations, minimizing risk to the environment and ensuring maximum safety for employees.

An effective reliability-centred maintenance program will be put into place that will provide a program to mitigate the normal challenges faced in today's mining industry. CFI will develop a trained, knowledgeable and experienced workforce available to complete the required maintenance work. Equipment monitoring and timely inspections will drive a proactive approach that will address equipment performance issues prior to any equipment failure.

A responsive mechanical prioritization and repair management system will provide prompt corrective action in the unlikely event that a critical piece of equipment unexpectedly fails. Planned unit turnarounds and regular scheduled maintenance using skilled tradesmen will keep the operations at optimum performance levels. Maintenance practices and procedures will assist personnel in maintaining full compliance to all regulations and codes. Some maintenance repair activities will be contracted to certified specialty services off-site. All equipment maintenance and repairs will be carried out in maintenance buildings at the mill and mine sites, which will be constructed. Maintenance dredging will not be required at the marine terminal.

5.2.3.8 Site Utilities, Infrastructure & Support Systems

Site Water Supply

Potable water supply for the facility will be obtained from the domestic supply of the Town of St. Lawrence, via a pipeline connecting directly into the Town system. All approvals will be obtained from the town, however based on past operations the domestic consumption quantities are within the town's capacity. A potable water storage tank will be constructed on site to maintain adequate water supplies during periods of low capacity (e.g. during peak fish plant operations when availability is reduced).

Fire Protection Water

Water required for fire protection will be obtained from either St. Lawrence Town water, or from separate supply (TBD, e.g., streams or nearby ponds or sedimentation ponds from site drainage). At the port, seawater will be used for firefighting at the marine terminal.

Domestic Wastewater

The domestic wastewater generated at the site will be accommodated using a septic system/tile field or a self-contained treatment unit.

Electrical Supply

Electrical power for the mill/mine facility will be supplied from the local utility power grid system. Transmission lines will follow existing utility corridors.

Site Drainage

To minimize the environmental impacts and risks of slope instability, all drainage from the site will be intercepted by rock-lined ditching and channelled beyond the site limits to the ocean. Natural drainage that runs through the area will be directed into ditches and culverts and directed off site. The entire site will be graded to direct stormwater and snowmelt from the site constructs through a series of perimeter ditches and culverts.

5.2.3.9 Emissions, Discharges, Water Balance & Waste Management

Atmospheric Emissions

Considering that the Project's main source of power during operations will be electrical and supplied via the provincial grid, there will be no air emissions associated with generating power at the site, with the possible exception of those produced by backup emergency generators.

The primary sources of air emissions during operations will therefore be as follows:

- Diesel exhaust from various equipment used underground and/or on the roads (haul trucks, loaders, etc);
- Road dust caused by moving vehicles over gravel roads;
- Dust generated by handling, conveying, storing, and loading AG concentrate between the mill and ship loading facilities;
- Mine ventilation system exhaust from underground openings (dust, diesel fumes, radon gas, stale mine air, etc.); and
- Various exhaust ports from the mill's crushing and processing equipment (dust, stale building air, etc.).

All potential sources of air emission will be controlled through various means (e.g. engineered systems, operational and maintenance activities, and industry best practices that will form part of the Project's environmental management system) to ensure that all regulatory requirements are met. Mitigation measures will be identified during various design phases and noted in the Project's Environmental Protection Plan, which will be developed for both construction and operation. These measures may include such things as:

- Application of water or water-based dust suppressants on gravel roads;
- Use of manufacturer-recommended dust control equipment for the crushing plant;
- Closed-conveyor systems used to deliver crushed ore from the crusher building to the mill storage bin, concentrate from the mill to the storage building, and from the storage building to the shiploader and the ship. Where trucks are used to transport concentrate instead of conveyors covers will be on the trucks.
- Proper building ventilation systems, complete with appropriate filters to reduce exhaust emissions; and
- Indoor storage of fine AG concentrates to reduce dust dispersion by winds.

Aquatic Discharges

Wastewater from the mill will consist of water extracted from the thickening and filtration circuits while dewatering the material exiting the final fluorspar cleaner cell. This wastewater will be mixed at the mill with tailings, which will be directed to the TMF.

Prior to discharge to the TMF, the tailings/wastewater will be pH adjusted and amended with a flocculent. This will promote settling of fine-grained tails in the primary settling lagoon of the TMF. Two dams will be built initially within Shoal Cove Pond to separate the primary settling lagoon from the polishing pond.

Water pumped from the mine will be used for process with the remainder discharged to the tailings pond or local streams.

Strict monitoring measures will be taken to ensure all effluent discharged to the receiving environment meets the requirements of all federal and provincial regulations.

Waste Disposal

CFI is committed to ensuring all waste will be handled properly through all Project phases. Efforts will be made to promote waste minimization and waste segregation.

As described above, liquid wastes will be treated to acceptable levels prior to discharge to the environment. Only qualified contractors will be engaged for hauling and disposing of wastes. This includes all wastes, if any, that may be classified as hazardous. As required by the provincial government, waste management plans will be developed for different project phases (to reflect the changes in waste associated with varying activities in each project phase).

There are currently ten waste disposal facilities on the Burin Peninsula:

- Epworth – Great Salmonier
- Lamaline
- St. Lawrence
- Fox Cove – Mortier
- Lawn
- Frenchman's Cove
- Winterland
- Lord's Cove
- Point May
- Garnish

CFI is aware of Provincial plans to develop Regional Waste Management Strategies and will ensure company policies support efforts to advance regional waste management initiatives.

All sanitary wastewater generated at the site will be accommodated using a septic system/tile field or a self-contained treatment unit, designed and constructed in accordance with Provincial government requirements.

5.2.3.10 Potential Sources of Resource Conflict

Potential causes of resource conflicts during operations will be very similar to those listed for construction in Section 5.2.2.5. Specifically, during operations there are possibilities for interactions to occur with respect to:

- Fish and Fish Habitat (freshwater and marine);
- Resource Harvesting (fisheries, berry picking);
- Birds and Wildlife;
- Possible Species at Risk (if present in the general area of construction);
- Water Quality; and
- Socio-Economic Environment.

Terrestrial and Freshwater

As identified in Section 5.2.2.5, there will be impacts to some freshwater bodies within the project site. All freshwater fish habitat impacted by project activities will be compensated for as required by the *Fisheries Act*.

Also, there will be some level of impact on recreational users of this area. Berry pickers, walkers, and hunters will be unable to gain access to the project site for safety purposes.

As water levels in the TMF rise (due to rising tailings levels), the current unpaved road around Shoal Cove Pond may become submerged. Canada Fluorspar (NL) Inc. has indicated that it will reroute/construct a walking trail to ensure walkers and recreational users have continuous access to the Cape Chapeau Rouge/Rosey Ridge area.

Marine

Shipping associated with Project operations is not anticipated to result in significant impacts to the area (e.g., fluorspar export would require less than fifteen (15) ships per year of size 10,000 DWT). All marine fish habitat impacted by Project activities will be evaluated and, if necessary, compensated for in accordance with the requirement of the *Fisheries Act*.

The potential impact of the project on the present fishing activities at the proposed marine terminal will be assessed and appropriate mitigation measures will be implemented. The Proponent has already begun public consultations with fish harvesters in the area and will ensure that the project will not have any significant impact on the fishing activities in the area.

5.2.4 Decommissioning

Once the Operations phase of the mine has ended, the facilities will be properly closed and rehabilitative measures will be taken to ensure that the site and surrounding area are returned to an environmentally appropriate condition. Decommissioning is anticipated to take up to two years, with the exception of the TMF and associated infrastructure (dams and berms), which will be subject to ongoing long-term environmental monitoring, inspection and maintenance. The length of the monitoring period will be determined at decommissioning and following an assessment of the site, in consultation with the appropriate regulatory authorities.

Rehabilitation and Closure Plans are part of CFI’s Environmental Health and Safety Management System (EHSMS). CFI views the development and implementation of its EHSMS from a life-of-Project perspective, to be revised and updated regularly and on an as-needed basis as the Project moves through construction, operation and decommissioning. EHSMS development and implementation is consistent with CFI’s commitment to continuous improvement, pollution prevention and stakeholder consultation. This will be accompanied by regular document review, revision and update.

In keeping with its Environmental Health and Safety Policy, CFI is committed to progressive rehabilitation during the Operations phase. Rehabilitation will form an integral part of the operating plan and will be implemented progressively over the life of the Project. This section outlines the basic elements of the proposed Rehabilitation and Closure Plan, which is designed to restore, to an acceptable state, the biological, chemical and physical quality of the environmental resources affected by the operation and development of the mine. The plan will meet regulatory requirements for rehabilitation, and will primarily focus on the reclamation and rehabilitation of the facility and associated site infrastructure (including materials storage and handling facilities, TMF, mill facilities, shipping facilities and other infrastructure). The rehabilitative measures have generally been developed at a conceptual level for the purpose of environmental assessment. Additional assessment and engineering work will be required in advance of completing the plan. The draft Rehabilitation and Closure Plan will be submitted to the Assessment Committee for approval by the Minister of Environment and Conservation, Government of Newfoundland and Labrador, prior to completion of construction.

Specific objectives of the Rehabilitation and Closure Plan are:

- Restoration of affected landscapes to a stable and safe condition, which will protect public health and safety;
- Reduction or elimination of potential adverse environmental effects associated with each phase of the Project;
- Re-establishment of conditions that permit a productive use of the land and the natural resources of the area, similar to its original use; and
- Reduction of the need for long-term monitoring and maintenance by establishing, as quickly as practical, effective physical and chemical stability of disturbed areas.

The decommissioning principles that will guide the overall development and implementation of these objectives include:

- Establishing adequate background information to determine the extent and type of impacts, if present;
- Developing effective strategies and techniques for conducting cleanup; and
- Conducting audit of procedures and documentation of results in order to satisfy regulatory and corporate requirements.

The Rehabilitation and Closure Plan will be subjected to a general review annually and a detailed review every five years. The annual review will be conducted by the facility's next level of management. Revisions will be made based on these reviews.

Upon decommissioning or rehabilitating a site or facility, a final report containing conclusions of the post-cleanup site assessment will be prepared and distributed for review and approval to facility management, corporate legal and corporate Environment Health and Safety departments. CFI will plan and implement reclamation and rehabilitation activities in compliance with all applicable legislation. Provincial and federal statutes and regulations that will guide rehabilitation practices include:

- Newfoundland Environmental Protection Act;
- Quarry Materials Act;
- The Occupational Health and Safety Act;
- Water Protection Act;
- Migratory Birds Convention Act;
- Fisheries Act;
- Lands Act;
- Forestry Act; and
- Navigable Waters Protection Act.

CFI's approach will be to integrate rehabilitation into all phases of the Project. Rehabilitation planning begins prior to construction when considerations such as delineating and limiting the area of disturbance are incorporated into construction planning. Progressive rehabilitation is implemented as components or phases of the Project are completed.

Rehabilitation Overview

Rehabilitation of the St Lawrence Fluorspar Mine will include:

- Removal and appropriate disposal of all hazardous chemicals, reagents and materials;
- Drainage and cleaning of process vessels, pipelines and equipment;
- Removal and appropriate disposal of all salvageable equipment, materials and supplies;
- Removal and appropriate disposal of all non-salvageable equipment, materials and supplies;
- Demolition and removal of all above-grade buildings, foundations and other infrastructure (e.g., wharves, pipelines, conveyors, power lines, sewage treatment facilities) no longer required once the facility has closed;
- Removal and appropriate disposal of all non-hazardous demolition debris;
- Assessment of soil, sediment and groundwater contamination in the area of buildings and other facilities, and implementation of appropriate remediation measures to address contaminated areas identified;
- Closure of the Tailings Management Facility, stabilization of dams, installation of barrier or cap over waste if necessary, treatment of overflow as necessary;
- Drainage and Closure of storm water settling ponds;
- Removal of fencing, scarification of road surfaces, removal of culverts and stream crossings and restoration of natural drainage patterns wherever practical;
- Closure of active borrow pits and quarries;
- Revegetation, where appropriate, to control erosion;
- Potential long-term treatment of effluent from the TMF; and
- A monitoring program to determine the effectiveness of the decommissioning.

Socio-Economic Considerations

The cessation of operations of the mine will bring change to the workers, their families and the residents and businesses in nearby local communities. To help those facing change, CFI will work with employees in advance of Closure to identify employment opportunities at other mine sites.

5.3 EXPLOSIVES STORAGE, HANDLING AND USE

CFI will require a license for the storage (ie. Magazine) of explosives under Section 7(1)(a) of the *Explosives Act*.

On average, approximately 328,000 tonnes of ore, per year, will be drilled and blasted during mining operations. Blasting operations will be carried out for the mine development, including ramps, drifts, cross-cuts and raises as well as in the production stopes. It is estimated that approximately 540 tonnes of explosives will be required during the year.

Due to the anticipated humid conditions underground, water resistance emulsion type explosives will be necessary and possibly some water resistant ANFO (ammonium nitrate/fuel oil). The explosives will be initiated using Nonel type detonators (or equivalent) of both short and long delays as required in stoping and development respectively.

The explosives will be stored in a magazine located strategically on site to service both the Tarefare #2 mine and the Blue Beach North mine. The main magazines for the explosives and for the detonators will meet all provincial and federal regulations with respect to construction and installation. The magazines will be sized to optimize supply to the mine of the products as well as the transportation schedule required for the explosives supplier.

Storage magazines will also be excavated underground in each of the mines to provide adequate quantities to ensure a smooth operation. Deliveries will be made from the main surface magazines to the underground magazines on a regular basis, with inventories control in accordance with all government and company safety regulations.

The explosives will be supplied via a reliable supply company located in Newfoundland. The explosives company will provide the transportation of all explosives and detonators to the licensed storage facilities on site. All unloading areas will be prepared to ensure efficient and safe unloading.

The explosives handling will be carried out by qualified mine personnel, using appropriate equipment. The transportation, storage, manufacture, handling, and use of explosives, detonators and accessories will be carried out in full compliance with all applicable government regulations.

At the time of site decommissioning, the explosives storage facilities will be disassembled and/or removed or demolished as required. All equipment will be removed also and transported off site for reuse or sale. Any other inert construction debris or materials will be disposed of at a suitable site by qualified persons.

5.4 TAILINGS MANAGEMENT ALTERNATIVES

5.4.1 Disposal Alternatives

The tailings disposal alternatives were studied to determine the best option for disposal. The methods include paste backfill, dry stacking and conventional slurry.

5.4.1.1 Paste Backfill

Paste backfill was considered as a tailings alternative, however given the low volume of tailings (86,000 t/yr) produced by the milling operation, it is a very expensive option. Paste backfill does not eliminate the need for a surface TMF. Only one-third of the tailings would be stored underground as a paste fill. The remaining two-thirds would still require storage in a TMF. In addition, hydraulic backfill create problems with future development of the mine should economics improve. Hydraulic backfill also adds additional water to the underground operations and increases the risk of sediment in the mine dewatering system.

5.4.1.2 Dry Stacking

Dry stacking was considered as an alternative for processing of tailings. Dry stacking is a method which is typically used in dry/arid environments where water is scarce and must be recycled. St. Lawrence is located in a wet coastal marine environment (>1500 mm/yr). Thickeners are needed to remove the water from the tailings which add a significant cost to the capital expenditure for the mine. It will also be necessary to build a containment pond for the pore water removed by the thickeners. Settling time and possible treatment of this water may also be required.

If the dry stacked tailings are stored at surface, a containment berm will be required to contain and direct any runoff from the tailings pile. Thickened tailings are difficult to vegetate because of the formation of a hard crust. A vegetated soil cover will be needed which will add significant cost to the closure plan. If the dry stacked tailings are used underground, there is still the cost of storing and treating the tailings pore water in addition to the stability issues created with regard to future development of the underground (similar to the issues created by hydraulic fill).

5.4.1.3 Conventional Slurry

Conventional slurried tailings were considered as an alternative for tailings disposal. Shoal Cove Pond has been historically used for tailings deposition (brown field site) in the past. As a result, it would be logical to continue using this site for tailings deposition rather than impacting a new green-field site. The capital cost for conventional slurried tailings is significantly less than the other alternatives considered in this report. Shoal Cove Pond basin has the storage capacity for the entire mine life and is expandable if future mining reserves increase.

Based on these facts, conventional slurried tailings option was chosen as the preferred option for the feasibility study.

5.4.2 Disposal Locations

A thorough review of the possible locations for tailings disposal was undertaken at the beginning of the feasibility study. The possible disposal locations include seven options including five options from the 1995 study (Environmental Preview Report - 1995). The following disposal options have been considered and evaluated:

1. Shoal Cove Pond

2. Hillside Option - Alternative 1

3. Hillside Option – Alternative 2

4. Underground

5. Marine

6. Clarke's Pond

7. Director's Watershed

Option 1. Shoal Cove Pond was described in detail in Section 5.1.5 , Figures 5.1-23 and 5.1-13.

Figures 5.4-1 to 5.4-5 show the layout of the above options 2, 3, 5 and 7.

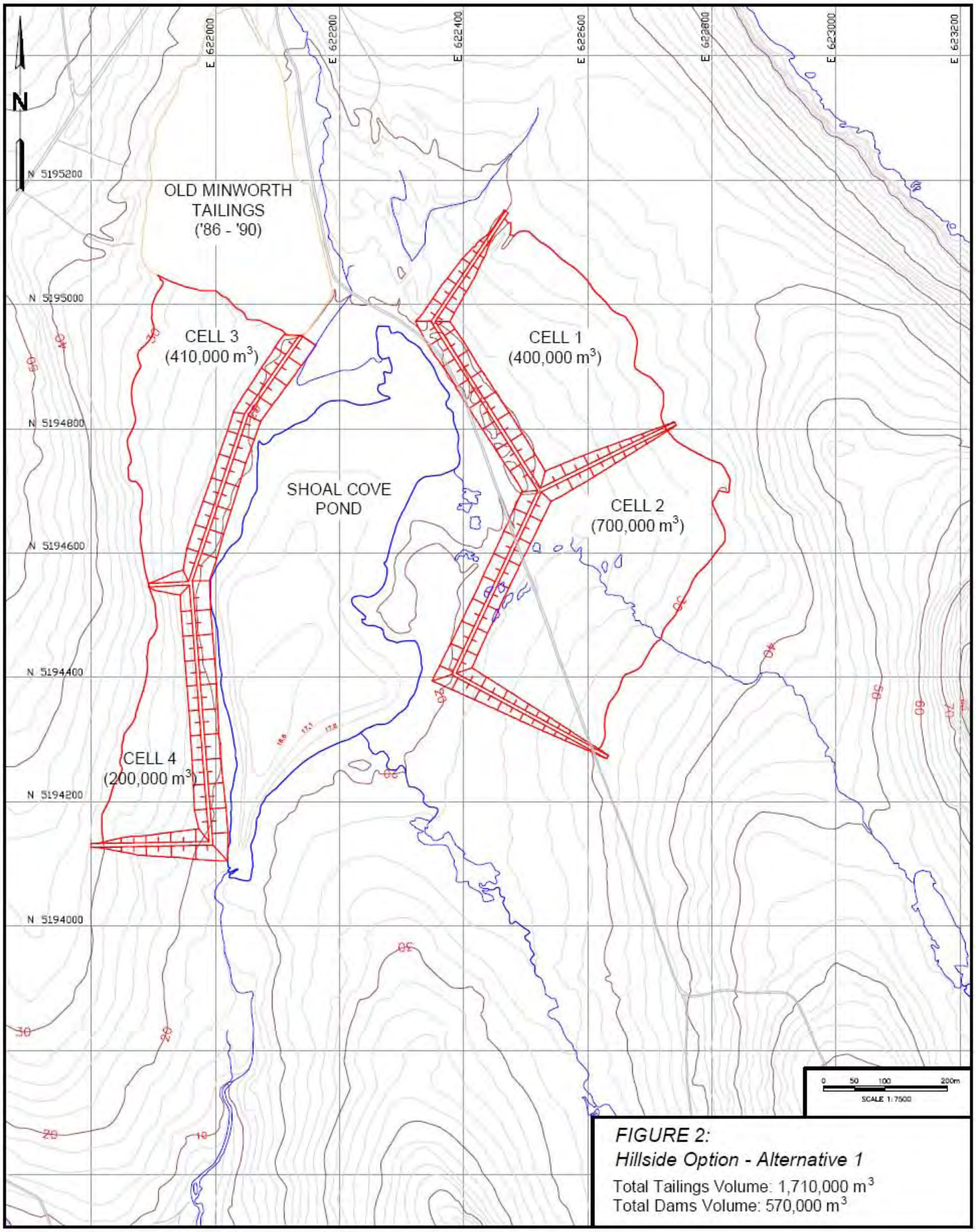


Figure 5.4-1: TMF Hillside Option - Alternative

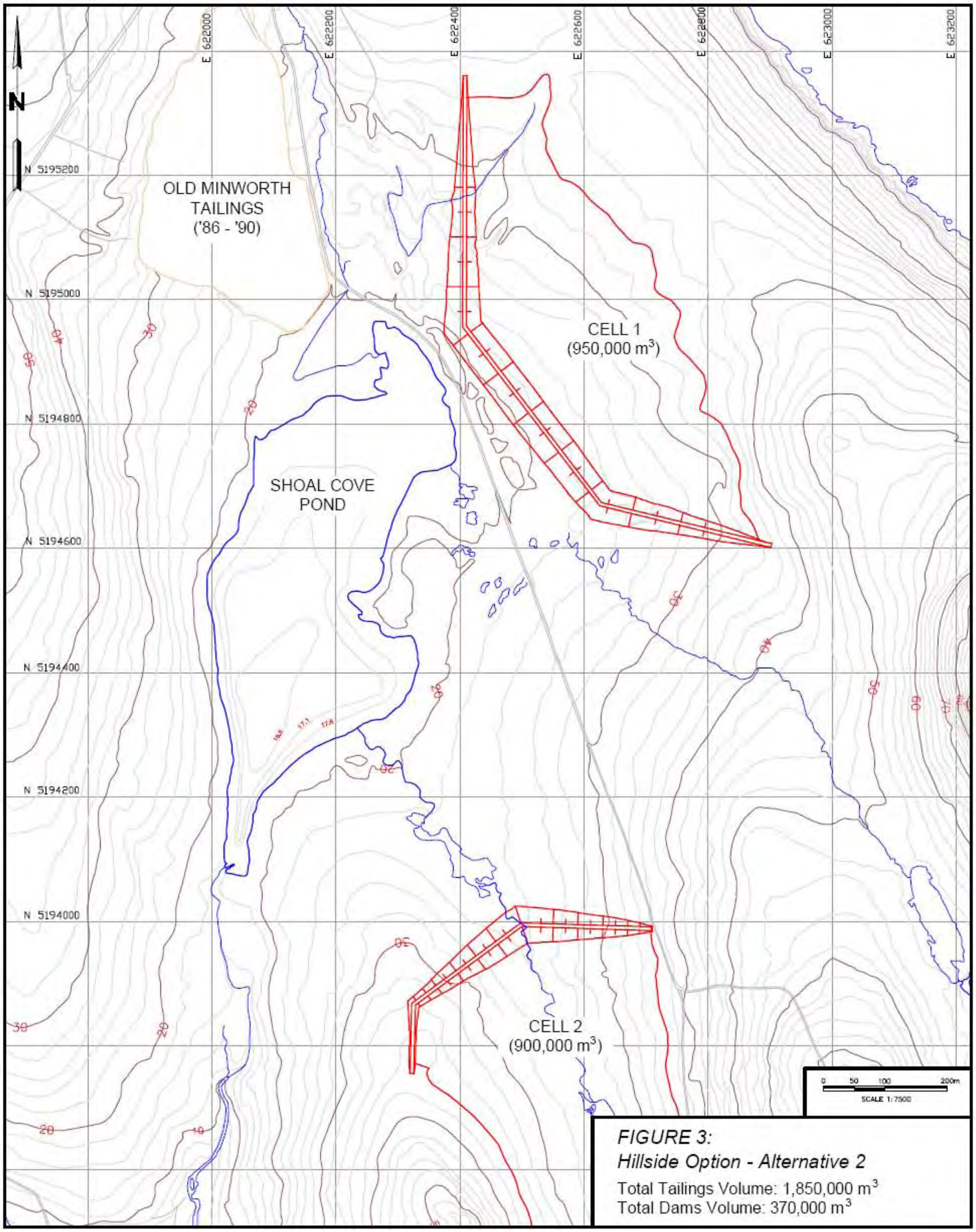


Figure 5.4-2: TMF Hillside Option – Alternative 2

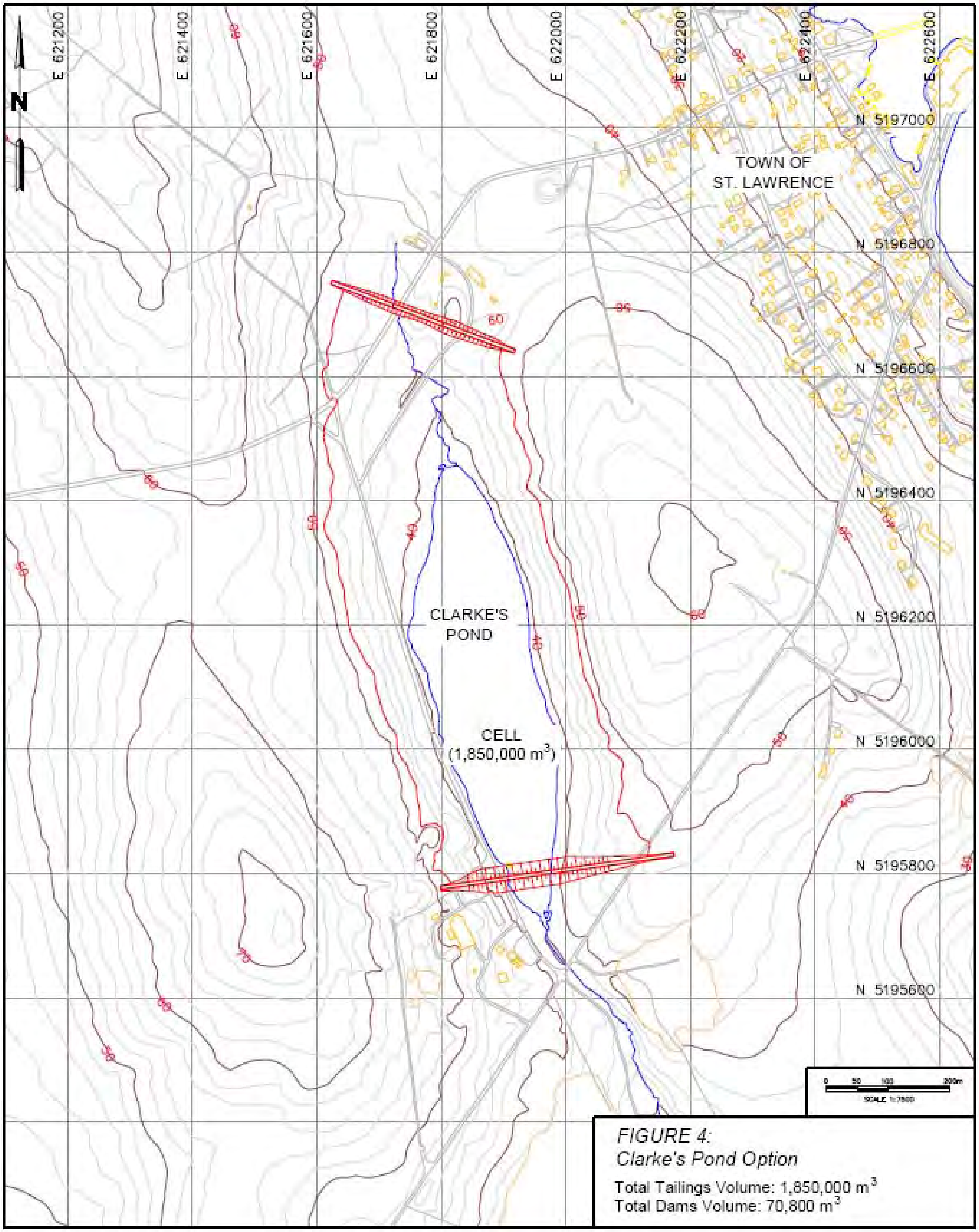


Figure 5.4-3: TMF Clark's Pond Option

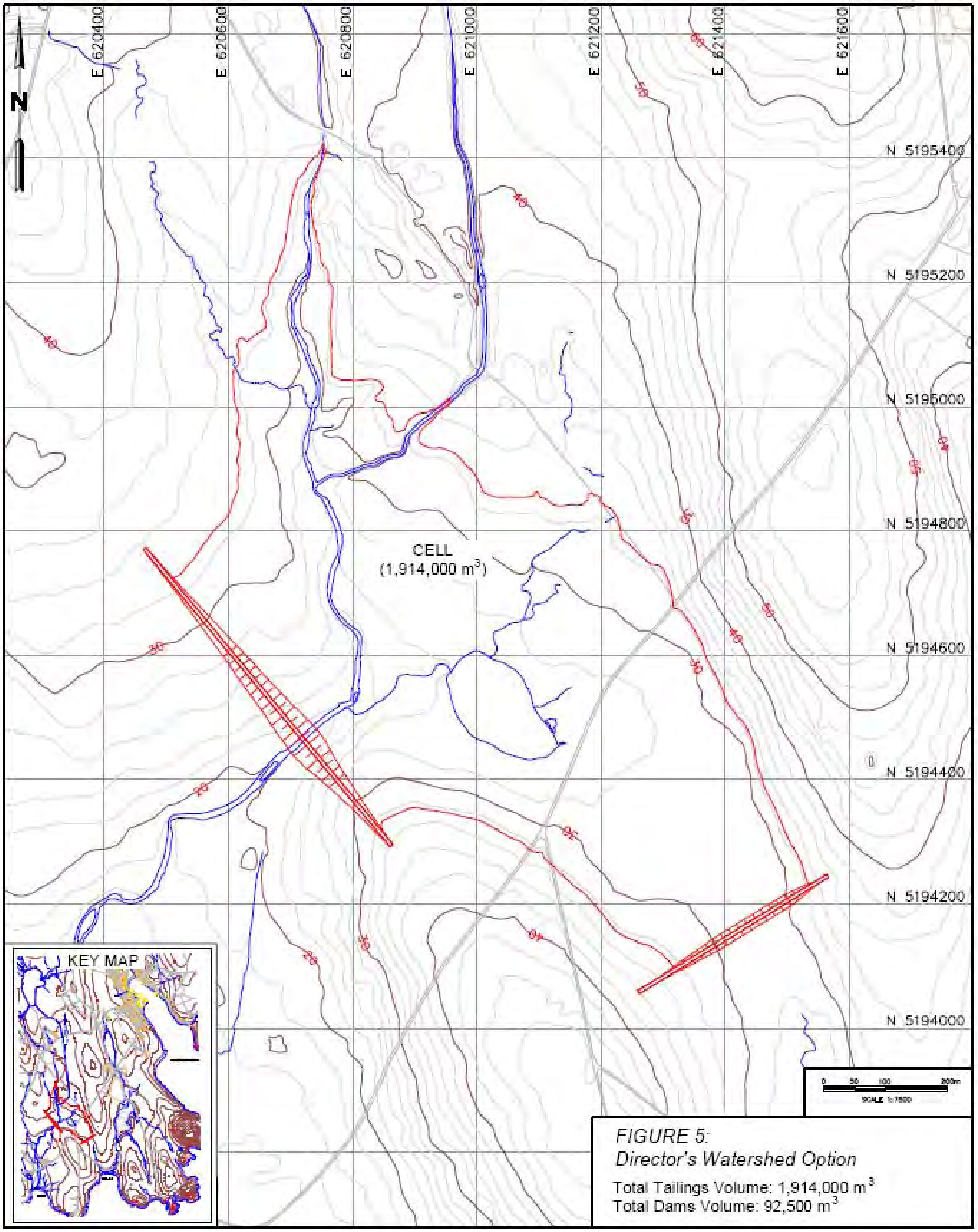


Figure 5.4-4: TMF Directors Watershed Option

5.4.3 Evaluation of Tailings Management Alternatives

A through evaluation of the above alternatives was carried out. The alternative assessment included both short term and long term impacts of each alternative, from the construction and operation through out the closure and post-closure phases. The options were evaluated using a comparative matrix which includes:

- Environmental considerations;
- Technical considerations; and
- Socio-Economic considerations.

The result of this evaluation is presented in Table 5.4-1, 5.4-2 and 5.4-3.

The marine disposal option has not been included in the comparative matrix table since this is not an environmentally valid option (ocean dumping, fish habitat, marine pollution, etc.)

For the purposes of this study, it has been assumed that there is no acid mine drainage (AMD) so that each potential location can be compared equally. The Owner has confirmed that any sulphides will be removed from the tailings stream at the mill site. Testing will be performed on tailing from a pilot plant during the detailed design stage to confirm this assumption.

Option 1 involves the disposal of tailings in Shoal Cove Pond. This is an existing brown field site where tailings were previously deposited during mining operations in the 1930s to 1950s. By using this location of tailings deposition, it would eliminate the impact to other green-field sites. In addition, there is sufficient capacity in the pond for a 20 year mine life and it is expandable capacity should the mine life be extended. Operating costs are minimal as the pond is located near the mill.

Options 2 and 3 involve the construction of large pervious rockfill dams on the hillsides above Shoal Cove Pond to contain the tailings material. Both of these options are cost prohibitive based on the volume of rockfill required (see Figures 5.4-2 & 5.4-3). From an environmental standpoint, both of these options use a large area of currently undisturbed land. In addition, both of these options will still require the use of Shoal Cove Pond as a settling pond prior to final discharge. The impact of this option is more significant than Option 1 making this option unfavourable.

Option 4 involves the disposal of tailings in the underground development. The main advantage to this option is that it eliminates the need for a surface TMF. However, a large settling pond will still be required to deal with the sediment-laden water from the underground tailings deposition. Underground deposition will also cause problems with stability of the underground work during mine operations. Also significant costs will be incurred in order to transport the tailings (slurry or dry stacked) into the underground workings and store them (hydraulic bulkheads). The underground stability and safety concerns along with the added cost of transporting the tailings underground make this option unfavourable.

Option 5 involves the disposal of tailings in the ocean (marine disposal). This option, which was presented in the 1995 report, is not being considered in this design due to environmental and social concerns.

Option 6 involves disposal of tailings in Clarke's Pond (see Figure 5.4-4). The main advantage to this option is its close proximity to the mill. However, this is a relatively undisturbed water body and deposition of tailings would mean finding a new source of process water make up for the mill, if required. Two dams would be required to contain all of the tailings over the 20 year mine life. Expandability of this option is limited and costly. In addition, there would likely be issues with extra water reporting to the underground workings in Blue Beach North, should this area be developed in the future. These issues make this option unfavourable.

Option 7 involves disposal of tailings in Director's Creek valley (see Figure 5.4-5). This is an undisturbed watershed and it is not desirable from an environmental or social standpoint. In addition, higher costs associated with the distance the tailings would have to be pumped along with requiring two dams make this option unfavourable.

The tables below (Tables 5.4-1, 5.4-2 and 5.4-3) are a comparative matrix which combines all of the environmental, technical and socio-economic issues affecting each of the potential TMF locations. Each of the criteria are weighted equally on a scale of 1 to 5, with a score of 1 being most favourable. The subtotal score for each section is given at the bottom of table section and the grand total is shown at the bottom of the table.

The results from the comparative matrix show that Option 1 (Shoal Cove Pond) is by far the preferred site for tailings disposal.

Table 5.4-1: Tailings Disposal Alternatives Evaluation – Environmental Considerations

Category	No.	Criteria	Disposal Alternatives				
			Shoal Cove Pond	Hillside Deposition	U/G mine Disposal *	Clarke's Pond	Director's Watershed
Environmental	1	Physical and geochemical characterization of wastes (e.g., acid rock drainage and metal leaching)	n/a	n/a	n/a	n/a	n/a
	2	Topographical factors (e.g., relief and complexity of topography)	3	4	2	3	5
	3	Geotechnical and seismic stability (e.g., depth of permafrost, geology of bedrock)	3	4	2	3	4
	4	Hydrology issues	3	4	1	2	3
	5	Hydrogeological issues (e.g., migration of contaminated groundwater, interference with surface water movement)	3	3	5	3	3
	6	Atmospheric issues (e.g., particulates, heavy metals)	2	5	3	2	5
	7	Overall affected land footprint size of impoundment (including secondary/polishing ponds), related infrastructure (e.g., dams, saddle dykes) and access roads	3	5	2	3	5
	8	Size of affected water body area (e.g., lake, stream) and watershed catchment boundaries	3	3	1	4	5
	9	Water quality issues	1	3	4	4	5
	10	Water quantity and storage issues	1	3	5	2	5
	11	Considerations related to climate change adaptation (e.g., changes in water management)	n/a	n/a	n/a	n/a	n/a
	12	Impacts to fish and their habitats related to each alternative	3	4	2	5	5
	13	Impacts to aquatic plant and animal species and their habitats related to each alternative	2	4	3	5	5
	14	Impacts to terrestrial plant and animal species related to each alternative	2	5	1	4	5
	15	Impacts to birds related to each alternative	3	5	2	3	5
	16	Impacts to species at risk and their habitats related to each alternative	3	4	1	3	4
	17	Impacts on humans (including air quality, noise, drinking water and contamination of country foods issues, as applicable)	2	5	3	5	4

Category	No.	Criteria	Disposal Alternatives				
			Shoal Cove Pond	Hillside Deposition	U/G mine Disposal *	Clarke's Pond	Director's Watershed
	18	Potential for post-closure/decommissioning recovery and rehabilitation related to these environmental vectors related to each alternative	2	3	3	3	3
	19	Distance from plant site to the TIA	2	3	4	1	5
	20	Total watershed area	3	2	3	2	4
	21	Dam failure consequences	3	3	3	3	3
	22	Dam reliability	1	2	3	1	2
		Sub-Total Score	**48**	**74**	**53**	**61**	**85**

Notes

* Tailings pond is still required for paste backfill. Only 30% can be stored U/G.

SCORE
1 Most favourable (no or negligible impact)
2 Favourable (minor or insignificant impact)
3 Average (Low to Moderate impact)
4 Slightly unfavourable (Moderate Impact)
5 Unfavourable (High or Significant Impact)

Table 5.4-2: Tailings Disposal Alternatives Evaluation – Technical Considerations

Category	No.	Criteria	Disposal Alternatives				
			Shoal Cove Pond	Hillside Deposition	UG Mine Disposal *	Clarke's Pond	Director's Watershed
Technical and Operations	1	Containment structure designs (e.g., size, hydraulic capacity, construction materials, substrate, etc.)	3	5	2	3	5
	2	Availability of construction materials and volume requirements (e.g., quarry material for containment structures, access road and closure construction)	2	4	1	4	5
	3	Possible use of impermeable or geo-textile liner for impoundments	n/a	n/a	n/a	n/a	n/a
	4	Diversion and other water control structures that may be required	2	4	3	3	5
	5	Potential for increased tailings deposition capacity (e.g., likelihood of additional future development)	1	4	5	5	2
	6	Feasibility of alternatives to managing tailings as a slurry, particularly thickened tailings, paste tailings or dry stacking of tailings	3	3	3	3	3
	7	Transportation of tailings (e.g., from the mine site to the proposed TIA)	2	4	5	1	5
	8	Chemical and physical characterization of tailings	3	3	3	3	3
	9	Design and construction of impermeable covers over wastes	n\a	n\a	n\a	n\a	n\a
	10	Ability to recycle tailings supernatant water	2	4	5	1	5
	11	Flexibility with regard to technical, operational and environmental uncertainties	1	4	5	4	1
	12	Proposed technologies and advantages/disadvantages of the technologies considered, (e.g., proven technology used elsewhere or new)	3	3	5	3	3
	13	Technical feasibility and risks (e.g., unforeseen geotechnical conditions that may require design modifications)	2	5	5	3	5
	14	Unforeseen technical difficulties (e.g., in terms of foundation complexities for dams, etc.)	2	5	5	3	5
	15	Risks associated with requirements for perpetual treatment or maintenance	3	5	2	2	5
	16	Post-closure risks and uncertainties	2	3	4	3	3
	17	Rehabilitation of aquatic and/or land ecosystems including timeframes	2	4	1	2	5
	18	Ratio of dam volume to storage capacity	2	5	4	5	2
	19	Dam, storage and access road footprint	2	5	1	5	3
	20	Risks associated with construction	1	3	3	2	3
		Sub-Total Score	**38**	**73**	**62**	**55**	**68**

Table 5.4-3: Tailings Disposal Alternatives Evaluation – Socio-Economic Considerations

Category	No.	Criteria	Disposal Alternatives				
			Shoal Cove Pond	Hillside Deposition	U/G mine Disposal *	Clarke's Pond	Director's Watershed
Socio-Economic	1	Capital costs	2	5	5	3	4
	2	Operational costs	1	5	5	4	2
	3	Closure costs	3	5	2	3	5
	4	Post-closure costs, including the costs of perpetual treatment/maintenance should it be required	3	5	2	3	4
	5	Fish habitat compensation and monitoring costs	1	4	2	5	4
	6	Economic risks and benefits	1	5	5	4	3
	7	Closure, post-closure plan risks where some form of perpetual treatment or maintenance is required	3	5	2	3	4
	8	Regulatory review and construction timeline costs	1	3	5	2	5
	9	Preservation of archeological/cultural sites	n/a	n/a	n/a	n/a	n/a
	10	Aboriginal land rights	n/a	n/a	n/a	n/a	n/a
	11	Maintenance of traditional lifestyle	2	5	2	5	4
	12	Spiritual well being	n/a	n/a	n/a	n/a	n/a
	13	Perceived community response	2	4	3	5	5
	14	Ecological/cultural values (in the sense of natural capital value)	2	3	1	4	5
	15	Use of fisheries resources	2	2	1	5	4
	16	Aesthetics	2	5	2	4	5
	17	Other uses such as recreation/tourism, industrial, etc.	2	5	3	5	5
	18	Contracting opportunities, building community capacity	3	1	3	3	1
	19	Safety considerations	1	4	5	1	4
	20	Landowner opinion including governments	1	2	5	3	5
	21	Overall perceived socio-economic consequences, benefits and relative preferences; and other factors considered significant by the project proponent and reviewers	2	5	5	5	4
		Sub-Total Score	**34**	**73**	**58**	**67**	**73**
		TOTAL	**120**	**220**	**173**	**183**	**226**

Notes
* Tailings pond is still required for paste backfill. Only 30% can be stored U/G.

SCORE
1 Most favourable (no or negligible impact)
2 Favourable (minor or insignificant impact)
3 Average (Low to Moderate impact)
4 Slightly unfavourable (Moderate Impact)
5 Unfavourable (High or Significant Impact)

5.4.4 Tailings Management Facility – Preferred Option

The results of the detailed evaluation presented in previous sections show the Shoal Cove Pond is the preferred option with best score in the three evaluation categories (i.e., environmentally, technically and economically the most viable alternative), and therefore was chosen as the preferred site for tailings disposal using conventional slurry. As mentioned before, this site was used in past mine operations as the tailing disposal area, without any control structures. The proposed TMF will be designed in such a way that all effluent from the facility will meet or better the regulatory requirements for discharge of deleterious substance into the environment (e.g., the *Fisheries Act*, the *CEPA* 1999, and the *NL Water and Sewage Regulations.*

The TMF in Shoal Cove Pond will consist of two retaining structures: 1) Separator Berm located across the middle of Shoal Cove Pond and 2) Tailings Dam located at the downstream outlet of the pond. The Separator Berm will be a pervious structure designed to retain tailings solids and yet allow seepage from Cell 1 into Cell 2 (Figure 5.4-1). The berm is comprised entirely of rockfill materials and constructed directly over the existing organic layer in the base of Shoal Cove Pond. The organic layer is highly compressible (~50%) and has a very low shear strength. As a result, it will be necessary to construct a wide footprint to provide adequate stability. The width of the starter berm footprint will be equal to the width of ultimate berm which will provide a stable platform for all future raises of the Separator Berm.

The Tailings Dam will be designed as a low permeability structure founded on the dense native glacial till. Due to the good foundation conditions and the availability of low permeability till, the dam section will be designed as a homogeneous fill with 2H (horizontal) to 1V (vertical) side slopes. Future raises of the Tailings Dam will performed using the downstream method to avoid building on the tailings.

The tailings pond will be surrounded by a perimeter access road and tailings pipeline. Tailings will be spigotted from all sides to create a uniform depth of tailings and maximize the storage capacity of both cells. Overflow spillways will be sized and constructed to route excess water from the tailings discharge and surrounding watershed resulting from a PMP event.

5.5 MARINE TERMINAL DESIGN OPTIONS

Previous operations at St. Lawrence used a wharf located in the inner harbour to export fluorspar concentrate. This presented Health & Safety concerns to mine/mill workers as well as residents of the community, in that mine traffic had to use public roads through the community to transport product to the dock. A steep road connecting the mill to the dock presented an ongoing safety hazard. In fact, a near miss happened in the 1970s when the brakes failed on a vehicle while it was descending the hill towards the dock. Fortunately, the vehicle came to a stop on the dock after hitting a small building and no injures were reported.

Another concern of past operations relates to high winds at the dock, which sometimes dispersed fine-powdered concentrate throughout the community. Although CFI will have dust control mechanisms in place, locating a new marine terminal further from the community will help mitigate potential impacts on community residents and businesses.

In recognition of the above, the Town of St. Lawrence amended its municipal plan several years ago to allow construction of a new marine terminal to service the reopening mine. It was recognized that such a terminal would be best suited at Blue Beach, and for that reason this area was specifically named during the town's public consultation process in support of the amendment.

Given the above, CFI has decided to build its new marine terminal in the Blue Beach area in outer Great St. Lawrence Harbour. This location offers several advantages, including close proximity to the required water depth (10 – 15 m) to support the design ship (10,000 to 65,000 DWT) without dredging; the 15 m contour is only about 200m from the shoreline, the area is sheltered from large open-ocean waves and swell; it offers good and safe navigation access to the wharf; it offers good land access to the terminal; it has sufficient lands for storage and laydown, and can accommodate future expansion, if needed; and finally this area minimizes interference with the existing marine operations in the St. Lawrence Harbour.

Two wharf sites have been evaluated in the Blue Beach area: the north and south options, as shown on Figure 5.5-1. There are many factors to be considered in selecting a port site. The initial site review focused on the following factors: shortest distance from shore, protection from prevailing wind and sea conditions, and ease of vessel manoeuvring. As the study progressed over the past year and data has become available other factors such as cost, schedule, environmental considerations, and public input were taken into account to help select the preferred wharf site. In essence, the selection of the preferred site is being done with consideration for technical, environmental, and socio-economic issues. At present, the north option is the preferred site, as shown on Figures 5.5-1 and 5.5-2 below.

Figure 5.5-1: Marine Terminal Options

This preliminary site selection has been made based on current knowledge of the area and the available data. Section 5.1.6 presents the design currently being used in project plans. Before a final selection is made, however, analysis of more site-specific data is required to confirm that this wharf location is the best. This data consists of:

- Bathymetry:

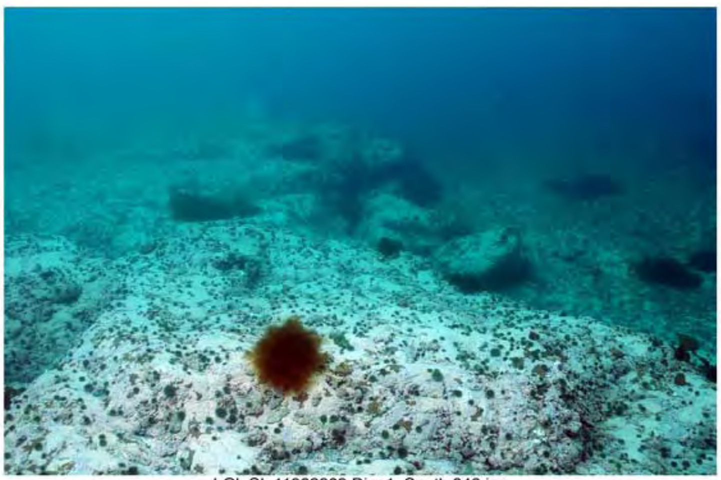
A survey of the potential wharf sites has been untaken to confirm water depths and seabed contours.

- Geotechnical:

A marine borehole program has been identified and will be undertaken to determine the characteristics of the sub-sea strata at the potential sites.

- Environmental:

An underwater survey has been undertaken to assess the marine habitat at both sites, and this information has been provided to DFO in order to quantify the respective habitats. Based on DFO's response, the north layout would have less impact on fish habitat in that it represents a smaller environmental footprint. The following images, taken during the recent underwater survey, show a predominantly sandy seabed for the north option, and a rockier, more productive seabed for the south option.



LGL SL 11062009 Dive1_South 040.jpg

LGL SL 11062009 Dive2_North 007.JPG

There are several advantages and disadvantages associated with each marine terminal design presented in Figures 5.5-2 and 5.5-3 below. These are as follows:

Advantages of Layout I (Figure 5.5-2) include: shorter distance from storage building for loading; wharf designs offers protection to Blue Beach; orientation allows a small boat basin on northern side of wharf; a second berth could be accommodated on southern side of wharf, and smaller environmental footprint.

Disadvantages of Layout I include: irregular seabed contours; ship berth beam face prevailing winds (NW) and waves (SE); less room would be available for vessel manoeuvring.

Advantages of Layout II (Figure 5.5-3) include: ships would berth parallel to prevailing waves (SE); more room for vessel manoeuvring; consistent seabed contours.

Disadvantages of Layout II include: longer distance from storage building for loading; cannot accommodate a second berth due to shallower water depths; and larger environmental footprint.

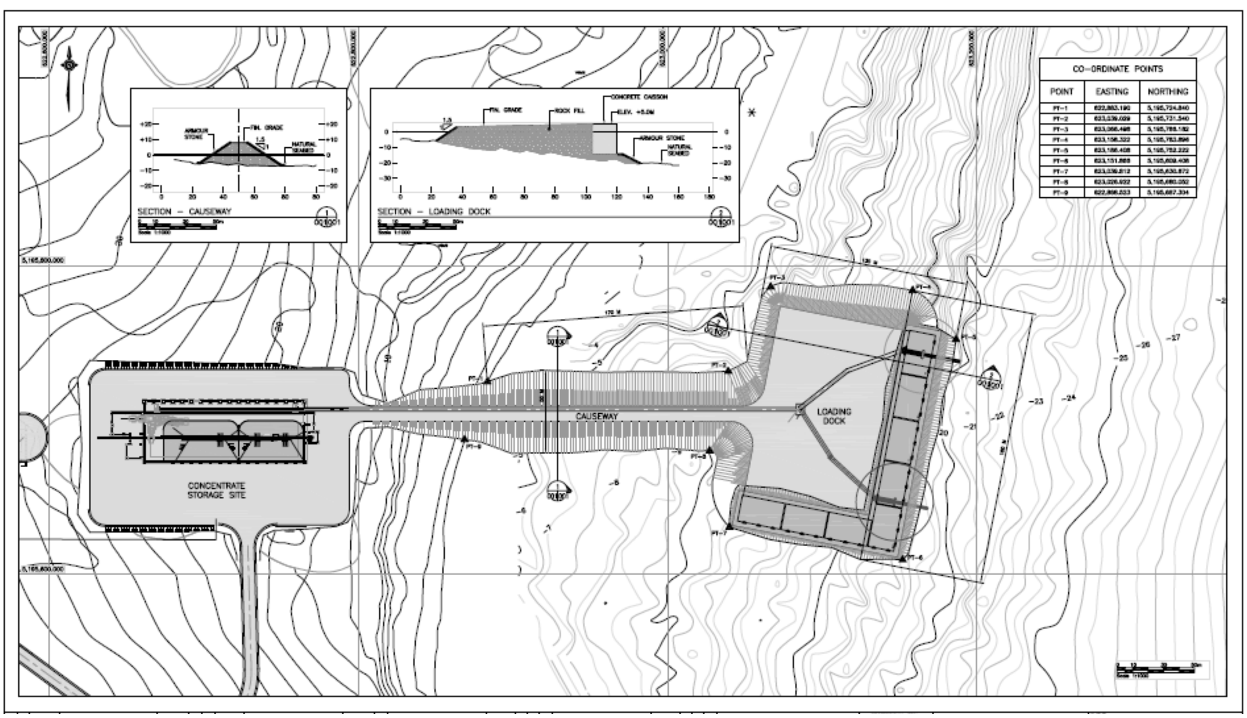


Figure 5.5-2: Marine Terminal Option 1 (Northern Location)

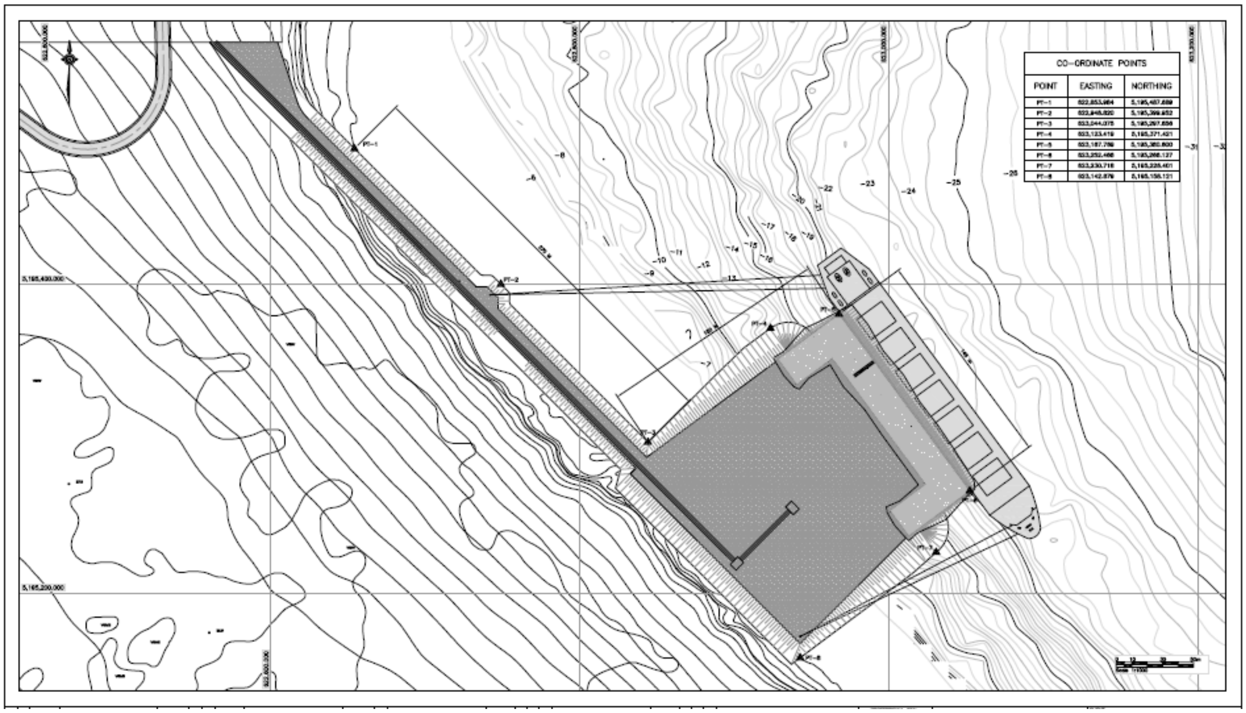


Figure 5.5-3: Marine Terminal Option 2 (Southern Location)

5.6 OCCUPATIONS

Canada Fluorspar (NL) Inc. is committed to maximizing local benefits and hiring locally or provincially as much as possible. Initial discussions have been held with groups, such as the Schooner Regional Economic Development Board and the Town of St. Lawrence, emphasizing the need for labour market analysis.

5.6.1 Estimated Occupational Requirements for Design & Construction

The estimates below reflect anticipated direct hiring by Burin Minerals Ltd for the design and construction phases of the project. The proposed project would directly create approximately 369 jobs (at peak) during construction. It is reasonable to assume that a large number of people in the project area will also benefit from indirect employment.

Table 5.6-1: Estimated Occupational Requirements for the Design Stage of the Project

Occupation	# of Personnel	NOC Code
Engineering Managers	4	0211
Process Engineers	3	2134
Mechanical Engineers	3	2132
Civil/Structural Engineers	4	2131
Geological Engineers	2	2144
Mining Engineer	2	2143
Electrical Engineers	3	2133
Metallurgical Engineers	2	2142
Loss Prevention, Safety Engineer	1	2148
Designer (Drawing Office)	14	2252
CAD Operator	12	2253
Buyer (procurement)	1	0113
Document Controller	1	1413
Secretary	2	1241
Mechanical Engineering Technologist	6	2232
Electrical Engineering Technologist	4	2241
Civil Engineering Technologists	4	2231
HSEQ	1	2263
Project Management	2	0711
Project Controls	2	2131
Administration	2	1221
Architects	1	2151
Land Surveyors	2	2154
Land Survey Technologists	2	2254
Construction Estimators	1	2234
Total	**81**	**-**

Table 5.6-2: Estimated Occupational Requirements for the Construction

Occupation	# of Personnel	NOC Code
Pipefitter	6	7252
Millwright	8	7311
Sheet Metal Workers	8	7261
Construction Management	6	0711
Scheduler	1	1473
Construction Trades Helpers and Labourer	30	7611
Electrician	4	7242
Equipment Operators	24	7421
Pipe Welder	6	7265
Roofers	4	7291

Occupation	# of Personnel	NOC Code
Insulator	2	7293
Painter (Industrial)	4	9496
Carpenter	12	7271
Surveyors	2	2154
Plumbers	4	7251
Ironworker	12	7264
Welder- Structural	6	7265
Concrete Finisher	4	7282
Drywall Installers	4	7284
Heavy Duty Equipment Mechanics	6	7312
Crane Operators	4	7371
Drillers & Blasters	6	7372
Commercial Divers	4	7382
Truck Drivers	12	7411
Electrical Power Line and Cable Workers	4	7244
Telecommunications Line and Cable Workers	4	7245
Other Trades and Related Occupations	12	7383
Construction Inspectors	4	2264
Engineering Inspectors	4	2262
Construction Supervisors – Electrical	2	7212
Construction Supervisors – Pipefitters	2	7213
Construction Supervisors – Metal Workers	2	7214
Construction Supervisors – Carpentry	2	7215
Construction Supervisors – Mechanic	2	7216
Construction Supervisors – Heavy Construction	2	7217
Construction Supervisors – Other Trades	4	7219
Mining Personnel (Year 2010)	21	8231/8411
Mining Personnel (Year 2011)	125	8231/8411
Total	**369**	**-**

5.6.2 Estimated Occupational Requirements for Operations

The estimates below reflect anticipated direct hiring by Canada Fluorspar (NL) Inc. for the operations stage of the project. It is estimated that approximately 178 full-time jobs will be created in the community during operations. The direct-to-indirect labour ratio associated with this project is estimated to be 1:3.

Table 5.6-3: Estimated Occupational Requirements for the Operations Phase

	Type of Occupation	Number Of Employees	NOC Code
Mill Workforce	Supervisor - Staff	4	9211
	DMS Operator	4	9411
	Grinding Operator	4	9411
	Flotation/Dewatering Operator	4	9411
	Laboratory Technician	5	2212
	Electrician/Fitter	4	7242
	Crushing Operator	4	9411
	Loader Operator	4	7421
	Reagent Operator	2	9411
	Laboratory Supervisor	1	2212
	Metallurgical Trainee	1	2212
	Laboratory Trainee	1	2212
	Maintenance Foreperson	1	0721
	Electrical Foreperson	1	7242
	Maintenance Fitter	2	0721
	Electrician	1	7242
	Lubrication / Forklift driver	1	7421
	TOTAL MILL	**44**	**-**
Mine Workforce	Captain	1	8221
	Shifter/supervisor	4	8221
	Safety/Trainer	1	2263
	Surveyor	1	2212
	Geologist	1	2113
	Mine Technician	1	2212
	Maintenance General Foreperson	1	0721
	Engineer	1	2143/2113
	Mine Clerk	1	1473
	Storeman/woman	1	1472
	Dryman/woman	2	8411
Mine Workforce (Continued)	Security	2	6651
	Leader	4	8231
	Miner 1	16	8231
	Hoistman/woman	4	7312
	Support 1	4	8411
	LHD Operator	12	8231
	Truck Operator 2	16	8231
	Miner 2	4	8231
	Pump/Crusher Operator	20	8231
	Mechanic Journeypersons	8	7312
	Mechanic 1	10	7312

	Type of Occupation	Number Of Employees	NOC Code
	Electrical Journeypersons	4	7242
	TOTAL MINE	**125**	**-**
Administration	General Manger	1	0811
	Mine Superintendent	1	8221
	Mill Superintendent	1	8221
	Comptroller	1	0111
	Receptionist/Clerk	1	1411 / 1414
	Accounts Payable	1	1431
	Accounts Receivable/other	1	1431
	Purchase/other	1	1225
	General Accountant	1	1111
	TOTAL ADMINISTRATION	**9**	**-**
	GRAND TOTAL	**178**	**-**

5.6.3 Employment Equity

5.6.3.1 Introduction

Canada Fluorspar (NL) Inc. is committed to being an equal opportunity employer. A human resources plan will be developed when project feasibility is confirmed. Canada Fluorspar (NL) inc. has been in communication with representatives of the Women's Policy Office (WPO) and is aware of the provincial employment equity guidelines. A women's employment plan will be fully prepared in accordance with the provincial employment equity guidelines.

Further information on socio-economic baseline information, project effects and impact assessment are presented in details in Section 6.5 – Human Receptor & Socio-Economic Impact.

5.6.3.2 Women in Mining

Though women form approximately half of the provincial labour force, the proponent recognizes that traditionally women have been under-represented in certain occupational groups. In 2001 the proportion of women in the skilled crafts and trades was 8.9%.

According to the Census data 2006, in the Newfoundland and Labrador, women represent 12.5% of the workforce in the mining sector. Based on available information, in mining women are concentrated in management services (e.g., human resources) and administrative support (e.g., secretarial). Women are also employed in smaller numbers as geologists and related roles, a number of skilled trades persons and mine labourers. There are fewer working underground in roles such as production and development, service and support workers.

Canada Fluorspar (NL) Inc. is committed to providing opportunities for qualified women across all occupational categories.

It is anticipated that the availability of women across the occupational groupings will present a challenge. This will be addressed in the employment equity plan.

5.6.3.3 Employment Opportunities

The mine reactivation project will involve the design and construction of a mine and mill site as well as a marine terminal for shipment of processed fluorspar. It will also involve an underground mining operation with anticipated life of 15-20 years. As shown in previous sections, it is expected that there will be approximately 620 jobs created, short-term and long-term. The estimated positions by occupational grouping are shown in the following table (Table 5.6-4).

Table 6.5-4 Estimated Positions by Occupational Grouping

Occupational Group	Design	Construction	Operations		Admin.	Estimated number of Positions
			Mine	Mill		
Senior Managers					1	1
Middle and Other Managers	4		1		2	7
Professionals	27		4	2	2	35
Semi-professionals and Technicians	44		5	10		59
Supervisors		24	4	4		10
Supervisors: Crafts and Trades		199	1	2		202
Administrative & senior clerical	4		2		4	10

Occupational Group	Design	Construction	Operations		Admin.	Estimated number of Positions
			Mine	Mill		
Skilled Crafts and service personnel		146 Mining Personnel	22	12		160
Skilled Crafts and Trades workers			23	7		30
Clerical Personnel	1		2			3
Intermediate Sales and Services						
Other sales and service personnel						
Other Manual workers			61	7		68
Total	**81**	**369**	**125**	**44**	**9**	**620**

Canada Fluorspar (NL) Inc. is determined it will have a qualified, professional workforce. It will set its aspiration goals targeting employment of qualified women when the workforce requirements are more clearly defined.

5.6.3.4 Recruitment, Selection and Hiring

Canada Fluorspar (NL) Inc. intends to ensure that women are provided with opportunities to be hired to work in the St. Lawrence Fluorspar Mine Activation Project.

All positions will be publicly advertised. Special efforts will be taken to encourage women to apply by indicating that competitions are open to both men and women.

Notices will be posted in the media including on its website. Recruitment efforts will be made through the colleges and universities, the Department of Human Resource Development and Employment, and Service Canada.

Participation in events, such as job fairs, will assist in providing information of employment opportunities in the mine.

Notification of opportunities will be circulated to organizations with a particular connection to women such as Women in Resource Development Corporation (WRDC).

Canada Fluorspar (NL) Inc. is committed to using open and transparent processes in its recruitment and hiring.

5.6.3.5 Training and Development Opportunities

The goal of Canada Fluorspar NL) Inc. is to develop a workforce of 'professional' employees / miners. To this end, it will need to train its recruits in the specialized equipment it plans to use. It is also determined to provide the most up-to-date training in health and safety for the St. Lawrence mine and mill.

Training programs will be designed for the mine and mill with particular attention paid to incorporating women in the workforce.

Canada Fluorspar (NL) Inc will seek assistance from colleges in the province with a particular interest and expertise in hard rock mining (e.g., Corona College) and in skilled trades (e.g., College of the North Atlantic). These resources will be drawn upon to design a training program that will be available to both men and women with an interest in working on the mine/mill project.

The training and development will be ongoing throughout the life of the operation. These opportunities will be available to all employees.

5.6.3.6 Employment Policies and Women in the Workplace

Canada Fluorspar (NL) Inc. will establish respectful a workplace. These policies will be part of the employment contract. All employees will be expected to comply with the policies as a condition of employment.

The company recognizes that the workplace will have to accommodate women, i.e., facilities designed to accommodate both genders like separate bathrooms, separate showering facilities.

In establishing its policies to promote the creation of a respectful workplace, a sexual harassment policy will be developed. These policies will be part of the employment contract and all employees will be expected to comply as a condition of employment.

The company encourages organizations, like the WPO and Women in Resource Development Corporation (WRDC), to promote a mining career for women and to encourage women to acquire the training and skills necessary for employment in the sector.

5.6.3.7 Implementation and Monitoring

An implementation plan for the Employment Equity and Women's Employment Policy will be developed at an early stage of the project as possible. Ongoing monitoring of the plan will be undertaken to ensure the goals are continuously reviewed and implemented.

5.7 ACCIDENTS AND MALFUNCTIONS

CFI has a goal of zero accidents. This requires that accident prevention be given priority within CFI's Environmental Health and Safety Management System. Anticipating potential problems and implementing corrective measures before accidents occur will be a guiding principle in CFI's EHSMS. As well, this system will require a high level of response capability be maintained throughout all Project Phases so that any failures in prevention can be dealt with efficiently. Mine personnel will maintain constant vigilance, undergo regular safety training, and be thoroughly familiar with the Environmental Protection Plan, the Occupational Health and Safety Plan, and all Emergency Response plans. Third-party contractors will be screened for compatibility with CFI policies and procedures.

The following discussion addresses potential accidental events and the measures that will be taken in planning to address each. As well, a set of "plausible worst- case scenarios" have been developed to form the basis for impact assessment.

Workplace health and safety is a priority of management, employees and unions. CFI will not accept accidents as a normal part of its business. While almost all physical activities associated with mining production involve some element of risk, CFI will ensure that the design, construction, and operation will be carried out with health & safety in mind. CFI will continually improve its safety regime by application of hazard analysis and other procedures to all aspects of its operations.

In addition to effects on human health and safety, accidental events can also lead to damage to the biophysical environment and lead to reduced production. In general, the severity of effects from accidental events is dependent upon the magnitude of the event, location of the event, and the time of year.

Accidental events can be generally categorized as either spills or releases to the environment of such materials as fuel and hazardous materials, concentrate or wastewater, or the failure of engineered designs that may result in material spills or releases to the environment. The following list of accidents and malfunctions covers all project phases (Construction, Operation, and Decommissioning/closure):

1. Underground Mine Failures (e.g. ventilation system failure, rock bursts, mine flooding);
2. Mill Failures (e.g. processes and equipment);
3. TMF Dam Failure;
4. Oil and Chemical Spills (Land & Marine);
5. Fires and Explosions; and
6. Medical Emergencies.

These are described in more details in the following sections.

5.7.1 Underground Mine Development and Operations

Various failures can potentially occur underground with devastating result. Given the large quantities of water that must be continuously pumped to keep the mines dry, failures of the pumping systems may result in flooding of underground openings if back up systems are not available or functioning. Back-up systems will be in place to endure continuous pumping.

Failure in ventilation systems can result in worker inhalation exposure to hazardous substances, such as dust, equipment exhaust, and radon gas. Again, functioning backup systems will be provided should the primary ventilation systems fail. Availability and use of personal protective equipment at times of failure may also be required.

Rock mass instability associated with underground excavation may result in rock bursts and failures. Measures to prevent such failures start with a good understanding of the rock mass quality and proper design of mine openings. Monitoring of stresses and strains at various locations is critical to ensure stable mine workings Such monitoring will be carried out as required.

5.7.2 Mill Failure

Failures associated with mill processes and equipment may result in releases of hazardous substances to the environment, such as liquid reagents, unacceptable dust and gaseous emissions, and untreated effluent. These will be prevented by proactive design where possible, as well as maintenance programs and monitoring to ensure that all emissions and discharges meet with government requirements.

5.7.3 TMF Dam Failure

TMF dams will be designed and constructed to stringent standards in accordance with probable maximum precipitation events. In the unlikely event of a dam failure, tailings solids and surface waters covering the tailings could be released into the adjacent watersheds. The material released to the environment would essentially consist of fine grained granite and water, giving rise to elevated suspended solids concentrations. The severity of the consequences would depend on the volume of this material released to the environment and the time of year.

A total dam failure scenario is considered as a worst case event, however a total dam failure scenario is considered to be highly unlikely. All dams will be built to meet the design criteria for the Canadian Dam Safety Association's Guidelines. It should be recognized that dam failures are avoidable by proper design, routine inspection, and maintenance. Should a failure occur, corrective measures will be implemented immediately to reduce the extent of the impact. Such measures would include additional dam development, stream diversion, removal of displaced solids, and storage and clean-up as required.

5.7.4 Oil and Chemical Spills (Land & Marine)

CFI will take all precautions necessary to prevent spills of hazardous materials. Contingency planning will be in place to enable a quick and effective response to a spill. Personnel will be trained in response measures, and spill response equipment will be readily available in the event of an accidental spill. CFI will continue to enforce strict procedures for the safe transportation of all hazardous materials on site.

In the unlikely event of a spill of oil or other chemicals, the severity of the environmental consequences will depend on the location and volume of the spill, and the time of year.

In the case of an oil or hazardous material spill, emergency response and clean-up procedures will be implemented. The procedures and requirements of the WHMIS program and other applicable government regulations will also be enforced.

In all cases, the response will conform to CFI's Emergency Response Plan. The procedures will be designed to reduce, contain, and recover spilled material in order to ensure that impacts are at most short-term and localized.

Fluorspar concentrate will be conveyed to the port site storage building where temporarily stored, then transferred by a ship loader to marine vessels docked at the marine terminal. In the unlikely event that a ship or any loading systems are damaged, fluorspar concentrate may be released to the environment. The concentrate would tend to slowly settle to the seabed due to its density. Currents in the area would likely disperse some material from the spill site. The majority of the material would sink in place and remain. Should an accident occur at the loading facility, large quantities of fluorspar concentrate could enter the St. Lawrence Harbour, potentially smothering benthic communities. Accidental releases of concentrate into the marine environment could also occur along the shipping route.

Oil storage tanks at various on-land locations could also fail as a result of spontaneous rupture or explosions, however the likelihood of any oil escaping to the environment as a result of a tank failure is very low. Spills could also result from human error during delivery of fuel to the oil storage tanks (e.g., overfilling, leaving valves open). Fuel storage tanks and facilities will be designed to conform to the Newfoundland Department of Environment and Labour regulations.

Such spills would probably be very small (less than 70 litres), and emergency response and clean-up procedures would be initiated.

5.7.5 Fires and Explosions

Fires could be caused by lightning, human error or electrical/equipment malfunctions. The extent and duration of a fire depends on meteorological conditions and the success of the response effort. In addition to destruction of habitat, emissions, particulate matter, and other contaminants may be generated.

Fire protection systems will be installed at the project site. The emergency response procedure will be implemented immediately upon the detection of a fire. Fire fighting equipment and an emergency response vehicle equipped with fire fighting equipment will be deployed immediately. The appropriate Forest Management Unit office and RCMP office will also be notified immediately.

Smoke emissions from the fire would contain particulate matter, CO_2, CO, NO_x, SO_2, volatile organic carbons, poly-cyclic aromatic hydrocarbons or other contaminants. Total particulate matter would increase and contribute metals to the aquatic environment. Runoff would contain ash and sediment and increase alkalinity and total suspended solids. A fire could also increase stream bank erosion and alter the temperature of small water bodies.

Mitigation and prevention of naturally occurring fires is difficult. CFI has taken and will continue to take all precautions necessary to prevent fire hazards. Contingency planning will be in place to enable a quick and effective response to an on-site fire. Personnel will be trained in fire prevention and response, and appropriate fire-fighting equipment will be readily available in the event of a fire. This capability will also serve to minimize the environmental effects of fires caused by lightning and other natural phenomena in the vicinity.

Explosions at the mill or marine terminal could result from an accident, failure of process equipment, over-pressure, sabotage, or as the result of a fire. A comprehensive leak and gas detection system will be in place to detect possible sources of ignition. A permit to work system will be in place to work in all areas of the plant and will be strictly controlled with regard to hot work in areas with a potential to have an ignition source. Site security will tightly control access to the site to approved personnel. The fire detection and alarm system will be monitored from the central control room and the fire brigade to minimize response time so that small fires are detected and extinguished before developing into a major incident.

5.7.6 Medical Emergencies

CFI will establish occupational health and safety policies, as well as environmental health and safety policies, in order to reduce and/or eliminate work-related accidents. The company is committed to providing the safest possible workforce for its employees through the strict enforcement of these policies.

The emergency operations component involves the true emergency response: securing the plant operations, securing the scene to protect people (responders, mill workers and the public), preventing fire and explosion, fire containment, preventing escalation of the incident, rescue and evacuation of personnel to safe zones, and provision of medical and other logistics support. The emergency component always has priority for resources. Despite the urgent need to respond, the safety of responders is the major consideration.

5.7.7 Emergency Response Plan

As part of CFI's Environmental, Health & Safety Management System, an Emergency Response Plan will be developed and implemented during all phases of the Project.

The Emergency Response Plan will provide an appropriate and consistent response to emergency situations that may occur during the construction, operation, and decommissioning of the Project.

5.7.7.1 Purpose

The main purpose of the Emergency Response Plan is to ensure the protection of life, environment and property/equipment and to identify predetermined courses of action for underground mine failure, TMF Dam failure, oil and chemical spills, fires and explosions medical emergencies, or other emergency situations. This plan defines the responsibility of key personnel and outlines the general procedures to be followed when responding to emergencies in a way that will avoid or reduce health and safety risks, minimize trauma, safety hazards and environmental damage, reduce cleanup cost and minimize property damage.

The Plan outlines the emergency response protocols to be followed by all site management, engineering and environmental staff and all contractor's site workforce. It provides easy access to information needed in dealing with emergency situations involving personnel, as well as spills or incidents involving release of hazardous or environmentally damaging substances.

5.7.7.2 Scope

The Emergency Response Plan will apply to all personnel working at the Project site, and describes the emergency procedures that will be implemented immediately upon the discovery of a situation that may endanger:

- safety and/or health of individuals;
- environment; and
- property and/or equipment.

5.7.7.3 Emergency Response Plan

The Project will be designed and operated in a manner such that accidents and malfunctions will be prevented or avoided. Despite risk-reduction measures, accidents may still occur.

CFI is an organization that may be affected by natural, technological, and human events that could have a detrimental impact on the following:

- The health and safety of persons in the affected areas;
- The health and safety of persons responding to incidents;
- Continuity of business operations;
- Property, facilities, and infrastructure;
- Delivery of services;

- Environmental conditions;
- Economic and financial conditions;
- Regulatory and contractual obligations;
- Organizational reputation.

The Canadian Standards Association standard *CAN/CSA-Z731-03 Emergency Preparedness and Respons*e will be used to guide CFI response planning process. The Standard provides advice on planning, administration, training, resource utilization, auditing, and other aspects of emergency preparedness and response. Also the *Environmental Emergency Regulations* (E2 Regulations, 2003), pursuant to Section 200 of the *Canadian Environmental Protection Act* (CEPA 1999) will be used.

5.7.7.4 Emergency Response Plan Outline

The Project will have an umbrella emergency response plan with sub-plans for each type of emergency. Contingency plans will be designed to deal with events such as:

- Power failure;
- Computer Control System Failure;
- Underground mine failure;
- TMF Dam failure;
- Chemical or oil spill on Project site;
- Vessel Incident;
- Man overboard from Marine Terminal;
- Injury to a person or persons;
- Loss of life;

- Heavy snowfall and freezing rain;
- Contamination of potable water supply;
- Vehicle incident with death or injury;
- Vehicle in the water;
- Journey management overdue report;
- Confined space entry incident – one or more persons;
- Security Breach;
- Bomb threat or sabotage;
- Forest Fire;
- Hurricane;
- Earthquake;
- Tsunami.

5.7.7.5 Organizational Structure for Emergency Response

The CFI Project operations will use an Incident Command System (ICS) structure to organize the response to each emergency situation. For each emergency event, an incident management team will be activated along with an Emergency Operations Centre (or command centre). The ICS structure is further described below.

The organizational structure assumes that there is an incident management team addressing the different operational components of the incident:

- Emergency operations;
- Pollution Response operations;

- External Affairs activities;
- Internal Affairs activities;
- Health and Safety operations.

Depending on the size of the incident, the size of the team addressing each operations component will vary. The incident management team will set objectives and priorities and decide the appropriate allocation of resources between these response operations components as the incident situation evolves, based on continuous assessment and analysis of the situation.

5.7.7.6 Emergency Operations

The emergency operations component involves the true emergency response: securing the mine operations, securing the scene to protect people (responders, mine workers and the public), preventing fire and explosion, fire containment, preventing escalation of the incident, rescue and evacuation of personnel to safe zones, and provision of medical and other logistics support. The emergency component always has priority for resources. Despite the urgent need to respond, the safety of responders is the major consideration.

5.7.7.7 Pollution Response Operations

During an incident, oil or other substances may be released on land or to the marine environment. Whether on land or ocean, the release must be contained to minimize environmental damage. In such cases, the health and safety of the response personnel and other persons will be the priority.

5.7.7.8 External Affairs Operations

The external affairs operations component of any incident involves communications with government agencies, the community and the media. The objectives are to protect people, the environment and property and to return to normal operations as soon as possible. To do this requires extensive communication to deal with a wide range of problems and issues. Certain communications must be systematically managed to be effective.

5.7.7.9 Internal Affairs Operations

The internal affairs operations component involves ensuring that the relevant corporate managers and mine staff clearly understand the situation and have sufficient resources to fulfill their roles. This component includes providing support for the personal needs of staff and their families. The corporate internal affairs aspects include financial, legal, insurance and business considerations.

5.7.7.10 Recovery Planning and Operations

The recovery planning and operations component addresses the processes and programs needed to return to a normal stable situation for mining operations, for the environment and for the surrounding community.

5.8 OCCUPATIONAL HEALTH AND SAFETY

Canada Fluorspar (NL) Inc. recognizes that a good occupational health and safety program is the basis for all health and safety activities in the proposed Project and that an effective health and safety program benefits all workplaces. The occupational health and safety program will be a master plan to:

- Identify and control hazards before they cause accidents or illnesses; and will
- Provide procedures for response to emergencies.

Canada Fluorspar (NL) Inc. will strive for a ZERO INCIDENT safety target.

5.8.1 Introduction

Safety is an integral part of the Project. It is an integral part of project operations and is there to protect employees, clients, property, the environment, and the public.

There are many costs associated with accidents and unsafe work practices. The greatest costs are human costs. By protecting employees, the Project will also be protecting their friends, families, fellow workers, management, the public, and the environment from the far-reaching effects of serious accidents. In addition to protecting lives, a safety program contributes to employee morale and pride because employees will participate in identifying safety needs and in developing safe work procedures.

By fulfilling their safety responsibilities, everyone who works for the Project will share the benefits of a safe workplace.

5.8.2 Occupational Health and Safety Plan

An Occupational Health and Safety Plan will also be developed, to ensure the undertaking is carried out in accordance with the Occupational Health and Safety Act and Regulations. These measures will provide the necessary equipment, systems and tools to ensure a safe workplace is maintained, and will include a properly trained Mine Rescue team that will be responsible for assisting in incidents that underground at St. Lawrence. Information, instruction, training, supervision and facilities will maintain the health and safety of personnel for all stages of the Project.

Safety professionals will be in place to monitor and assess work practices and procedures. Safety awareness will be a prime focus for all site activities. The Occupational Health and Safety Plan will include the following:

- A dedicated Health, Safety and Environmental organization;
- The plan will be specific to the mine, mill and marine terminal;
- The plan will be made available to all employees and will be effectively communicated;
- There will be site orientation for all workers;
- The plan will have commitment from the employer and senior management;
- The plan will have input from the workers;
- The plan will assign clear responsibilities and accountabilities;
- The plan will have an evaluation mechanism;

- There will be a safety performance tracking, reporting and stewardship system;
- Safety awareness and communication programs will be established;
- The plan will provide procedures for emergency response teams and equipment.

The site will have an Emergency Management Team that will deal with all incidents. Should external resources be required to support the Project needs, the appropriate protocols will be in place to manage the incident.

5.8.3 Responsibility

Safety is everyone's responsibility. Everyone employed on the Project will be responsible for maintaining the safety program. Managers and supervisors will be responsible for identifying safety needs, communicating safety hazards, investigating hazardous conditions and accidents, providing training, supplying or wearing appropriate safety and personal protective equipment, and ensuring all equipment is properly maintained and meets legislated safety standards. Their role is supported by input from all employees.

All Project employees and contractors will be responsible for obeying all safety rules; following recommended safe work procedures; wearing and using personal protective equipment when required; participating in safety training programs; and informing supervisors of any unsafe work conditions. Everyone has the right and responsibility to refuse work when unsafe conditions exist.

5.8.4 Enforcement

Systems will be put into place so that the Occupational Health and Safety Plan is mandatory. Employees and subcontractors who knowingly violate safety rules may face disciplinary action, dismissal or legal action. Visitors may also face legal action if they knowingly disobey safety rules. In addition, the company may face legal action and fines for violations of regulatory requirements. Those individuals who do not fulfill their safety responsibilities will become accountable for any problems their negligence creates, and may be liable under the law.

5.9 ENVIRONMENTAL MANAGEMENT

Canada Fluorspar (NL) Inc. is committed to implementing appropriate environmental management in all facets of the proposed St. Lawrence Fluorspar Mine Reactivation Project. To ensure minimum impacts during daily operations of the mine, mill and marine terminal, the Best Available Technology that is Economically Achievable (BATEA) will be integrated into the project at all phases. In particular, BATEA will be incorporated into the Project design and implemented during the construction and operation phases. All measures will be taken to ensure that project-related activities have as few adverse impacts on the environment as possible.

Environmental Management planning provides Canada Fluorspar (NL) Inc. with the tools to ensure environmental protection measures are implemented and appropriate monitoring is conducted. A sound environmental management strategy and suitable mitigation measures can minimize or eliminate adverse effects to the environment.

Canada Fluorspar (NL) Inc. will protect the environment by addressing waste management and water management at all phases of the project. To prevent harm to the environment, a detailed Environmental Protection Plan will be developed. All employees will be trained to prevent environmental harm during work activities. The Project will also be designed and prepared to respond to environmental emergencies. Environmental monitoring will be concurrent with project activities to foster continuous environmental consciousness, protection and control. A reclamation plan will be developed in anticipation of project decommissioning and abandonment after operation. The reclamation plan will aim to restore the Project site to a condition that approximates a healthy natural environment.

5.9.1 Environmental Protection Plan - Construction

The Environmental Protection Plan (EPP) is an important part of the overall Environmental, Health and Safety Management (EHSM) System. This document will be finalized for approval by DOEC before any site preparation and construction activities begin. The EPP will provide a basis for implementation of the environmental requirements for the project and will include all proposed mitigation and monitoring procedures for construction.

Canada Fluorspar (NL) Inc. will develop and implement an EPP for construction that will meet or exceed all applicable regulatory, permitting and licensing requirements. The EPP will ensure a high level of environmental protection throughout its work areas and activities associated with the construction of the mine, mill and marine terminal. Mitigation measures will be developed to ensure minimal construction related impacts. The proponent is familiar with DFO Fact Sheets specifying mitigation measures for construction activities such as the installation of culverts. Appropriate buffer zones will be respected near water bodies during site preparation and construction. No blasting or dredging is planned within the marine environment for the proposed undertaking.

The EPP will be structured to allow for updates and revisions as required to meet the needs of the reviewers, and as engineering design and work methods progress. All revisions for the EPP will be reviewed and approved by the management of Canada Fluorspar (NL) Inc. Engineering drawings Issued for Construction (IFC) will contain environmental considerations and/or EPP notation boxes referencing relevant sections of the EPP to be consulted by contractors/field personnel when carrying out activities defined within the IFC drawing. EPP notation will be included on drawings to highlight important environmental protection measures relevant to the given construction activity (e.g. buffer zones, stream crossings, etc.).

The EPP will be a support document between the overall approach to environmental protection planning and the specific requirements contained in relevant permits, approvals and authorizations issued for project development and activities.

The following is a generic contents list for the Project EPP:

Section 1: provides an introduction, responsibilities of various project personnel and implementation procedures.

Section 2: provides an overview of the environmental concerns and the standard environmental protection measures associated with a variety of specific activities anticipated to occur in relation to each specific phase. Standard environmental protection procedures will be developed for:

- Clearing of Vegetation;
- Grubbing and Disposal of Related Debris;

- Storage, Handling and Transfer of Explosives, Fuel and other Hazardous Material;
- Sewage Disposal;
- Solid Waste Disposal;
- Quarrying and Aggregate Removal;
- Buffer Zones;
- Erosion Prevention;
- Excavations, Embankment and Grading;
- Stream Crossings;
- Dust Control;
- Trenching;
- Dewatering – Work Areas;
- Marine Vessels;
- Pumps and Generators;
- Noise Control;
- Blasting;
- Winter Trails;
- Groundwater Development and Use;
- Drilling – Geotechnical/Water Well;
- Concrete Production;
- Permafrost;
- Waste Rock Segregation;
- Linear Developments;
- Vehicular Traffic;
- Works in/around Marine Environment;

- Surveying;
- Equipment Operations;
- Drilling – Geotechnical in the Marine Environment;
- Drilling – Exploration;
- Emissions Reduction/Ventilation for Radon;
- Miscellaneous – Others.

Section 3: references key sources of information for the purposes of HS&E performance including items such as DFO Fact Sheets and a list of Proponent's background technical data reports compiled during the environmental assessment.

Section 4: provides contingency plans for:

- Mine Failure, Radon - Maintaining Atmospheric Concentration in Working Environment;
- Fuel and Hazardous Materials Spills;
- Wildlife Encounters;
- Discovery of Historic Resources;
- Forest Fires; and
- Vessel Accidents.

Section 5: provides the names and numbers of key contacts of the project.

Section 6: contains the site-specific Environmental Protection practices for the principal work areas for construction. These areas include:

- Underground Mine Area
- The Mill
- Marine Terminal;
- Access and Service Areas;

Site specific EPP will contain information on local environmental concerns; potential effects and sensitive areas and periods; general environmental protection measures, relevant drawings and documents; and a list of applicable permits, approvals and authorizations and compliance monitoring requirements.

5.9.2 Waste Management Plan

A detailed Waste Management Plan will be developed during the design of the proposed Project. This plan will act as a working document developed in accordance with applicable legislation and environmental standards. The plan will detail procedures and policies for appropriate handling, storage and disposal of waste products generated on-site.

5.9.2.1 Purpose

The proponent is committed to taking all steps necessary for the proper collection, storage, transportation and disposal of all wastes generated by the construction and general operations of the Project. A comprehensive Waste Management Plan will be developed for all phases of the project. This is a working document to be used by all employees and contractors on the project site, which will be updated and improved throughout all stages of the project.

5.9.2.2 Implementation

A Waste Management Plan will be developed and implemented for each stage of the project (construction, operations and decommissioning) to deal with specific waste management issues unique to that particular stage. Revisions and additions will be made as necessary and the structure of the Plan will allow for updates and revisions to be made easily as further details of the engineering design and work methods become available. The implementation of the plan will ensure activities are compliant with all applicable Acts, Regulations and Guidelines.

5.9.2.3 Waste Management Plan Content

Section 1 of the Waste Management Plan will provide an introduction, responsibilities of project personnel and implementation procedures.

Section 2 of the Waste Management Plan will provide a detailed description of the disposal plan and measures necessary for proper disposal of all waste types, including tailings, hazardous waste and non-hazardous waste, and recyclable materials at all project phases.

Section 3 of the Waste Management Plan will provide references to pertinent regulations and key sources of information to enable high levels of waste management performance, such as:

- Provincial Legislation;
- Water Resources Act (2004),
- Environmental Control Water and Sewage Regulations (2003),
- Environmental Protection Act (2002),
- Storage and Handling of Gasoline and Associated Products Regulations (2003),
- Used Oil Control Regulations (2002),
- Waste Management Regulations (2003),
- Air Pollution Control Regulations (2004),
- Dangerous Goods Transportation Act and Regulations (1990).
- Federal Legislation;
- Transportation of Dangerous Goods Act (1992),
- Fisheries Act (1985),
- Canadian Shipping Act (1985),
- Migratory Birds Convention Act (1994),
- Hazardous Products Act (1985).

Section 4 of the Waste Management Plan will provide contingency plans for occurrences such as improper disposal of wastes, fire, extreme weather conditions, and accidental spills.

Section 5 of the Waste Management Plan will provide the names and numbers of key contacts for the Project.

5.9.3 Water Management Plan

A detailed water management plan will be developed at an early stage of the project implementation. Water balance and usage is described in details in previous sections as well as in Section 6.1.1.

The water management plan for the project is formulated to satisfy the following objectives:

- ensure a reliable, acceptable quantity and quality of water be available to the project components for all operations;
- maximize the use of recycled water for processing (e.g., re-use of mine dewatering water, slurry filtration water, etc.);
- minimize amount of water used during construction and operation though the reuse and recycling of storm water and treated wastewater wherever possible;
- reduce the amount of water required by concerted efforts to incorporate conservation during design and operation of the project;

5.9.3.1 Water Supply Integrity

As described earlier, process water will be obtained mainly form the mine dewatering, with make-up freshwater drawn from Clark's Pond (if needed, pending tests results of the mine dewatering and metallurgical testing).

Water for firefighting purposes will be obtained from freshwater reservoir on-site. At the marine terminal, salt water will be used for firefighting.

5.9.3.2 Water Requirements

Details on water use, water supply, mine dewatering, and water management is provided in Sections 5.1.3, 5.1.4, and 6.1.1.

Water systems for firefighting processes will be appropriate to the final design and in accordance with the NFPA standards.

5.9.3.3 Stormwater Management

The program for stormwater management is designated to ensure that clean runoff is intercepted and diverted from site before it can become potentially contaminated by the project operations. The remainder of the stormwater control process is to intercept runoff water from the site and treat it in a manner appropriate to the potential contaminants and sediment loadings, so that it can be discharged back into the marine environment.

5.9.4 Environmental Monitoring and Follow-up

The Proponent will develop a comprehensive Environmental Monitoring Plan at an early stage of the Project implementation. It will start with baseline monitoring of existing conditions. The program has already started and will continue for some time during construction. Then a long-term monitoring program will be implemented as needed by permits and certificate of approval.

5.9.4.1 Environmental Monitoring Plan

The Environmental Monitoring Plan will include Environmental Effects and Compliance Monitoring. The Plan will be developed in consultation with regulators.

The Plan will detail the methods and procedures to be used by contractors on-site when conducting their activities. The Plan will allow Vendors/Contractors to ensure that all the activities carried out under their direction or by their subcontractors/suppliers are in compliance with the permit, approval and authorization requirements, the Proponent's site EPP and the Emergency Preparedness Plan. The Proponent's HS&E On-site Supervisor (or designate) and/or Company Representative has the right to monitor and/or audit any work in progress, or completed, at any time to ensure compliance with the EPP.

5.9.4.2 Permits, Approvals and Authorizations

An initial list of the required permits, approvals and authorizations has been identified (Chapter 7). Contractors will submit a list of all required permits, authorizations, licences and certificates to the Company Representative upon award of contract.

Contractors will be responsible for obtaining all permits, approvals, authorizations and certificates directly related to their contract activities, which were not identified as being the responsibility of the Proponent or Company Representative. The Vendors/ Contractors will also identify any additional permits, approvals, authorizations and certificates that do not appear on the above-mentioned list. The Contractor(s) will submit their respective applications to the Company Representative, in sufficient time prior to the date required to commence on-site activities.

5.9.4.3 Documentation

Documentation submitted in support of, and copies of the permits, approvals and authorizations obtained by the Proponent, Company Representative and Contractors will be maintained at the site and at the offices of Canada Fluorspar (NL) Inc. and/or the Company Representative.

5.9.4.4 On-Site Monitoring and Control

Contractors, including all their sub-contractors/suppliers and associated personnel, will be responsible for the implementation and compliance with all conditions specified on the permits, approvals or authorizations and practices and procedures identified in the EPP.

The Proponent or its representative will have full-time monitors on-site to monitor and enforce environmental protection measures and to ensure all activities are conducted in accordance with the EPP and the conditions specified in all permits, authorizations or approvals. In addition, main contractors will be required to have a full-time Environmental Coordinator on-site for the duration of the contract activities.

5.9.4.5 Environmental Orientation

The Proponent is committed to providing a Site Orientation Program as part of the overall HS&E Management System. Upon arrival at site a Site Orientation will be provided to all new site workers/visitors prior to commencing activities at the site. The orientation will provide information on a broad range of site rules and policies, worker health and safety, workplace health and safety, and environmental protection planning, etc.

5.10 PROJECT ACTIVITIES AND ENVIRONMENT INTERACTIONS

The project activities during all phases of the Project and their interaction with the various environmental valued environmental components (VEC's) are presented in a form of "Interaction Matrix" as shown below (Table 5.10-1). The interaction matrices are for the Project phases: Construction, Operations, Decommissioning, as well as for Accidents & Malfunctions, for both terrestrial and marine environments, bio-physical and socio-economic components' as shown below.

5.10.1 Bio-Physical Interaction Matrix – Construction

Project Activities	**Environmental Considerations**	**VECs**				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Marine		
On-Shore Construction						
Site preparation; including clearing, leveling, grubbing, blasting & drilling	Air emissions	Y	Y	Y	Y	Y
	Noise/blasting	Y	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
	Loss of habitat	Y	0	0	O	Y
Shoal Cove Tailings berm and dam development: including clearing, leveling, fill emplacement in pond, etc	Air emissions	Y	Y	Y	Y	Y
	Noise	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
	siltation control	Y	Y	Y	O	Y
	Vehicular traffic	0	0	0	Y	Y
	Loss of habitat	Y	0	0	Y	Y
Site access road, transmission lines, bridges/culverts, grading, paving, excavating, in-filling, clearing of right of way, concrete production	Air emissions	Y	Y	Y	Y	Y
	Noise	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
	Stream Crossings	Y	0	0	Y	0
Intakes/outfalls, process water system, fire water system, storm water system (sedimentation ponds)	Air emissions	Y	Y	Y	Y	Y
	Noise	Y	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y

Project Activities	**Environmental Considerations**	**VECs**				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Marine		
Quarry Development	Air emissions	Y	Y	Y	Y	Y
	Noise/blasting	Y	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	O	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Buildings - substations, headframes, support buildings, etc	Air emissions	Y	Y	Y	Y	Y
	Noise	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	O	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Underground Mine Develop. including u/g drilling, blasting, mine dewatering, ventillation, waste rock hauling & surface stockpiling.	Air emissions	Y	Y	Y	Y	Y
	Noise/blasting and lights	Y	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	O	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Process mill and product storage	Air emissions	Y	Y	Y	Y	Y
	Noise and lights	0	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	O	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y

Project Activities	Environmental Considerations	VECs				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Marine		
Waste management - Solid waste, liquid waste, sewage, hazardous waste	Air emissions	0	Y	Y	Y	Y
	Noise	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	O	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Accidents & Malfunctions			Y	Y	Y	Y
Marine Construction						
Marine Terminal structures, marine infilling, underwater drilling and/or pile driving	Air emissions		Y	Y	Y	Y
	Noise		Y	Y	O	Y
	Lights		Y	Y	Y	Y
	rock emplacement & siltation		Y	Y	Y	Y
	Vessel traffic		0	Y	O	Y
	Vehicular traffic		0	0	O	Y
	Presence of new structures		Y	Y	Y	Y
	Proximity to fish harvesting sites		?	?	O	?
Marine Traffic	Noise		Y	Y	Y	Y
	Lights		Y	Y	Y	Y
	vessel/barge movement		0	Y	O	Y
Accidents & Malfunctions	spills (marine & land-based)	Y	Y	Y	Y	Y
	explosions	0	0	0	Y	Y
	fires	Y	0	0	O	Y
	structural failures	Y	Y	Y	O	Y

5.10.2 Bio-Physical Interaction Matrix – Operations and Decommissioning

Project Activities	Environmental Considerations	VECs				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Commercial		
Operations						
Mine Development, Mine Operations: u/g drilling and blasting, mine dewatering, ventilation, waste rock hauling & surface storage, ore hauling to mill	Noise/blasting	Y	0	0	0	Y
	Air emissions	0	Y	Y	Y	Y
	Storage and disposal of wastes	0	0	0	Y	Y
	Effluent discharges (to land)	Y	0	0	0	Y
	Vehicular traffic	0	0	0	Y	Y
	groundwater impacts	0	0	0	0	Y
Fluorspar Processing	Noise	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
	Storage and disposal of wastes	0	0	0	Y	Y
	Reagent storage and equipment	0	0	0	Y	Y
	Vehicular traffic	0	0	0	Y	Y
	Air emissions	0	Y	Y	Y	Y
	Effluent discharges	Y	Y	Y	Y	Y
Water Management	Mine water extraction	0	0	0	0	Y
	Potable water extraction	0	0	0	0	Y
	Process water extraction (from BBN)	0	0	0	0	Y
	Surface water control (runoff)	Y	Y	Y	0	Y
	Mine water discharge (to freshwater bodies)	Y	0	0	0	Y

Project Activities	Environmental Considerations	VECs				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Commercial		
Waste management - Solid waste, liquid waste, sewage, hazardous waste	Air emissions	0	Y	Y	Y	Y
	Effluent discharges	Y	Y	Y	Y	Y
	Noise & Lights	0	0	0	Y	Y
	Vehicular traffic	0	0	0	Y	Y
	Lights	0	0	0	Y	Y
Maintenance and repairs - site access road, bridges/culverts, power lines, right of way maintenance, buildings and equipment	Air emissions	0	Y	Y	Y	Y
	Noise & Lights	0	0	0	Y	Y
	Storage and disposal of wastes, debris	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Vessel loading and off-loading	Air emissions (incl dust)	0	Y	Y	Y	Y
	Noise & Lights	0	Y	Y	Y	Y
	management of bilge water	0	Y	Y	Y	Y
	Noise & Lights	0	Y	Y	Y	Y
	Vessel traffic	0	0	Y	Y	Y
Decommissioning						
Site decommissioning and rehabilitation; incl. Bldg. demolition and debris disposal, leveling, topsoil placement and seeding	Air emissions	0	Y	Y	Y	Y
	Noise & Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	-	Y
	Vehicular traffic	0	0	0	Y	Y
Shoal Cove Tailings management facility decommissioning	Air emissions	0	Y	Y	-	Y
	Noise & Lights	0	0	0	-	Y
	siltation control	Y	Y	Y	-	Y
	Vehicular traffic	0	0	0	Y	Y

Project Activities	**Environmental Considerations**	**VECs**				
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Fish & Fish Habitat**		**Commercial Fisheries**	**Migratory Birds**	**SARA Species**
		Freshwater	Marine	Commercial		
Underground Mine Decommissioning: including capping of access portals and shafts.	Air emissions	0	Y	Y	Y	Y
	Noise and lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Waste management - Solid waste, liquid waste, sewage, hazardous waste	Air emissions	0	Y	Y	Y	Y
	Noise & Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Marine Terminal Decommissioning (material handling systems, storage buildings)	Air emissions	0	Y	Y	Y	Y
	Noise & Lights	0	0	0	Y	Y
	Run-off, siltation	Y	Y	Y	Y	Y
	Vehicular traffic	0	0	0	Y	Y
Accidents & Malfunctions	Dam Failures	Y	Y	Y	Y	Y
	explosions	0	0	0	Y	Y
	spills	0	Y	Y	Y	Y
	Fire		0	0	Y	Y

5.10.3 Socio-Economic Interaction Matrix – Construction, Operations and Decommissioning

Project Components & Activities		**VEC - Human Receptors**									
KEY: 0 = No Interaction, Y = Interaction but effect undetermined		**Human Health**	**Employment / Job Creation**	**Training**	**Business Opp. & Impacts**	**Comm. Econo. Dev. (CED)**	**Fisheries & Aquaculture**	**Tourism & Recreation**	**Infrastructure & services**	**Quality of Life**	**Historic Resources**
Construction	Site Development/ Project footprint	Y	Y	O	Y	Y	O	Y		Y	Y
	Tailings Facilities	Y	Y	Y	Y		O	O		O	O
	Marine Terminal	O	O	O	Y		O	O		O	O
	Mine Development/Reactivation	Y	Y	Y	Y		O	O		Y	O
	Processing Buildings (crusher, Mill, workshops, etc.)	Y	O	Y	Y		O	O		O	O
	Site Utilities & Infrastructure	O	O	Y	Y		O	O		O	O
	Shipping (Construction Materials if applicable)	O	O	O	Y		O	O		O	O
Operations	Mining & Mine Wastes, etc.	Y	Y	Y	Y		O	O		O	O
	Marine Terminal Operation	Y	Y	Y	Y		O	O		O	O
	Ore Processing	Y	Y	Y	Y		O	O		O	O
	Tailings Management	Y	Y	Y	Y		O	O		Y	O
	Site Utilities & Infrastructure & Waste Management	Y	Y	O	Y		O	O		O	O
	Marine Traffic	Y	Y	O	Y		O	O		O	O
Decommissioning		Y	Y	O	Y		O	O		O	O
Accidents & Malfunctions		Y		Y	Y		O	O		O	O