ARGENTIA HYDROMETALLURGICAL DEMONSTRATION PLANT
ENVIRONMENTAL PROTECTION PLAN
FOR OPERATIONS

ISSUE DATE
MAY 23, 2006

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Current Status

PREFACE

ENVIRONMENTAL PROTECTION PLAN (EPP) DISTRIBUTION LIST

Copy #	Name	Position	Location
1	Earl Dwyer	VBNC - Manager, EH&S	St. John's
2	Grant Gaudet	Inco – EH&S Superintendent	Argentia
3	Don Stevens	Inco – Plant Manager	Argentia
4	Fred King	Inco - Plant Maintenance Superintendent	Argentia
5	Nancy Whittle	Inco – EH&S Officer	Argentia
6	Bill Julian	Inco– Operations Superintendent	Argentia
7	Ken Dominie	ADM, Department of Environment	St. John's
8	Allister Taylor	ADM, Department of Natural Resources	St. John's
9	Brian Power	Environment Canada	St. John's
10	John O'Rourke	DFO	St. John's
11	Hazen Scarth	Department of Government Services	St. John's
12	Les Hulett	Inco - Director, Environmental Affairs	Toronto

MAINTENANCE OF THE EPP

Responsibilities

Inco Environment, Health and Safety (EH&S) Superintendent:

- review revision requests;
- forward revision requests to the EH&S Department;
- conduct a review of the EPP on an as needed basis; and
- determine if EPP Holders and their staff are familiar with the EPP and its procedures.

VBNC EH&S Department:

- document control;
- receive revision requests;
- obtain necessary approvals of revisions; and
- distribute approved revisions to plan holders.

EPP Holders:

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

Personnel Responsibilities:

- familiarize themselves with the EPP; and
- have knowledge of reporting procedures.

Initiating Revisions

This is a controlled document and revisions may only be made by the EH&S Superintendent. It is anticipated that most of the revisions to the EPP for Operations will arise from the environmental management team at site. Plan holders and readers/reviewers may initiate proposed revisions by forwarding recommended changes to the Inco EH&S Superintendent. They will be reviewed and appropriate revisions sent to the EH&S Department who will distribute revisions for approval.

Revision Procedures

Revisions must be approved by the VBNC Manager of EH&S. The approved revisions will be issued by the EH&S Department to all holders of controlled copies of the EPP. Each revision will be accompanied by a Revision Control Sheet that:

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

An updated Table of Contents will be included with each revision. A revision number and revision date will be added to each revised page. Within two working days of receiving a revision, EPP holders will:

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

REVISION REQUEST INITIATION FORM

Section To Be Revised:
Nature Of Revision:
Rationale For Revision: (*i.e.*, environment/worker safety, etc.)
Submission:
Please submit request to the Inco Environment, Health and Safety Superintendent

REVISION CONTROL RECORD

EPP Section	Revision Date	EPP Holder's Signature

PLAN APPROVAL:

This document titled *"Argentia Hydrometallurgical Demonstration Plant Environmental Protection Plan for Operations"* has been reviewed and accepted as the document to be used for environmental protection planning for the operation of Inco's demonstration plant.

This has been reviewed and approved by the undersigned.

Earl Dwyer
Manager – Environment, Health and Safety
Voisey's Bay Nickel Company Ltd.

Don Stevens
Manager, Demonstration Plant
Inco Limited
Voisey's Bay Project

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1.0 INTRODUCTION

1.1 Environment, Health and Safety Management System

Inco/VBNC's Integrated Management System comprises a variety of Environment, Health and Safety (EH&S) plans representing the way in which the company approaches the management of EH&S functions and requirements throughout the life of the Project.

Environmental Protection Plans (EPPs) represent one of the key EH&S plans required to support the overall IMS for the Plant. EPPs are the cornerstone for implementing environmental protection measures, providing documentation of environmental protection procedures, against which performance can readily be assessed and the need for additional corrective measures can be determined, if appropriate. Other associated plans that support the overall IMS for the Plant work scope include:

- Occupational Health and Safety Plan – Argentia Hydrometallurgical Demonstration Plant;
- Site Orientation Guide: this guide provides all new site workers with information on a broad range of site rules and policies, worker health and safety, workplace health and safety, environmental protection planning, historic resources management planning and wildlife harassment issues;
- Plant Rehabilitation And Closure Plan;
- Emergency Response Plan;
- Waste Management Plan;
- Environmental Effects Monitoring Plan.

Inco/VBNC developed and implemented an EPP for the Construction phase and has subsequently developed this EPP for the Operations phase of Project development.

1.1.1 Environmental Policy

It is the objective of Inco to apply cost-effective, best management practices to advance environmental management to all facets of its operations. Officers, management, employees and contractors of Inco are all responsible for the incorporation of environmental protection measures into their work responsibilities.

To this end, Inco has developed an EH&S policy (Figure 1.1) demonstrating this commitment. In implementing the EPP, Inco is committed to continuous environmental improvement. In it's EH&S Policy, Inco has established the principal driver for implementing and improving the EPP so that environmental performance can be maintained and potentially improved.

1.1.2 Roles and Responsibilities

The EPP for Operations is developed and implemented by an Environmental Management Team, the structure, roles and responsibilities of which are illustrated in Figure 1.2 and summarized below.

Voisey's Bay Nickel Company Ltd. Managing Director:
The Managing Director of VBNC is responsible for the overall direction of VBNC's Integrated Management System and approves environmental policies and plans.

VBNC Manager, Environment, Health and Safety:
VBNC's EH&S Manager is responsible for the development and maintenance of VBNC's Integrated Management System, as well as the company's environmental policies and plans, including EPPs.

Inco Manager, Demonstration Plant:
The Plant Manager is responsible for implementation of the Integrated Management System, and reports regularly to the Managing Director on the implementation and status of environmental measures. Other responsibilities include defining the scope of project and ensuring that non-compliance issues are addressed in a timely manner.

Inco EH&S Superintendent, Demonstration Plant:
The EH&S Superintendent will report directly to Inco's Plant Manager, Demonstration Plant with functional responsibility to the VBNC EH&S Manager. The role of the Superintendent is to communicate EH&S progress to the Plant Manager and the EH&S Manager and to prepare status reports, implement site inspection programs to ensure regulatory compliance, and identify environmental, and health and safety risk situations. He/she has the authority to provide direction, including stop work orders, on EH&S matters as they arise. The Inco EH&S Superintendent will also oversee Plant activities. The role of the EH&S Superintendent also includes the implementation, assessment and interpretation of environmental protection procedures as set down in the EPP, regulations, guidelines, permits, approvals and authorizations. The Inco EH&S Superintendent advises Operations management of environmental procedures and requirements, participates in project team meetings, monitors project activities, conducts environmental audits and performance reviews, and assists in the development and revision of the EPP.

Provincial and Federal Government Representatives: Government Representatives will visit the site periodically to audit compliance with applicable government regulations, as per the mandates of their respective agencies. They will provide information and advice directly to VBNC's EH&S Manager and/or Inco's EH&S Superintendent.

Contractors: Contractors will provide some of services of the Operations phase of the Plant. The contractors are responsible for implementing environmental protection procedures as outlined in the Inco EPP, regulations, guidelines, permits, approvals and authorizations. The EPP will be one of several Project documents that will be used to evaluate the Contractors' EH&S performance.

Figure 1. 1 Inco EH&S Policy

ENVIRONMENTAL, HEALTH AND SAFETY POLICY

Inco endorses the principle of sustainable development. It is recognized that sustainable development includes commitments to health, safety and the environment through a balanced approach to economic, technical and social issues. Accordingly, this Policy is intended to set forth Inco's ongoing commitment to health, safety and the environment.

Through Inco's exploration, mining, processing, refining, marketing and decommissioning activities on a global basis, Inco will apply appropriate pollution prevention principles and environmental, health and safety risk management practices.

To implement this Policy and its commitment to such principles and practices, Inco will:

- assess, plan, construct, operate and decommission all projects and facilities in compliance with all applicable legislation. We will seek not only to meet but, when possible, surpass standards set by applicable legislation through the diligent application of technically proven and economically feasible measures.
- in the absence of legislation, apply cost-effective best management practices to advance environmental protection at all our facilities and projects and to minimize risks to occupational and public health and safety and the environment.
- maintain active, ongoing monitoring programs to evaluate operational risks to human health and safety and the environment and apply appropriate risk management principles to ensure compliance with applicable legislation and internal requirements.
- involve employees at all levels in programs directed towards continuous improvement of the workplace environment and the minimization of adverse effects on the environment.
- employ appropriate environmental management systems that are intended to continually improve performance consistent with defined goals.
- foster research directed at expanding scientific knowledge of the impact of industry activities on the environment, evaluating the linkages between the environment and economy, and improving processing technologies.
- work proactively with governments and the public in the development of equitable, cost-effective and realistic laws and regulations for the protection of the environment and the enhancement of occupational health and safety.
- engage with stakeholders, including employees, shareholders, customers, the public, communities, businesses and governments, to address applicable environmental, health, safety and social concerns stemming from Inco's operations.
- review with Inco's Board of Directors, on a regular basis, company performance with respect to occupational health and safety and the environment.

Inco regards the quality of the environment, the health and safety of its employees and the communities in which it operates as among its highest corporate priorities and requires that this Policy be implemented worldwide by each Inco employee. This Environmental, Health and Safety Policy supercedes and replaces a corresponding Policy adopted in 1993.

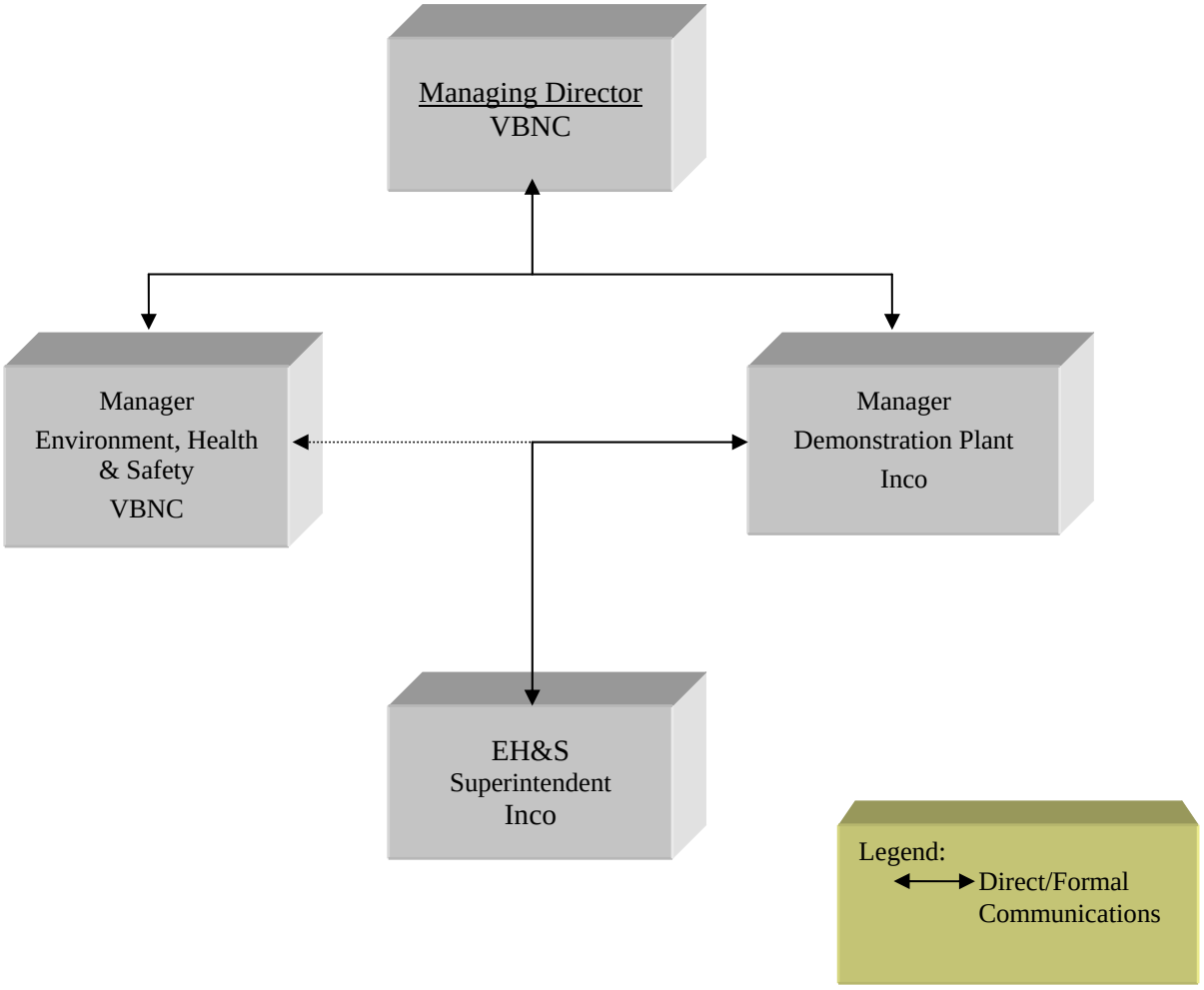
Scott M. Hand
Chairman and Chief Executive Officer

Peter C. Jones
President and
Chief Operating Officer

INCO
STRONGER FOR OUR EXPERIENCE

April 2002

Figure 1. 2 Environmental Management Team



1.1.3 EPP for Operations – Development Strategy

The EPP for Operations is intended to address the Inco Operations phase work scope. These include:

- Plant (Including Crushing, Grinding, Leaching, Filtration, Solvent Extraction, Neutralization, Electrowinning);
- Site Water Management and Water Treatment Facilities (Residue Storage Ponds);
- Process Chemicals/Fuel Storage and Distribution;
- Sewage Collection, Treatment and Disposal;
- Hazardous Waste Management and Disposal;
- Non-Hazardous Waste Management and Disposal;

Environmental Performance: Focusing on early Operations activities provides an opportunity for critical early monitoring of the EPP and overall environmental performance at the work site. During this period the effectiveness of environmental protection measures can be monitored and evaluated, and modifications or improvements to mitigative measures can be assessed, or Operations methods evaluated as necessary, to improve EH&S performance.

Inco EH&S personnel will work closely with VBNC department personnel and site contractors on a daily basis, to ensure any deficiencies are addressed in a timely fashion. EH&S plant personnel and the Plant Manager shall work together to ensure that the environmental protection measures at the Argentia site are effective. Each year environmental performance will be reviewed. This annual review will provide a venue for open discussion, review of performance and planning.

1.2 Purpose of the EPP

Environmental protection planning is an important component of overall project planning and implementation of the Operations phase. EPPs are often required as part of a project approval by governments following an environmental assessment. EPPs provide a practical way in which a proponent can demonstrate its understanding of environmental regulations, practices and procedures required to reduce or eliminate the potential environmental effects of the Plant.

Inco has committed to the development and implementation of a comprehensive EPP to help ensure a high level of environmental protection throughout its work areas and activities associated with the Operations of the Demonstration Plant. An EPP is a working document for use in the workplace for project personnel and contractors, as well as at the corporate level for ensuring commitments made in policy statements are implemented and monitored. EPPs provide a quick reference for project personnel and regulators to monitor compliance and to make suggestions for improvements.

This EPP for Operations provides the general protection procedures for the **routine** activities associated with Operations activities anticipated for the Plant and identifies applicable permits, authorizations and approvals, as well as key site-specific conditions of approvals, as appropriate. The EPP forms an integral part of the company's integrated Environmental, Health and Safety Management System (IMS). The specific purposes of the EPP are to:

- provide a reference document to ensure that commitments to minimize environmental effects will be met;
- document environmental concerns and appropriate protection measures;
- provide concise and clear instructions to project personnel regarding procedures for protecting the environment and minimizing environmental effects;
- provide a reference document for personnel when planning and/or conducting specific activities and working in specific areas.;.
- provide a training aid during implementation efforts;
- communicate changes in the program through the revision process; and
- provide a reference to applicable legislative requirements and guidelines.

1.3 Organization of the EPP

This EPP provides instructions to ensure project personnel understand and implement environmental protection procedures for both routine activities and unplanned events associated with Plant operations at the Argentia site.

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

The EPP comprises the following sections:

The *Preface* describes the distribution of the EPP, and outlines its maintenance, revision and document control procedures.

Section 1 provides an introduction to the EPP including its relationship to Inco EH&S Management System, key roles and responsibilities and the strategy for developing and implementing the EPP for Operations.

Section 2 provides an overview of the environmental concerns and general environmental protection procedures associated with a variety of specific activities anticipated to occur in relation to Operations in the Plant area.

The general environmental protection procedures are presented in association with anticipated routine activities, such as solid waste disposal, and residue disposal, etc.

Section 3 contains the site-specific EPP for the principal work areas for the Operations of the Demonstration Plant. It addresses the key elements of the Plant Operations work scope, namely the different process areas of the Plant and Residue Management.

Section 4 provides contact information for key environmental personnel.

The site-specific EPP is intended to provide EPP holders with key information to enhance overall EH&S performance. It contains information on local environmental sensitivities and periods as well as the site-specific environmental protection procedures that may be contained in permits, authorizations or approvals. Site-specific EPPs contain references to other key documents and information sources as well as drawings issued for Operations.

1.4 Development and Implementation of the EPP

The EPP will be revised and expanded as warranted to meet the requirements of reviewers, and as engineering design and work methods are further defined.

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

1.4.1 Mechanisms for Implementation

The effectiveness of the EPP depends largely on the avenues for appropriate application of EPP guidelines. Adequate communication between the Operations personnel and the site environmental superintendent is necessary to ensure that work tasks that have the potential to cause environmental impact are identified and monitored. Mechanisms currently used to ensure conformance and dissemination of EPP guidelines and information include: annual environmental performance reviews; Environmental Significance Evaluation for work tasks that have the potential to harm the environment; and periodic environmental meetings with Inco management and the EH&S Superintendent.

1.4.1.1 Environmental Aspects and Impacts Control Measures

An Inco Environmental Significance Evaluation Procedure will be conducted on each of the Operations activities to identify and manage the potential environmental aspects and

impacts. Inco will ensure that staff with responsibilities for activities having potential environmental impacts are aware of their potential and the control measures in place to mitigate their impact.

1.4.1.2 Environmental Meetings

Regular environmental meetings (frequency to be agreed among parties) shall be held with the site EH&S Superintendent and Inco/VBNC Management to review any EH&S issues and/or EPP implementation items. These meetings serve to identify and resolve environmental concerns as they develop. Non-compliance items identified during routine monitoring activities are tabled for discussion and resolution.

1.4.1.3 Crew Line-up Meetings

Crew Line-up meetings are short meetings that are held with Operation crews and supervisors at the beginning of each work shift. Discussion involves the work task assignment for the day and any safety concerns or hazards associated with the performance of these work tasks are identified. In parallel with this, these meeting also provide opportunity for brief discussion of environmental issues that may be associated with daily work tasks and as well as applicable mitigative measures that are outlined in the EPP that apply to that work.

1.4.1.4 Employee Orientation

A site orientation has been developed for the Demonstration Plant and is presented to all people that arrive at the property. New workers at the project site are presented with general information, rules and procedures to assist them in performing their work safely and with minimal impact on the environment.

During the Operations phase there will be an environmental awareness component to the site orientation that addresses documentation within the EPP including: waste disposal and handling (including food waste), spill reporting procedures, pollution prevention, proper storage and handling of materials, and emergency response.

1.5 Environmental Monitoring

1.5.1 Monitoring Activities

Environmental monitoring at the Plant site is an essential component that supports commitment to environmental protection. Environmental monitoring of Operations activities occurs on a daily basis by representatives from Inco EH&S.

The basis for environmental monitoring at the plant rests with the principles, procedures and guidelines presented in the EPP for Operations. As a supplement to this, conditions of regulatory permit approvals also assist in establishing a foundation for which to conduct environmental monitoring activities.

1.5.2 Non-Conformance

Non-conformance items noted during environmental inspections shall be documented in Non-Conformance Reports and addressed during environmental meetings in the presence of the Manager or Superintendent responsible for mitigative measures. Target dates shall be identified and required responsibilities assigned to the appropriate personnel. All corrective action shall be documented and reported back to EH&S. Corrective actions for non-conformance items shall be communicated in Non-Conformance Reports and in the weekly environmental meetings.

If serious non-conformance items are noted that require immediate attention, appropriate personnel shall be contacted and mitigative measures implemented immediately.

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2.0 INTRODUCTION

Section 2 of the EPP provides general environmental protection procedures for activities of the Operations phase of the Demonstration Plant Project. These procedures are designed to prevent and minimize damage to the environment, which could be caused by the activities of Demonstration Plant operations and that may occur in the event of an accident.

2.1 Storage, Handling and Transfer of Fuel and Other Hazardous Materials

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

Process Chemicals

- Sulphuric Acid
- Hydrochloric Acid
- Sodium Carbonate
- Calcium Carbonate (Limestone)
- Hydrated Lime
- Sodium Hydroxide (20%)
- Sodium Chloride
- Boric Acid (H_3BO_3)
- Flocculent
- Sodium Metabisulphite ($Na_2S_2S_5$) (potential)
- Sodium Hydrosulphide (NaHS) (potential)
- Sodium Lignosulphonate
- Thiourea
- Glue
- SLS (Sodium Lauryl Sulphate)
- BHT (Butyl Hydroxy Toluene)
- ECH (Ethylene Cyanahydrin)

Process Gases

- Oxygen
- Argon
- Nitrogen
- Chlorine (made and used by the process, not stored)

Other Process Make-Up

- Escaid 110
- LIX 84
- DEHPA
- Cyanex 272
- Cd IX Resin

Supplies

- Activated Carbon
- Anthracite for MMF
- Clay (Diatomaceous earth)

- Grinding Balls (Limestone Mill)
- Grinding Balls (Concentrate Repulping)
- SMD Sand, 20 um

Environmental Concerns

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

Environmental Protection Procedures

Inco shall have in place a demonstrated spill response capability that includes an appropriately trained Environmental Emergency Response Team. Details of emergency response team training and operations are provided in the Emergency Response plan for the operations phase.

The following protection procedures will be implemented:

2.1.1 Transport of Fuel and Other Hazardous Materials

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

2.1.2 Storage of Fuel and Other Hazardous Materials

All bulk storage of fuel products and other hazardous materials on land will be stored in above-ground tanks with secondary containment in compliance with *The Storage and Handling of Gasoline and Associated Products Regulations, 2003 (NLR 58/03)*.

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

a) Fuels and other hazardous materials shall only be handled by persons who are trained and qualified in handling these materials. Implementation of training, labeling and access to material safety data sheets (MSDS) required for products controlled under Workplace Hazardous Materials Information System (WHMIS) will provide workers with the tools to ensure safe handling and storage of these products.

b) Oils, grease, gasoline, diesel or other fuels or any material deemed to be hazardous shall be stored at least 100 m from any watercourses, water bodies or ecologically sensitive areas.

c) Fuels and liquid hazards chemicals shall be stored inside dykes or self-dyked units and will be clearly marked to minimize the risk of damage by moving vehicles.

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

e) Any above-ground fuel tank that is not self-dyked shall be positioned over an impervious mat and shall be surrounded by an impervious dyke of sufficient height (minimum height 0.6 m) to contain:

i. where a dyked area contains only one storage tank, the dyked area shall retain not less than 110% of the capacity of the tank;
ii. where a dyked area contains more than one storage tank, the dyked area shall retain not less than 110% of the capacity of the largest tank or 100% of the capacity of the largest tank plus 10% of the aggregate capacity of all the other tanks, whichever is greater. Otherwise approved self-dyked storage tanks shall be used where required; and
iii. dyked areas are to be dewatered on an as needed basis. The water shall be decontaminated prior to release into the environment.

f) Any dykes of earthwork construction shall have a flat top not less than 0.6 m wide, and be constructed and maintained to be liquid tight to a permeability of 25 L/m²/day. The distance between a storage tank shell and the centerline of a dyke shall be at least one half the tank height.

g) Fuel storage areas and non-portable transfer lines shall be clearly marked or barricaded to minimize the risk of damage by moving vehicles. The markers will be visible under all weather conditions. Barriers will be constructed in compliance with the provincial Storage and Handling of Gasoline and Associated Products Regulations, 2003 (NLR 58/03).

h) Waste oils, lubricants, and other used oil shall be reused, recycled or disposed of at an approved, licensed waste management facility Used Oil Control Regulations, 2002 (NLR 82/02) and the Air Pollution Control Regulations, 2004 (NLR 39/04).

i) All storage tank systems shall be inspected on a regular basis (as determined by EH&S Superintendent) to ensure compliance all applicable regulations, including Sections 20 and 21 of Storage and Handling of Gasoline and Associated Products Regulations 2003 (NLR 58/03). This involves, but is not limited to, gauging or dipping and the keeping of reconciliation records for the duration of the program.

j) Contracted fuel suppliers must comply with Inco's EPP. Prior to transporting or positioning fuel at the site, they must provide an acceptable copy of their "Fuel and Hazardous Material Spills Contingency Plan" to Inco.

k) Smoking shall be prohibited within 10 m of a fuel storage area. Proper signage shall be erected notifying people of this prohibition.

l) Work Permits shall be required before undertaking welding or torch cutting at a fuel storage area.

m) Within 30 days of known decommissioning of a storage tank system the system shall be emptied of all products, the tank and associated piping from the ground shall be removed, all contaminated soil removed, and the area cleaned and the site restored.

n) Any soil contaminated by small leaks of fuel, oil or grease from equipment shall be disposed of in accordance with the provincial Environmental Protection Act and Storage and Handling of Gasoline and Associated Products Regulations. The Contaminated Sites Cleanup Criteria will be used as a guideline to the Department of Environment and Conservation requirements for such disposal.

o) A fuel and other hazardous materials spill contingency plan, and adequate emergency spill equipment shall be in place on site.

p) The provisions of INCO Corporate EH&S Guideline No. 11 – "Fuel and Chemical Storage & Handling" shall apply to all site activities.

Complete information may be obtained by accessing the Inco website at: http://sudwebp01/ehscorp/uploads/CorporateGuidelines/CG11.02FuelsChemicalsStorageHandling.doc

q) Outdoor storage of gasoline or diesel in portable containers is acceptable only in areas designated for that purpose.

2.1.3 Equipment Fuelling

The following procedures shall apply to the fuelling of equipment:

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

b) All mobile equipment will be serviced and fuelled on land at least 100 m from watercourses, water bodies or ecologically sensitive areas unless in designated areas designed for spill containment or unless adequate spill containment is in place and approved by the EH&S department.

c) When refuelling equipment, operators shall:

i. use leak-free containers and reinforced rip and puncture-proof hoses and nozzles;
ii. be in attendance for the duration of the operation; and
iii. seal all storage container outlets except the outlet currently in use.

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

e) Fuelling attendants shall be trained in the requirements under the Inco Emergency Response Plan.

2.1.4 Hazardous Materials

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

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

b) Prior to receipt of any hazardous materials Material Safety Data Sheets (MSDS) must be available at the worksite to all workers, including medical personnel, who may be exposed to the product.

c) All hazardous materials shall be removed and disposed of in an acceptable manner, in accordance with government regulations, the requirements of the Waste Management Plan, and the Inco HSE Corporate Guidelines: fuels; chemicals; storage and handling CG No. 11.02.

2.1.5 Spills of Fuel and Hazardous Materials

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

b) All spills of fuel and hazardous materials shall be reported immediately to the EH&S Coordinator or designate.

c) Spills of hazardous materials, spills of fuels to the marine environment, and all spills of 70 L or more on land shall be reported immediately to the Canadian Coast Guard at 709-772-2083 or 1-800-563-9089 as outlined in the Inco Emergency Response Plan. Spills of fuel and hazardous materials shall be reported to Pollution Prevention Division of Department of Environment and Conservation.

Complete information on corporate guidelines may be obtained by accessing the Inco website - http://sudwebp01/ehscorp/uploads/CorporateGuidelines/CG11.02FuelsChemicalsStorageHandling.doc

d) Emergency response personnel will be available to respond when required to spills of hazardous materials, as outlined in the Inco Emergency Response Plan.

e) Every effort shall immediately be made by workers who first notice the spill to safely control the source of the leak or spill and to clean up the contaminated area.

f) All material and equipment used during spill clean up must be stored properly until it can either be disposed of or cleaned to avoid further contamination. Disposal of clean up materials must be in accordance with the EPP, the Waste Management Plan and all government regulations and requirements.

g) There shall be appropriate emergency spill response equipment on site for all phases of the process. An emergency response team shall be available at all times to response to environmental emergencies at site.

h) A complete list of the emergency spill response equipment shall be available on site and kept up to date.

i) All emergency response equipment should be kept in good working condition suitable for required use. To ensure working condition of equipment, practice deployments will be conducted under the supervision of the Emergency Response Team Coordinator and/or EH&S Coordinator.

j) Regular inspections of all spill response supplies and equipment will be conducted and documented to ensure adequate supply and condition.

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

2.2 Equipment Operations

A variety of equipment will be used on site during the Operations phase, which are potential sources of noise, air emissions, and leaks or spills.

Environmental Concerns

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

Environmental Protection Procedures

2.2.1 All Equipment Operations

The following protection measures shall be taken during all equipment operations:

a) All approvals, authorizations and permits for activities will be followed.

b) Noise control procedures will be put in place during the operation of equipment.

c) All equipment will have exhaust systems regularly inspected and mufflers will be operating properly.

d) All equipment will meet the requirements of the provincial Air Pollution Control Regulations under the Environmental Protection Act.

e) All equipment use on-site will follow the environmental protection procedures outlined in this EPP.

f) In the case of an accidental event resulting from the use of equipment (e.g., a vehicle incident involving a fuel spill and/or a medical emergency, etc.), the appropriate contingency plans will be implemented.

g) Regular maintenance inspections for leaks will be made on all equipment. If problems are identified the equipment will be taken out of service and repaired. Mitigation measures to prevent release of hydrocarbons into the environment (drip tray, spill pan, absorbent material, etc.) will be put in place immediately.

2.3 Sewage Disposal

Environmental Concerns

The accidental release of untreated sewage is a concern to human health, drinking water quality, and freshwater and marine ecosystems.

Environmental Protection Procedures

a) The site sewage treatment facilities shall comply with the Department of Health guidelines and the provincial *Water Resources Act*, *Environmental Control Water and Sewage Regulations.*

b) Effluent from sewage treatment for discharge through the outfall in Argentia Harbour, shall be in compliance with the provincial *Environmental Control Water and Sewage Regulations*.

c) Operation of the Sewage Treatment Plant (STP) shall be undertaken in accordance with the approval from the Department of Environment and Conservation.

d) Any problems with operation of sewage treatment facilities (e.g., improper operation, pipeline rupture, or system breakdown, *etc*.) shall be immediately reported to the Site Services Supervisor and EH&S Coordinator or their designates.

e) In the event of any release of sewage into the environment (e.g., pipeline rupture, vacuum truck incident, etc.) immediate action will be taken to ensure that the release is contained and prevented from reaching any water body. Untreated sewage effluent will be pumped back into the STP. All sewage spills must be reported to the Site Services Supervisor and EH&S Coordinator or designates.

2.4 Solid Waste Disposal

Environmental Concerns

Solid waste (e.g., domestic waste, paper, cardboard, and wood), if not properly controlled and disposed of, will be unsightly and may cause human safety and health concerns.

Environmental Protection Procedures

2.4.1 Solid Waste Disposal Operations

a) A Waste Management Plan will be in place to address all waste generation, handling and disposal at the Demonstration Plant site during the Operations phase.

b) All solid waste generated during Operations will be collected, stored and disposed of as per the Waste Management Plan and in accordance with all applicable government laws, regulations and requirements.

c) Solid Waste Disposal will be in accordance with the requirements of the provincial *Environmental Protection Act*, associated regulations, and standards.

d) All solid waste will be collected and transported to the site in accordance with the *Newfoundland and Labrador Dangerous Goods Transportation Act*, and the *Newfoundland and Labrador Environmental Protection Act* and accompanying regulations.

e) Prior to disposal, waste accumulated on site shall be confined so that it does not pose an environmental or health hazard. All temporary storage of waste must first be approved by the EH&S Coordinator or designate.

f) Time lapse between collection and disposal shall be minimal.

g) Transportation of waste to the municipal landfill shall be in covered vehicles designated for waste collection.

h) All non-recyclable non-hazardous solid domestic wastes (i.e., plastic, glass, metal banding on crates, metal food containers, etc) will be transported to landfill.

i) To reduce the amount of waste being generated and landfilled, all site personnel will abide by the recycling procedures outlined in the Waste Management Plan.

j) No solid waste material will be deposited in a body of water.

2.4.2 Hazardous Waste Storage

a) All hazardous wastes will be stored in acceptable leak proof containers.

b) All containers will have the generator's name, contents and all appropriate labels securely affixed to it.

c) All on-site hazardous waste storage is temporary. All Hazardous waste is to be shipped offsite to a licensed facility for disposal.

2.5 Trenching

Environmental Concerns

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

Environmental Protection Procedures

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

a. Topsoil and excavated overburden and bedrock shall be stored in separate stockpiles for later use during rehabilitation.

b. Any unsuitable material shall be disposed of in a disposal area approved by the EH&S Coordinator.

Dewatering of trenches shall make use of measures to minimize and control the release of sediment-laden water through the use of filtration, erosion control devices, settling ponds, geotextiles or other devices.

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3.0 SITE-SPECIFIC ENVIRONMENTAL PROTECTION PLAN

In addition to the general environmental protection procedures provided in Section 2, this EPP also provides site-specific environmental protection procedures in relation to the primary areas of Plant operations. These site-specific environmental protection procedures provide information on Operation Phase components and activities; general environmental issues and concerns; environmental protection procedures applicable to that process area; and associated compliance monitoring requirements.

3.1 Demonstration Plant

The Demonstration Plant is located approximately 10 km from Placentia. The processing facilities consist of primary ore crushing, conveying and chlorine CCD circuit. The layout of these facilities is shown on Figure 3.1.

The primary components of the Demonstration Plant, and the key activities include:

- **Concentrate Crushing and Grinding Area**, which is the area where a reduction of particle size occurs and enables the blending, concentrate qualities.
- **Chlorine Pre-leach area:** which closes the chlorine balance for chemistry purposes. Chlorine received from the E. W. system.
- **Autoclave system**: extraction of nickel, cobalt, and copper.
- **CCD Counter Current Decantation Circuit** (leach residue thickener) separation of soluble nickel from leach residue.
- **Weak Liquor Neutralization System**: this unit takes the weaker blends of residual nickel that are within the circuit and extracts the remainder of the nickel out.
- **Nickel Hydroxide Dissolution & Iron removal 1**: this unit purifies the nickel solution, adjacent to this system there is an **Iron Removal/Gypsum filtration** system.
- **Copper Solvent Extraction:** this unit uses solvents to extract copper from the nickel solution.
- **Copper Electro winning Unit:** this unit is used to produce metallic copper from copper electrolyte.

3.1.1 Environmental Issues and Related Controls/Procedures

3.1.1.1 General

General environmental issues which may be associated with specific areas of the Demonstration Plant operation, and the applicable controls and/or procedures for each are as follows:

- **Concentrate Crushing and Grinding Area**: a ruptured filter bag in the bag filter system, which would create a high concentration of nickel dust to be released through the stack.
  - Controls include a differential pressure gauge in place and the pressure is checked by operations and documented readings taken.

- specific contaminant(s);
  - Nickel sulphide dust, 20% by weight nickel.
- anticipated release quantity of each contaminant;
  - 1.35 kg total dust.
- anticipated release concentration of each contaminant;
  - 0.052 g/m3 dust
- discharge location;
  - Mineral processing stack, South East building roof area.
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Dust.

- **Chlorine Pre-leach area:** a scrubber malfunction could potentially create a high concentration of chlorine to atmosphere. Failure of the chlorine compressor could cause the accumulation of Sodium Hypo-chloride within the system.
  - Controls in place will be operation parameters, operations check, and sampling.
  - For chlorine compressor failure, clean out compressor and dispose of material through a certified disposal company.
  - specific contaminant(s);
    - Wet chlorine gas, 17.2 by weight chlorine.
  - anticipated release quantity of each contaminant;
    - 2.4 kg total chlorine gas
  - anticipated release concentration of each contaminant;
    - 1.6 g/m3 chlorine
  - discharge location;
    - Chlorine recovery stack, South East building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas

- **Autoclave system:** a malfunction of the quenching system could result in a release of nickel sulphite.
  - Controls in place are operational checks and DCS alarms for the system.
  - specific contaminant(s);
    - Nickel in the form of nickel sulphate.
  - anticipated release quantity of each contaminant;
    - 217 g Nickel
  - anticipated release concentration of each contaminant;
    - 8.6 g/m3.
  - discharge location;
    - Autoclave vent, South wall of building.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Aqueous/Aerosol

- **CCD Circuit:** a potential for high concentration of nickel with an upset of the system.
  - Controls are regular sampling, instrumentation controls, and operator checks

- specific contaminant(s);
  - Nickel in the form of Nickel Hydroxide.
- anticipated release quantity of each contaminant;
  - 3.4 kg Nickel.
- anticipated release concentration of each contaminant;
  - 0.03 wt% Ni in solid leach residue
- discharge location;
  - Residue Pond
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Solid Waste.

- **Weak Liquor Neutralization System**: malfunction of scrubber, which would potentially create a release of a small amount of nickel to the atmosphere.
  - Controls are operational checks and an alarm on the DCS system.
  - specific contaminant(s);
    - Nickel in the form of Nickel Sulphate.
  - anticipated release quantity of each contaminant;
    - 216 g Nickel
  - anticipated release concentration of each contaminant;
    - 0.048 g/m3
  - discharge location;
    - Neutralization Scrubber stack. Northwest roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Aqueous/aerosol

- **Nickel Hydroxide Dissolution & Iron removal 1:** with an inadequate wash during the wash process there is potential a high concentration of nickel to be released to residue.
  - Controls are operational checks and sampling on a regular basis.
  - specific contaminant(s);
    - Nickel as Nickel Hydroxide.
  - anticipated release quantity of each contaminant;
    - 65.7 g Nickel.
  - anticipated release concentration of each contaminant;
    - 0.23 wt% in solid Iron-Gypsum residue.
  - discharge location;
    - Residue Pond
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Solid Waste.

- **Copper Solvent Extraction:** this area has potential for fire.
  - There is gas detection in place and operational checks; there is also a fire suppression system in place in this area.

- The quantity of emission released before extinction with fire fighting foam is very difficult to estimate. Given the current setup of individual fire sensors in each reactor it is estimate that only trace contaminants would be released.

- **Copper Electrowinning Unit:** this unit has the potential to create a high acid mist concentration during an operational upset.
  - Controls are operational checks and sampling on a regular basis.
  - specific contaminant(s);
    - Sulphuric acid and Copper sulphate.
  - anticipated release quantity of each contaminant;
    - 9.5 g of H2SO4 and 4.7 g of CuSO4 (1.9 g as Cu).
  - anticipated release concentration of each contaminant;
    - 0.036 g/m3 H2SO4 and 0.018 g/m3 CuSO4.
  - discharge location;
    - Copper Electrowinning Stack, North East roof area
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Aqueous/aerosol

- **Iron Removal:** with the operation of this unit, waste is created in the form of cartridge filters.
  - Controls are that these cartridge filters will be disposed of via a licensed contractor.
  - These filters are being disposed of according to design.

- **Impurity Solvent Extraction:** this area has a potential for fire.
  - Controls: There is gas detection in place and operational checks; there is also a fire suppression system in place in this area.
  - The quantity of emission released before extinction with fire fighting foam is very difficult to estimate. Given the current setup of individual fire sensors in each reactor it is estimate that only trace contaminants would be released.

- **Cobalt Solvent Extraction Unit:** this area has a potential for fire.
  - Controls: There is gas detection in place and operational checks; there is also a fire suppression system in place in this area.
  - The quantity of emission released before extinction with fire fighting foam is very difficult to estimate. Given the current setup of individual fire sensors in each reactor it is estimate that only trace contaminants would be released.

- **Cobalt Electrowinning:** this unit has the potential of discharging acid vapors out to the atmosphere during an upset condition. This unit also may have a situation where worn or damaged bags have to be replaced (bag waste).
  - Controls: Operational parameters, operational checks. Bag disposal through a licensed contractor.
  - specific contaminant(s);
    - Sulphuric acid and Cobalt sulphate.

- anticipated release quantity of each contaminant;
  - 1.8 g of H2SO4 and 3.6 g of CoSO4 (1.4 g as Cu).
- anticipated release concentration of each contaminant;
  - 0.0012 g/m3 H2SO4 and 0.024 g/m3 CoSO4.
- discharge location;
  - Chlorine recovery stack, South East building roof area.
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Aqueous/aerosol

- **Nickel Electrowinning:** this unit has the potential of discharging acid vapors out to the atmosphere during an upset condition. This unit also may have a situation where worn or damaged bags have to be replaced (bag waste).
  - Controls: Operational parameters, operational checks. Bag disposal through a licensed contractor.
  - specific contaminant(s);
    - Chlorine, Sulphuric acid and Nickel sulphate.
  - anticipated release quantity of each contaminant;
    - 2.5 kg of Chlorine, 25.7g of H2SO4 and 60.1 g of NiSO4 (23 g as Ni).
  - anticipated release concentration of each contaminant;
    - 1.67 g/m3 chlorine, 0.017 g/m3 H2SO4 and 0.04 g/m3 NiSO4 (0.015 g/m3 Ni).
  - discharge location;
    - Chlorine recovery stack, South East building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas + Aqueous/aerosol

- **Chlorine/Caustic Scrubber:** Potential for a release of chlorine vapor with a malfunction of the scrubber system.
  - Controls: Scrubber system runs in sequence (this gives the unit some added protection), operational checks, operational parameters, and regular PMs.
  - specific contaminant(s);
    - Chlorine, Sulphuric acid, Cobalt sulphate and Nickel sulphate.
  - anticipated release quantity of each contaminant;
    - 2.5 kg of Chlorine, 29.3g of H2SO4, 3.6 g of CoSO4 (1.4g as Co) and 60.1 g of NiSO4 (23 g as Ni).
  - anticipated release concentration of each contaminant;
    - 1.67 g/m3 chlorine, 0.019 g/m3 H2SO4, 0.0024 g/m3 CoSO4 (0.0009 g/m3 as Co) and 0.04 g/m3 NiSO4 (0.015 g/m3 Ni).
  - discharge location;
    - Chlorine recovery stack, South East building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas + Aqueous/aerosol

- **Chlorine Stripping:** There is a potential to have a failure of the rupture disc on this system, which would release chlorine vapors to atmosphere.
  - Controls: operational checks, operational parameters.
  - specific contaminant(s);
    - Chlorine
  - anticipated release quantity of each contaminant;
    - 0.858 kg of Chlorine
  - anticipated release concentration of each contaminant;
    - 0.57 g/m3 chlorine
  - discharge location;
    - Chlorine recovery stack, South East building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas

- **Chlorine Compressor System:** There is a potential to have a failure of the rupture disc on this system, which would release chlorine vapors to the atmosphere.
  - Controls: operational checks, operational parameters, and instrumentation notification.
  - specific contaminant(s);
    - Wet chlorine gas, 17.2 by weight chlorine.
  - anticipated release quantity of each contaminant;
    - 2.4 kg total chlorine gas
  - anticipated release concentration of each contaminant;
    - 1.6 g/m3 chlorine
  - discharge location;
    - Chlorine recovery stack, South East building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas

- **Process Effluent Neutralization System:** There is a potential for concentration of nickel to the pond during process-upset conditions.
  - Controls: operational checks, operational parameters, and instrumentation notification. Follow monitoring requirements as specified in Certificate of Approval for Operations.
  - specific contaminant(s);
    - Nickel as Nickel Hydroxide.
  - anticipated release quantity of each contaminant;
    - 65.7 g Nickel.
  - anticipated release concentration of each contaminant;
    - 0.23 wt% in solid Iron-Gypsum residue.
  - discharge location;
    - Residue Pond
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Solid Waste.

Utilities Systems:

- **Limestone System:** there is a potential for a release of dust to atmosphere with the rupture of a bag within the system.
  - Controls: operational checks, operational parameters, and instrumentation notification.
  - specific contaminant(s);
    - Limestone Dust
  - anticipated release quantity of each contaminant;
    - 1.02 kg total dust.
  - anticipated release concentration of each contaminant;
    - 0.4 g/m3 dust
  - discharge location;
    - Utilities Stack, North building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Dust.

- **Flocculent Skids:** No environmental effects.

- **Oxygen Storage:** higher then normal risk of fire with the uncontrolled release of oxygen (oxygen rich atmosphere higher potential for fire).
  - Controls: operational checks, vender QA/QC program.
  - specific contaminant(s);
    - Oxygen Gas
  - anticipated release quantity of each contaminant;
    - 114 t maximum
  - anticipated release concentration of each contaminant;
    - >99.8wt%
  - discharge location;
    - Oxygen storage area, South end of building.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas

- **Argon system:** No environmental effects.

- **Lime system:** there is a potential for a release of dust to atmosphere with the rupture of a bag within the system.
  - Controls: Operational checks, and Operational procedures.
  - specific contaminant(s);
    - Slaked Lime Dust
  - anticipated release quantity of each contaminant;
    - 1.02 kg total dust.
  - anticipated release concentration of each contaminant;

- 0.4 g/m3 dust
- discharge location;
  - Utilities Stack, North building roof area.
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Dust.

- **Soda Ash System:** there is a potential for a release of dust to atmosphere with the rupture of a bag within the system.
  - Controls: Operational checks, and Operational procedures.
  - specific contaminant(s);
    - Soda Ash Dust
  - anticipated release quantity of each contaminant;
    - 1.02 kg total dust.
  - anticipated release concentration of each contaminant;
    - 0.4 g/m3 dust
  - discharge location;
    - Utilities Stack, North building roof area.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Dust.

- **Sulfuric Acid Totes:** in the event of a scrubber failure there is a potential for a release of acid vapours discharge to the atmosphere.
  - Controls: Operational checks, and regular PMs on the system.
    :a loss of containment is a potential.
  - Controls: containment berms are in place, and trained personnel.
  - specific contaminant(s);
    - Sulphuric Acid
  - anticipated release quantity of each contaminant;
    - One 1,920 kg tote.
  - anticipated release concentration of each contaminant;
    - 93 wt%
  - discharge location;
    - Utilities area sump.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Aqueous

- **Analytical Lab:** analytical laboratory wastes consist of solids, solutions, organics and fumes. The solids are process solid samples that generally have varying levels of Ni, Cu, Co and Fe. There is very little volume of this material, however it is still considered "hazardous" because of the heavy metal content and needs to be disposed properly. The solutions are process solutions, titration rejects and digestion rejects from solid digestions. Process solutions and digestion rejects are sent back via sinks and a pump to the neutralization circuit. Titration rejects that contain potassium iodide are separately contained for professional disposal because of possible iodine fumes. The organics are

separately contained for professional disposal. The matrix is Escaid which has a low vapor pressure and does contain heavy metals. Fumes (both acid and organic) are separately vented without scrubbing to atmosphere at the top of the building. A perchloric acid fume hood is available when the use of perchloric acid is required.

- specific contaminant(s);
  - Nickel containing solutions from burst pipe.
- anticipated release quantity of each contaminant;
  - 112.5 g Ni.
- anticipated release concentration of each contaminant;
  - 0.5 g/L
- discharge location;
  - Under analytical Lab.
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Aqueous.

- **Steam Boiler:** Boiler to be maintained to ensure proper operation.

- **Propane System:** uncontrolled propane release with potential for fire.
  - Controls: Trained personnel, vender package.
  - specific contaminant(s);
    - Propane Gas
  - anticipated release quantity of each contaminant;
    - 19.1 t maximum
  - anticipated release concentration of each contaminant;
    - >99.8wt%
  - discharge location;
    - Propane storage area, South end of building.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Gas

- **Water System:** Potential loss of containment (leaks).
  - Controls: Operational Checks, Response Team, site grading.

- **Diesel Fuel Storage:** potential loss of containment
  - Controls: operational checks, containment berms, PMs.
  - specific contaminant(s);
    - Diesel fuel
  - anticipated release quantity of each contaminant;
    - 1,100 L
  - anticipated release concentration of each contaminant;
    - 100%
  - discharge location;
    - Double walled containment vessel within emergency diesel container, North end of building.

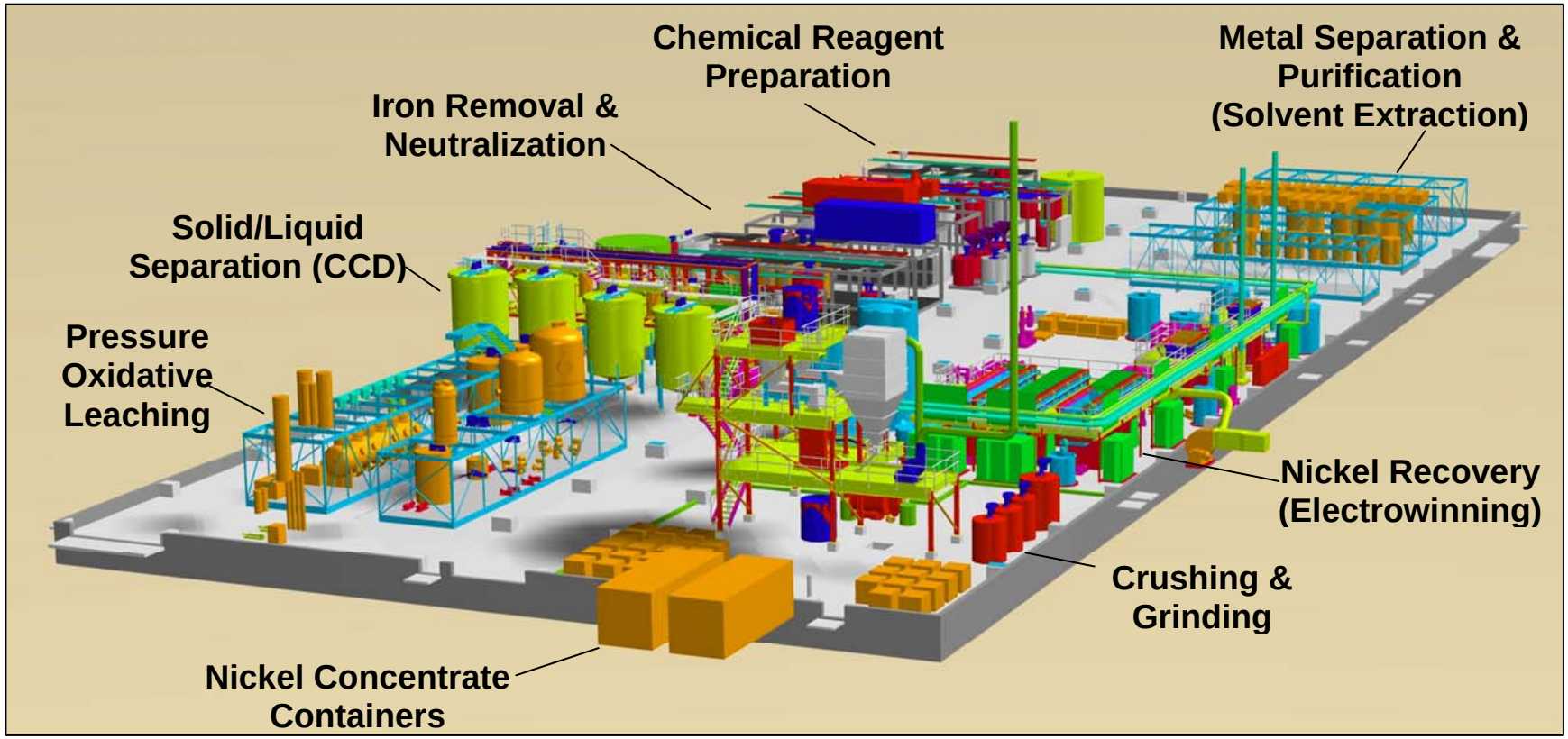
- form of contaminant (dust, aerosol, gas, solid waste, effluent).
  - Oil

- **Cooling Tower:** Bio-hazardous release is a potential through vapour.
  - Controls: Chemical treatment of Cooling towers.

- **Sewage Treatment System:** loss of containment is a potential, potential solid waste created.
  - Controls: Operational checks, a contract in place with disposal company for solid waste.

- **Residue Ponds:** with the failure of the neutralization system there is a potential for a concentration of nickel or other process parameters out to the pond. There is a potential for birds or animals to enter the pond system.
  - Controls: Operational checks, sampling program in place, treatment through the neutralization system.
  - Controls: set up bird deterrents around the pond if required; operator checks.
  - specific contaminant(s);
    - Nickel Sulphate
  - anticipated release quantity of each contaminant;
    - >1.75 kg
  - anticipated release concentration of each contaminant;
    - >0.5 mg/L
  - discharge location;
    - If discharged without treatment in error, to Placentia Bay.
  - form of contaminant (dust, aerosol, gas, solid waste, effluent).
    - Aqueous.

Figure 3. 1 Facility Layout



3.1.1.2 Demonstration Plant Chemical Spills

Spill management at the Demonstration Plant will include preventative measures and control of materials released into the environment. This includes:

a) Spill Control Measures:

i. All spills of slurry, process water, and hazardous materials will be contained and cleaned up according to standard operating procedures.
ii. All spills of controlled products, regardless of volume, shall be reported to the EH&S department in the form of an immediate verbal report followed by a written spill report.
iii. Liquid spills and wash down of dry chemical spills inside the Demonstration Plant building shall be contained in a closed system of sumps. Sump collection shall be monitored and directed back into the process.

b) Preventative Measures:

i. Inco shall have in place standard operating procedures (SOP) and contingency planning, including inspection and preventative maintenance components to prevent uncontrolled releases at the Demonstration Plant facility.
ii. procedures will be implemented for the following:

i. use of appropriate containers;
ıı. labeling of containers according to the Workplace Hazardous Materials Information System (WHMIS);
iii. appropriate storage of process reagents;
iv. incompatible chemicals shall be stored separately in order to prevent deleterious chemical reactions and cross contamination;
v. personnel handling dangerous goods are trained and provided with appropriate PPE; and
vi. bulk liquid chemical storage areas have a concrete or lined secondary containment.

3.1.1.3 Surface Water Run-off

Surface water run-off at the Demonstration Plant area will be managed by the drainage infrastructure designed to divert surface run-off to the Runoff Capture Pond. The pond is sized for a 1 in 25 year precipitation event. Water will be tested and treated if required before discharge into Placentia Bay.

3.1.1.4 Air Emissions

Air quality management at the Demonstration Plant area will include measures to minimize and control dust.

Potential source of dust generation at the Demonstration Plant area include:

- rupture in the bag filter system with the crush/grinding area.

This system will be monitored on a regular basis.

Air quality protective measures include:

a) Dust Control Measures:

i. A baghouse dust collector shall control dust emissions at transfer points between the crusher and grinder area. Dust collected by the baghouse will be re-deposited into the operating system. Operational checks will be completed on a regular basis.

Note: Please reference 3.1.1.1 for further details regarding emissions.

3.1.2 Permits, Approvals and Authorizations

Table 3.1.2 provides a summary of the various permits, approvals and authorizations pertaining to Demo Plant Operations. This list will be updated if and when permit requirements change.

Table 3.1.2 Permits, Approvals and Authorizations

Permit Name	Government Department
Certificate of Approval for Industrial Facilities/Processes – Demonstration Plant Operations (including residue ponds)	Department of Environment and Conservation
Permit Water and Sewage Works – Sewage Treatment Plant	Department of Environment and Conservation
Design Registration of Pressure Piping Systems, Central Aisle, Piping, Plant Air Design, POL Area Design and Oxygen System	Government Services Centre
Licence for Fixed and Portable Gauges	Canadian Nuclear Safety Commission
Fuel Tank Registration (2) (for diesel driven fire pump and for back-up generator)	Government Services Centre
Environmental Protection Plan for Operations	Department of Environment and Conservation
Waste Management Plan for Operations	Department of Environment and Conservation

3.1.3 Compliance Monitoring Requirements

Compliance monitoring applicable to the Demonstration Plant area includes:

- treated effluent discharges in accordance with regulatory requirements specified in the Certificate of Approval for Operations;
- sewage treatment plant discharge in accordance with Permit Water and Sewage Works.

4.0 KEY CONTACTS

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CANADIAN COAST GUARD

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