



Spill Contingency Plan

PROJECT ID: Great Slave Lake Remediation

SUBMITTAL ID: AANDC - CARD - SCP - version 1

DATE OF SUBMISSION: January 3, 2014

SUBMITTED BY: Ron Breadmore – Aboriginal Affairs and Northern Development Canada (AANDC)

SUBMITTED TO: Mackenzie Valley Land and Water Board



Table of Contents

- 1 Introduction and Project Details 4
 - 1.1 Company Name, site name, site location and mailing address 4
 - 1.2 Effective Date of Spill Contingency Plan 4
 - 1.3 Revisions to Spill Contingency Plan..... 4
 - 1.4 Purpose and Scope..... 5
 - 1.5 Environmental, Health and Safety Policy..... 5
 - 1.6 Project Description..... 6
 - 1.7 Site Description 7
 - 1.8 List of Hazardous Materials..... 7
 - 1.9 Existing Preventative Measures 9
 - 1.10 Additional Copies of this Spill Contingency Plan..... 11
 - 1.11 Process for Staff Response to Media and Public Inquiries 11
- 2 Response Organization and General Duties 11
- 3 Action Plan 14
 - 3.1 Potential Spill Size and Sources for Each Hazardous Material On Site 14
 - 3.2 Potential Environmental Impacts of Spill..... 17
 - 3.3 Procedures 18
 - 3.3.1 Procedures for Initial Actions..... 18
 - 3.3.2 Spill Reporting Procedures..... 18
 - 3.3.3 Procedures for Containing and Controlling the Spill..... 19
 - 3.3.4 Procedures for Transferring, Storing and Managing Spill Related Wastes 21
 - 3.3.5 Procedures for Restoring Affected Areas 22
- 4 Resource Inventory 22
 - 4.1 On-site Resources 22
 - 3.2 Off-site Resources 23
- 4 Training Program..... 24
 - 4.1 Outline of Training Program 24
- Appendix A - Site Maps 25
- Appendix B - Material Safety Data Sheets 32
- Appendix C - NT-NU Spill Report Form 50





Appendix D – Immediately Reportable Spill Quantities..... 53



1 Introduction and Project Details

Aboriginal Affairs and Northern Development Canada (AANDC) - Contaminants and Remediation Directorate (CARD) has developed the *Great Slave Lake Remediation Project – Spill Contingency Plan* (Plan) in accordance with the “Guidelines for Spill Contingency Planning” (AANDC 2007), and although conceptual in nature, the Plan is being submitted in support of our Type “A” Land Use Permit application. A more robust plan will be submitted by the successful Final Remediation Contractor as part of their contract submittal process and in advance of their mobilization to site.

This plan will be the minimum standard that submittals will be measured against.

1.1 Company Name, site name, site location and mailing address

Table 1 presents key corporate information pertaining to CARD.

Table 1. Key Information Pertaining to CARD

Federal Proponent	Aboriginal Affairs and Northern Development Canada – Contaminants and Remediation Directorate
Contact Person	Ron Breadmore Project Manager Telephone number: (867) 669-2743 Fax number: (867) 669-2721 Ron.Breadmore@aandc-aadnc.gc.ca
Project Office Location	PO Box 1500 4920 52 nd Ave Yellowknife, NT, X1A 2R3

1.2 Effective Date of Spill Contingency Plan

This Spill Contingency Plan is effective as of the above date of submission. This is a living document that will be reviewed at minimum annually prior to the start of any site activities, with additional reviews as warranted.

1.3 Revisions to Spill Contingency Plan

Table 2 tracks the Spill Contingency Plan (SCP) revisions and ensures that all stakeholders have the most up to date copy of the plan. The table must be updated each time a revision is made to the Spill Contingency Plan.



Table 2. Revision history of the Spill Contingency Plan

Version #	Contractor Approval	Date	Crown Approval	Date	Sections Revised	Comments	Revision Distribution Date
v.1	n/a	n/a	Ron Breadmore, Project Manager	January 3, 2014	n/a	First Approval	n/a

1.4 Purpose and Scope

The purpose of this plan is to outline response actions for potential spills of any size, including a worst case scenario for CARD and all Contractors on site at the GSL Remediation Project Sites. The plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards, environmental damage, and clean-up efforts. The plan has been prepared to ensure quick access to all the information required in responding to a spill.

1.5 Environmental, Health and Safety Policy

Within AANDC’s Northern Contaminated Sites Program the health and safety of employees and protection of the environment are an overriding priority. Management is committed to doing everything possible to prevent injuries and to maintain a healthy environment. To this end:

- Senior managers are responsible for ensuring that all the requirements of this EHS Policy are fully implemented.
- All managers and supervisors are responsible for ensuring that their employees are trained in safe work procedures, to undertake their assigned duties without accidents, injuries or harm to the environment, and for ensuring that employees follow safe work methods and all related regulations.
- All personnel are required to support and comply with the EHS program, making safety, health and protection of the environment a part of their daily routine, and ensuring that they follow safe work methods and relevant regulations.
- All personnel will be held accountable for implementing, and adhering to, the requirements of the EHS program.
- All personnel are accountable for reporting to their immediate supervisor any unsafe practices or areas in need of improvement. Personnel are further accountable for bringing such reports to the attention of higher levels in the organization, without fear of reprisal, if the situation is not addressed appropriately.



- All relevant Territorial and Federal laws, regulations and policies, including the requirements of INAC's NAP Contaminated Sites Program Management Framework, are incorporated into our program as minimum standards.
- Pollution prevention practices and programs to achieve continuous improvement will be implemented as an ongoing requirement of the program.
- Where a conflict arises due to different standards or requirements between different regulations or standards, the more stringent of the two will apply.

The plan will be presented to all staff during their on-site orientation sessions. During the worker orientation seminar, training sessions will be scheduled to ensure employees have an understanding of the steps to be undertaken in the event of a spill. All spill kits are located wherever fuel is stored or transferred. Workers will be trained in using spill equipment and spill response.

1.6 Project Description

The aim of this project is to remediate 3 abandoned mine sites and to leave as minimal presence in the area as possible. The footprint left behind must be acceptable to the affected aboriginal people for their future use and to ensure the safety of local wildlife and plants.

This project is expected to span approximately 2 years. Project works will be primarily limited to the open water season, with the exception of a portion of the mobilization and demobilization to Copper Pass via a re-activated winter road (~7 km). Work will commence June/July 2014 with initial mobilization following ice-out.

Activities for the GSL Remediation Project consist of the following tasks:

1. Mobilization and demobilization
2. Temporary camp operation
3. Closing mine openings
4. Upgrading and maintenance of site roads and Copper Pass winter access road
5. Excavation and consolidation of hydrocarbon contaminated material
6. Excavation and consolidation of select waste rock
7. Excavation and consolidation of ore and ore concentrate
8. Excavation and consolidation of metals-impacted soil
9. Off-site disposal of hydrocarbon contaminated material, ore, and select metals-impacted soil
10. Stabilization of select ore and waste rock consolidations
11. Capping of select on-site ore and waste rock consolidations
12. Dewatering and backfilling select trenches
13. Quarrying and placing material as cover
14. Disposal of buildings/structures



15. Consolidation of hazardous and non-hazardous refuse for off-site disposal

1.7 Site Description

The GSL Remediation Project consists of the remediation of 3 abandoned mine sites within the East Arm Region of Great Slave Lake, including; Outpost Island Mine, Blanchet Island Mine, and Copper Pass Mine. All sites are remote with no nearby inhabitants.

The Outpost Island mine site is located approximately 94 km southeast of Yellowknife, NT and occupies two islands, Outpost Island (West Island) and East Island in Great Slave Lake. The coordinates for the site are 61° 44' 17" N, 113° 27' 30" W. The site consists of an abandoned underground mine. The majority of the mining operation was located on Outpost Island (West Island) including the main camp, mill and service buildings. Access to the site is by air or boat in the summer and by winter road, however a winter road to the site has not been constructed in recent years, and there are no plans to construct one. Mining operations took place on the site from 1941 to 1942 and 1951 to 1952.

The Blanchet Island mine site is located approximately 115 km southeast of Yellowknife, NT on the southern shore of Blanchet Island in Great Slave Lake. The coordinates for the site are 61° 59' 45" N, 112° 23' 45" W. The site consists of an abandoned underground mine. The mine area is located approximately 1.5 km northeast of the camp and beach areas of the site. Access to the site is by air or boat in the summer and by winter road, however a winter road to the site has not been constructed in recent years, and there are no plans to construct one. The mine operated from 1968 to 1970, with no milling operations on site.

The Copper Pass mine site is located approximately 129 km east of Yellowknife, NT on Sachowia Lake (7.5 km northwest of Sachowia Point on the Hearne Channel of Great Slave Lake). The coordinates for the site are 62° 24' 30" N, 111° 51' 45" W. The site consists of an abandoned mine site. The mining works were limited to aboveground operations with no milling. The majority of exploration occurred in late 1960s, with no other mining or significant exploration activities reported since 1970.

Site maps are included in Appendix A.

1.8 List of Hazardous Materials

Hazardous materials on-site will be primarily limited to fuel. Additional hazardous materials may include POL wastes (Petroleum, Oil and Lubricant), and small amounts of cleaning supplies. All hazardous materials will be stored securely to prevent spills.

Table 3 describes the anticipated fuel on-site at each of the three remediation sites for the duration of the GSL Remediation Project. It is expected that all fuel will be mobilized to the sites at the



beginning of each site remediation, with no fuel resupplies expected. Maximum fuel volume on-site will coincide with initial site mobilization, and will decrease as the project progresses. This section will be updated when final fuel volumes become available.

Table 3. Anticipated fuel breakdown stored at each site for the Great Slave Lake Remediation Project

<i>Material</i>	<i>Storage Container</i>	<i>Normally On-site</i>	<i>Maximum On-site</i>	<i>Storage Areas and Uses</i>
Outpost Island Mine				
Diesel	205 L Drums and/or Double Walled Tank	71,500 L (up to 350 drums and/or up to 4 Tanks)	71,500 L (up to 350 drums and/or up to 4 Tanks)	Main fuel storage area. Camp power and heat, and equipment operation.
Gasoline	205 L Drums	1,230 L (6 drums)	1,230 L (6 drums)	Main fuel storage area. Light vehicles, generators, saws.
Jet B Fuel	205 L Drums	1,250 L (6 drums)	1,250 L (6 drums)	Main fuel storage area. Aircraft refuel.
Propane	100 lb cylinders	8,500 lb (85 cylinders)	8,500 lb (85 cylinders)	Main fuel storage area. Camp kitchen operation
Blanchet Island				
Diesel	205 L Drums and/or Double Walled Tank	90,000 L (up to 436 drums and/or up to 4 Tanks)	90,000 L (up to 436 drums and/or up to 4 Tanks)	Two fuel storage areas. Camp power and heat, and equipment operation.
Gasoline	205 L Drums	1,700 L (8 drums)	2,500 L (12 drums)	Two fuel storage areas. Light vehicles, generators, saws.
Jet B Fuel	205 L Drums	1,250 L (6 drums)	1,250 L (6 drums)	Fuel storage area nearest the lake access. Aircraft refuel.
Propane	100 lb cylinders	10,700 lb (107 cylinders)	10,700 lb (107 cylinders)	Fuel storage area nearest the camp. Camp kitchen operation
Copper Pass				
Diesel	205 L Drums and/or Double Walled Tank	90,000 L (up to 436 drums and/or up to 4 Tanks)	90,000 L (up to 436 drums and/or up to 4 Tanks)	GSL Staging area and mine site fuel storage area. Camp power and heat, and equipment operation.
Gasoline	205 L Drums	1,700 L (8 drums)	1,700 L (8 drums)	GSL Staging area and mine site fuel storage area. Light vehicles, generators, saws.
Jet B Fuel	205 L Drums	1,250 L (6 drums)	1,250 L (6 drums)	Mine site fuel storage area. Aircraft refuel.



<i>Material</i>	<i>Storage Container</i>	<i>Normally On-site</i>	<i>Maximum On-site</i>	<i>Storage Areas and Uses</i>
Copper Pass (Cont'd)				
Propane	100 lb cylinders	10,700 lb (107 cylinders)	10,700 lb (107 cylinders)	Mine site fuel storage area. Camp kitchen operation

* All volumes are anticipatory. Spill Contingency Plan will be updated when final volumes become available.

Waste oil is stored securely (likely in empty 205L drums) and will be shipped off-site for processing at an appropriate waste facility.

Grey water produced from camp will be disposed of in one of three ways, listed below in order of preference:

- placed into natural depressions 100 m from any watercourse;
- placed into sump 100m from any watercourse; and/or
- transport off-site to an approved disposal facility

The final grey water disposal method will be decided by the Remediation Contractor and will require approval by an Inspector prior to any grey water discharge.

MSDS sheets will be provided for all chemicals used on-site. All MSDS sheets on-site will be filed in an MSDS binder. An MSDS binder will be available on-site at all times. See Appendix B for fuel MSDS sheets. Any additional MSDS sheets will be provided by the selected Remediation Contractor.

1.9 Existing Preventative Measures

Planning for an emergency situation is imperative, due to the nature of the materials stored on-site as well as the remoteness of the site. Along with the preventative measures outlined below, adequate training of staff and contractors is paramount.

Hazardous material will arrive to site via marine vessel (including barges), float plane or winter road, with the majority arriving to site via barge at the beginning of each field season. Once on site, handling of hazardous material will be supervised by the Contractor and the Departmental Representative. Anyone handling hazardous material on-site will be required to wear all necessary personal protective equipment.

Annual diesel and gasoline requirements will be barged to site at the beginning of each field season in 205L drums or in bulk containers, and stored in the fuel storage area. Any additional/unforeseen fuel requirements will be flown to site via float plane.

Fuel storage will consist of secondary containment (e.g. lined and bermed, and/or double walled fuel containers) with 110% containment. Smaller amounts of standard hazardous materials (e.g. vehicle and engine maintenance materials) will also be available on site, and will be stored in a secure



manner. All fuel and hazardous material storage areas will be selected by the Remediation Contractor, in consultation with the Departmental Representative, and approved by an Inspector. All fuel and hazardous material storage areas will be located over 100 m from any water body whenever possible. The Outpost Island Site is located on a small island, where a 100 m buffer from Great Slave Lake may not be achievable. In any case where hazardous material storage areas cannot achieve a 100 m buffer from any water body, an area will be selected by the Departmental Representative that provides the least amount of risk to water bodies, while maintaining operational suitability.

Fuel tanks will be protected from equipment by installing bollards (steel and/or concrete) or by placing waste rock around fuel tanks. Should bollards or waste rock not be available, fuel storage tanks will be protected by an earthen berm.

To avoid any leaks from fuel transmission, all fuel lines, hoses, fittings and valves are to meet or exceed industry standards.

Spill kits are to be located wherever fuel is stored or transferred. Portable drip trays are to be used when refueling vehicles to avoid any leaks/drips onto the land. Fuel transfer and storage for the proposed activities of the Great Slave Lake Project will be conducted by the Prime Contractor in accordance to the following regulations, under the supervision of the Departmental Representative:

- National Fire Code of Canada (1995)
- Transportation of Dangerous Goods Act (1992)
- Transportation of Dangerous Goods Regulations
- CEPA Petroleum and Allied Petroleum Products Storage Tanks Regulations

The site superintendent or designate will conduct visual inspections to check for leaks and damage to the fuel storage containers and transfer equipment, as well as check for stained or discoloured soils around the fuel storage areas and motorized equipment. The visual inspections will be included in the Superintendent's weekly checks. For example lids and caps are checked for tight seals. Regular maintenance and oil checks of all motorized equipment will also be undertaken to avoid preventable leaks.

Grey water will be placed into natural depressions or sumps in the ground a minimum of 100 m from any water body. Grey water disposal locations will be approved by an Inspector prior to any discharge. Potential sumps will be regularly inspected by the site superintendent or designate to ensure proper functioning. This grey water management strategy has been recommended by Inspectors as an acceptable approach during previous CARD Remediation Projects.



In the event that an Inspector is not able to approve grey water disposal at a specific site (e.g. non-conductive surficial material), then grey water at that site will be securely stored in tanks, and will be disposed of in one of two manners:

- transport off-site to an approved disposal facility; or
- transport to a project site that has an approved grey water discharge location.

1.10 Additional Copies of this Spill Contingency Plan

Copies of the plan (most current version) will be available on-site at all times. Copies are also held at the CARD office in Yellowknife, as well as with the Prime Contractor, and the Mackenzie Valley Land and Water Board. Additional copies of the plan can be obtained by contacting CARD directly. See CARD contact information in section 1.1.

1.11 Process for Staff Response to Media and Public Inquiries

CARD has established procedures for dealing with media and public inquiries. All inquiries are to be directed to the manager of public relations at the headquarters office in Yellowknife. If the manager is not available, there will be another staff member available to act in this position. If a reporter or member of the public arrives at the site unexpectedly, the on-site Departmental Representative will direct any inquiries to the CARD Project Manager. Prior to responding to their questions, they should make every effort possible to contact the head of public relations to discuss the situation.

The Project Manager should always keep the head of public relations informed of any news or updates of potential interest to the media or general public, such that CARD is prepared to deal with inquiries any time.

If a spill has occurred and a NWT Spill Report needs to be filled out (see Appendix C). This information is available for the public to view upon request by contacting the NWT Spill Line or by viewing the GNWT Hazardous Materials Spills Database online at http://www.enr.gov.nt.ca/_live/pages/wpPages/Hazardous_Materials_Spill_Database.aspx.

2 Response Organization and General Duties

Spills may be the result of any of the following occurrences:

- Tank leaks, ruptures, valve failure or heat expansion due to overfilling
- Improper chemical storage
- Human error
- Mechanical failure
- Freezing of distribution piping
- Vandalism
- Acts of nature



Figure 1 shows the organizational chart for Site Spill Response. Details of each step will be provided in the procedures for initial actions under Section 3. General duties include:

- Ensuring the safety of all persons in the vicinity - if necessary, remove staff from the area affected by the spill immediately
- Making every effort to IDENTIFY the spilled product
- Consulting appropriate MSDS and determine principal types of health and safety hazards associated with this product or material
- Wearing appropriate PPE when working on or near the spill
- If safe to do so, STOPPING THE LEAK
- Trying to CONTAIN THE SPILL
- CLEANING UP SPILLED MATERIALS
- Disposing materials in approved manner
- AT ALL TIMES: CONSIDER YOUR PERSONAL SAFETY AND THOSE OF YOUR CO-WORKERS BEFORE PROCEEDING WITH ANY ACTION

The flow chart depicted in the below figure identifies the response organization and when applicable their alternates, as well as the chain of command for responding to a spill or release. The duties of various response personnel are summarized, contact information is provided including 24-hour phone numbers for responsible people and the location of communications equipment on site is discussed.

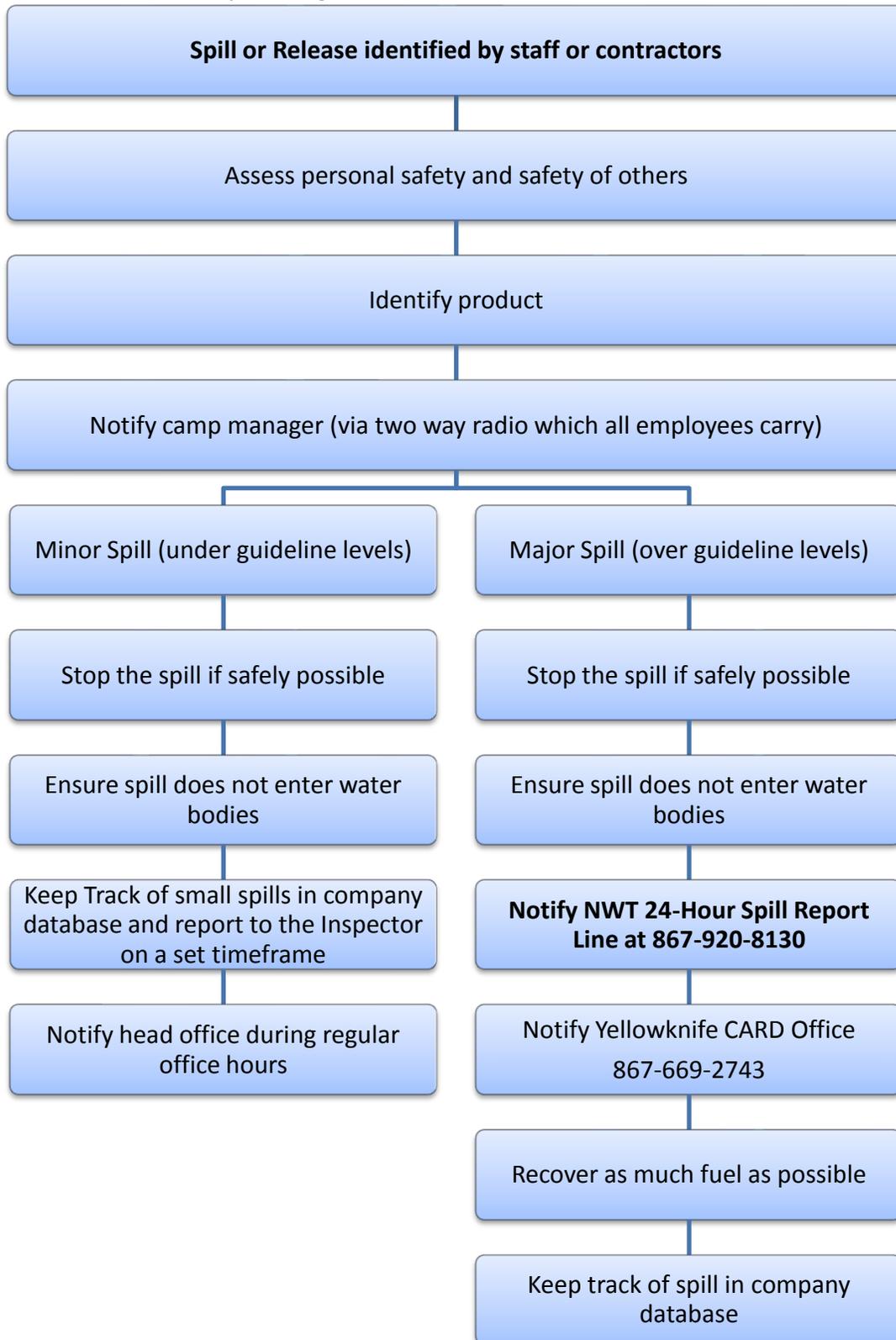
An immediately reportable spill is defined as a release of a substance that is likely to be an imminent environmental or human health hazard or meets or exceeds the volumes outlined in Appendix D. It must be reported to the NWT 24-Hour Spill Report Line at 867-920-8130. Any spills less than these quantities do not need to be reported immediately to the spill reporting line. Rather, these minor spills will be tracked and documented by the company and submitted to the appropriate authority either immediately upon request or at a pre-determined reporting interval. If there is any doubt that the quantity spilled exceeds reportable levels, the spill will be reported to the NWT 24-Hour Spill Report Line.

An emergency satellite phone is located in the office. In the event of a spill involving danger to human life, this phone will be used to contact emergency response personnel in Yellowknife. In addition, all employees and contractors carry two-way radios for communication with the site superintendent and other staff on site.

Following reporting of the spill to the site superintendent, he/she will report spills to the NWT 24-Hour Spill Line as necessary. The site superintendent will also inform the Yellowknife office for tracking spills in the CARD database and notify the Project Manager in the event of media inquiries. The emergency Yellowknife office number is 867-669-2743.



Figure 1. Flow chart of response organization





3 Action Plan

3.1 Potential Spill Size and Sources for Each Hazardous Material On Site

Table 4 represents the range of potential hazardous material discharge events associated with each of the three project sites, including discharge pathway.

Table 4. List of hazardous materials, potential discharge events, potential discharge volumes (worst case scenario in brackets) and direction of potential discharge.

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Outpost Island Mine Direction of Potential Discharge	Blanchet Mine Direction of Potential Discharge	Copper Pass Mine Direction of Potential Discharge
Diesel Fuel (fuel storage, refueling stations, vehicles, generators, incinerators)	<ol style="list-style-type: none"> 1.) Over pumping during refueling 2.) Leaking of hose or fittings 3.) Leaking from vehicles and equipment 4.) Leaking of fuel drum(s) in/outside fuel storage area 	Likely under 205 L/1 drum (max 90,000 L/ bulk fuel container)	<p>Toward Great Slave Lake from adjacent equipment operation, fuel transfer, camp or fuel storage area(s).</p> <p>To ground from equipment operation, fuel transfer, camp or fuel storage area(s), however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.</p>	<p>Toward stream west of the mine site from equipment operation, fuel transfer or fuel storage.</p> <p>Toward Great Slave Lake adjacent to remedial activities in Beach Area and Borrow Source.</p> <p>To ground from equipment operation, fuel transfer, camp or fuel storage area(s), with potential for underground seepage to Great Slave Lake, and stream adjacent to mine site.</p>	<p>Toward Great Slave Lake from adjacent winter road staging area, equipment operation, fuel transfer, and personnel refuge station.</p> <p>To ground from winter road staging area, equipment operation, fuel transfer, and personnel refuge station, with potential for underground seepage to Great Slave Lake</p> <p>Toward Sachowia Lake from adjacent equipment operation, fuel transfer, camp or fuel storage area(s).</p>
Jet B Fuel (float plane, helicopter)	<ol style="list-style-type: none"> 1.) Overfilling aircraft 2.) Leaking of hose or fittings 3.) Leaking of fuel drum (s) in/outside fuel storage area 	Likely under 205 L/1 drum (max 1,250 L/6 drums)	<p>Toward Great Slave Lake from adjacent fuel storage area and fuel transfer.</p> <p>To ground from fuel leak from drums and/or fueling equipment, however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.</p>	<p>Toward Great Slave Lake from aircraft fuel transfer or fuel storage.</p> <p>To ground from fuel leak from drums and/or fueling equipment, with potential for underground seepage to Great Slave Lake.</p>	<p>Toward Sachowia Lake from aircraft fuel transfer or fuel storage.</p> <p>To ground from fuel leak from drums and/or fueling equipment, with potential for underground seepage to Sachowia Lake</p>



Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Outpost Island Mine Direction of Potential Discharge	Blanchet Mine Direction of Potential Discharge	Copper Pass Mine Direction of Potential Discharge
Gasoline (Generators, power tools, vehicles, water crafts)	<ol style="list-style-type: none"> 1.) Over pumping during refueling 2.) Leaking of hose or fittings 3.) Leaking from vehicles and equipment 4.) Leaking of fuel drum(s) in/outside fuel storage area 	Likely under 205 L/1 drum (max 1,700 L/8 drums)	<p>Toward Great Slave Lake from adjacent equipment operation, fuel transfer, camp or fuel storage area(s).</p> <p>To ground from equipment operation, fuel transfer, camp or fuel storage area(s), however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.</p>	<p>Toward stream west of the mine site from equipment operation, fuel transfer or fuel storage.</p> <p>Toward Great Slave Lake adjacent to remedial activities in Beach Area and Borrow Source.</p> <p>To ground from equipment operation, fuel transfer, camp or fuel storage area(s), with potential for underground seepage to Great Slave Lake, and stream adjacent to mine site.</p>	<p>Toward Great Slave Lake from adjacent winter road staging area, equipment operation, fuel transfer, and personnel refuge station.</p> <p>To ground from winter road staging area, equipment operation, fuel transfer, and personnel refuge station, with potential for underground seepage to Great Slave Lake .</p> <p>Toward Sachowia Lake from adjacent equipment operation, fuel transfer, camp or fuel storage area(s).</p>
Propane (kitchen, stove, fridge)	<ol style="list-style-type: none"> 1.) Leaking of hose or fittings 2.) Leaking of cylinder 	Likely under 100 lbs/1 cylinder (max 10,700 lbs /107 cylinders)	To ground from camp operations or fuel storage area(s), however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.	To ground from camp operations or fuel storage area(s), with potential for underground seepage to Great Slave Lake, and stream adjacent to mine site.	<p>To ground from camp operations or fuel storage area(s), with potential for underground seepage to Sachowia Lake.</p> <p>To ground from winter road staging area or personnel refuge station, with potential for underground seepage to Great Slave Lake.</p>
Petroleum, Oils and Lubricants (POLs)	<ol style="list-style-type: none"> 1.) Leaking from vehicles and equipment 2.) Leaking of drum(s) in/outside storage area 	Likely under 205 L/1 drum (max 405 L/10x20 L pail and 1x205 L drum)	<p>Toward Great Slave Lake from adjacent equipment operation or POL storage area(s).</p> <p>To ground from equipment or POL storage area(s), however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.</p>	<p>Toward stream west of the mine site from equipment operation, or POL storage area(s).</p> <p>Toward Great Slave Lake adjacent to remedial activities in Beach Area and Borrow Source.</p> <p>To ground from equipment or POL storage areas, with potential for underground seepage to Great Slave Lake, and stream adjacent to mine site.</p>	<p>Toward Great Slave Lake from adjacent winter road staging area, equipment operation, or POL storage area(s).</p> <p>To ground from winter road staging area, equipment, or POL storage area(s), with potential for underground seepage to Great Slave Lake.</p> <p>Toward Sachowia Lake from adjacent equipment, or POL storage areas.</p>



Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Outpost Island Mine Direction of Potential Discharge	Blanchet Mine Direction of Potential Discharge	Copper Pass Mine Direction of Potential Discharge
Dust Suppressant	<ol style="list-style-type: none"> 1.) Leaking of drum(s) in/outside storage area 2.) Leaking from distribution tank 	Likely under 205L/1 drum (max 205 L/1 drum)	<p>Toward Great Slave Lake from adjacent dust suppression or storage area(s).</p> <p>To ground from equipment or storage area(s), however very little potential for underground seepage to Great Slave Lake as the Islands are almost exclusively bedrock.</p>	<p>Toward stream west of the mine site from adjacent dust suppression, or storage area(s).</p> <p>Toward Great Slave Lake adjacent to remedial activities in Beach Area and Borrow Source.</p> <p>To ground from equipment or storage areas, with potential for underground seepage to Great Slave Lake, and stream adjacent to mine site.</p>	<p>Toward Great Slave Lake from adjacent winter road staging area, equipment operation, or storage area(s).</p> <p>To ground from winter road staging area, equipment, or POL storage area(s), with potential for underground seepage to Great Slave Lake or Sachowia Lake.</p> <p>Toward Sachowia Lake from adjacent equipment operation, or storage areas.</p>



Worst Case Scenario: All storage drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Water with High Sediment Load

Environmental Impacts: Water with high sediment load has the potential to enter water bodies and cause sediment plumes which can be damaging to the aquatic life. Once released into a water body this it is nearly impossible to recover and therefore must be avoided.

Worst Case Scenario: Water with a high sediment load is released into the environment. This would cause a significant sediment plume in the lake. This could cause illness or death to aquatic life.

3.3 Procedures

3.3.1 Procedures for Initial Actions

- Ensure safety of all personnel.
- Assess spill hazards and risks.
- Remove all sources of ignition.
- Stop the spill if safely possible e.g. shut of pump, replace cap, tip drum upward, patch leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so. Tyvek suits and chemical master gloves are located in the spill kit and should be worn immediately if there is any risk of being in contact with fuel.
- No matter what the volume is, notify site superintendent via two-way radio (all employees carry these, as well as on-site contractors if they are not accompanied by an employee).
- Contain the spill – use contents of spill kits to place sorbent materials on the spill, or use shovel to dig dike to contain spill. Methods will vary depending on the nature of the spill. See section 3.2.3 – Procedures for Containing and Controlling the Spill for more details.

3.3.2 Spill Reporting Procedures

Report spill immediately to site superintendent, who will determine if spill is to be reported to the NWT 24-Hour Spill Line at 867-920-8130.

Each spill kit, as well as the office and site superintendent, will have copies of the NWT Spill Report form to be filled out (see Appendix C). Fill out and fax or e-mail the Spill Report to the staff of the NWT 24-Hour spill line. Also fax or e-mail the report to the CARD office in Yellowknife.

NWT 24-Hour Spill Line Phone: 867-920-8130

NWT 24-Hour Spill Line Fax: 867-873-6924

NWT 24-Hour Spill Line E-mail: spills@gov.nt.ca



CARD Office in Yellowknife: Phone: 867-669-2743

CARD Office in Yellowknife: Fax: 867-669-2721

CARD Office in Yellowknife: E-mail: ron.breadmore@aandc-aadnc.g.ca

3.3.3 Procedures for Containing and Controlling the Spill

- Initiate spill containment by first determining what will be affected by the spill.
- Assess speed and direction of spill and cause of movement (water, wind and slope).
- Determine best location for containing spill, avoiding any water bodies.
- Have a contingency plan ready in case spill worsens beyond control or if the weather or topography impedes containment.

3.3.3.1 Specific Spill Containment Methods for Land, Water, Ice and Snow

1) Containment of Spills on Land

Spills on land include spills on rock, gravel, soil and/or vegetation. Generally spills on land occur during the late spring, summer or fall when snow cover is at a minimum. It is important that all measures be undertaken to avoid spills reaching open water bodies.

Dykes

Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled fuel. A dyke needs to be built up to a size that will ensure containment of the maximum quantity of fuel that may reach it. A plastic tarp can be placed on and at the base of the dyke such that fuel can pool up and subsequently be removed with sorbent materials or by pump into barrels or bags. If the spill is migrating very slowly a dyke may not be necessary and sorbents can be used to soak up fuels before they migrate away from the source of the spill.

Trenches

Trenches can be dug out to contain spills as long as the top layer of soil is thawed. Shovels pick axes or a loader can be used depending on the size of trench required. It is recommended that the trench be dug to the bedrock or permafrost, which will then provide containment layer for the spilled fuel. Fuel can then be recovered using a pump or sorbent materials.

2) Containment of Spills on Water

Spills on water such as rivers, streams or lakes are the most serious types of spills as they can negatively impact water quality and aquatic life. All measures need to be undertaken to taken to contain spills on open water.

Booms

Booms are commonly used to recover fuel floating on the surface of lakes or slow moving streams. They are released from the shore of a water body to create a circle around the spill. If the spill is



away from the shoreline, a boat will need to be used to reach the spill, and then the boom can be set out. More than one boom may be used at once. Booms may be also be used in streams and should be set out at an angle to the current. Booms are designed to float and have sorbent materials built into them to absorb fuels at the edge of the boom. Fuel contained within the circle of the boom will need to be recovered using sorbent materials or pumps and placed into barrels or bags for disposal.

Weirs

Weirs can be used to contain spills in streams and to prevent further migration downstream. Plywood or other materials found on site can be placed into and across the width of the stream, such that water can still flow under the weir. Spilled fuel will float on the water surface and be contained at the foot of the weir. It can then be removed using sorbents, booms or pumps and placed into barrels or plastic bags.

Barriers

In some situations barriers made of netting or fence material can be installed across a stream, and sorbent materials placed at the base to absorb spilled fuel. Sorbents will need to be replaced as soon as they are saturated. Water will be allowed to flow through. This is very similar to the weir option discussed above.

Note that in some cases, it may be appropriate to burn fuel or to let volatile fuels such as gasoline evaporate after containment on the water surface. This should only be undertaken in consultation with, and after approval from the INAC or lead agency Inspector.

3) Containment of Spills on Ice

Spills on ice are generally the easiest spills to contain due to the predominantly impermeable nature of the ice. For small spills, sorbent materials are used to soak up spilled fuel. Remaining contaminated ice/slush can be scraped and shoveled into a plastic bag or barrel. However, all possible attempts should be made to prevent spills from entering ice covered waters as no easy method exists for containment and recovery of spills if they seep under ice.

Dykes

Dykes can be used to contain fuel spills on ice. By collecting surrounding snow, compacting and mounding it to form a dyke down slope of the spill, a barrier is created thus helping to contain the spill. If the quantity of spill is fairly large, a plastic tarp can be placed over the dyke such that the spill pools at the base of the dyke. The collected fuel can then be pumped into barrels or collected with sorbent materials.

Trenches

For significant spills on ice, trenches can be cut into the ice surrounding and/or down slope of the spill such that fuel is allowed to pool in the trench. It can then be removed via pump into barrels, collected with sorbent materials, or mixed with snow and shoveled into barrels or bags.



Burning

Burning should only be considered if other approaches are not feasible, and is only to be undertaken with the permission of the INAC or lead agency Inspector.

4) Containment of Spills on Snow

Snow is a natural sorbent, thus as with spills on soil, spilled fuel can be more easily recovered. Generally, small spills on snow can be easily cleaned up by raking and shoveling the contaminated snow into plastic bags or empty barrels, and storing these at an approved location.

Dykes

Dykes can be used to contain fuel spill on snow. By compacting snow down slope from the spill, and mounding it to form a dyke, a barrier or berm is created thus helping to contain the spill. If the quantity of spill is fairly large, a plastic tarp can be placed over the dyke such that the spill pools at the base of the dyke. The collected fuel/snow mixture can then be shoveled into barrels or bags, or collected with sorbent materials.

5) Worst Case Scenarios

Dealing with spilled fuel which exceeds the freeboard of a dyke or barrier would present a possible worst case scenario for the Mine site. To contain the overflow, a trench or collection pit would have to be created downstream of the spill to contain the overflow.

Another worst case scenario would be an excessive spill on water may be difficult to contain with the booms present at the site. In this case, an emergency response mobile unit would have to be called in to deal with the spill using appropriate equipment.

3.3.4 Procedures for Transferring, Storing and Managing Spill Related Wastes

In most cases, spill cleanups are initiated at the far end of the spill and contained moving toward the center of the spill. Sorbent socks and pads are generally used for small spill cleanup. A pump with attached fuel transfer hose can suction spills from leaking containers or large accumulations on land or ice, and direct these larger quantities into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. Heavy Equipment can be used if deemed necessary, and given space and time constraints.

Used sorbent materials are to be placed in plastic bags for future disposal. All materials mentioned in this section are available in the spill kits located at the fuel storage areas, in trucks, the mechanic shop, and in camp. Following clean-up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

For most of the containment procedures outlined in Section C, spilled petroleum products and materials used for containment will be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility.



3.3.5 Procedures for Restoring Affected Areas

Once a spill of reportable size has been contained, CARD will consult with the AANDC or Lead Agency Inspector assigned to the file to determine the level of cleanup required. The Inspector may require a site-specific study to ensure appropriate clean up levels are met. Criteria that may be considered include natural biodegradation of oil, replacement of soil and re-vegetation.

4 Resource Inventory

4.1 On-site Resources

Spill Kits are located throughout the sites (e.g. fuel storage areas, fuel transfer areas, and camps). The contents of a typical spill kit are listed below. Spill kit contents may vary from those listed below; however, industry standards must be maintained. In addition, earth moving and other equipment located at site are also listed below.

Standard Contents of Conventional Spill Kits

- Tyvek splash suits
- pairs of chemical master gloves
- 10 large bags with ties for temporary use
- 2 oil only booms (5' x 10')
- 50 oil only mats (16' x 20')
- sorbent socks
- 10 sorbent pads
- 2 large tarps and rolls of polyethylene sheeting
- 1 roll duct tape
- 1 utility knife
- 1 field notebook and pencil
- 1 rake
- 1 pick axe
- 1 Shovel
- 1 instruction binder
- Empty drums
- Hatch removal sock

Standard Contents of Marine Spill Kits

- 100 Absorbent Pads (Oil, Gas and Diesel)
- 8 Sections of 5' x 10' Linkable absorbent Boom
- 8 HD Hazmat Disposal Bags
- 2 Pairs of Nitrile Gloves
- Spill Response Instructions
- List of Contents



- Aquaguard Skimmer

Earth Moving and Other Equipment Resources

- Dozer
- Excavator
- Loader/Backhoe
- Pick-up Trucks with trailer attachment
- All terrain vehicles with trailer attachment
- Fuel Pump

3.2 Off-site Resources

The following table lists the Project Management Team and applicable contacts for spill response. Additional off-site resources will become available upon Prime Contract award, including but not limited to; Departmental Representative, Project Manager, Mine Manager, Site Superintendent, health and Safety Manger, Health and Safety Officer/Medic, and Field Engineer.

Table 5. Off-site spill response contacts.

Name	Position	Contact #	Organization
PROJECT MANAGEMENT			
Ron Breadmore	Project Manager	Ph. (867) 669-2743	AANDC - CARD
Jessie Hoyt	Project Manager	Ph. (780) 497-3786	Public Works and Government Services Canada
SPILL RESPONSE NUMBERS			
NWT 24 Hour Spill Reporting Line	GNWT and AANDC	Ph. (867) 920-8130 (call collect if required) Fax. (867) 873-6924	Triggers multiple governmental and private organizations for spill response
CANUTEC	Federal Department of Transportation	Ph. (613) 996.6666 (call collect if required)	Triggers multiple governmental and private organizations for spill response for dangerous goods
Clint Ambrose	AANDC, Yellowknife District Inspector	Ph. (867) 669-2794	AANDC
Gerald Fillatre	DFO, Yellowknife Conservation and Protection	Ph. (867) 669-49040	Fisheries and Oceans Canada
Craig Broome	EC, Yellowknife Enforcement	Ph. (867) 669-4730	Environment Canada



4 Training Program

4.1 Outline of Training Program

The employee and contractor training program was developed by the of health and safety officer, and has been distributed by the site superintendent. The following are key steps in the program:

- all individuals entering the site are required to participate in an orientation session
- during this session, all locations of the spill plan and spill kits are provided on a map in hard copy
- an overview of the plan is provided by the site superintendent or designate leading the orientation session
- specific training sessions, including mock spill exercises, are scheduled for individuals directly involved in handling hazardous materials to ensure they know all steps to be undertaken in handling these materials, as well as the steps involved in the event of a spill, including the proper use of spill kits
- all employees and contractors are required to have their basic first aid training, as well as WHMIS training, before working on the site
- supervisors are required to have first aid training

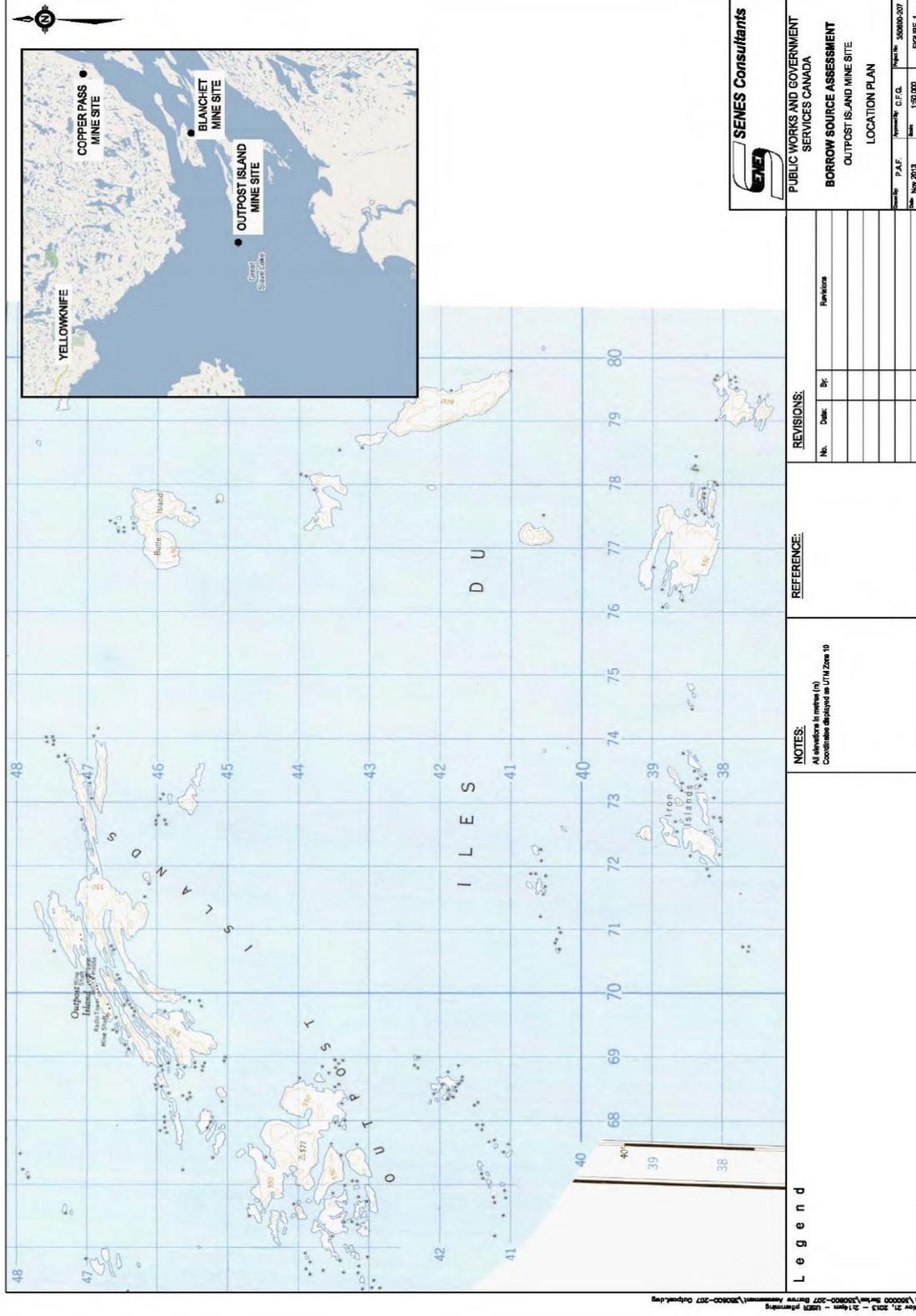


Appendix A

Site Maps

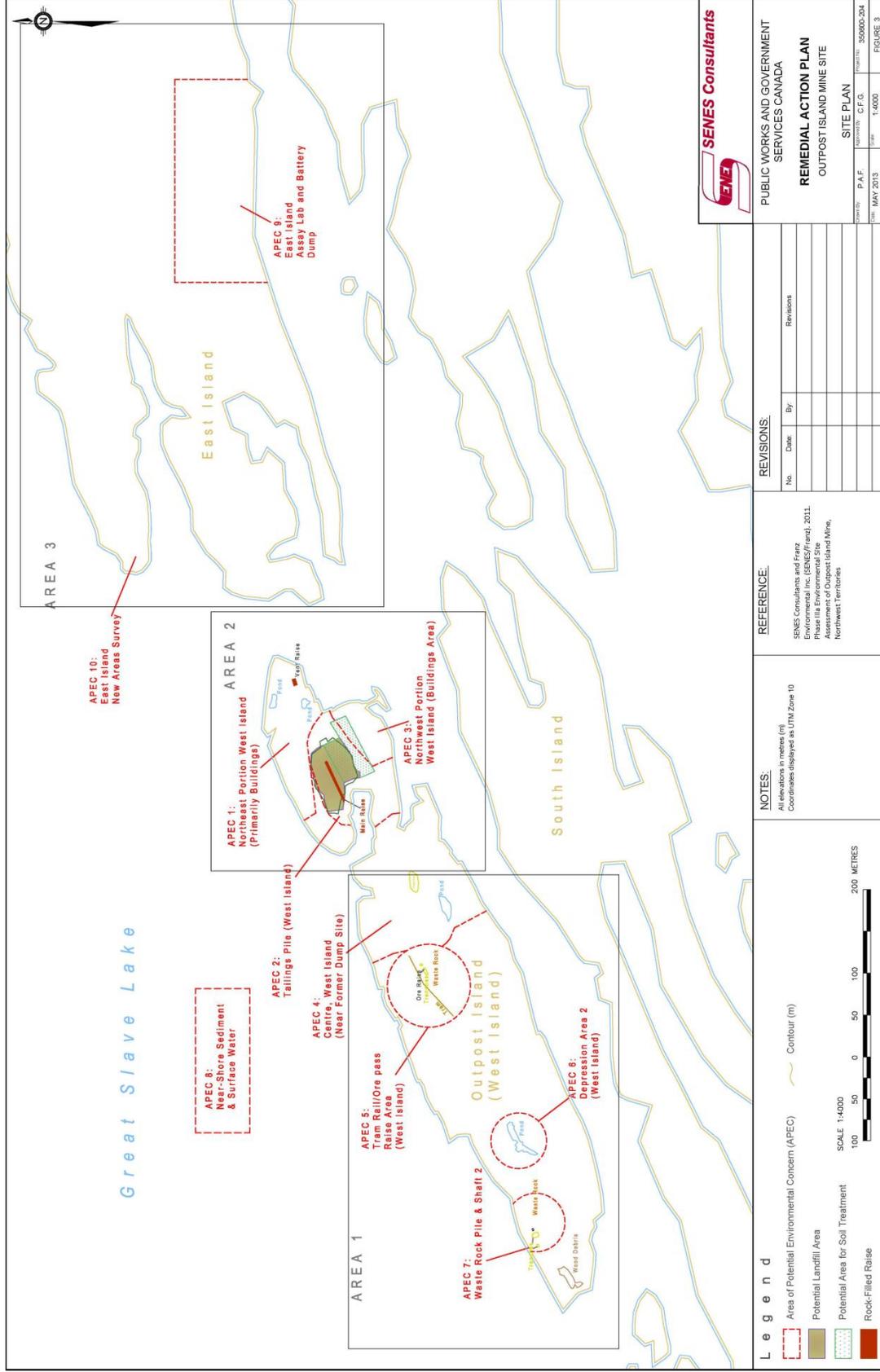


Outpost Island Mine – Site Location



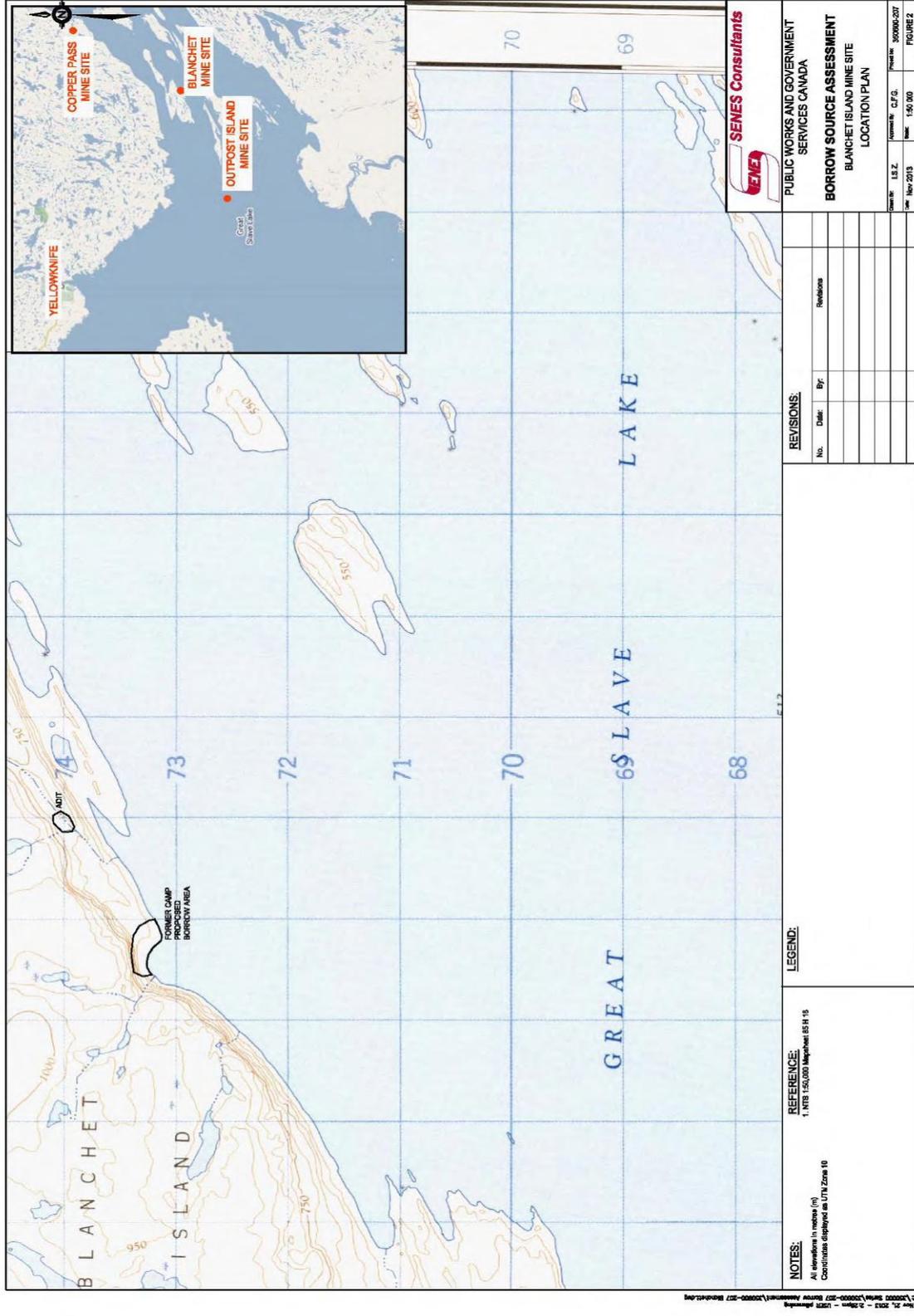


Outpost Island Mine Layout



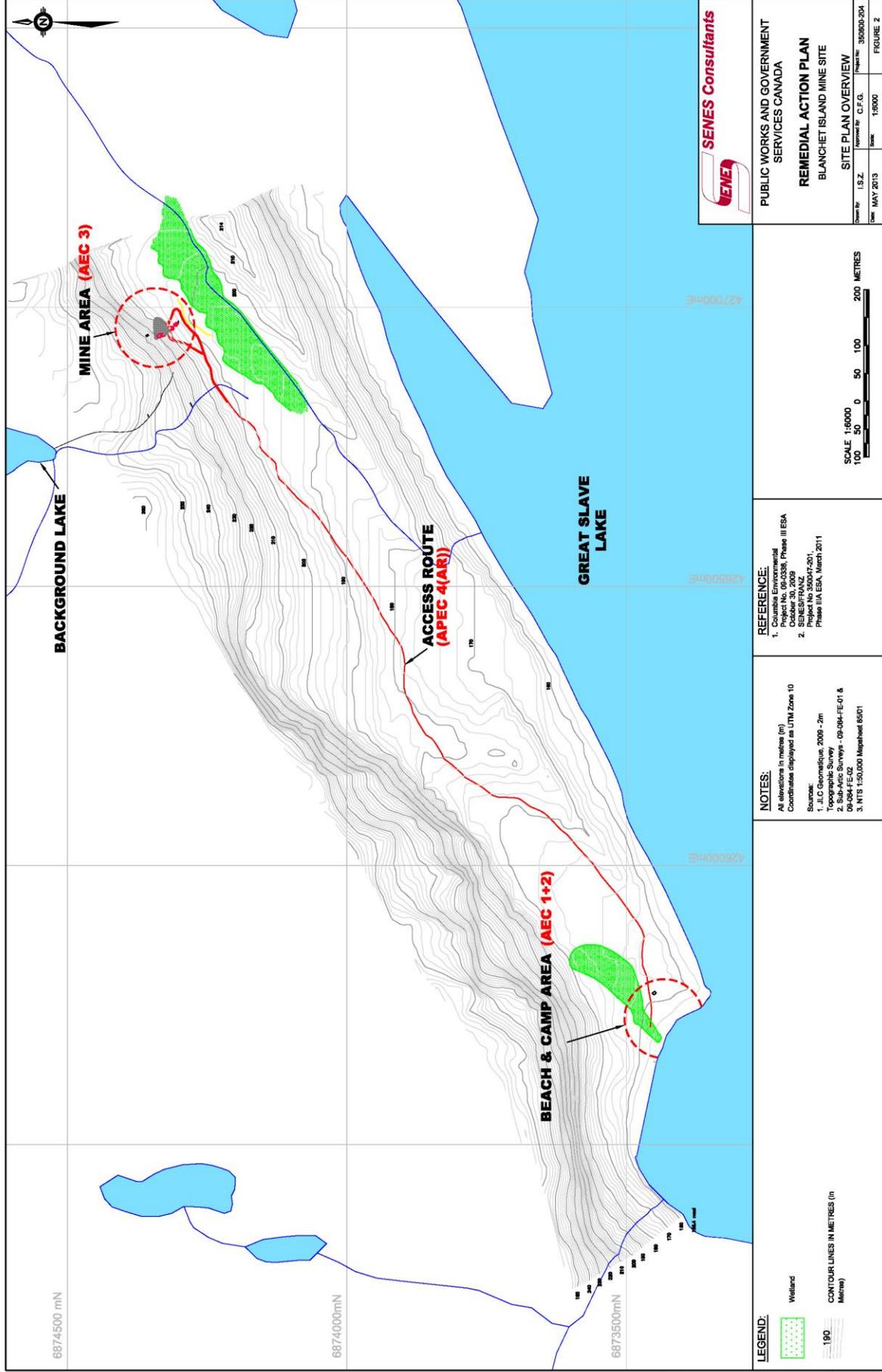


Blanchet Mine – Site Location



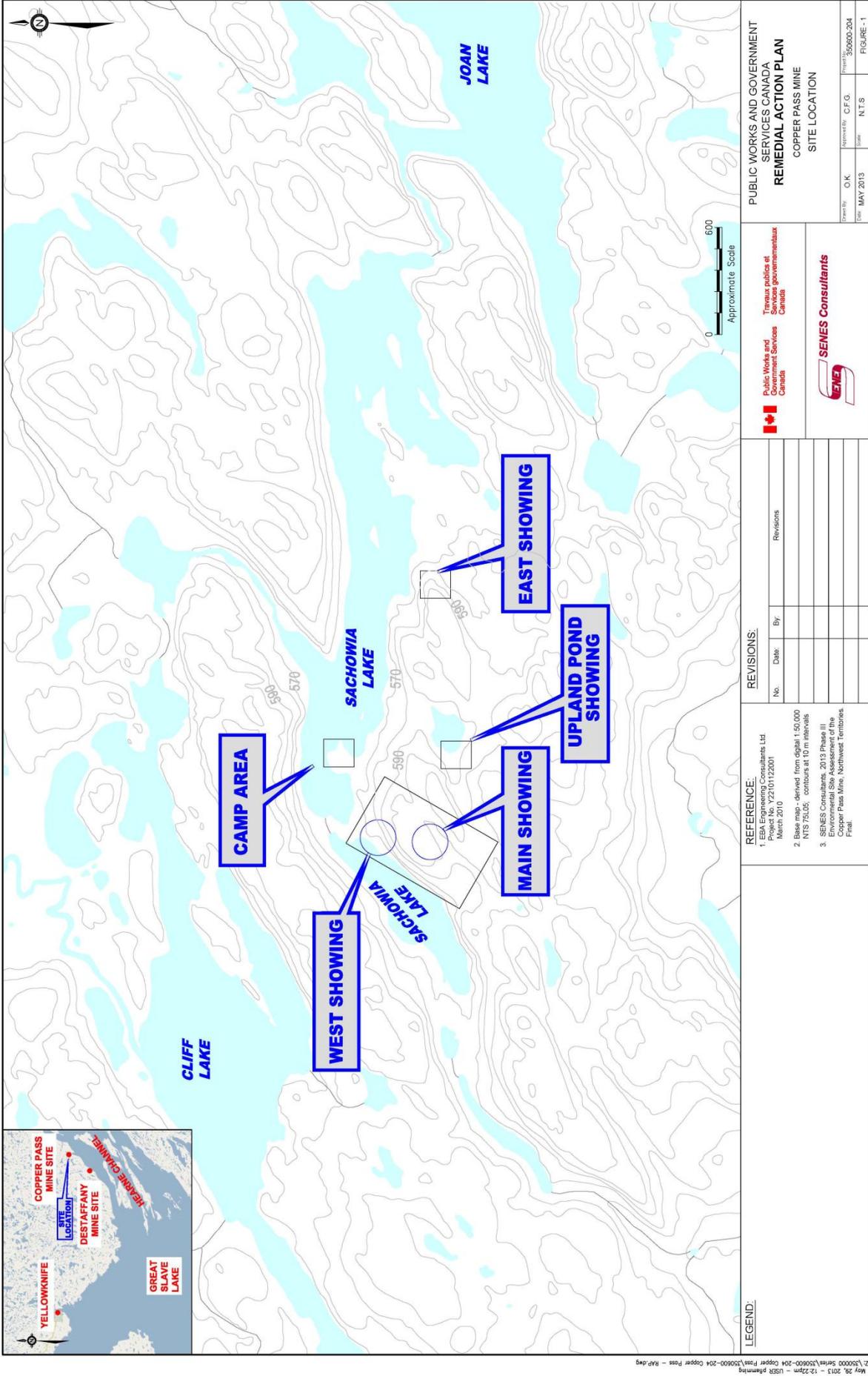


Blanchet Site Layout





Copper Pass Site Layout





Appendix B

Material Safety Data Sheets



Material Safety Data Sheet

GASOLINE - ÉTHANOL



1. Product and company identification

Product name	: GASOLINE - ETHANOL
Synonym	: SuperClean, SuperClean 94 (Montreal), GASOHOL, Regular, Mid-Grade, Plus, WinterGas, RegularClean, PlusClean, marked or dyed gasoline, Super Premium (94 RO), E-10, Ethanol blended gasoline
Code	: GASOHOL
Material uses	: Gasoline-Ethanol is used in spark Ignition engines including motor vehicles, farm vehicles, inboard and outboard boat engines, small engines and recreational vehicles.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
In case of emergency	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2. Hazards identification

Physical state	: Clear liquid.
Odour	: Gasoline
WHMIS (Canada)	:   Class B-2: Flammable liquid Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: WARNING! FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CAN CAUSE CANCER. CONTAINS MATERIAL WHICH MAY CAUSE HERITABLE GENETIC EFFECTS. Flammable liquid. Irritating to eyes, respiratory system and skin. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapour or mist. Avoid contact with eyes, skin and clothing. Can cause cancer. Risk of cancer depends on duration and level of exposure. Contains material which may cause heritable genetic effects. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects	
Inhalation	: Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Ingestion	: Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Skin	: Irritating to skin.
Eyes	: Irritating to eyes.
Potential chronic health effects	



GASOLINE - ETHANOL

Page Number: 2

2. Hazards identification

- Chronic effects** : This product contains an ingredient or ingredients, which have been shown to cause chronic toxic effects. Repeated or prolonged exposure to the substance can produce blood disorders.
- Carcinogenicity** : Can cause cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : Contains material which may cause heritable genetic effects.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Medical conditions aggravated by over-exposure** : Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (section 11)

3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Gasoline	86290-81-5	90 - 97
Toluene	108-88-3	10-20
Ethanol	64-17-5	5-10
Benzene	71-43-2	0.5-1.5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First-aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

- Flammability of the product** : Flammable.
- Extinguishing media**
 - Suitable** : Use dry chemical, CO₂, alcohol-resistant foam or water spray (fog).
 - Not suitable** : Do not use water jet.





5. Fire-fighting measures

- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Products of combustion** : Carbon oxides (CO, CO₂), nitrogen oxides (NO_x), lead, aldehydes, ketones, phenols, polynuclear aromatic hydrocarbons, smoke and irritating vapours as products of incomplete combustion.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Extremely flammable in presence of open flames, sparks, and heat. This product can accumulate static charge and ignite. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back.
- Special remarks on explosion hazards** : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Runoff to sewer may create fire or explosion hazard.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container. Ground all equipment containing material.



7. Handling and storage

- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8. Exposure controls/personal protection

Ingredient	Exposure limits
Gasoline	ACGIH TLV (United States). TWA: 300 ppm 8 hour(s). STEL: 500 ppm 15 minute(s).
Toluene	ACGIH TLV (United States). TWA: 20 ppm 8 hour(s).
Ethanol	ACGIH TLV (United States). STEL: 1000 ppm 15 minute(s).
Benzene	ACGIH TLV (United States). Absorbed through skin. TWA: 0.5 ppm 8 hour(s). STEL: 2.5 ppm 15 minute(s).

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.



8 . Exposure controls/personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

- Physical state** : Clear liquid.
- Flash point** : -43°C (-45.4°F) (NFPA)
- Auto-ignition temperature** : Not available.
- Flammable limits** : Lower: 1.4% (NFPA)
Upper: 7.6% (NFPA)
- Colour** : Clear, undyed liquid. May be dyed for taxation purposes.
- Odour** : Gasoline
- Odour threshold** : Not available.
- pH** : Not available.
- Boiling/condensation point** : 26 to 200°C (78.8 to 392°F)
- Melting/freezing point** : Not available.
- Relative density** : 0.7 to 0.78 kg/L @ 15°C (59°F)
- Vapour pressure** : 41 to 107 kPa (307 to 802 mm Hg) @ 15°C (59°F)
- Vapour density** : 3 to 4 [Air = 1] (NFPA)
- Volatility** : Not available.
- Evaporation rate** : Not available.
- Viscosity** : 0.6 cSt @ 40°C (104°F)
- Pour point** : Not available.
- Solubility** : Hydrocarbon components virtually insoluble in water. Ethyl alcohol is completely soluble in water.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Hazardous polymerisation** : Under normal conditions of storage and use, hazardous polymerisation will not occur.
- Materials to avoid** : Reactive with oxidising agents, acids and interhalogens.
- Hazardous decomposition products** : May release COx, NOx, aldehydes, ketones, phenols, polynuclear aromatic hydrocarbons, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Gasoline	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	13600 mg/kg	-
Toluene	LD50 Dermal	Rabbit	12125 mg/kg	-
	LD50 Oral	Rat	636 mg/kg	-
	LC50 Inhalation Vapour	Rat	7585 ppm	4 hours
Ethanol	LD50 Dermal	Rabbit	>15800 mg/kg	-
	LD50 Oral	Mouse	3450 mg/kg	-



GASOLINE - ETHANOL

Page Number: 6

11 . Toxicological information

Benzene	LC50 Inhalation Vapour	Rat	8850 mg/m ³	4 hours
	LD50 Dermal	Rabbit	>8240 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
	LC50 Inhalation Vapour	Rat	13228 ppm	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Gasoline	A3	2B	-	-	-	-
Toluene	A4	3	D	-	-	-
Ethanol	A3	-	-	-	-	-
Benzene	A1	1	A	+	Proven.	+

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : There is a wealth of information about the teratogenic hazards of Toluene in the literature; however, based upon professional judgement regarding the body of evidence, WHMIS classification as a teratogen is not warranted.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: **HANDLING AND STORAGE** and Section 8: **EXPOSURE CONTROLS/PERSONAL PROTECTION** for additional handling information and protection of employees.



GASOLINE - ETHANOL

Page Number: 7

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1203	GASOLINE	3	II		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Flammable liquid
Irritating material
Carcinogen

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

Label requirements : FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CAN CAUSE CANCER. CONTAINS MATERIAL WHICH MAY CAUSE HERITABLE GENETIC EFFECTS.

Hazardous Material Information System (U.S.A.) :

Health	3
Flammability	3
Physical hazards	0
Personal protection	H

National Fire Protection Association (U.S.A.) :



References : Available upon request.
™ Trademark of Suncor Energy Inc. Used under licence.

Date of printing : 4/22/2010.

Date of issue : 22 April 2010

Date of previous issue : 4/22/2010.

Responsible name : Product Safety - RS

Indicates information that has changed from previously issued version.



16 . Other information

For Copy of (M)SDS

: Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

DIESEL FUEL



1. Product and company identification

Product name	: DIESEL FUEL
Synonym	: Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, D60, P40, P50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special
Code	: W104, W293; SAP: 120, 121, 122, 129, 135, 287
Material uses	: Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining Diesel has a higher flash point requirement, for safe use in underground mines.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
In case of emergency	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2. Hazards identification

Physical state	: Bright oily liquid.
Odour	: Mild petroleum oil like.
WHMIS (Canada)	:   Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: WARNING! COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION. Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapour or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects	
Inhalation	: Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Ingestion	: Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.
Skin	: Severely irritating to the skin.
Eyes	: Irritating to eyes.
Potential chronic health effects	
Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.



DIESEL FUEL

Page Number: 2

2. Hazards identification

- Fertility effects** : No known significant effects or critical hazards.
- Medical conditions aggravated by over-exposure** : Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (section 11)

3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Kerosine (petroleum), hydrodesulfurized/Fuels, diesel/Fuel Oil No. 2	64742-81-0/68334-30-5/68476-30-2	100

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First-aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

- Flammability of the product** : Combustible liquid
- Extinguishing media**
 - Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
 - Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Products of combustion** : Carbon oxides (CO, CO₂), nitrogen oxides (NO_x), sulphur oxides (SO_x), sulphur compounds (H₂S), smoke and irritating vapours as products of incomplete combustion.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.
- Special remarks on explosion hazards** : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.





6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8. Exposure controls/personal protection

Ingredient	Exposure limits
Kerosine (petroleum), hydrodesulfurized	ACGIH TLV (United States). Absorbed through skin. TWA: 200 mg/m ³ 8 hour(s).
Fuels, diesel	ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m ³ , (Inhalable fraction and vapour) 8 hour(s).
Fuel oil No. 2	ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m ³ , (Inhalable fraction and vapour) 8 hour(s).

Consult local authorities for acceptable exposure limits.



8 . Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: nitrile, neoprene, polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

- Physical state** : Bright oily liquid.
- Flash point** : Diesel fuel: Closed cup: $\geq 40^{\circ}\text{C}$ ($\geq 104^{\circ}\text{F}$)
Marine Diesel Fuel: Closed Cup: $\geq 60^{\circ}\text{C}$ ($\geq 140^{\circ}\text{F}$)
Mining Diesel: Closed Cup: $\geq 52^{\circ}\text{C}$ ($\geq 126^{\circ}\text{F}$)
- Auto-ignition temperature** : 225°C (437°F)
- Flammable limits** : Lower: 0.7%
Upper: 6%
- Colour** : Clear to yellow (This product may be dyed red for taxation purposes).
- Odour** : Mild petroleum oil like.
- Odour threshold** : Not available.
- pH** : Not available.
- Boiling/condensation point** : 150 to 371°C (302 to 699.8°F)



DIESEL FUEL

Page Number: 5

9 . Physical and chemical properties

Melting/freezing point	: Not available.
Relative density	: 0.80 to 0.88 kg/L @ 15°C (59°F)
Vapour pressure	: 1 kPa (7.5 mm Hg) @ 20°C (68°F).
Vapour density	: 4.5 [Air = 1]
Volatility	: Semivolatile to volatile.
Evaporation rate	: Not available.
Viscosity	: Diesel fuel: 1.3 - 4.1 cSt @ 40°C (104°F) Marine Diesel Fuel: 1.3 - 4.4 cSt @ 40°C (104°F)
Pour point	: Not available.
Solubility	: Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

10 . Stability and reactivity

Chemical stability	: The product is stable.
Hazardous polymerisation	: Under normal conditions of storage and use, hazardous polymerisation will not occur.
Materials to avoid	: Reactive with oxidising agents and acids.
Hazardous decomposition products	: May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Kerosine (petroleum), hydrodesulfurized	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>5000 mg/m ³	4 hours
Fuels, diesel	LD50 Dermal	Mouse	24500 mg/kg	-
	LD50 Oral	Rat	7500 mg/kg	-
Fuel oil No. 2	LD50 Oral	Rat	12000 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Kerosine (petroleum), hydrodesulfurized	A3	-	-	-	-	-
Fuels, diesel	A3	3	-	-	-	-
Fuel oil No. 2	A3	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.



DIESEL FUEL

Page Number: 6

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1202	DIESEL FUEL	3	III		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Combustible liquid
Irritating material

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.



16 . Other information

Label requirements : COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	2
Physical hazards	0
Personal protection	H

National Fire Protection Association (U.S.A.) :



References : Available upon request.
TMAC Marque de commerce de Petro-Canada - Trademark

Date of printing : 12/17/2009.

Date of issue : 3 July 2009

Date of previous issue : No previous validation.

Responsible name : **Product Safety - DSR**

▣ Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



A division of Superior Plus LP

MATERIAL SAFETY DATA SHEET



SECTION 1 – PRODUCT INFORMATION

Product Name:	Propane	Supplier:	Superior Propane A Division of Superior Plus LP 1111 - 49th Avenue N.E. Calgary, AB T2E 8V2 Business: (403) 730-7500
Trade Name:	LPG (Liquefied Petroleum Gas), LP-Gas		
Chemical Formula:	C ₃ H ₈		
WHMIS Classification:	Class A – Compressed Gas Class B, Division 1 – Flammable Gas	24-Hour Emergency Contact:	Canutec (613) 996-6666

Application and Use: Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

SECTION 2 – HAZARDOUS INGREDIENTS

COMPONENTS	CAS No	% VOLUME (v/v)	LD ₅₀ (RAT, ORAL)
Propane	74-98-6	90% -99%	Not Applicable
Propylene	115-07-1	0% - 5%	Not Applicable
Ethane	74-84-0	0% - 5%	Not Applicable
Butane and heavier hydro carbons	106-97-8	0% - 2.5%	Not Applicable

Occupational Exposure Limit:

Based upon animal test data, the acute toxicity of this product is expected to be inhalation: 4 hour LC50 = 280,000 ppm (Rat)

Note: Composition is typical for HD-5 Propane per The Canadian General Standard Board CGSB 3.14 National Standard of Canada. Exact composition will vary from shipment to shipment.

SECTION 3 – CHEMICAL AND PHYSICAL DATA

Form:	Liquid and vapour while stored under pressure	pH:	Not available
Boiling Point:	-42°C @ 1 atm	Solubility in Water :	Slight, 6.1% by volume @ 17.8°C
Freezing Point:	-188°C	Specific Gravity:	0.51 (water = 1)
Evaporation Rate:	Rapid (Gas at normal ambient conditions)	Appearance/Odour:	Colourless liquid and vapour while stored under pressure. Colourless and odourless gas in natural state at any concentration. Commercial propane has an odourant added, ethyl mercaptan, which has an odour similar to boiling cabbage.
Vapour Pressure:	1435 kPa (maximum) @ 37.8°C	Odour Threshold:	4800 ppm
Vapour Density:	1.52 (Air = 1)		
Coefficient of Water/Oil Distribution:	Not available		

With proper handling, transportation and storage, adding a chemical odourant such as ethyl mercaptan has proven to be a very effective warning device, but all odourants have certain limitations. The effectiveness of the odourant may be diminished by a person's sense of smell, by competing odours and by oxidation which may cause a potentially dangerous situation.

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flash Point:	-103.4°C	Fire Extinguishing Precautions:	Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated. If gas has not ignited, liquid or vapour may be dispersed by water spray or flooding.
Method:	Closed cup	Special Fire Fighting Equipment:	Protective clothing, hose monitors, fog nozzles, self-contained breathing apparatus.
Flammable Limits:	Lower 2.4%, Upper 9.5%		
Auto Ignition Temperature:	432°C		
Hazardous Combustion Products:	Carbon monoxide can be produced when primary air and secondary air are deficient while combustion is taking place.		
Fire and Explosive Hazards:	Explosive air -vapour allowed to leak to atmosphere.		
Sensitivity to Impact:	No		
Sensitivity to Static Discharge:	Yes		

SECTION 5 – REACTIVITY DATA

Stability:	Stable	Hazardous Decomposition Products:	Deficient primary and secondary air can produce carbon monoxide.
Conditions to Avoid:	Keep separate from oxidizing agents. Gas explodes spontaneously when mixed with chloride dioxide.	Hazardous Polymerization:	Will not occur.

Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains and openings to building.

MSDS-Propane-32003-2 (02/08)



Superior
Propane

A division of Superior Plus LP



SECTION 6 – TOXICOLOGICAL PROPERTIES OF MATERIAL

Routes of Entry: Skin Contact, Eye Contact, Inhalation

Inhalation: Simple asphyxiant. No effect at concentrations of 10,000 ppm (peak exposures). Higher concentrations may cause central nervous system disorder and/or damage. Lack of oxygen may cause dizziness, loss of coordination, weakness, fatigue, euphoria, mental confusion, blurred vision, convulsions, breathing failure, coma and death. Breathing high vapour concentrations (saturated vapours) for a few minutes may be fatal. Saturated vapours may be encountered in confined spaces and/or under conditions of poor ventilation. Avoid breathing vapours or mist.

Skin and Eye Contact: Exposure to vapourizing liquid may cause frostbite (cold burns) and permanent eye damage.

Ingestion: Not considered to be a hazard.

Acute Exposure: Contact with Liquefied Petroleum Gas may cause frostbite or cold burns. Propane acts as a simple asphyxiant as oxygen content in air is displaced by the propane. At increasing concentration levels, propane may cause dizziness, headaches, loss of coordination, fatigue, unconsciousness and death.

Chronic Exposure: No reported effects from long term low level exposure.

Sensitization to Product: Not known to be a sensitizer.

Occupational Exposure Limits: American Conference of Governmental Industrial Hygienists (ACGIH) lists as a simple asphyxiant.

ACGIH TLV: 1000 ppm

Carcinogenicity, Reproductive Toxicity, Teratogenicity, Mutagenicity: No effects reported.

Other Toxicological Effects: None

SECTION 7 – PREVENTATIVE MEASURES

Eyes: Safety glasses or chemical goggles are recommended when transferring product.

Skin: Insulated gloves required if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.

Inhalation: Where concentration in air would reduce the oxygen level below 18% air or exceed occupational exposure limits in section 6, self-contained breathing apparatus is required.

Ventilation: Use in well-ventilated areas. Use with explosion proof mechanical ventilation in confined spaces or poorly ventilated areas.

SECTION 8 – EMERGENCY AND FIRST AID PROCEDURES

Eyes: Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.

Skin: In case of "Cold Burn" from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.

Ingestion: None considered necessary.

Inhalation: Remove person to fresh air. If breathing is difficult or has stopped, administer artificial respiration. Obtain immediate medical care.

Spill or Leak: Eliminate leak if possible. Eliminate source of ignition. Ensure cylinder is upright. Disperse vapours with hose streams using fog nozzles. Monitor low areas as propane is heavier than air and can settle into low areas. Remain upwind of leak. Keep people away. Prevent vapour and/or liquid from entering into sewers, basements or confined areas.

SECTION 9 – TRANSPORTATION, HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space away from ignition sources (so the pressure relief valve is in contact with the vapour space of the cylinder or tank).
- Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.

Transportation of Dangerous Goods (TDG)
TDG Classification: Flammable Gas 2.1

- Do not store with oxidizing agents, oxygen, or chlorine cylinders.
- Empty cylinders and tanks may contain product residue. Do not pressurize, cut, heat or weld empty containers.
- Transport, handle and store according to applicable federal and provincial codes and regulations.

TDG Shipping Name: Liquefied Petroleum Gas (Propane)

Pin Number: UN1075

SECTION 10 – PREPARATION INFORMATION

Prepared by: Superior Propane
Health Safety and Environment Team

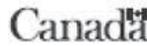
Telephone: (403) 730-7500
Revision: March 1, 2008
Supersedes: March 24, 2005

The information contained herein is believed to be accurate. It is provided independently of any sale of the product. It is not intended to constitute performance information concerning the product. No express warranty, implied warranty of merchantability or fitness for a particular purpose is made with respect to the product information contained herein.



Appendix C

NT – NU Spill Report Form



NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR		REPORT TIME		<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____
	B OCCURRENCE DATE: MONTH - DAY - YEAR		B OCCURRENCE TIME			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION <input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE			LONGITUDE		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
F	RESPONSIBLE PARTY OR VESSEL NAME			RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED			CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER		
	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER		
I	SPILL SOURCE		SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES		
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
	M ANY ALTERNATE CONTACT		POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE
REPORT LINE USE ONLY						
N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER	
	STATION OPERATOR		YELLOWKNIFE, NT		(867) 920-8130	
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> COG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED	
AGENCY	CONTACT NAME		CONTACT TIME	REMARKS		
LEAD AGENCY						
FIRST SUPPORT AGENCY						
SECOND SUPPORT AGENCY						
THIRD SUPPORT AGENCY						





Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and faxed to the spill line at 867-873-6924. Commencing on January 2, 2007, the form can also be e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. Please do not fill in the Report Number: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. You must include the geographic coordinates (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overflow, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m ²)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or equipment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. Please number the pages to ensure that recipients can be certain that they received all pertinent documents. If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	Leave Blank. This box is for the Spill Line's use only.



Appendix D

Immediately Reportable Spill Quantities



Immediately Reportable Spill Quantities

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.