BHP Minerals Canada Ltd.

BOSTON GOLD PROJECT, AIMAOKTAK LAKE, N. T.

SPILL CONTINGENCY PLAN

Prepared for:

Nunavut Water Board
Gjoa Haven, N. T.

Prepared by:

BHP Minerals Canada
Vancouver, B.C.

August 1998

BHP

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BHP MINERALS CANADA LTD.
BOSTON GOLD PROJECT, N.T.

SPILL CONTINGENCY PLAN

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1. Introduction

1. INTRODUCTION

1.1 Plan Purpose

BHP Minerals Canada Ltd. (BHP) is a subsidiary of the Broken Hill Propriety Company Ltd., a major global resource company headquartered in Melbourne, Australia. BHP, headquartered in Vancouver, B.C. is involved in mining and exploration activities throughout Canada.

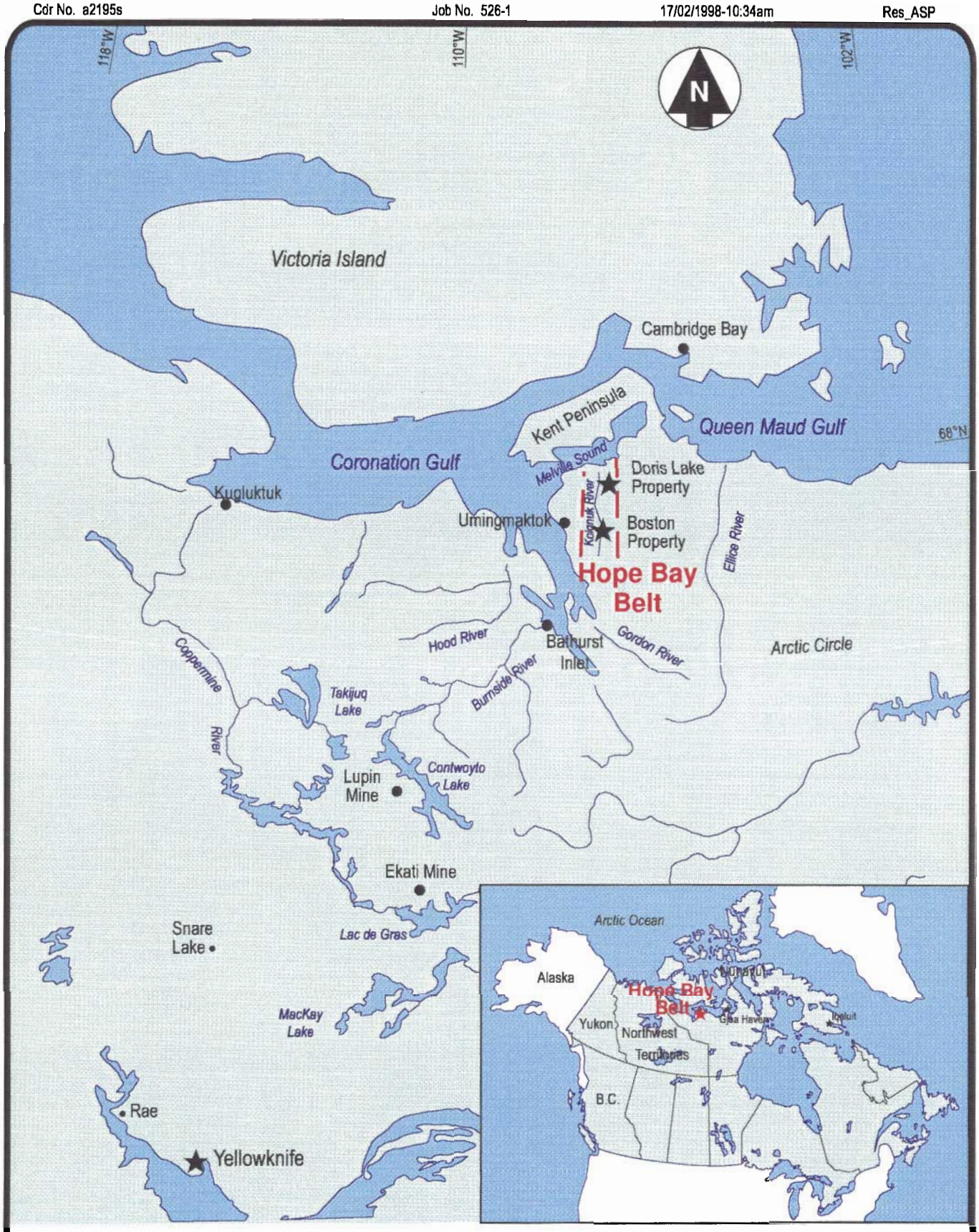
The economic mineral for the Boston Gold Project in the Nunavut Settlement Area is gold. The Boston Gold Project is located about 450 km west southwest of Gjoa Haven and about 175 km southwest of Cambridge Bay in the Hope Bay Belt (Figure 1-1).

This document, ***BHP Minerals Boston Gold Project, N.T. Spill Contingency Plan***, is a review and analysis of the preparedness for events which may occur due to unforeseen circumstances. The plans and predetermined lines of response detail actions to be taken in the event of unintentional materials release from the exploration portal, development rock, wastewater, holding facilities, sewage treatment area, fuel or chemical storage areas.

This contingency plan is a living document, intended to be readily amended to accommodate changes. It first describes the main facilities to be operated as a component of the ongoing exploration drilling and bulk sampling activities, followed by contingency measures to support them. On site activity this year is planned to run from the fall of 1998 to late summer of 1999. An abbreviated version of the plan will be posted for all exploration staff and visitors on the site as part of the BHP Minerals field orientation program for the Boston Gold Property.

1.2 BHP Minerals Canada Policy on Initiating Cleanup Activities

It is the policy of BHP to initiate clean up activity when, in the opinion of its management, BHP is clearly associated, or likely associated with the spilled product. It is also the policy of BHP to comply with existing regulations to ensure protection of the environment, and to keep employees, government officials and the public informed.



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Project Location Map

FIGURE 1-1

2. Project Facility Description

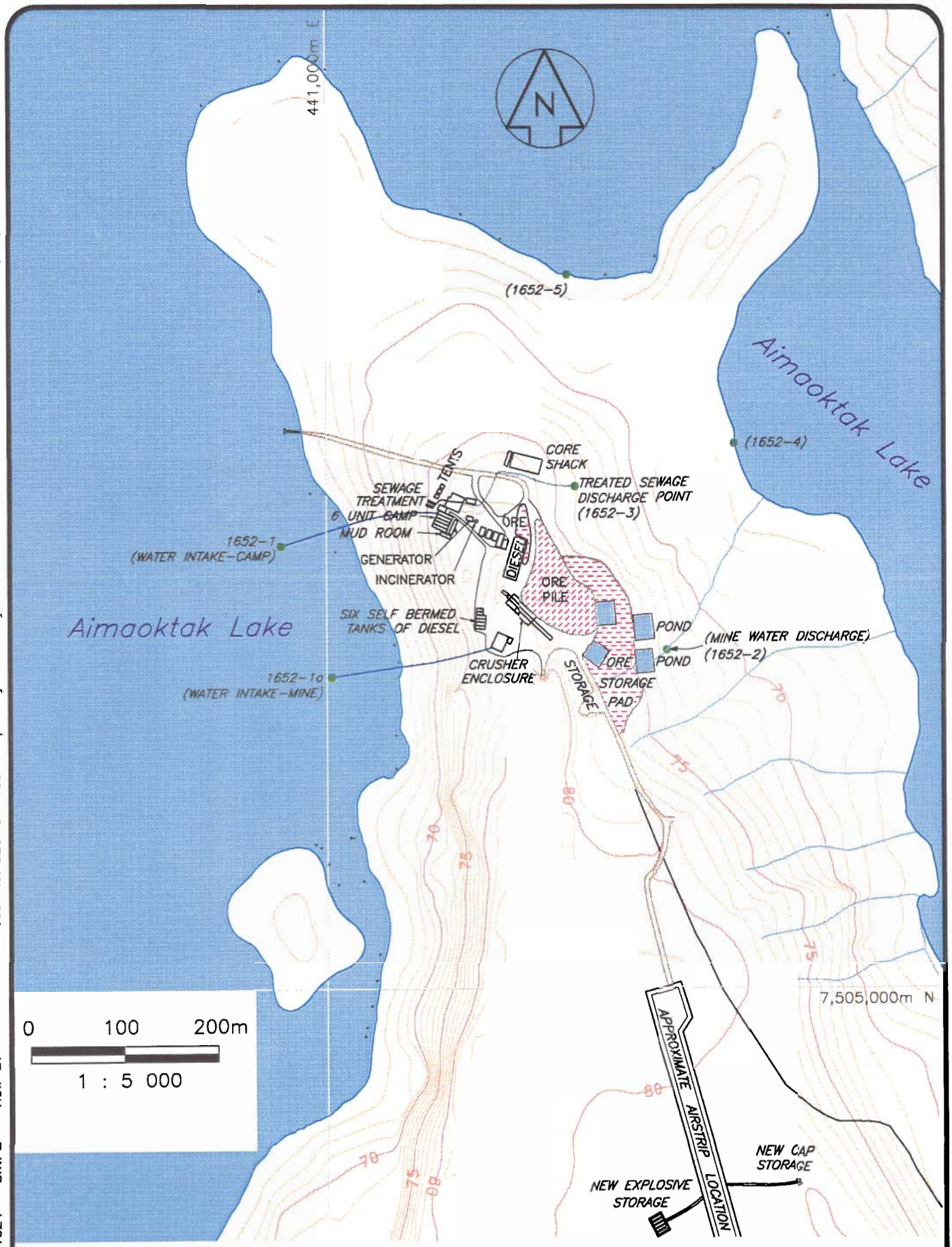
2. PROJECT FACILITY DESCRIPTION

2.1 Bulk Sampling and Processing System

The 1997 bulk sampling program generated approximately 18,000 tonnes of ore material and 56,000 tonnes of development rock. Approximately 1,600 m of underground development was undertaken in unmineralized rock and along the mineralized veins. Much of the development rock generated from the operation was used on roadways and the airstrip after appropriate testing to ensure that the rock is non-acid generating.

The treatment of the mineralized samples from the bulk sampling program was, and in the future will continue to be performed off-site. Composite samples will continue to be transported off-site by air. Bermed stockpile pads for ore and potentially acid generating rock have been situated north and east of the portal entrance, as shown in Figure 2-1. Development rock with high NNP was used to construct the stockpile pads, to store and neutralize potential acidic runnoff. Development rock that is not acid generating was used as road/pad building to minimize additional terrain disruption.

During 1997 two water lines from Aimaoktak (Spyder) Lake were installed to service the underground workings and camp. Underground water reporting to the mine intake line (south of camp) is recycled to the sumps for use at drilling locations. Water is not generally discharged above surface into the watershed unless flooding occurs. Sumps are located underground to settle solids (primary water sumps) from recycled water prior to being reused. Two settling ponds are located at the portal entrance on the east side of the roadway by the ore storage pads. The ponds have been designed to accommodate excess water generated in the underground workings. The ponds also act as settling basins to control the level of suspended solids prior to discharge. The pond berms have been built with suitable development rock. A bentonite/geotextile membrane lines the primary settling pond. The primary sump capacity is 112 m^3 and the secondary sump is 80 m^3. A similar membrane will also be installed in the second pond if more capacity becomes necessary.



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Boston Gold Project Site Land Use Plan

Figure 2-1

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The intake line for servicing the camp is located on the northwest side of the camp and leads to Aimoaktak Lake (not exceeding 3 m^3/hr). To prevent water used for underground service water from freezing, a brine solution is added to the fresh water intake in the mine.

Minewater may be produced but, it is not anticipated to pose a major concern (*Bulk Sampling Waste Disposal Plan*, Rescan Environmental Services Ltd. 1997). Any runoff from the potentially acid generating development rock heap is combined with the minewater and monitored for compliance prior to discharge from the settling ponds (SNP-1652-2).

2.2 Domestic Sewage

The sewage system presently in use at the project site treats effluent from the camp facility and is monitored on a monthly basis. The camp uses a "ROTORDISK" rotating biological contactor (RBC), approved for installation and use by the Nunavut Water Board (NWB). A chlorination unit has been added to reduce fecal coliform in the effluent discharge. However, the necessity for chlorination of the effluent is presently under review and is expected to be eliminated. This processing system treats about 75% grey water and 25% domestic sewage. The camp's discharge is released approximately 50 m from camp (Figure 2-1) (SNP-1652-3) into a natural depression in the land, upland from the Trout Creek arm of Aimoaktak Lake (SNP-1652-4 and 5). During the summer of 1998, BHP requested and the Nunavut Water Board authorized the temporary discharge of some treated sewage effluent to an area near the camp which had been contaminated by hydrocarbons. This activity has now been completed and future discharges will be re-directed to the previously designated area (SNP-1652-3).

2.3 Solid Waste

Combustible solid wastes generated from the camp facility are incinerated. The incinerator is located approximately 75 m from the temporary camp. Products such as putrescible domestic and office waste are burned. Waste that cannot be incinerated is flown off-site for recycling or acceptable disposal at authorized facilities.

Solid waste or any waste material determined to be acid producing is being stored on the potential acid generating stockpile.

2.4 Fuel Storage

Diesel fuel is required to generate power on-site, heat buildings and to fuel mobile equipment. The diesel fuel storage requirement for the continued exploration and bulk sampling program at the BHP Boston Gold Project is 70,000 L (bulk), and 800,000 L of drummed diesel. The drummed fuel storage area is an open facility located north of the campsite. This area offers a natural clay loam basin for fuel storage. The fuel is shipped to the site in 205 L barrels. The drum storage site contained 4,000 barrels of fuel as of April 30, 1998. The site has storage capacity for approximately 70,000 L of bulk fuel. In addition to diesel, approximately 30,000 L of drummed jet fuel and 2,000 L of drummed gasoline were brought in during April, 1998. All barrels are stored at least 30 m away from Aimoaktak Lake's high water level.

The spill contingency plan and associated response equipment are available on-site to handle potential spill incidents. Once operations have ceased, all remaining fuel will be transported off-site.

2.5 Chemicals

BHP is committed to the safe and proper handling of waste materials to ensure minimal environmental impact and land disturbance. Waste chemicals that require special attention and handling are waste oil, hydraulic oil, lubricating oils, calcium hypochlorite, grease and ethylene glycol.

Waste oil and oil from filters are recycled offsite or reused as incinerator fuel. Drained, spent oil filters are stored in drums for removal from the site for disposal at an authorized disposal facility. As a last resort, waste oil is temporarily stored in empty fuel barrels on-site and intermittently sent to an authorized recycling and/or waste disposal facility. Used grease is temporarily stored on-site and will be removed at the end of the bulk sampling program. Ethylene glycol is recycled as much as possible. The remaining ethylene glycol will be collected and sent to an appropriate disposal service. Reagents are not used on site.

Rock salt, commonly applied on roads in winter, is added to the fresh water entering the bulk sample workings to form an antifreeze drilling brine solution and does not warrant any environmental concern. Explosive material, when on-site,

will be stored in sealed C-cans at the designated explosives storage site adjacent to the Airstrip (Fig 2-1).

Material Safety Data Sheets (MSDS) are included as Appendix A of this plan and are kept at the site for all chemicals and fuel products brought on-site. Appropriate storage and handling of these products will be undertaken. The action plans for spills of diesel fuel, lubricating and hydraulic oils and ethylene glycol are also included in Appendix A.

3. System Failure and Preventative Measures

3. SYSTEM FAILURE AND PREVENTATIVE MEASURES

3.1 Potential Runoff from Ore Stockpile

The ore stockpiles are located approximately 120 metres upgradient from the camp. The pad area will isolate the stockpiles from the camp. Possible causes for drainage from the stockpile include:

- slumping or settling of the pad berm;
- seepage beneath the pad; and
- erosion of the pad by natural elements.

Visual inspections of the stockpile area are carried out on a weekly basis.

3.2 Discharge from Underground Sumps

The minewater ponds located near the portal entrance will be used if excess water is encountered underground. Discharge from the surface sump may result from:

- underground decant system failure;
- occurrence of higher than design groundwater flow; and
- high precipitation.

In addition to measures for the monitoring of potential runoff from the ore stockpile, the effectiveness of the underground decant system will continue to be monitored regularly. Maintenance of adequate depth for settling purposes at the discharge will be ensured before underground work begins again.

3.3 Domestic Sewage

The domestic sewage treatment system is designed to carry a hydraulic load of 130 persons at 300 L per person per day.

Failures may occur in the domestic sewage system under the following scenarios:

- pump failure;

- power outage;
- treatment system malfunction due to changes in the design load;
- pipeline worn or broken;
- pipeline blockage;
- accidental damage to the pipeline and its components;
- presence of oil and grease in the influent;
- mechanical breakdown;
- improper maintenance; and
- subsidence of the pipeline supporting structures.

Visual inspection of the treatment system and the pipeline will continue to be carried out on a weekly basis. The operations manual protocols for the sewage treatment plant will continue to be adhered to.

3.4 Solid Waste

Failures may occur in the removal of solid waste in the following modes:

- incinerator failure;
- power outage;
- treatment system malfunction due to changes in the design load;
- accidental damage to the incinerator and its components;
- mechanical breakdown; and
- improper maintenance.

Visual inspection of the incinerator and its combustion products will continue to be carried out on a regular basis. The operations manual protocols for the incinerator will continue to be adhered to.

3.5 Fuel

Fuel spills could potentially occur from:

- fuel storage barrel leaks;
- spills during drum transport from aircraft to fuel storage area; and
- spills from vehicles or equipment that may be involved in accidents or roll-overs.

Spills occurring during fuel handling, transfer or storage operations will be minimized by:

- proper storage of the barrels;
- regular inspections of the barrels;
- training in proper fuel handling procedures;
- spill response training for personnel associated with fuel handling;
- immediate cleanup of minor spills; and
- maintaining fuel storage cache for emergencies.

The potential for spills affecting surface waters is low, as fuel storage and transfer points are located away from watercourses.

3.6 Chemicals

Any chemicals brought on site are stored in drums, canisters or packages. These are normally stored indoors. Leaks may occur, causing limited spills of chemical product in storage or during the transfer or from accidental failure of containers.

Spills from chemicals will continue to be minimized by practicing safe handling and storage procedures, ensuring proper training of staff handling these products and by conducting regular inspections of stored chemicals.

4. Initial Actions

4. INITIAL ACTIONS

In the event of any leak, spill or system failure, the following steps will be taken by company personnel at the spill site:

1. Be alert, ensure your safety and the safety of others first.
2. Assess the hazard to persons in the vicinity of the spill or leak.
3. Report the spill, leak or system failure immediately to the On-Scene Coordinator so that person can ensure that the responsible regulator is notified by contacting the NWT 24 Hour Spill Line at (867) 920-8130.
4. Assess nature and status of the spill, leak or system failure and measures to be taken to bring the situation under control.
5. When safe to do so, stop the flow of the spilled material.
6. Record all information on the status of the situation.
7. Resume safe, effective actions to contain, stop the flow of spilled product or clean up the incident.

5. System Malfunction Responses

5. SYSTEM MALFUNCTION RESPONSES

5.1 Runoff from Ore Stockpile

Any person noticing uncontrolled runoff from the ore stockpile will immediately report the occurrence to the On-Scene Coordinator. Contaminated runoff will be contained and prevented from reaching any water body by application of the following measures:

- contain the runoff by building a suitable berm;
- contact the Spill Response Coordinator and report the spill incident to the 24 Hour Spill Reporting Line for approval before undertaking further action; and
- initiate further remedial actions such as redirection of the uncontrolled runoff to the settling pond, removal and disposal of contaminated soils, vegetation, restoration, *etc.*

5.2 Discharge from Settling Ponds

BHP is required to notify the Nunavut Water Board inspector prior to the decant of settling pond water. Total suspended solids is the parameter that may most likely exceed discharge limits. If the decant water discharged from the surface sump exceeds the permissible level of total suspended solids (based on testing), additional flocculant may be needed to settle suspended solids. Toxicity and the proper flocculant dosage will be monitored.

5.3 Domestic Sewage and Solid Waste

Any problems in the sewage treatment plant, such as improper operation, pipeline rupture, pump/power breakdown *etc.,* will be immediately reported to the On-Scene Coordinator. Problems encountered with the incinerator will also be reported to the On-Scene Coordinator. The On-Scene Coordinator will refer to the Operation and Maintenance Manual, Section 6.0 Trouble Shooting. Further assistance may be provided by Mr. Ric Goce of the CMS Group, manufacturers of the "ROTORDISK" system, at (416) 447-4964.

In the event of power failure, the stand-by generator will be promptly put into operation. Similarly, in the case of a pump failure, the back-up pump will be put on-line. Any spillage occurring inside the sewage treatment system will be contained therein and if necessary pumped back in. Necessary safety equipment and contamination protective clothing will be available in the sewage unit.

5.4 Fuel Spill

Fuel spills, leaks at storage facilities or vehicle accidents will be handled by following these steps:

- identify the source of the leak or spill;
- contact the Spill Response Coordinator;
- stop leaks from a tank or barrel by:
- turning off valves;
- utilizing patching kits to seal leaks;
- placing plastic sheeting at the foot of the tank or barrel to prevent seepage into the ground; and
- contain the spill and the source if possible.

Further information on the handling of fuel spills is detailed in Appendix A.

5.4.1 Fuel Spills on Land

Fuel spills on land (gravel, rock, soil, vegetation) can be contained by:

- constructing temporary berms and deploying absorbents;
- Stains on rock can be soaked up with absorbent mats. The mats should be placed in empty drums for disposal; and
- Contaminated soil and vegetation may have to be removed and disposed.

5.4.2 Fuel Spills on Snow

- Snow can work well as a natural absorbent and collect spilled fuel;

- Temporary berms can be made from snow by compacting it and spraying with water to create an ice barrier or lining the snow-berm with plastic; and
- The snow-fuel mixture can be scraped up and stored in a lined area or in drums for future disposal.

5.4.3 Fuel Spills on Water

It is important to immediately limit the area of the spill on water:

- Deploy booms to contain the spill area. Boom effectiveness will be limited by winds, waves and other factors; and
- Use absorbent mats and similar materials to capture small spills on water.

Booms can be drawn in to encircle spilled fuel. The absorbent mats are hydrophobic (absorb hydrocarbons and repel water).

5.4.4 Fuel Spills on Ice

- Where a spill occurs on ice, snow can be compacted around the edge of the spill to serve as a berm. The ice will prevent (or reduce the rate of) seepage of fuel into the water, but the contaminated snow/ice must be scraped up as soon as possible. Permission may be given from the government to burn off fuel (contact the NWT 24 Hour Spill Line). Remaining contaminated snow can be placed in drums or in a lined berm (on land);
- Fuel that escapes under the ice through breaks or cracks in the ice can be recovered with the rapid application of absorbents;
- Fuel that becomes frozen in cracks in the ice can be "dug out" once the ice becomes safe for personnel and equipment to work on; and
- Fuel that escapes under the ice will generally freeze in to the underside of the ice surface and will become encapsulated as the ice continues to grow thicker during the winter months. Under this condition the fuel is unavailable to contaminate or harm aquatic life and plans can be formulated to recover the under ice fuel spill in the spring when the thaw cycle will cause fuel to migrate to the ice surface.

5.5 Chemical Spills

- Assess the hazard of the spilled material by referring to the relevant MSDS sheet and applicable action plan (Appendix A);
- If the chemical is hazardous, ensure protective personal equipment is appropriately utilized (latex gloves, eye protection, *etc.*) before approaching the spill (refer to Appendix A);
- Use absorbents to soak up spilled liquids;
- Plastic sheeting can be utilized to prevent solid chemicals from being blown around;
- Neutralize acids or caustics; and
- Place spilled material, absorbents, and rags in an open-top drum and seal for storage (the drum will be disposed of in an authorized treatment facility).

6. Response Equipment

6. RESPONSE EQUIPMENT

6.1 General Equipment

Heavy equipment used for the exploration drilling and/or bulk sampling operations will be available on-site for emergency use and to respond to spill incidents. A comprehensive list of equipment can be provided upon request when formal mining operations begin. Presently, the facility is well equipped to respond to emergencies or spills.

6.2 Spill Kits

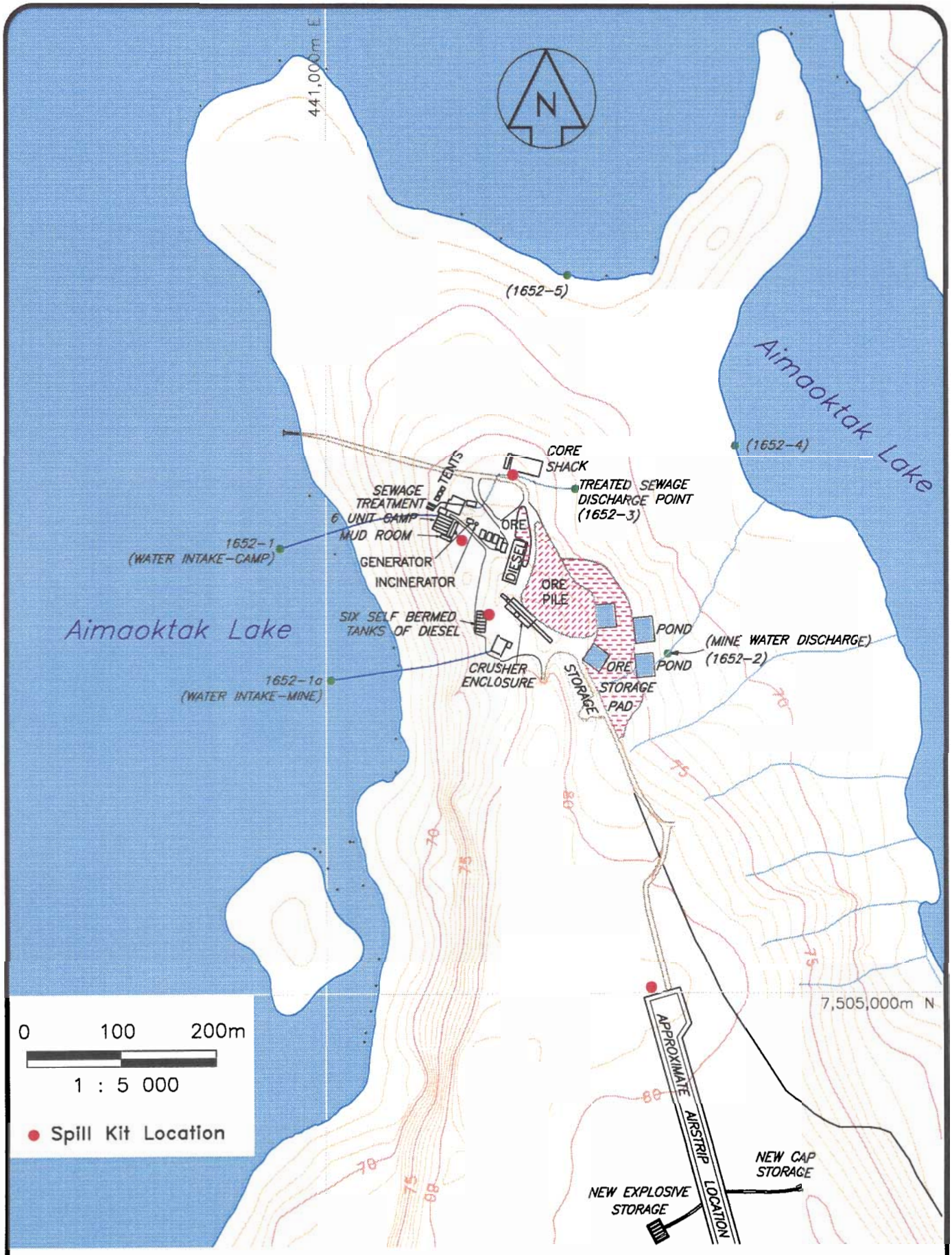
Four spill kits are located at the Boston Gold Project (Figure 6-1). They are located by the generator shack (1), the bulk fueling area by the workshop (1), the drum fuel storage area (1), and the airstrip (1). Spill kit contents are listed in Table 6-1. The contents of each spill kit were inspected in June 1998, and supplies replenished.

Table 6-1
Items Contained in Each Spill Kit

1 - 45 gal, 16-Gauge Open Top Drum, c/w Bolting Ring & Gasket
1 - 48" x 48" x 1/16" Neoprene Pad (Drain Stop)
20- Short Pig Putty Epoxy Sticks
Splash Protection Goggles
2 - PVC Oil Resistant Gloves
1 Pkg. Polyethylene Disposable Bags (5 ml) 10 per Package
1 Shovel (Spark Proof)
1 Case T-12 3" x 10' Absorbent Boom, 4 Booms/Case
1 Pkg. Universal Absorbent Mats, 16½ " x 20", 100 Mats per Package
1 Roll, Oil Only Absorbent Mats, 150' x 33"

6.3 Mobile Environmental Response Unit

A Mobile Environmental Response Unit is available to BHP from one of the major fuel suppliers (Shell) in Yellowknife or Cambridge Bay (for phone number, see BHP Contractors in Section 7). This unit can be transported to the site from Cambridge Bay in less than three hours, weather permitting.



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Spill Kit Locations at Boston Gold Project Site

Figure 6-1

7. Response Organization

BHP

BHP Diamonds Inc.

March 25, 1999

Phillippe di Pizzo
Executive Director
Nunavut Water Board
P.O. Box 119
Gjoa Haven NT X0E 1J0

REVISED

Re: Updated Emergency Response Contacts for the Boston Site – NWB1BOS9801

Dear Phillippe;

Please find enclosed the revised emergency response organization for the Boston Camp – Winter 1999 drilling programme. This sheet replaces page 7-1 in the Spill Contingency Plan BHP filed with the NWB in August of 1998.

Thank you for your consideration in this matter.

Sincerely yours;

Chris Hanks
Acting Environmental Manager

cc. Scott Williams, John Witteman, Greg McMaster

BHP Diamonds Inc., #1102 4920 - 52nd Street, Yellowknife, NT, Canada X1A 3T1
Telephone (867) 669-9292 Facsimile (867) 669-9293 Web Site www.bhp.com.au/minerals/diamonds/index.htm
BHP Diamonds Inc. is part of the Non-Ferrous and Industrial Minerals Division which is a Business Group of the Broken Hill Proprietary Company Limited

Nunavut Water Board – March 25, 1999 - BHP Diamonds Inc.
RESPONSE ORGANIZATION

The members of the Spill Response Team and their duties are listed below for each of Boston Camp.

Response Organization for Boston Camp

REVISED

Internal Contacts

Field Contacts: Boston Camp (600) 700-4175

On-Scene Coordinator: **Jeremy Howe / Lauren Anonby**
Alternate Contact Person: **Brian Hill**
Spill Cleanup Supervisors: **Johnny Qulluniq / Geoff Newton**
Environmental Field Manager: N/A
Safety Supervisors: **Brian Hill**

Emergency Response Team: Approximately 10 personnel will be available on-site to assist with spill response activities.

Office Contacts:

Environmental Manager:
Hope Bay Project
Chris Hanks
Ph: (867) 669-6145 (w)
(867) 920-7720 (h)
Fax: (867) 669-9293

Evironmental Manager:
EKATI™ Diamond Mine
John Witteman
Ph: (867) 880-2232

Additional Assistance:

Environmental & Safety Advice: **Rescan Environmental Services Ltd.**
D. Jarratt/R. Hoos
Ph: (604) 689-9460
Fax: (604) 687-4277

7. RESPONSE ORGANIZATION

The members of the Spill Response Team and their duties are listed below for each of Boston Camp and Windy Camp.

Response Organization for Boston Camp

Internal Contacts

Field Contacts:

On-Scene Coordinator:	TBA
Alternate Contact Person:	TBA
Spill Cleanup Supervisors:	TBA
Environmental Field Manager:	TBA
Safety Supervisors:	TBA

A revised form including a spill response organization chart will be submitted to the Nunavut Water Board prior to resumption of the operation.

Emergency Response Team: Approximately 10 personnel will be available on-site to assist with spill response activities.

Office Contacts:

Environmental Manager:
Hope Bay Project
Chris Hanks
Ph: (867) 669-6145
Fax: (867) 669-9293

Manager of Project Feasibility:
BHP World Minerals
Rich Rein
Ph: (415) 774-2256

Additional Assistance

Environmental & Safety Advice:
Rescan Environmental Services Ltd.
D. Jarratt/R. Hoos
Ph: (604) 689-9460
Fax: (604) 687-4277

Response Organization for Windy Camp (Available to Assist at Boston)

Internal Contacts

Field Contacts:

On-Scene Coordinator:	**Dave Clark/Ross McElroy** Ph: (604) 520-6259 Fax: (604) 521-0634
Alternate Contact Person:	**Calvin Zaremba** Ph: (604) 520-6259 Fax: (604) 521-0634
Spill Cleanup Supervisors:	**Johnny Qilluniq** Ph: (604) 520-6259 Fax: (604) 520-0634
Environmental Field Manager:	**Justin Parsons** Ph: (604) 520-3164/520-6259 Fax: (604) 520-3412/520-3412
Safety Supervisors:	**Keith DeGruchy** Ph: (604) 520-6259 Fax: (604) 521-0634
Emergency Response Team:	Approximately 10 personnel will be available on-site to assist with spill response activities.

Office Contacts:

Environmental Manager: Hope Bay Project	**Chris Hanks** Ph: (867) 669-6145 Fax: (867) 669-9293

7.1 Responsibilities

All Employees (First Responders)

- Assess the initial severity of the spill and safety concerns.
- Identify the source of the spill.
- Report all spills to immediate Supervisor as soon as possible.
- Determine the size of the spill and stop or contain it, if possible.
- Participate in spill response as member of cleanup crew.

Emergency Response Team (ERT - Spill Cleanup Crew)

- Conduct cleanup of spills under direction of Spill Cleanup supervisor.
- Deploy booms, sorbent and other equipment and materials as required.
- Take appropriate response measures.
- Continue cleanup as directed by Spill Cleanup Supervisor or until relieved.

Spill Cleanup Supervisors

- Report to the On-Scene Coordinator.
- If the On-Scene Coordinator is not available, immediately report the spill to the alternate.
- Assist in initial and ongoing response efforts.
- Supervise emergency response team.
- With work crew, take initial action to seal off the source and contain spill.
- Continue actions until relieved or supplemented by other supervisor.
- Decide with On-Scene Coordinator if mobilization of additional equipment from Spill response Organization or Contractor is warranted.
- Assess whether burning is a viable cleanup measure. Consult with Environmental Manager.

On-Scene Coordinator (OSC)

- Ensures that the spill is reported to the NWT 24-Hour Spill Report Line at (867) 920-8130.

- Contacts the Emergency Response Team if the situation requires.
- Records the time of the report, source of information and details on locations, size, type of spill and any other information and details on the spill report form.
- Oversees the cleanup operation until it is satisfactorily completed.
- Together with the Spill Cleanup Supervisor, decides if additional equipment and manpower is required to contain and cleanup spills (BHP and Contractors).
- Notifies Environmental Field Manager, Environmental Manager (Yellowknife), Project Manager, Operations manager.
- Oversees completion and distribution of spill report.
- Ensures investigation and identifies measure to prevent similar spills.

Operations Manager

- Is responsible for all communication with the media. Ensures that all press releases are accurate and in accordance with company policy.
- Makes financial decisions on major expenses during large spill response.
- Initiates Mutual Aid Agreements if so required.

Environmental Field Manager

- Provides cleanup advice to the On-Scene Coordinator and Spill Cleanup Supervisor with assistance from Environmental Consultant as necessary.
- Develops safe and effective spill management and prevention practices.
- Provides advice to the Spill Cleanup Supervisor of storage and disposal options.
- Conducts ongoing monitoring of cleanup operations leading to close-out.
- Updates and distributes Contingency Plan.
- Ensures that the Spill Report was sent by the On-Scene Coordinator to the GNWT.
- Ensures Emergency Response Team is adequately trained in spill response.
- Organizes spill response training and exercises.

Senior Environmental Specialist (Yellowknife)

- Assists the Operations manager in the preparation of press releases.
- Confirms receipt of spill report.
- Ensures that follow up reports are prepared on spill event, cleanup and environmental impacts.
- Ensures that Post-Spill reports are completed and takes actions, as necessary, to prevent a recurrence.
- Liaise with government agencies (as required).
- Ensures ongoing spill mitigation and spill closeout.

Legal Counsel

Advises the Operations Manager and Senior Environmental Manager as requested related to:

- Legislative authority of various government agencies.
- Questions of due diligence.
- Costs/fines and liabilities, including penalties associated with regulations.
- Consults with the corporate insurance coordinator and advises the Operations Manager on matters to insurance.

BHP Board of Directors

Establishes corporate environmental policy based on the recommendations of the Environmental Management Committee.

Additional services or assistance will be obtained as necessary from the following organizations:

BHP Contractors:

Sheldon Otto, Braden Burrey Expediting	Ph: (867) 873-8666 Fax: (867) 873-8285
Matthew Wasserman, Mobile Environmental Response Unit Shell Canada	Ph: (867) 873-3337
Rocky Britles, J.T. Thomas (Smithers Phone Number)	Ph: (250) 847-4361 Fax: (250) 847-5039

Local Air Charter

Air Tindi, Dispatch	Ph: (867) 669-8218
NWT Air (First Air), Dispatch	Ph: (867) 669-6645
First Air, Dispatch	Ph: (867) 669-6682
Great Slave Helicopters	Ph: (867) 873-2081

Environmental Consultants

Rescan Environmental Services Ltd. Vancouver Office	Ph: (604) 689-9460 Fax: (604) 687-4277
Yellowknife Office	Ph: (867) 920-2090 Fax: (867) 920-2015
EBA Engineering Consultants Ltd. Edmonton Office	Ph: (403) 451-2121 Fax: (403) 454-5688

Neighbouring Sites:

John Witteman, BHP Ekati Diamond Mine Environmental Manager Main Switchboard	Ph: (867) 880-2232 Fax: (867) 880-4008 Ph: (867) 880-2200
Diavik Diamond Mine	Ph: (867) 669-6500

Equipment and Material Suppliers:

Dupont (Fuel Dye) Contact: Ray Buckland	Ph: (905) 821-5660
Sorbents:	
Frontier Mining	Ph: (867) 920-7617
Acklands	Ph: (867) 873-4100
pager	Ph: (867) 920-5359

8. Reporting Procedures

8. REPORTING PROCEDURES

The Spill Response Team must be notified immediately of any spill. Communication on-site will be via radio and to other centres by satellite. The On-Scene Coordinator (OSC) or his designate will ensure that each spill is reported to the NWT 24-Hour Spill Report Line at (867) 920-8130, and that a Northwest Territories Spill Report Form (Appendix B) is filled out as completely as possible. Other contacts follow:

External Contacts

GNWT:

Harvey Gaukel, Hazardous Substance Specialist Environmental Protection Services, RWED	Ph: (867) 873-7654
Sylvester Wong, Director Prevention Services Workers Compensation Board (Formerly Mine Safety Division)	Ph: (867) 669-4408
Larry Adamson, Regional Superintendent, RWED	Ph: (867) 920-6134
Grant Corey, Officer III, RWED Cambridge Bay	Ph: (867) 983-7315 Fax: (867) 983-2802
Andy McMullen, Officer III, RWED Kugluktuk	Ph: (867) 982-7251 Fax: (867) 982-3701
Bruce Stebbing, Office of the Fire Marshall Municipal & Community Affairs	Ph: (867) 873-7030

Federal Government:

RCMP (Yellowknife)	Ph: (867) 669-1111 Fax: (867) 669-5135
RCMP (Cambridge Bay)	Ph: (867) 983-2111 Fax: (867) 983-2498
Darren Unrau, Resource Management Officer–BHP Indian & Northern Affairs Canada (DIAND)	Ph: (867) 669-2763
Magnus Bourque, Environment Canada	Ph: (867) 920-4700
Margaret Keast, Fisheries and Oceans	Ph: (867) 979-8000 Fax: (867) 989-8039

NWT Pollution Control Division	Ph: (867) 873-7654 Fax: (867) 873-0221
Wynet Smith, Kitikmeot Inuit Association Lands Division Manager	Ph: (867) 982-3310 Fax: (867) 982-3311
Phillipe di Pizzo, Nunavut Water Board Executive Director	Ph: (867) 360-6338 Fax: (867) 360-6369

9. Training and Spill Exercises

9. TRAINING AND SPILL EXERCISES

9.1 Training

All members of the Spill Response Team will be trained and be familiar with the spill response resources, including their location and access, the Spill Contingency Plan and appropriate spill response methodologies. During 1998 the onsite training program for both Boston and Windy Camp personnel was completed in June with the assistance of a qualified contractor (Rescan Environmental Services Ltd.). The training program included the dissemination of information on the NWT Water Board Guidelines for Contingency Planning, the NT Environmental Protection and Spill Regulations, the viewing of RWED spill response videos, and the field application of suitable techniques.

All personnel at the BHP Property will be familiar with spill reporting requirements.

Fuel handling crews will be fully trained in the safe operation of these facilities, spill prevention techniques and initial spill response. Similarly, the staff involved in wastewater treatment systems will be trained in the safe and effective operation of these systems.

9.2 Spill Exercises

BHP will conduct regular spill exercises to test the response of the Spill Response Team to manage fuel and other system failure spills.

Reports will be made by the On-Scene Coordinator noting the response time, personnel, and problems or deficiencies encountered. These reports will be used to evaluate the ability to respond to spills and determine areas necessary for improvement.

Appendix A
Action Plan for Spills and Material Safety Data Sheets

BHP

Baroid Drilling Fluids, Inc.
Environmental, Safety and Transportation Data Sheet

BARAFLOC#

HEALTH HAZARD 1 FLAMABILITY 0 REACTIVITY 0
Ratings based on NFPA
'Standard system for the Identification of the Fire Hazards of Materials'

I. PRODUCT IDENTIFICATION

Supplier
BAROID DRILLING FLUIDS, INC.
Address
P.O. BOX 1675 HOUSTON, TX 77251
Trade Name
BARAFLOC
Generic Description
ORGANIC POLYMERIC POWDER

Regular Telephone No. 713/987-5900
Emergency Telephone No. 800 424-9300

II. HAZARDOUS INGREDIENTS

Material or Component	%	Hazard Data
NONE		

III. PHYSICAL DATA

Boiling Point (Deg F)	Melting Point	Freezing Point
NA	NA	NA
Specific Gravity (Water = 1)	Vapor Pressure (mm Hg)	
ND	NA	
Vapor Density (Air = 1)	Solubility in water, % by wt.	
NA	SOLUBLE	
Volatiles, % by Volume	Evaporation Rate (Butyl Acetate = 1)	
NA	NA	
Appearance and Odor	Density @ 20 Deg C	
WHITE FLAKY POWDER, LITTLE ODOR	ND	
pH		
6 @ 3.5ppb		

NA = Not Applicable ND = Not Determined

All information recommendations and suggestions herein concerning our product are based upon tests and data believed to be reliable, however, it is the user's responsibility to determine the safety, toxicity, and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Baroid Drilling Fluids, Inc. as to the effects of such use, the results to be obtained, or the safety and toxicity of the product nor does Baroid Drilling Fluids, Inc. assume any liability arising out of use, by others, of the product referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

IV. FIRE AND EXPLOSION DATA

EXTINGUISHING MEDIA: ALCOHOL FOAM, CO2, DRY CHEMICAL

THERE ARE NO UNUSUAL FIRE OR EXPLOSION HAZARDS.

V. HEALTH HAZARD INFORMATION

Carcinogenicity -NOT ON NTP, IARC, OR OSHA LISTS

Acute Oral (LD50)	Acute Dermal (LD50)	Aquatic Toxicity (LC50)
ND	ND	ND

Routes of exposure and effects
NUISANCE DUST: TLV 10 mg/m3.

EYES: POSSIBLE MINOR IRRITATION.

SKIN: IRRITANT, SHORT CONTACT MAY RESULT IN DERMATITIS

INHALATION: IRRITANT TO NOSE, THROAT, LUNGS.

Emergency and First Aid procedures
EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES.

SKIN: FLUSH WITH WATER.

INHALATION: IF INHALED IN LARGE AMOUNTS, MOVE TO FRESH AIR.

VI. REACTIVITY DATA

Conditions contributing to instability
SOLIDS SOFTEN AT 220C

Incompatibility
OXIDIZING MATERIAL

Hazardous Decomposition Products

Conditions Contributing to Hazardous Polymerization
WILL NOT OCCUR

VII. SPILL OR LEAK PROCEDURES

Steps to be taken if material is released or spilled
SWEEP UP AND SALVAGE AS MUCH AS POSSIBLE. PRODUCT IS SLIPPERY WHEN WET.

Neutralizing Chemicals
NA

Waste Disposal Method
DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

VIII. INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements
NORMAL ROOM VENILATION.

Specific Personal Protective Equipment
Respiratory
NONE NECESSARY UNLESS NUISANCE DUST LEVEL EXCEEDED
Eye
SAFETY GLASSES
Gloves
WORKING GLOVES
Other Clothing and Equipment
NONE

IX. SPECIAL PRECAUTIONS

Precautionary Statements
PRODUCT BECOMES SLIPPERY WHEN WET, PRACTICE GOOD HOUSEKEEPING TO PREVENT SLIPPERY FLOORS.

Other Handling and Storage Requirements
STORE PRODUCT IN SHELTERED AREA OR COVER FOR MOISTURE PROTECTION.

X. DEPARTMENT OF TRANSPORTATION INFORMATION

Proper Shipping Name:
NOT REGULATED AS HAZARDOUS

Hazard Class:
NONE

Hazardous Substance:
NONE

Label:
NONE

Placards:
NONE

Reportable quantity:
NONE

ID Number:
NONE

XI. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS

Comprehensive Environmental Response, Compensation and Liability Act of 1980,(CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product which may require notification are:

Chemical	CAS #
NONE	

Superfund Amendments and Reauthorization Act of 1986 Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on RQs.

Components present in this product at a level which could require reporting under the statute are:

NONE

SARA requires the submission of annual reports of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDS that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

NONE

Toxic Substances Control Act (TSCA)

The ingredients of this product are on the TSCA inventory.

XII. STATE RIGHT-TO-KNOW

NOT ON ANY STATE LISTS.

ALLIED COLLOIDS INC

2301 WILROY ROAD, P.O. BOX 820
SUFFOLK, VA 23439-0820
(804) 538-3700

24-HOUR EMERGENCY CONTACT
CHEMTREC: 800/424-9300

Material Safety Data Sheet

SECTION I - IDENTIFICATION

PRODUCT: **PERCOL® 757**

ISSUE/REV DATE: 18-Nov-92

CHEMICAL FAMILY: Copolymer of a quaternary acrylate salt and acrylamide.

DESCRIPTION: White, free flowing micro-beads with little or no odor.

HMIS RATING (NPCA)

H	1	HEALTH (ACUTE)
F	1	FLAMMABILITY
R	0	REACTIVITY
P	*	PERSONAL PROTECTION

* PERSONAL PROTECTION RATING BY USER, DEPENDENT ON USE.

DEGREE OF HAZARD
4 = SEVERE
3 = SERIOUS
2 = MODERATE
1 = SLIGHT
0 = MINIMAL

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS No.	LIMIT(S) IN AIR PPM	LIMIT(S) IN AIR mg/m³	REMARKS
ADIPIC ACID	124-04-9	ND	ND	None
COPOLYMER ACRYLAMIDE: DMAEA Q.(MeCl)	69418-26-4	ND	ND	None

T = TWA-8, C = CEILING, S = STEL-15min
NTP and/or IARC in remarks indicates possible or probable human carcinogen

SECTION III - PHYSICAL PROPERTIES

BOILING POINT: NA

SPECIFIC GRAVITY: 0.8-1.0

VAPOR DENSITY (air=1): NA

pH: NA

VOLATILES (% by volume): NA

VAPOR PRESSURE (mmHg): NA

EVAPORATION RATE (ether=1): NA

SOLUBILITY IN WATER: Soluble - solubility limited by viscosity.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical or foam.

FLASH POINT: NA
LEL: NA
UEL: NA

SPECIAL FIRE FIGHTING PROCEDURES
No special procedures. However, wetted product presents a slip hazard. Pedestrian and vehicular traffic must proceed with caution where wet product may exist.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting, and eliminate open flame and other sources of ignition.

SECTION V - REACTIVITY DATA

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

INCOMPATIBILITY: Strong oxidants such as liquid chlorine, enriched gaseous or liquid oxygen, and sodium or calcium hypochlorite.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce oxides of carbon and nitrogen, various hydrocarbons, ammonia and/or hydrogen chloride vapor. Vapor may be irritating or harmful.

Allied Colloids Inc

Material Safety Data Sheet

SECTION VI - HEALTH HAZARD DATA

NATURE OF PRINCIPAL HAZARD(S): Eye irritant

TARGET ORGAN(S): Eyes, lungs

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:
Contact with the eye may produce irritation and/or redness.
Inhaled dust may cause some respiratory irritation.

CARCINOGENICITY:
Not listed as a carcinogen by IARC, NTP, OSHA or ACGIH

EXPOSURE LIMITS (as particulates not otherwise regulated):
The OSHA 8-hour TWA for total dust is 15 mg/cu-meter (5 mg/cu-meter for the respirable fraction). The ACGIH TLV-TWA is 10 mg/cu-meter.

SAFETY PRECAUTIONS:
Do not get in eyes, on skin, on clothing.
Wash thoroughly after handling.
Avoid prolonged or repeated inhalation of dust.
Avoid prolonged or repeated skin contact.
Caution - slip hazard - see Sections IV and/or VII.

FIRST AID:

EYE CONTACT:	Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
INGESTION:	Do not give an emetic unless directed by a physician. Never give anything by mouth to an unconscious person.
SKIN CONTACT:	Remove contaminated clothing and launder before reuse. Wash effected area with soap and water.
INHALATION:	Remove to fresh air.

SECTION VII - ENVIRONMENTAL DATA

SPILL OR LEAK PROCEDURES

Product becomes slippery and difficult to handle when wet; spills are best handled while still dry. Sweep up and collect dry product. Absorb wet product with vermiculite or other inert material. Then water wash area to waste treatment to eliminate slip hazard.

WASTE DISPOSAL METHOD

Disposal must be arranged in accordance with local, state and federal regulations. This material, when unadulterated, is not a RCRA regulated hazardous waste. However, local disposal regulations will often apply. Care must be taken to prevent environmental contamination from the disposal of material, residues and containers.

This product, or a similar product, is toxic to fish. Prevent spills from entering drains or waterways. The LC50 for Rainbow Trout is between 1 and 10 ppm.

SECTION VIII - PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION:	Use NIOSH approved dust respirator as required to control exposure. Follow ANSI Z88.2.
PROTECTIVE GLOVES:	Not normally required.
EYE PROTECTION:	Goggles (ANSI Z87.1 std; safety glasses alone do not protect from dust).
VENTILATION:	Provide mechanical ventilation to prevent dust concentrations, and to reduce potential exposure.
OTHER EQUIPMENT:	Provide eyewash station(s). Select additional protective equipment (eg apron, face shield, etc.), depending on conditions of use.

SECTION IX - REGULATORY INFORMATION

SHIPPING INFORMATION

PROPER SHIPPING NAME: NOT A DOT/IMO HAZARDOUS MATERIAL

ID NUMBER: NA RQ: NA DOT EMERGENCY GUIDE (ERG) #: 31

HAZARD CLASS or DIVISION: NA PACKING GROUP: –

TSCA COMPONENTS APPEAR ON THE TSCA INVENTORY

SARA PRODUCT HAZARD CATEGORIES (Sec 311): ACUTE HEALTH HAZARD

The following components are defined as toxic chemicals subject to reporting requirements of SARA Section 313 and of 40 CFR 372:

No components are 313 Toxic Chemicals

STATE LABELLING INFORMATION

NJ RTK LABEL - COMPONENTS INCLUDE:	CAS or ID #:
WATER	7732-18-5
ADIPIC ACID	124-04-9
COPOLYMER ACRYLAMIDE: DMAEA Q. (MeCl)	69418-26-4

CA PROP 65: CALL FOR ADDITIONAL INFORMATION

SECTION X - ADDITIONAL INFORMATION

NA=Not Applicable; ND=Not Determined or No Data

Good personal hygiene practices can reduce potential exposure. Wash with soap and water following any contact with this product, as well as before breaks and meals. Shower and change clothing at end of work shift. If clothing becomes contaminated, remove and launder or dry-clean before reuse.

Post-it® Fax Note	7671	Date May 27	# of pages ▸ 5
To [illegible]		From [illegible]	
Co./Dept. BAP [illegible]		Co. [illegible]	
Phone #		Phone # (403) 452-[illegible]	
Fax #		Fax # 452-[illegible]	

PRODUCT INFORMATION:

Product Identifier: Calcium hypochlorite

Chemical Name: Calcium hypochlorite

Synonym(s): Calcium oxychloride, chlorinated lime, hypochlorous acid, Chloryte, Chlor-tabs, Sock it dry chlorine granular, HTH dry chlorine granular

Chemical Family: Salt of hypochlorous acid **Molecular Formula:** Ca(OCL)2

Product Use: Disinfection in swimming pools and drinking water supplies; slime and odour control.

Supplier / Manufacturer:	**Address:**	**Emergency Tel:**
PrairieChem Inc.	2302 Hanselman Avenue, Saskatoon, SK S7L 5Z3 *See "Preparation Information" for a list of regional offices.*	(306) 664-2522
Olin Corporation	Charleston, TN	(800) 654-6911

TDG / WHMIS INFORMATION:

Shipping Name:
Calcium hypochlorite, hydrated

PIN:	**Class:**	**Packing Group:**	**WHMIS:**
UN 2880	5.1 (9.2)	II	Product regulated under the Pest Control Products Act.

MAIN / HAZARDOUS INGREDIENTS:

Ingredients:	**Weight %:**	**CAS #:**
Calcium hypochlorite	60-80%	7778-54-3
Calcium hydroxide	0-5%	1305-62-0
Calcium carbonate	0-5%	471-34-1
Calcium chlorate	0-5%	10137-74-3

PHYSICAL DATA:

Odour and Appearance:	White, free flowing granular solid. Strong chlorine odour.
Odour Threshold:	0.02-0.35 ppm based on Chlorine
Molecular Weight:	142.98
Boiling Point:	Decomposes above 100 C
Freezing / Melting Point:	Not applicable.
Specific Gravity (water=1):	2.35 @ 20 C
Bulk Density:	Varies with grade.

... section continued on next page

... continued from "Physical Data"

Vapour Density (air=1):	Not applicable.
Vapour Pressure (mm Hg, 20C):	Not applicable.
Evaporation Rate:	Not applicable.
% Volatiles by Volume:	Not applicable.
pH:	11.5 (5% solution)
Solubility in Water:	18% @ 25 C
Water / Oil Distribution Coefficient:	Not applicable (decomposes).

FIRE AND EXPLOSION DATA:

Conditions of Flammability:
Non-flammable. Calcium hypochlorite is a strong oxidizing agent; may form explosive mixtures with combustibles, organic, or other oxidizable materials.

Explosion Hazards:
Sensitivity to mechanical impact and static discharge: none.

Flash Point and its Method of Determination: Not applicable.

Auto-ignition Temperature:	Upper Flammable Limit (% by vol.):	Lower Flammable Limit (% by vol.):
Not applicable.	Not applicable.	Not applicable.

Hazardous Combustible Products:
Chlorine, oxygen, and chlorine monoxide at higher temperatures. Water in contact with hot calcium hypochlorite can release hydrochloric acid or chlorine gas.

Means of Extinction:
Drench with water, and cool surrounding products and area with water. Avoid dry extinguishers containing ammonium compounds.

Special Fire Fighting Procedures:
Wear NIOSH-approved self-contained breathing apparatus and protective clothing. Dike area to prevent runoff and contamination to water resources.

REACTIVITY DATA:

Stability:	Stable. Heat and contamination could cause decomposition.
Incompatibility:	Acids, reducing agents, combustible materials such as wood, cloth, or organic materials, metals such as iron and copper and their alloys, water or steam, ammonia, urea, amines.

Hazardous Reactions / Decompositions:
Water in contact with hot calcium hypochlorite can release hydrochloric acid or chlorine gas. Contact with incompatibles presents an explosion and fire hazard. Toxic or corrosive fumes may be liberated. These include chlorine gas.

Hazardous Polymerization: Will not occur.

HEALTH HAZARD DATA:

Inhalation:

Dust and mist irritate the nose and throat. In confined areas, mechanical agitation can result in high levels of dust, and reaction with incompatibles materials (e.g., acids and water/moisture) can result in high concentrations of chlorine vapour, either of which may result in burns to the respiratory tract, producing lung edema, shortness of breath, wheezing, choking, chest pains, impairment of lung function, and possible permanent lung damage.

Skin Contact / Absorption:

Calcium hypochlorite dust and solutions can cause irritation and in severe cases, chemical burns, which are characterized by redness, swelling, and scab formation. Moisture from perspirations will accelerate tissue destruction.

Eye Contact:

Exposure to calcium hypochlorite can cause eye irritation and vision impairment. Concentrated solutions cause burns which may result in permanent eye damage if not promptly treated.

Ingestion:

When ingested, there will be burning of the mouth and throat. Can cause abdominal cramps, vomiting, diarrhea, nausea, and/or tissue ulceration which may lead to convulsions, coma, and even death.

Chronic / Acute Effects:

Skin irritation may occur from repeated or prolonged skin contact. Chronic inhalation exposure may cause impairment of lung function and permanent lung damage.

Exposure Limits:

ACGIH TLV (TWA) = not established; OEHA PEL = not established.

Irritancy:	Data not available.
Carcinogenicity:	Not considered to be carcinogenic as per IARC, NTP, OSHA, and ACGIH
Reproductive Toxicity:	Not reported to show reproductive toxicity.
Teratogenicity:	Not known as a teratogen.
Sensitization:	Data not available.
Mutagenicity:	Risk of genetic damage to humans is judged insignificant.
Synergistic Materials:	Data not available.

Animal Toxicity Data:

LC50 (inhalation, rats, 1 hr) = <20 mg/L and >2 mg/L; LD50 (oral, rats) = 850 mg/kg, (rabbit, dermal) = >2 g/kg

PREVENTATIVE MEASURES:

Respiratory Protection:
Use NIOSH-approved respirator - full facepiece with chlorine and dust/mist cartridges or self-contained breathing apparatus.

Skin Protection:
Impervious gloves, body suits, boots, and other resistant protective clothing made of butyl rubber, natural rubber, neoprene, nitrile, polyethylene, polyvinyl chloride.

Eye/Face Protection:
Chemical goggles and full faceshield unless full facepiece respirator is worn. Contact lenses should not be worn during the handling of this product; they may contribute to severe eye injury.

Special Handling Procedures:
Use "good" industrial hygiene and housekeeping practises. Avoid dust formations. Wash thoroughly after handling. Avoid situations that could lead to harmful exposure.

Storage Requirements:
Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from incompatible materials. Keep out of the sun.

Engineering Controls:
Local exhaust ventilation required where exposure to dust might occur.

Special Shipping Requirements:
According to all applicable legislations.

Other Precautions:
Eyewash stations and safety showers should be provided in the vicinity where this material is in use.

FIRST AID MEASURES:

Inhalation:	Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention.
Skin Contact:	Remove contaminated clothing. Irrigate affected area with water for at least 20 minutes. Seek immediate medical attention.
Eye Contact:	Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention.
Ingestion:	Do not induce vomiting. If vomiting occurs, lean victim forward to prevent breathing in vomitus. Give large amounts of water. Do not give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.
Other Info:	None.

ENVIRONMENTAL PROTECTION DATA:

Steps in the Event of a Leak or Spill:
Prevent material from entering sewers, shovel into clean, labelled containers that contain water. Flush area with water. Neutralize wastewater with neutralizing agent. In the case of an adverse air release, vapours may be suppressed by use of water fog.

Environmental Effects:
Aquatic toxicity: Bluegill, 96-hr, LC50 = 0.088 mg/L (nominal, static); Rainbow trout, 96-hr, LC50 = 0.16 mg/L (nominal, static)
Daphnia magna, 48-hr, LC50 = 0.11 mg/L (nominal static)
Toxicity to wildlife: Bobwhite quail, dietary LC50 = >5,000 ppm, oral LD50 = 3474 mg/kg; Mallard ducklings, dietary LC50 = >5,000 ppm

Deactivating Chemicals:
35% hydrogen peroxide, sodium sulphite, or sodium bisulphite.

Waste Disposal Methods:
Dispose in accordance with all federal, provincial, and local regulations.

PREPARATION INFORMATION:

References:
Manufacturers' MSDS

Date Prepared/Revised: April 18, 1997 **Date Printed:** April 18, 1997

Please obtain MSDS updates for this product from your regional PrairieChem Office.

Calgary:
5618 - 40th Street SE, Calgary, AB T2C 2A1
Tel: (403) 279-1088, Fax: (403) 236-0989

Vancouver:
#108, 84 North Bend St., Coquitlam, BC V3K 6H1
Tel: (604) 941-3857, Fax: (604) 941-4386

Edmonton:
11750 - 180th Street, Edmonton, AB T5S 1N7
Tel: (403) 452-8000, Fax: (403) 452-4850

Winnipeg:
340 Saulteaux Crescent, Winnipeg, MB R3J 3T2
Tel: (204) 837-5661, Fax: (204) 897-3632

Saskatoon:
North Corman Ind. Park, Saskatoon, SK S7L 5Z3
Tel: (306) 933-0177, Fax: (306) 933-3282

Head Office:
2302 Hanselman Ave., Saskatoon, SK S7L 5Z3
Tel: (306) 664-2522, Fax: (306) 665-8216

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	Not controlled under WHMIS (Canada).	

Section 1. Chemical Product and Company Identification

Product Name	**SUPER PLUS 10W, 20W20, 30, 40, 50**
Code	420-001, 002, 003, 004, 005 File # W307
DSL	On the DSL list.
Print Date:	10/25/95.
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	Not applicable
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbon
Chemical Formula	Not applicable.
In case of Emergency	Petro-Canada: (403) 296-3000 Canutec Transportation *Emergency: (613) 996-6666* Poison Control Centre Numbers: Consult local telephone number(s)
Manufacturer	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Material Uses	Super Plus oils are universal crankcase lubricants, developed specifically for mixed commercial fleets. They are suitable for all types of heavy-duty diesel, gasoline, propane and natural gas engines.

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Severely hydrotreated paraffinic oil (C20-C66) and additives*. *Contains zinc dialkyldithiophosphate (<0.13% as Zn).	72623-86-0, 72623-87-1, 72623-85-9, 72623-83-7	5 mg/m3 (oil mist)	Not applicable	Not applicable	100

Section 3. Hazards Identification.

Potential Acute Health Effects	Low toxicity on ingestion. Has laxative effect. Mildly irritating to eyes. Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures.
Potential Chronic Health Effects	Prolonged or repeated contact with skin may cause mild irritation and possibly dermatitis.

Section 4. First Aid Measures

Eye Contact	NO known EFFECT on eye contact, rinse with water for a few minutes.
Skin Contact	Remove contaminated clothing - launder before reuse. Soap and water wash. Discard saturated leather articles.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.
Hazardous Inhalation	No additional information.
Ingestion	Ingestion is unlikely.
Hazardous Ingestion	No additional information.

Continued on Next Page

Section 5. Fire-fighting Measures

The Product is:	Low fire hazard.
Auto-Ignition Temperature	250°C (482°F)
Flash Points	OPEN CUP: 212°C (413.6°F) (Cleveland.)
Flammable Limits	Not available.
Products of Combustion	Smoke on combustion.
Fire Hazards in Presence of Various Substances	Addition of water or foam may cause frothing. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids.
Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat or drill empty containers.
Fire Fighting Media and Instructions	Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: Use DRY chemicals, CO_2, water spray of foam. LARGE FIRE: Use water spray, fog or foam.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures

Small Spill	Avoid contact. Absorb with an inert material and place in an appropriate waste disposal container. Contain spill. DO NOT FLUSH TO SEWER. Check with applicable jurisdictions for specific disposal requirements of material and empty containers.
Large Spill	No additional remark.

Section 7. Handling and Storage

Handling	Practice good personal hygiene. Wash hands after handling and before eating. Avoid contact with skin and eyes.
Storage	Store in cool, dry and well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. General ventilation.
Personal Protection	No special protective clothing is required. For casual contact, PVC gloves are suitable. For direct contact for more than 2 hours, NEOPRENE or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	8-hour TLV-TWA of 5 mg/m³ recommended by manufacturer based on ACGIH TLV for oil mists.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Liquid. (Viscous)
Dropping Point	Not available.
Penetration (@ 25°C)	Not available.
Boiling Point	345°C (653°F)
Melting Point	Not available.

Odor	Hydrocarbon. (Slight.)
Taste	Not applicable.
Color	Amber. (Light.)

Specific Gravity	0.88 (Water = 1)
Vapor Pressure	0.075 mm of Hg (@ 20°C)
Vapor Density	Not available.
Volatility	Not available.
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	35, 63, 92, 146, 224 cSt (respectively)
Solubility	Insoluble in cold water.

Section 10. Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Avoid excessive heat. Formation of oil mist.		
Incompatibility with Various Substances	Highly reactive with oxidizing agents.	Decompostion products:	COx, NOx, SOx, oxides of zinc, calcium, and phosphorus, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Peroxides, chlorine, strong acids, etc.		
Special Remarks on Corrosivity	No additional remark		

Section 11. Toxicological Information

Routes of Entry	Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 5000 mg/kg (Rat).
Chronic Effects on Humans	Prolonged or repeated contact with skin may cause mild irritation and possibly dermatitis.
Other Toxic Effects on Humans	Low toxicity on ingestion. Has laxative effect. Mildly irritating to eyes. Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures.
Special Remarks on Toxicity to Animals	Based on toxicity of severely hydrotreated base oils. Severely hydrotreated base oils are negative when tested by the modified Ames test.
Special Remarks on Chronic Effects on Humans	No additional remark.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark

Continued on Next Page

Section 13. Disposal Considerations

Waste Disposal	Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).
Special Provisions for Transport	No additional remark.

Section 15. Regulatory Information and Pictograms

Other Regulations	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.	
Other Classifications	WHMIS (Canada)	Not controlled under WHMIS (Canada).
	DSD/DPD (EEC)	Not controlled under DSCL (Europe).

WHMIS (Canada) (Pictograms)

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	1
Reactivity	0
Personal Protection	a

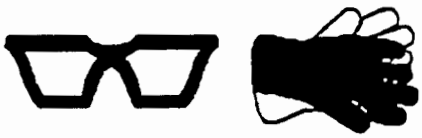
NFPA (U.S.A.)

DSD/DPD (Europe) (Pictograms)

TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)



Section 16. Other Information

References	Available upon request.	
Other Special Considerations	No additional remark.	
Prepared by McBride on 10/25/95.		Data entry by McBride.
		Print Date: 10/25/95.
Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410	

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

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	**Not controlled under WHMIS (Canada).**	

Section 1. Chemical Product and Company Identification

Product Name	**RALUBE 40, 1024, 1340, 1724, 1740, 2040**
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	Not applicable
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbon
Chemical Formula	Not applicable.
Manufacturer	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Material Uses	Ralube oils are designed to lubricate the medium speed diesel engines, which power railway locomotives.

Code	490-785, 783, 866, 786, 779, 791 File # W200
DSL	On the DSL list.
Print Date:	7/19/96.

In case of Emergency

PETRO-CANADA: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Severely hydrotreated hydrocarbon oil (C26-C45) and additives	72623-85-9, 72623-87-1	5 mg/m3 (oil mist)	Not applicable	Not applicable	100

Section 3. Hazards Identification.

Potential Acute Health Effects	Low toxicity on ingestion; has laxative effect and rapidly eliminated. Mildly irritating to eyes. Negligible breathing hazard at normal temperatures (up to 38 deg C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists, or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Potential Chronic Health Effects	Prolonged or repeated contact with skin may cause mild irritation and possibly dermatitis.

Section 4. First Aid Measures

Eye Contact	NO known EFFECT on eye contact, rinse with water for a few minutes. Physician assessment if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Soap and water wash. Discard saturated leather articles.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.

Hazardous Inhalation	No additional information.
Ingestion	DO NOT induce vomiting. Force fluids. Activated charcoal tablets.
Hazardous Ingestion	No additional information.

Section 5. Fire-fighting Measures

The Product is:	Low fire hazard.
Auto-Ignition Temperature	355°C (671°F)
Flash Points	OPEN CUP: 215°C (419°F) (Cleveland.)
Flammable Limits	Not available.
Products of Combustion	Smoke on combustion.
Fire Hazards in Presence of Various Substances	Addition of water or foam may cause frothing. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids.
Explosion Hazards in Presence of Various Substances	Do not cut, drill or weld empty containers.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO_2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures

Small Spill	Avoid contact. Absorb with an inert material and place in an appropriate waste disposal container. Contain spill. DO NOT FLUSH TO SEWER. Check with applicable jurisdictions for specific disposal requirements of material and empty containers.
Large Spill	No additional remark.

Section 7. Handling and Storage

Handling	Avoid inhalation and skin contact especially when handling used oil. Wash hands after handling and before eating.. Launder work clothes frequently. Discard saturated leather goods. An API study has indicated that prolonged or repeated skin exposure to used motor oils can cause cancer in mice.
Storage	Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Store in cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	General ventilation.
Personal Protection	Safety glasses. For direct contact of more than 2 hours -- VITON or NITRILE gloves are needed, otherwise PVC gloves may be used. Wear long sleeved clothing to minimize skin contact. Respirator normally not necessary. If mist generated by heating, spraying, etc. wear an organic vapour respirator with a mist filter. All respirators must be NIOSH certified.

Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	TWA 5(mg/m3): manufacturers recommendation based on ACGIH TLV for oil mists.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Liquid. (Viscous liquid.)
Dropping Point	Not available.
Penetration (@ 25°C)	Not available.

Odor	Hydrocarbon. (Slight.)
Taste	Not available.
Color	Amber. (Dark.)

Boiling Point	316°C (600.8°F)
Melting Point	Not available.
Specific Gravity	0.88 (Water = 1)
Vapor Pressure	0.0075 mm of Hg (@ 20°C)
Vapor Density	Not available.
Volatility	Not available.
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	> 120 cSt
Solubility	Soluble in methanol. Insoluble in cold water.

Section 10. Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	82°C (179.6°F) based on data for: Agent 434.		
Conditions to Avoid	Avoid excessive heat. Formation of oil mist.		
Incompatibility with Various Substances	Highly reactive with oxidizing agents.	Decompostion products:	COx, SOx, NOx, oxides of calcium, chlorocarbons, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Peroxides, chlorine, strong acids, etc.		
Special Remarks on Corrosivity	No additional remark.		

Section 11. Toxicological Information

Routes of Entry	Inhalation. Skin contact.
Toxicity to Animals	Acute oral toxicity (LD50): 5000 mg/kg (rat).
Chronic Effects on Humans	Prolonged or repeated contact with skin may cause mild irritation and possibly dermatitis.
Other Toxic Effects on Humans	Low toxicity on ingestion; has laxative effect and rapidly eliminated. Mildly irritating to eyes. Negligible breathing hazard at normal temperatures (up to 38 deg C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists, or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.

Special Remarks on Toxicity to Animals	Severely hydrotreated base oils are negative when tested by the modified Ames test.
Special Remarks on Chronic Effects on Humans	No additional remark.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Section 13. Disposal Considerations

Waste Disposal	Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).
Special Provisions for Transport	No additional remark.

Section 15. Regulatory Information and Pictograms

Other Regulations	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.	
Other Classifications	**WHMIS (Canada)**	Not controlled under WHMIS (Canada).
	DSD/DPD (EEC)	Not classified under the Dangerous Substances or Dangerous Preparations Directives.

WHMIS (Canada) (Pictograms)

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	1
Reactivity	0
Personal Protection	a

NFPA (U.S.A.)

DSD/DPD (Europe) (Pictograms)

TDG (Canada) (pictograms)	
DOT (U.S.A) (Pictograms)	
Protective Clothing (Pictograms)	 

Section 16: Other Information

References	Available upon request.
Other Special Considerations	No additional remark.
Prepared by McBride on 10/25/95.	Data entry by McBride.
	Print Date: 7/19/96.
Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410

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.

ACTION PLAN FOR ETHYLENE GLYCOL ANTIFREEZE SPILL

Initial Spill

Response

- STOP the flow at source if possible
- ELIMINATE open flame ignition sources
- CONTAIN flow of liquid by dyking, barricading or blocking flow by any means available
- PREVENT antifreeze from entering any flowing streams

Hazards

- moderately toxic by ingestion and inhalation
- flammable

Action for Fire

- use carbon dioxide, dry chemical, form or water spray (fog).

Recovery

- ethylene glycol antifreeze can be soaked up by peat moss or by commercial sorbents such as Hazorb
- access to spilled or recovered ethylene glycol by mammals should be prevented

Disposal

- incineration under controlled conditions
- burial at an approved site.

Properties

- chemical composition: 96% ethylene glycol
  4% water and rust inhibitors
- clear, syrupy liquid
- soluble in water
- flammable.

Environmental

Threat

- low to moderate toxicity for fish and other aquatic organisms
- attractive smell and taste to some mammals & toxic by ingestion.

Containers

- transported and stored in steel drums or cubes (which is a self-contained unit with an 8 drum capacity).
- DOW Chemical of Canada Ltd.

010 02/03/94 ETHYLENE GLYCOL, INDUSTRIAL GRADE

PRODUCT NAME:
ETHYLENE GLYCOL, INDUSTRIAL GRADE

MSDS #: UCN0178E

03/19/92 EFFECTIVE DATE

I. IDENTIFICATION

PRODUCT NAME: ETHYLENE GLYCOL, INDUSTRIAL GRADE

CHEMICAL NAME: Ethylene Glycol

CHEMICAL FAMILY: Glycols

FORMULA: HOC_2H_4OH

MOLECULAR WEIGHT: 62.07

SYNONYMS: EG; Glycol; 1,2-Ethanediol

CAS # AND NAME:
107-21-1
1,2-Ethanediol

II. PHYSICAL DATA (Determined on typical material)

BOILING POINT, 760 mm Hg: >197'C (>387'F)

SPECIFIC GRAVITY(H2O = 1): 1.115 AT 20/20'C

FREEZING POINT: -13'C (9'F)

VAPOR PRESSURE AT 20'C: 0.08 mmHg

VAPOR DENSITY (air = 1): 2.1

EVAPORATION RATE:
(Butyl Acetate = 1): 0.01

SOLUBILITY IN WATER by wt: 100%

APPEARANCE: Transparent colorless

ODOR: Mild sweet

PHYSICAL STATE: Liquid

III. INGREDIENTS

*	MATERIAL	CAS#	EXPOSURE LIMIT
100	Ethylene Glycol	107-21-1	50 PPM ceiling OSHA & ACGIH

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method(s)):
241'F
Tag Closed Cup ASTM D 56
240'F
Cleveland Open Cup ASTM D 92

FLAMMABLE LIMITS IN AIR, by volume:

LOWER: 3.2 Calculated
UPPER: 15.3 (Estimated)

EXTINGUISHING MEDIA:
Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

SPECIAL FIRE FIGHTING PROCEDURES:
Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.
Use self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None

V. HEALTH HAZARD DATA

TLV AND SOURCE:
See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING:
May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, lumbar pain, oliguria, uremia, and central nervous system effects, including irregular eye movements, convulsions and coma. Cardiac failure and pulmonary edema may develop. Severe kidney damage follows the swallowing of large volumes of ethylene glycol. May be fatal. A few reports have been published describing the development of weakness of the facial muscles, diminished hearing, and difficulty with swallowing, during the late stages of severe poisoning.

SKIN ABSORPTION:
No evidence of harmful effects from available information.

INHALATION:
May cause irritation of the nose and throat with headache, particularly from mist. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace, may produce nausea, vomiting, headache, dizziness, and irregular eye movements.

SKIN CONTACT:
No evidence of harmful effects from available information.

EYE CONTACT:
Injury to the cornea is not expected.
Liquid, vapor, or mist causes irritation, experienced as stinging, excess blinking and tear production, with excess redness of the conjunctiva.

EFFECTS OF REPEATED OVEREXPOSURE:
Repeated inhalation of ethylene glycol mist may produce signs of central nervous system involvement, particularly dizziness and nystagmus.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
May aggravate an existing kidney disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:
Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to assess the effects of exposure of pregnant rats and mice to aerosols at concentrations of 150, 1000 and 2500 mg/m3 for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol, percutaneous absorption of ethylene glycol from contaminated skin, or swallowing of ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 2500 mg/m3) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m3). The no-effects concentration (based on maternal toxicity) was 500 mg/m3. In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity. The major route for producing developmental toxicity is perorally.

Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence, or a different pattern of tumors compared with untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

OTHER EFFECTS OF OVEREXPOSURE:
Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING:
If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention without delay. If medical advice is delayed, and if the person has swallowed a moderate volume of material (a few ounces), then give three to four ounces of hard liquor, such as whiskey. For children, give proportionally less liquor, according to weight.

SKIN:
Remove contaminated clothing. Wash skin with soap and water. If irritation persists or if contact has been prolonged, obtain medical attention.

INHALATION:
Remove to fresh air. Obtain medical attention if symptoms persist.

EYES:
Flush eyes thoroughly with water for several minutes.

NOTES TO PHYSICIAN:
It is estimated that the lethal oral dose of ethylene glycol to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenase to various metabolites including glycoaldehyde, glycolic acid, and oxalic acid, which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression, and kidney injury. Urinalysis may show

albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia.
The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis, and prevention of kidney injury. It is essential to have immediate and follow-up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis.
As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100-150 mg/dl, and should be achieved by a rapid loading dose and maintained by intravenous infusion.
For severe and/or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentrations greater than 25 mg/dl, or compromise of renal functions.
4-Methylpyrazole, a potent inhibitor of alcohol dehydrogenases, has been effectively used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis, coma, seizures, and renal failure have occurred.
Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.
Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-expiratory pressure may be required.
There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

VI. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID:
None known.

INCOMPATIBILITY (materials to avoid):
Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures. Therefore, avoid strong acids and strong bases at elevated temperatures. Avoid contamination with strong oxidizing agents and materials reactive with hydroxyl compounds.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:
Burning can produce the following combustion products:
Carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID:
None known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Small spills can be flushed with large amounts of water; larger spills should be collected for disposal.
Wear suitable protective equipment.

WASTE DISPOSAL METHOD:
At very low concentrations in water, this product is biodegradable in a biological wastewater treatment plant.
Incinerate in a furnace where permitted under Federal, State, and local regulations.

VIII. SPECIAL PROTECTION

RESPIRATORY PROTECTION (specify type):
NIOSH approved breathing air equipment or NIOSH approved face mask with organic vapor cartridge and dust or mist pre-filter (not for use in fire fighting or in atmospheres with reduced oxygen content).

VENTILATION:
General (mechanical) room ventilation may be adequate if handled at ambient temperatures or in covered equipment. If ambient temperatures are exceeded or operations exist which may produce misting, local exhaust ventilation is required.

PROTECTIVE GLOVES:
PVC-coated
Rubber

EYE PROTECTION:
Monogoggles or Faceshield

OTHER PROTECTIVE EQUIPMENT:
Eye Bath, Safety Shower

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
DANGER!! Harmful or fatal if swallowed.
Prolonged or repeated breathing of mist or vapor harmful.
Causes eye irritation.
May cause kidney and nervous system damage.
Causes birth defects in laboratory animals.
Do not swallow.
Do not breathe mist from spray.
Avoid prolonged or repeated breathing of vapor.
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS:
WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:
The concentrations shown are maximum or ceiling levels (weight %) to be

used for calculations for regulations. Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	100.0
Dioxane	123-91-1	.0026
Ethylene Oxide	75-21-8	.0001

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:

###NONE###

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	100.0

TSCA INVENTORY STATUS:

The ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product contains trace levels of ACETALDEHYDE AND DIOXANE which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS 105 CMR 670.000 Right-To-Know, Substance List (MSL)

Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

EXTRAORDINARILY HAZARDOUS SUBSTANCES (=> 0.0001%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Dioxane	123-91-1	.0026
Methanol	67-56-1	.0024

HAZARDOUS SUBSTANCES (=> 1%)

CHEMICAL	CAS NUMBER	...ER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	100.0

PENNSYLVANIA Right-To-Know, Hazardous Substance List
Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.
Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (=> 1%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	100.0

CALIFORNIA SCAQMD RULE 443.1 VOC'S:
VOC. 1111.16 g/L; Vapor Pressure 0.04 mmHg at 20'C.
REVISED SECTIONS
The format of this MSDS has been altered slightly. In addition, the text of several statements have been changed to enhance consistency among products with similar characteristics. Please review the entire MSDS to insure safe handling and use of this material.

---------- NOTICE ----------

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---

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* * * E N D O F M S D S * * *

MATERIAL SAFETY DATA SHEET

Section 1 - Product Identification & Use

Product Name: **Calcium Hypochlorite**
Synonyms: Pittchlor, calcium oxychloride, bleaching powder, chlorinated lime, granulated chlorine.
WHMIS Classification: Class C: Oxidizing Material
Class E: Corrosive Material
TDG Classification: Calcium hypochlorite, hydrated
Class 5.1(9.2), UN2880, II
Supplier: Advance Chemicals Ltd.
105 - 19613, 56th Avenue
Langley, B.C. V3A 3X7
phone (604) 533-3901, fax (604) 533-5181
Emergency phone: CANUTEC 24 hrs (613) 996-6666

Section 2 - Hazardous Ingredients

Hazardous Components	%(w/w)	C.A.S. No.	LD_{50} & LC_{50}
Calcium Hypochlorite	65-75	7778-54-3	(oral rat): 850 mg/kg

Section 3 - Physical Data

Physical state: solid
Boiling point: decomposes at 100°C
Specific Gravity: 2.35
pH: 11.5 (5% solution)
Freezing point: not applicable
Volatiles (% weight): 0
Solubility in water: 21%
Evaporation rate: no data
Vapour pressure: not applicable
Odour & Appearance: White granules with a chlorine odour.

Section 4 - Fire or Explosion Hazard

Flammability: The product is not considered to be flammable but will support combustion.
Extinguishing media: Flood with water. Wear full chemical protective clothing. Use an extinguishing media for surrounding the fire, or all purpose foam by manufacturer's recommended techniques for large fires. Use water to cool fire exposed containers to prevent vapour build-up and rupture.
Hazardous Combustion/Decomposition Products: Toxic and corrosive fumes of chlorine gas are emitted during decomposition or upon exposure to acids.

Section 5 - Reactivity Data

Stability: Normally stable. High heat may cause rapid decomposition.
Incompatible substances: Organic or any oxidizable materials, acids and ammonia.
Polymerization: Will not occur.
Hazardous decomposition products: Toxic fumes of chlorine gas.

Section 6 - Toxicological Properties

Inhalation: Dusts are corrosive to the entire respiratory tract. Breathing dust can damage the mucous membranes. Fumes liberated during decomposition or upon contact with acids or water are corrosive to the respiratory tract and can cause confusion, pulmonary edema and confusion.
Skin contact: May irritate skin, possibly causing mild lesions if not treated.
Eye contact: Severe irritation to the eye.
Ingestion: Severe irritation to the gastrointestinal tract. Possible lesions to the esophagus if not treated promptly.
Carcinogenicity: Not listed as a carcinogen by IARC, NTP, or OSHA.

Section 7 - Preventative Measures

Personal Protective Equipment: Avoid contact with skin and eyes. Wear chemical protective gloves, goggles and face shield, rubber apron and boots. Eye wash fountains and safety shower facilities should be provided nearby for emergency use.
Respiratory protection: None necessary under normal use conditions. In poorly ventilated are or if dust is evident, use an NIOSH/MSHA approved air purifying, dust, mist and particulate respirator.
Action to take for spills & leaks: Wear chemical protective clothing, rubber gloves and suitable respiratory protection. Small spills should be swept or vacuumed up and disposed of in government approved waste containers. The spill area may then be flushed with large quantities of water. Larger spills should be contained by diking with sand, soil or other non-combustible material, then transferred into approved waste containers for proper disposal. Do not allow spilled, or waste product to flow into waterways. Keep product out of sewers, storm drains, surface run-off water and soil. Restrict access to non-protected personnel. Comply with all government regulations on spill reporting, and handling and disposal of waste.
Disposal methods: Dispose of contaminated product and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, provincial and local regulatory agencies to ascertain proper disposal procedures. **Note:** Empty containers can have residues, gasses and mists, and are subject to proper waste disposal as mentioned above.
Storage & Handling Precautions: Warning, harmful or fatal if swallowed. Causes eye, skin and respiratory irritation. Avoid contact with eyes and repeated contact with skin and clothing. Do not ingest. Keep container tightly closed when not in use. Store upright in a cool, dry, well ventilated place away from incompatible materials including organic materials and acids. Do not use pressure to empty container. Wash thoroughly after handling. Use with adequate ventilation.
Repair and Maintenance Precautions: Do not cut, grind, weld or drill in, on or near this container.

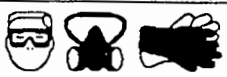
Section 8 - First Aid Measures

If inhaled: Remove victim to fresh air. Give artificial respiration if not breathing. Get immediate emergency medical attention. Keep patient warm and at rest.
In case of eye contact: Immediately flush eyes with clean water for at least twenty (20) minutes, lifting the upper and lower eye lids to ensure complete flushing action of the eyeball. Get immediate emergency medical attention. Do not transport victim until the recommended flushing period has been completed, unless eye flushing can be carried out during transport.
In case of skin contact: Wash affected area with soap and water. Remove contaminated clothing and shoes. If irritation persists, get emergency medical attention. Wash and launder clothes before re-use.
In case of ingestion or swallowing: If victim is conscious, dilute stomach contents by giving one or two glasses of water. DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious victim. GET IMMEDIATE EMERGENCY MEDICAL ATTENTION.

Section 9 - Preparation Information

Advance Chemicals Limited expressly disclaims all expressed or implied warranties of merchantability and fitness for a particular purpose with respect to the product provided. The information contained herein is offered only as a guide to the handling of this specific product, and has been prepared in good faith by technically knowledgeable personnel. This M.S.D.S. is not intended to be all inclusive, and the manner and conditions of use may involve other and additional considerations.
Prepared by: Advance Chemicals Ltd. phone (604) 533-3901
17 October, 1996.
Revised 23 July, 1998

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	B-3, D-2B	

Section 1: Chemical Product and Company Identification

Product Name	**KEROSENE**
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	Kerosene 1-K
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbons.
Chemical Formula	Not applicable.

Code	3711-3712-02 File # W106
DSL	On the DSL.
Print Date:	7/19/96.

In case of Emergency

Petro-Canada Emergency Number: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Manufacturer	PETRO-CANADA P.O. Box 2844 Petro-Canada Centre Calgary, Alberta T2P 3E3
Material Uses	Kerosene is a refined petroleum distillate suitable for burning in wick lamps and non-vented space heaters.

Section 2: Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Complex mixture of petroleum hydrocarbons* (C9-C17)	8008-20-6, 64742-81-0	100 ppm (525 mg/m³)	Not available	Not available	99.9
Anti-static additive.	Not applicable	Not applicable	Not applicable	Not applicable	0.1
*Aromatic content is 15-25% typical (benzene: nil).					

Section 3: Hazards Identification

Potential Acute Health Effects

This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours, or mists, inhalation of this product may cause irritation of the breathing passages, headaches, nausea, dizziness, blurred vision, fatigue, tremors, convulsions, shortness of breath or loss of consciousness. Defatting or drying of skin. Vapours may irritate eyes. Aspiration into lungs may cause chemical pneumonitis. For more information, refer to Section 11.

Potential Chronic Health Effects

Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.

Continued on Next Page

Section 4: First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.
Hazardous Inhalation	No additional remark.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Get immediate medical attention.
Hazardous Ingestion	Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed.

Section 5: Fire-fighting Measures

The Product is:	Class II - combustible liquid.
Auto-Ignition Temperature	224°C (435°F)
Flash Points	CLOSED CUP: >43°C (>109.4°F) (ASTMD56, Tag).
Flammable Limits	LOWER: 1.2%, UPPER: 6%
Products of Combustion	Carbon oxides (CO, CO2), smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids. May accumulate static charges which may cause spark.
Explosion Hazards in Presence of Various Substances	Do not pressurize, cut, weld, heat, or drill empty container. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back.
Fire Fighting Media and Instructions	Keep upwind. Isolate hazard area. SMALL FIRE: Use DRY chemicals, foam, CO2, water spray or fog. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire and disconnect all ignition sources if it is possible to do so without risk. Stay away from ends of tanks. Cool containers with water from maximum distance until well after fire is out. Avoid spraying water directly into storage containers due to danger of boilover. Try to cover spilled liquid with foam. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. DO NOT flush spilled material into sewers, streams, or other bodies of water. Respiratory, eye and body protection are required for fire fighting personnel. Self-contained breathing apparatus (SCBA) is required if approaching the fire from downwind, or to enter enclosed areas or buildings.
Special Remarks on Fire Hazards	No additional remark
Special Remarks on Explosion Hazards	No additional remark.

Continued on Next Page

Section 6. Accidental Release Measures

Small Spill	Avoid contact. ELIMINATE ALL IGINITION SOURCES; no flares, smoking or flames in hazard area. Stop leak if without risk. Contain spill. Absorb with inert absorbent such as dry clay, diatomaceous earth, or commericial sorbents. Place used absorbent in closed metal containers for later disposal. DO NOT FLUSH TO SEWERS, STREAMS, OR OTHER BODIES OF WATER. Check with applicable jurisdictions for specific disposal requirements and cleanup of contaminated materials and empty containers.
Large Spill	Land spill: Dike with dry clay, earth or sand to contain spill. DO NOT use combustible materials such as sawdust. Recover spill with electrically grounded explosion-proof pumps, hand pumps or vacuum into drums for re-use or disposal. Water spill: If floating, skim and remove. Check with applicable jurisdictions for specific disposal requirements and cleanup of contaminated materials.

Section 7. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Use explosion-proof ventilation to prevent vapour accumulation. Empty container may contain flammable/explosive residues or vapours. DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Do not breathe gas/fumes/vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin and eyes. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area and away from oxidizing agents. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Chemical splash goggles in case of splashing. Wear long sleeved clothing to minimize skin contact. Be sure to use a NIOSH approved respirator or equivalent when ventilation is inadequate. Full-faced self-contained breathing apparatus or air supplied (when concentrations exceed 100 ppm (525 mg/m^3) for Kerosene.) For direct contact of more than 2 hours -- VITON or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	Petro-Canada recommends an allowable exposure of 100 ppm (525 mg/m^3) when handling Kerosene. Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.
Dropping Point	Not applicable.
Penetration (@ 25°C)	Not applicable.
Boiling Point	160°C (320°F) - 290°C (554°F)
Melting Point	Not applicable.
Specific Gravity	0.81 (Water = 1)
Vapor Pressure	0.70 kPa @ 20°C (5.25 mmHg @ 68°F).
Vapor Density	4.5 (Air = 1)
Volatility	Lower than gasoline.

Odor	Kerosene.
Taste	Not applicable.
Color	Colorless.

Continued on Next Page

Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	<1.9 cSt @ 40°C (104°F).
Solubility	Insoluble in water, alcohol, acids, alkalies; soluble in oil turpentine, petroleum, carbon disulphide, chloroform, ether, and acetone.

Section 10: Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.		
Incompatibility with Various Substances	Highly reactive with oxidizing agents.	Decompostion products:	COx, NOx, SOx.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Incompatible with strong acids, and strong oxidizing agents (peroxides).		
Special Remarks on Corrosivity	No additional remark.		

Section 11: Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 5000 mg/kg (rat). *Rabbit primary dermal skin irritation index (Draize) = 5.5: irritating. Rabbit eye irritation index (Draize) = 0: non-irritating.
Chronic Effects on Humans	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.
Other Toxic Effects on Humans	This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours, or mists, inhalation of this product may cause irritation of the breathing passages, headaches, nausea, dizziness, blurred vision, fatigue, tremors, convulsions, shortness of breath or loss of consciousness. Defatting or drying of skin. Vapours may irritate eyes. Aspiration into lungs may cause chemical pneumonitis. For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	*Based on API Study #83-09 on Kerosene. Dermal primary skin irritation score (draize) = 5.5; irritating (rabbit). Eye irritation index (draize) = 0; non-irritating (rabbit).
Special Remarks on Chronic Effects on Humans	No additional remark.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12: Ecological Information

Ecotoxicity	No studies wrere found.
BOD5 and COD	Not available.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	Not readily biodegradable. Potential for bioaccumulation.

Continued on Next Page

Section 13: Disposal Considerations

Waste Disposal	Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14: Transport Information

TDG Classification	Shipping Name: Kerosene; UN 1223; Class 3; Packing Group III.
Special Provisions for Transport	No additional remark.

Section 15: Regulatory Information and Pictograms

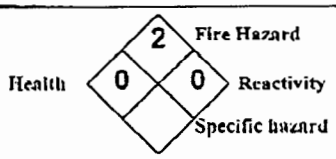
Other Regulations	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA. All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws. This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.).	
Other Classifications	**WHMIS (Canada)**	B-3, D-2B
	DSD/DPD (EEC)	10- Flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/38- Irritating to eyes and skin.

WHMIS (Canada) (Pictograms)

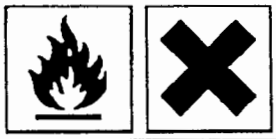
HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	2
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)



DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Continued on Next Page

Section 16. Other Information

References	Available upon request.
Other Special Considerations	No additional remark
Prepared by Deguire on 1/4/96.	**Data entry by McBride.**
	Print Date: 7/19/96.
Information Contact	**Petro-Canada** **Product Safety Coordinator** **(403) 296-4410**

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.

ACTION PLAN FOR SPILL OF DIESEL FUEL

Initial Spill

Response
- STOP the flow if possible
- CONTAIN flow of oil by dyking, barricading or blocking flow by any means available. Use earth moving equipment if nearby
- if flow has reached flowing natural stream, mobilize team to deploy river boom, skimmer, and sorbent booms
- if possible, pump fuel into a tanker unit

Hazards
- slightly toxic by ingestion, highly toxic if aspirated
- flammable

Action for fire
- use carbon dioxide, dry chemical, foam, or water spray (fog), although water may spread the fire
- use fog streams to protect rescue teams and trapped people
- use water to cool surface of tanks
- divert the diesel fuel to an open area and let it burn off under control
- if the fire is put out before all diesel fuel is consumed, beware of re-ignition
- where diesel fuel is running downhill, try to contain it as quickly as possible
- rubber tires are almost impossible to extinguish after involvement with a fire. Have vehicles with burning tires removed from danger area

A. DIESEL FUEL

Recovery

- unburned diesel fuel can be soaked up by sand and peat moss, or by chemical sorbents such as Graboil or Conwed
- if necessary, contaminated soil should be excavated
- diesel fuel entering the ground can be recovered by digging sumps or trenches
- diesel fuel on a water surface should be recovered by skimmers and sorbent booms (See Section on Recovery of Oil Spills).

Disposal

- incineration under controlled conditions
- burial at an approved site.

Properties

- chemical composition: mixture of hydrocarbons in the range C9 to C18
- clear, oily liquid
- not soluble, floats in water

Environmental

Threat

- moderately toxic to fish and other aquatic organisms
- harmful to waterfowl
- may create unsightly film on water

Containers

- transported by tanker truck and stored in the tank farm

Supplier

- As per annual tendering

ACTION PLAN FOR LUBRICATING & HYDRAULIC OIL SPILLS

Initial Spill

Response

- STOP the flow is possible
- ELIMINATE open flame ignition sources
- CONTAIN flow of oil by dyking, barricading or blocking flow by any means available. Use earth moving equipment if nearby
- if flow has reached a flowing natural stream mobilize the team to deploy river boom, skimmer and sorbent booms.

Hazards

- slightly toxic by ingestion
- combustible

Action for Fire

- use carbon dioxide, dry chemical, foam or water spray (fog), although water may spread the fire
- use fog streams to protect rescue team and trapped people
- use water to cool surface of tanks
- divert the oil to an open area and let it burn off under control
- if the fire is put out before all oil is consumed, beware of re-ignition
- rubber tires are almost impossible to extinguish after involvement with a fire. Have vehicles with burning tires removed from the danger area.

Recovery

- unburned oil can be soaked up by sand and peat moss, or by chemical sorbents, such as Graboil or Conwed

- if necessary, contaminated soil should be excavated
- oil on a water surface should be recovered by skimmers and sorbent booms.

Disposal

- incineration under controlled conditions
- burial at an approved site.

Properties

- chemical composition: mixture of hydrocarbons and conventional industrial oil additives
- generally viscous liquids, various colours
- not soluble, floats on water

Environmental

Threat

- moderately toxic to fish and other aquatic organisms
- harmful to waterfowl
- may create unsightly film on water and shorelines.

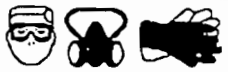
Containers

- transported by tanker truck or cubes (which is a self contained unit with an eight drum capacity).

Supplier

As per annual tendering.

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	B-3, D-2B	

Section 1. Chemical Product and Company Identification

Product Name	**DIESEL FUEL**
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	Diesel 50, Diesel 50 LS, #1 Diesel , #1 Diesel LS, Diesel LC, Seasonal Diesel, Seasonal Diesel LS, Diesel AA, Domestic Marine Diesel, International marine Diesel, Seasonal Diesel Locomotive, Dosmestic Marine diesel LS, disesel -20°C (LS), Mining Diesel Special, Mining Diesel Special LS.
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbons.
Chemical Formula	Not applicable.
Manufacturer	PETRO-CANADA P.O. Box 2844 Petro-Canada Centre Calgary, Alberta T2P 3E3

Code	File # W105
DSL	On the DSL.
Print Date:	7/19/96.

In case of Emergency

Petro-Canada Emergency Number: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Material Uses Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type.

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Mixture of petroleum distillates. Aromatic content is 50% maximum (benzene: nil).	68476-30-5	100 ppm (525 mg/m³)	Not available	Not available	100

Section 3. Hazards Identification

Potential Acute Health Effects	Inhalation of vapours or mist in high concentration may cause headaches, nausea, dizziness, drowsiness, unconsciousness and passing out. May irritate skin, eyes and respiratory tract. For more information, refer to Section 11.
Potential Chronic Health Effects	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. Allow the victim to rest in a well ventilated area. If the victim is not breathing, perform mouth-to-mouth resuscitation. If resuscitation is required, physician assessment mandatory.

Continued on Next Page

Hazardous Inhalation	No additional remark.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Physician assessment mandatory.
Hazardous Ingestion	Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed.

Section 5: Fire-fighting Measures

The Product is:	Class II - combustible liquid (NFPA).
Auto-Ignition Temperature	225°C (437°F)
Flash Points	CLOSED CUP (tag): 52°C (126°F) for Mining Diesel Special and Mining Diesel special-LS. 40°C (104°F) for others.
Flammable Limits	LOWER: 0.7%, UPPER: 6%
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S); smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat.
Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, or drill empty containers.
Fire Fighting Media and Instructions	DO NOT flush spilled material into sewers, streams, or other bodies of water. Respiratory, eye and body protection are required for fire fighting personnel. Self-contained breathing apparatus (SCBA) is required if approaching the fire from downwind, or to enter enclosed areas or buildings. Keep upwind. Isolate hazard area. SMALL FIRE: Use DRY chemicals, foam, CO2, water spray or fog. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire and disconnect all ignition sources if it is possible to do so without risk. Stay away from ends of tanks. Cool containers with water from maximum distance until well after fire is out. Avoid spraying water directly into storage containers due to danger of boilover. Try to cover spilled liquid with foam. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire.
Special Remarks on Fire Hazards	No additional remark
Special Remarks on Explosion Hazards	No additional remark.

Section 6: Accidental Release Measures

Small Spill	Avoid contact. ELIMINATE ALL IGINITION SOURCES; no flares, smoking or flames in hazard area. Stop leak if without risk. Contain spill. Absorb with inert absorbent such as dry clay, diatomaceous earth, or commericial sorbents. Place used absorbent in closed metal containers for later disposal. DO NOT FLUSH TO SEWERS, STREAMS, OR OTHER BODIES OF WATER. Check with applicable jurisdictions for specific disposal requirements and cleanup of contaminated materials and empty containers.
Large Spill	Land spill: Dike with dry clay or diatomaceous earth to contain spill. DO NOT use combustible materials such as sawdust. Recover spill with electrically grounded explosion-proof pumps, hand pumps or vacuum into drums for re-use or disposal. Water spill: If floating, skim and remove. Check with applicable jurisdictions for specific disposal requirements of material and empty containers.

Continued on Next Page

Section 7. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Use explosion-proof ventilation to prevent vapour accumulation. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Avoid contact with skin and eyes. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated and well-ventilated area. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Chemical splash goggles in case of splashing. Wear long sleeved clothing to minimize skin contact. Be sure to use a MSHA/NIOSH approved respirator or equivalent when ventilation is inadequate. Full-faced self-contained breathing apparatus or air supplied (when concentrations exceed H2S 10ppm or for SO2 2 ppm). For casual contact, PVC gloves are suitable. For direct contact for more than 2 hours, NEOPRENE or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	Petro-Canada recommends an allowable exposure of 100 ppm (525 mg/m³) when handling Diesel fuel. Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.
Dropping Point	Not applicable.
Penetration (@ 25°C)	Not applicable.

Odor	Mild petroleum oil like.
Taste	Not applicable.
Color	Clear to yellow. Low sulphur diesel fuels are colourless to light yellow / brown, and are not dyed. Regular sulphur diesel fuels (>0.05 % Sulphur) may be colourless to yellow / brown , or may be dyed with green dye. This product may be dyed purple or red for taxation purposes.

Boiling Point	150°C (302°F)
Melting Point	Not applicable.
Specific Gravity	0.85 kg/L @ 15°C (Water = 1).
Vapor Pressure	1.0 kPa @ 20°C (7.5 mmHg @ 68°F).
Vapor Density	4.5 (Air = 1)
Volatility	Semivolatile to volatile
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	1.3-4.1 cSt (approx.).
Solubility	Insoluble in cold water.

Continued on Next Page

Section 10: Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.		
Incompatibility with Various Substances	Strong acids, peroxides, alkalis, oxidizing agents (chlorine, oxygen)	Decompostion products:	COx, SOx, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Incompatible with strong acids, and strong oxidizing agents (peroxides).		
Special Remarks on Corrosivity	No additional remark.		

Section 11: Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 5000 mg/kg (rat).
Chronic Effects on Humans	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.
Other Toxic Effects on Humans	Inhalation of vapours or mist in high concentration may cause headaches, nausea, dizziness, drowsiness, unconsciousness and passing out. May irritate skin, eyes and respiratory tract. For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	Based on API Study # 79-6, 83-09. Eye irritation index (Draize) = 0-1.3; non irritating (rabbit). Dermal primary skin irritation score (Draize) = 4-6.8; moderately to extremely irritating (rabbit).
Special Remarks on Chronic Effects on Humans	Preexisting eye, skin, respiratory, neurological, liver or kidney conditions may be aggravated by exposure to this product.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12: Ecological Information

Ecotoxicity	No studies wrere found.
BOD5 and COD	BOD5 : 5.3 ug/ml (C16).
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Section 13: Disposal Considerations

Waste Disposal	Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Continued on Next Page

Section 14: Transport Information

TDG Classification	Shipping name: Diesel Fuel; UN 1202; Class 3; Packing Group III.
Special Provisions for Transport	No additional remark.

Section 15: Regulatory Information and Pictograms

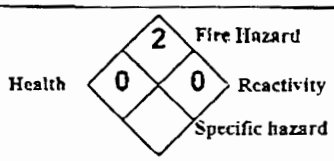
Other Regulations	All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in EPCRA or SARA Title III, Section 313, Toxic Chemicals (40 CFR 355). Not listed in CERCLA (40 CFR 302.40). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
Other Classifications	WHMIS (Canada) B-3, D-2B
	DSD/DPD (EEC) 10- Flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/38- *Irritating to eyes and skin.*

WHMIS (Canada) (Pictograms)

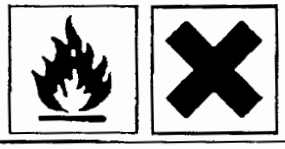
HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	2
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)



DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Section 16: Other Information

References	Available upon request.
Other Special Considerations	Note 1: * Aromatic content is 50% maximum (% volume). Nil benzene present. Note 2: ** This product may be dyed purple or red for taxation purposes.

Prepared by Luc de Guire on 1/12/96.	Data entry by May Chau. Print Date: 7/19/96.

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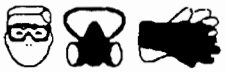
Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410

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.

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	B-2, D-2A	

Section 1. Chemical Product and Company Identification

Product Name **GASOLINE, UNLEADED**

Code	File # W102E
DSL	On the DSL.
Print Date:	7/19/96.

Supplier PETRO-CANADA
P.O. Box 2844, Petro-Canada Centre
Calgary, Alberta
T2P 3E3

Synonym	Supreme, Regular, Unleaded Gasoline (US Grade), Mid-Grade, Super, Super Green 94.
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbons.
Chemical Formula	Not applicable.

In case of Emergency
Petro-Canada Emergency Number: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Manufacturer PETRO-CANADA
P.O. Box 2844
Petro-Canada Centre
Calgary, Alberta T2P 3E3

Material Uses Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Complex mixture of aliphatic and aromatic hydrocarbons (C4-C12)	8006-61-9	300 ppm (890 mg/m³)	500 ppm (1480 mg/m³)	Not available	85-100
Methyl-tert butyl ether (MTBE)	1634-04-4	40 ppm (144 mg/m³)	Not applicable	Not applicable	0-15

Section 3. Hazards Identification

Potential Acute Health Effects Inhalation of vapours or mist may cause headaches, nausea, dizziness, central nervous system depressant; kidney and liver damage from long-term exposure in high concentrations. Defatting or drying of skin. Vapours or mist may irritate eyes. Can cause severe irritation and swelling of eye tissues (conjunctivitis). For more information, refer to Section 11.

Potential Chronic Health Effects Repeated skin exposure can produce local skin destruction, or dermatitis. Kidney and liver damage may result from long-term exposure.

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.

Skin Contact Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.

Inhalation Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.

Continued on Next Page

Hazardous Inhalation	No additional remark.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Physician assessment mandatory.
Hazardous Ingestion	Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed. Harmful or fatal is swallowed.

Section 5: Fire-fighting Measures

The Product is:	Class I - flammable liquid (NFPA).
Auto-Ignition Temperature	257°C (494.6°F) (NFPA).
Flash Points	OPEN CUP: -50 to -38°C (-58 to -36°F) (Cleveland,ASTM D92) (NFPA).
Flammable Limits	LOWER: 1.4%; UPPER: 7.6% (NFPA).
Products of Combustion	Carbon oxides (CO, CO2), smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of heat, open flames and sparks. Vapor may travel considerable distance to source of ignition and flash back.
Explosion Hazards in Presence of Various Substances	Excessive heat. Do not cut, weld, heat, or drill empty container. Runoff to sewer may create explosion hazard.
Fire Fighting Media and Instructions	Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire if it is possible to do so without hazard. If a leak or spill has not ignited, use water spray to disperse the vapours. Remotely disconnect or shut off the power sources. Either allow the fire to burn out under controlled conditions or extinquish with foam, dry chemicals or other approved extinquishing medium. Try to cover spilled liquid with foam. Avoid spraying water directly into storage containers due to danger of boilover. Avoid flushing hydrocarbon into sewers. Respiratory, eye and body protection may be required for fire fighting personnel. Emergency response to small fires with extinquishers will usually be done upwind and only if considered safe. Personal protective equipment is usually not required when using portable extinquishers. Response to larger (catastrophic) fires should only be attempted by trained fire fighters, wearing proper fire coats, boots, helmets and face shields. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings.
Special Remarks on Fire Hazards	Vapor may travel considerable distance to source of ignition and flash back.
Special Remarks on Explosion Hazards	Runoff to sewer may create fire or explosion hazards.

Section 6: Accidental Release Measures

Small Spill	Evacuate personnel. Avoid contact. Use full protective equipment and breathing apparatus. Eliminate ignition sources. Shut off source of spill. Absorb with inert absorbent such as clay, and or diatomaceous earth, commericial sorbents, or recover using electrically grounded explosion-proof pumps. Place absorbent in closed metal containers. DO NOT FLUSH TO SEWER. Large spills may be pumped from upwind locations using vacuum trucks and extended hoses. Large pools may be covered with foam to prevent vapour evolution. Immediate shut down and evacuation if wind shifts. Constant monitoring is required.
Large Spill	Large spills may be pumped from upwind locations using vacuum trucks and extended hoses. Large pools may be covered with foam to prevent vapour evolution. Immediate shut down and evacuation if wind shifts. Constant monitoring is required.

Continued on Next Page

Section 7: Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Avoid inhalation and contact with skin or eyes. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat,and sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material.

Section 8: Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineering controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Splash goggles. Wear long sleeved clothing to minimize skin contact. Be sure to use a NIOSH approved respirator or equivalent. Between 300 ppm and 3000 ppm, with sufficient oxygen use an approved full-face organic vapour cartridge respirator. Above this level, use full-faced self-contained or air-suppled breathing apparatus. For casual contact, PVA gloves are suitable. For direct contact for more than 2 hours, NITRILE or VITON+NEOPRENE gloves are recommended.
Personal Protection in Case of a Large Spill	Splash goggles, full suit, boots, and gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	8-hour TLV-TWA of 300 ppm (890 mg/m^3) recommended by manufacturer based on ACGIH TLV-TWA for gasoline. Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical State and Appearance	Clear liquid.
Dropping Point	Not applicable.
Penetration (@ 25°C)	Not applicable.

Odor	Gasoline. MTBE has a terpene-like odour.
Taste	Not applicable.
Color	Clear, undyed liquid (Regular); Supreme and Plus may be clear green liquid.

Boiling Point	25°C (77°F)
Melting Point	Not applicable.
Specific Gravity	0.7 kg/L @ 15°C (Water = 1).
Vapor Pressure	56.0 kPa @ 20°C (420 mmHg @ 68°F). (55 kPa from July 16 to August 14 for Burrard Gasoline).
Vapor Density	3 to 4 (Air = 1) (NFPA, 1986).
Volatility	100% (v/v).
Odor Threshold	Less than 1 ppm.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	0.6 cSt.
Solubility	Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform, and benzene. Dissolves fats, oils and natural resins.

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Section 10: Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Heat, sparks, pilot lights, static electricity, and open flames.		
Incompatibility with Various Substances	Extremely reactive or incompatible with oxidizing agents (nitric acid, sulfuric acid, chlorine, ozones, peroxides, etc.) which cause detonation on contact.	Decompostion products:	COx, partially oxidized hydrocarbons, oxides of manganese, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Avoid: nitric acid, sulfuric acid, chlorine, ozones, peroxides, etc., which cause detonation on contact.		
Special Remarks on Corrosivity	No additional remark.		

Section 11: Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 12750 mg/kg (rat).
Chronic Effects on Humans	Repeated skin exposure can produce local skin destruction, or dermatitis. Kidney and liver damage may result from long-term exposure.
Other Toxic Effects on Humans	Inhalation of vapours or mist may cause headaches, nausea, dizziness, central nervous system depressant; kidney and liver damage from long-term exposure in high concentrations. Defatting or drying of skin. Vapours or mist may irritate eyes. Can cause severe irritation and swelling of eye tissues (conjunctivitis). For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	*Based on API Study PS-6 on Unleaded Motor Gasoline, which quotes oral rat LD50 = 18.75 mL/kg. Dermal primary skin irritation score (Draize) = 0.98; mildly irritating (rabbit). Eye irritation index (Draize) = 0; non irritating (Rabbit).
Special Remarks on Chronic Effects on Humans	Long term exposure to high concentration of gasoline can damage kidney in male rats.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12: Ecological Information

Ecotoxicity	Fresh water Bluegill: LC50: 8 ppm/96h; saltwater Mullet: LC50: 4 ppm/96h (OHM/TADS, 1990).
BOD5 and COD	BOD5: 8%.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Continued on Next Page

Section 13. Disposal Considerations

Waste Disposal	Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations. Consult your local or regional authorities.

Section 14. Transport Information

TDG Classification	Shipping Name: Unleaded Gasoline; UN 1203; Class 3; Packing Group II.
Special Provisions for Transport	No additional remark.

Section 15. Regulatory Information and Pictograms

Other Regulations	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA. All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.	
Other Classifications	**WHMIS (Canada)**	B-2, D-2A
	DSD/DPD (EEC)	5- Heating may cause an explosion. 12- Extremely flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/37/38- Irritating to eyes,respiratory system and skin. 40- Possible risks of irreversible effects. 45- May cause cancer.

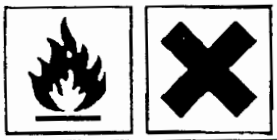
WHMIS (Canada) (Pictograms)

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	3
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)

DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Continued on Next Page

Section 16. Other Information

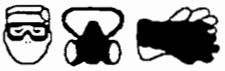
References	Available upon request.
Other Special Considerations	Note 1: * Contains trace amounts of conventional gasoline additives such as antioxidant, MMT (organo-manganese compound) and dye. May also contain methyl-tert-butyl ether (MTBE), Cas # 1634-04-4, up to 15% volume and benzene from 0-5% volume.

Prepared by May on 1/11/96.	Data entry by May Chau.
	Print Date: 7/19/96.

Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	B-3, D-2B	

Section 1: Chemical Product and Company Identification

Product Name	**FUEL OIL**
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	#1 Furnace Oil, Furnace Oil 50, Seasonal Furnace Oil, Seasonal Furnace Oil Special, Economy Diesel, Stove Oil.
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbons.
Chemical Formula	Not applicable.

Code	File # W105
DSL	On the DSL.
Print Date:	7/19/96.

In case of Emergency

Petro-Canada Emergency Number: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Manufacturer	PETRO-CANADA P.O. Box 2844 Petro-Canada Centre Calgary, Alberta T2P 3E3	**Material Uses**	Fuel Oils are distillate fuels suitable for use in liquid fuel burning equipment without preheating.

Section 2: Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Mixture of petroleum distillates. Aromatic content is 50% maximum (benzene: nil).	68476-30-2, 64742-81-0	100 ppm (525 mg/m³)	Not available	Not available	100

Section 3: Hazards Identification

Potential Acute Health Effects	Inhalation of vapours or mist in high concentration may cause headaches, nausea, dizziness, drowsiness, unconsciousness and passing out. May irritate skin, eyes and respiratory tract. For more information, refer to Section 11.
Potential Chronic Health Effects	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.

Section 4: First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. Allow the victim to rest in a well ventilated area. If the victim is not breathing, perform mouth-to-mouth resuscitation. If resuscitation is required, physician assessment mandatory.
Hazardous Inhalation	No additional remark.

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Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Physician assessment mandatory.
Hazardous Ingestion	Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed.

Section 5: Fire-fighting Measures

The Product is:	Class II - combustible liquid (NFPA).
Auto-Ignition Temperature	225°C (437°F)
Flash Points	OPEN CUP: 40°C (104°F) (Cleveland.)
Flammable Limits	LOWER: 0.7%, UPPER: 6%
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S); smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat.
Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, or drill empty containers.
Fire Fighting Media and Instructions	DO NOT flush spilled material into sewers, streams, or other bodies of water. Respiratory, eye and body protection are required for fire fighting personnel. Self-contained breathing apparatus (SCBA) is required if approaching the fire from downwind, or to enter enclosed areas or buildings. Keep upwind. Isolate hazard area. SMALL FIRE: Use DRY chemicals, foam, CO2, water spray or fog. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire and disconnect all ignition sources if it is possible to do so without risk. Stay away from ends of tanks. Cool containers with water from maximum distance until well after fire is out. Avoid spraying water directly into storage containers due to danger of boilover. Try to cover spilled liquid with foam. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire.
Special Remarks on Fire Hazards	No additional remark
Special Remarks on Explosion Hazards	No additional remark.

Section 6: Accidental Release Measures

Small Spill	Avoid contact. ELIMINATE ALL IGINITION SOURCES; no flares, smoking or flames in hazard area. Stop leak if without risk. Contain spill. Absorb with inert absorbent such as dry clay, diatomaceous earth, or commericial sorbents. Place used absorbent in closed metal containers for later disposal. DO NOT FLUSH TO SEWERS, STREAMS, OR OTHER BODIES OF WATER. Check with applicable jurisdictions for specific disposal requirements and cleanup of contaminated materials and empty containers.
Large Spill	Land spill: Dike with dry clay or diatomaceous earth to contain spill. DO NOT use combustible materials such as sawdust. Recover spill with electrically grounded explosion-proof pumps, hand pumps or vacuum into drums for re-use or disposal. Water spill: If floating, skim and remove. Check with applicable jurisdictions for specific disposal requirements of material and empty containers.

Continued on Next Page

Section 7. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Use explosion-proof ventilation to prevent vapour accumulation. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Avoid contact with skin and eyes. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated and well-ventilated area. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Chemical splash goggles in case of splashing. Wear long sleeved clothing to minimize skin contact. Be sure to use a MSHA/NIOSH approved respirator or equivalent when ventilation is inadequate. Full-faced self-contained breathing apparatus or air supplied (when concentrations exceed H2S 10ppm or for SO2 2 ppm). For casual contact, PVC gloves are suitable. For direct contact for more than 2 hours, NEOPRENE or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	Petro-Canada recommends an allowable exposure of 100 ppm (525 mg/m³) when handling Fuel oil. Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.
Dropping Point	Not applicable.
Penetration (@ 25°C)	Not applicable.

Odor	Hydrocarbon.
Taste	Not applicable.
Color	Clear to yellow. (This product may be dyed purple or red for taxation purposes).

Boiling Point	150°C (302°F)
Melting Point	Not applicable.
Specific Gravity	0.85 kg/L @ 15°C (Water = 1).
Vapor Pressure	*1.0 kPa @ 20°C (7.5 mmHg @ 68°F).*
Vapor Density	4.5 (Air = 1)
Volatility	Semivolatile.
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	1.3-4.1 cSt (approx.).
Solubility	Insoluble in cold water.

Continued on Next Page

Section 10. Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.		
Incompatibility with Various Substances	Strong acids, peroxides, alkalis, oxidizing agents (chlorine, oxygen)	**Decompostion products:**	COx, SOx, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Incompatible with strong acids, and strong oxidizing agents (peroxides).		
Special Remarks on Corrosivity	No additional remark.		

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 5000 mg/kg (rat).
Chronic Effects on Humans	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.
Other Toxic Effects on Humans	Inhalation of vapours or mist in high concentration may cause headaches, nausea, dizziness, drowsiness, unconsciousness and passing out. May irritate skin, eyes and respiratory tract. For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	Based on API Study # 79-6, 83-09. Eye irritation index (Draize) = 0-1.3; non irritating (rabbit). Dermal primary skin irritation score (Draize) = 4-6.8; moderately to extremely irritating (rabbit).
Special Remarks on Chronic Effects on Humans	Preexisting eye, skin, respiratory, neurological, liver or kidney conditions may be aggravated by exposure to this product.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12. Ecological Information

Ecotoxicity	No studies wrere found.
BOD5 and COD	BOD5 : 5.3 ug/ml (C16).
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Section 13. Disposal Considerations

Waste Disposal	Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Continued on Next Page

Section 14. Transport Information

TDG Classification	Shipping name: Fuel Oil; UN 1202; Class 3; Packing Group III.
Special Provisions for Transport	No additional remark.

Section 15. Regulatory Information and Pictograms

Other Regulations	All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in EPCRA or SARA Title III, Section 313, Toxic Chemicals (40 CFR 355). Not listed in CERCLA (40 CFR 302.40). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
Other Classifications	WHMIS (Canada) B-3, D-2B
	DSD/DPD (EEC) 10- Flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/38- Irritating to eyes and skin.

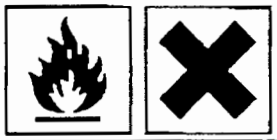
WHMIS (Canada) (Pictograms)

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	2
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)

DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Section 16. Other Information

References	Available upon request.
Other Special Considerations	Note 1: * Aromatic content is 50% maximum (% volume). Nil benzene present. Note 2: ** This product may be dyed purple or red for taxation purposes.
Prepared by Luc de Guire on 1/12/96.	Data entry by May Chau. Print Date: 7/19/96.

Continued on Next Page

Information Contact	Petro-Canada Product Safety Coordinator (403) 296-4410

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

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing
	Not controlled.	

Section 1: Chemical Product and Company Identification

Product Name	**SUPER PLUS SAE 10W-30, 15W-40**
Supplier	PETRO-CANADA P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Synonym	Not applicable
Chemical Name	Not applicable.
Chemical Family	Petroleum hydrocarbons.
Chemical Formula	Not applicable.
Manufacturer	PETRO-CANADA P.O. Box 2844 Petro-Canada Centre Calgary, Alberta T2P 3E3

Code	420-006, 007 File # W188
DSL	On the DSL list.
Print Date:	12/12/95.

In case of Emergency

Petro-Canada Emergency Number: (403) 296-3000
Canutec Transportation Emergency: (613) 996-6666
Poison Control Centre Numbers: Consult local telephone directory for emergency number(s).

Material Uses

Super Plus multigrades are universal crankcase lubricants developed for mixed commercial fleets. They are suitable for diesel, gasoline, propane and compressed natural gas engines, powershift transmissions and hydraulic systems, with particular emphasis on winter operation.

Section 2: Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Severely hydrotreated paraffinic oil (C20-C45) and additives*. *Contains zinc dialkyldithiophosphate (<0.13% as Zn_i)	72623-85-9, 72623-86-0, 72623-87-1	5 mg/m3 (oil mist)	Not applicable	Not applicable	100

Section 3: Hazards Identification.

Potential Acute Health Effects Low toxicity on ingestion. Has laxative effect. Mildly irritating to eyes.

Potential Chronic Health Effects Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists, or fumes. Prolong and repeated inhalation of large amounts of oil mists or vapours from hot oil may produce accumulations of mineral oil in the lungs which may lead to areas of fibrosis and reduced pulmonary function. Prolonged or repeated contact with skin may produce dermatitis or an oil acne.

Section 4: First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.
Hazardous Inhalation	No additional information.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Get immediate medical attention.

Hazardous Ingestion	No additional information.

Section 5: Fire-fighting Measures

The Product is:	Class IIIB - combustible liquid.
Auto-Ignition Temperature	>250°C (>482°F)
Flash Points	OPEN CUP: >205°C (>401°F)
Flammable Limits	Not available.
Products of Combustion	Carbon oxides (CO, CO2), smoke on combustion.
Fire Hazards in Presence of Various Substances	Low fire hazard. This material must be heated before ignition will occur.
Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, or drill empty container.
Fire Fighting Media and Instructions	Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. Shut off fuel to fire if it is possible to do so without hazard. SMALL FIRE: Use DRY chemicals, foam, or CO2. LARGE FIRE: Use water spray, fog or foam. WATER OR FOAM MAY CAUSE FROTHING. Avoid flushing spilled material into sewers, streams or other bodies of water. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.
Special Remarks on Fire Hazards	No additional remark
Special Remarks on Explosion Hazards	No additional remark.

Section 6: Accidental Release Measures

Small Spill	Avoid contact. Contain spill. Use appropriate tools to put the spilled materials in a container for reclaiming or disposal. Check with applicable jurisdictions for specific disposal requirements of material and empty containers. DO NOT FLUSH TO SEWER.
Large Spill	No additional remark.

Section 7: Handling and Storage

Handling	Avoid inhalation and skin contact especially when handling used oil. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Store in tightly closed containers in cool, dry, isolated and well-ventilated area. Ground all equipment containing materials.

Section 8: Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. Good general ventilation should be sufficient to control airborne levels. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Safety glasses. For direct contact of more than 2 hours – VITON or NITRILE gloves are needed, otherwise, PVC gloves may be used. Wear long sleeved clothing to minimize skin contact.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	8-hour TLV-TWA of 5 mg/m³ recommended by manufacturer based on ACGIH TLV for oil mists. Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical State and Appearance	Liquid. (Viscous)
Dropping Point	Not available.
Penetration (@ 25°C)	Not available.
Boiling Point	349°C (660.2°F)
Melting Point	Not applicable.
Specific Gravity	0.87 - 0.89 kg/L @ 15°C (Water = 1).
Vapor Pressure	<0.01 kPa @ 37.8°C (<0.075 mmHg @ 100.04°F).
Vapor Density	Not available.
Volatility	Non-volatile
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not available.
Viscosity (@ 40 °C)	63, 99 cSt (respectively)
Solubility	Insoluble in cold water.

Odor	Hydrocarbon. (Slight.)
Taste	Not available.
Color	Amber. (Light.)

Section 10: Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Avoid excessive heat. Formation of oil mist.		
Incompatibility with Various Substances	Highly reactive with oxidizing agents.	**Decompostion products:**	Carbon oxides (CO, CO2), sulphur oxides (SOx), phosphorus oxides (POx), nitrogen oxides (NOx), zinc oxides (ZnO) and smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Peroxides, chlorine, strong acids, etc.		
Special Remarks on Corrosivity	No additional remark.		

Section 11: Toxicological Information

Routes of Entry	Inhalation. Skin contact.
Toxicity to Animals	Acute oral toxicity (LD50): >5000 mg/kg (Rat).
Chronic Effects on Humans	Negligible breathing hazard at normal temperatures (up to 36°C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists, or fumes. Prolong and repeated inhalation of large amounts of oil mists or vapours from hot oil may produce accumulations of mineral oil in the lungs which may lead to areas of fibrosis and reduced pulmonary function. Prolonged or repeated contact with skin may produce dermatitis or an oil acne.
Other Toxic Effects on Humans	Low toxicity on ingestion. Has laxative effect. Mildly irritating to eyes.
Special Remarks on Toxicity to Animals	Based on toxicity of severely hydrotreated paraffinic oil only.
Special Remarks on Chronic Effects on Humans	Severely hydrotreated base oil is negative when tested by the modified Ames test.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12: Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	No additional remark.

Section 13: Disposal Considerations

Waste Disposal	Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Section 14: Transport Information

TDG Classification	Not controlled under TDG (Canada).
Special Provisions for Transport	No additional remark.

Section 15: Regulatory Information and Pictograms

Other Regulations	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA. All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws. This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.).	
Other Classifications	WHMIS (Canada)	Not controlled.
	DSD/DPD (EEC)	Not classified under the Dangerous Substances or Dangerous Preparations Directives.

WHMIS (Canada) (Pictograms)

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	1
Reactivity	0
Personal Protection	a

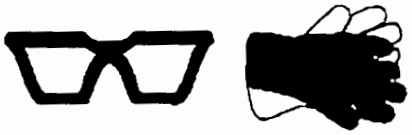
NFPA (U.S.A.)

DSD/DPD (Europe) (Pictograms)

TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)



Section 16: Other Information

References	Available upon request.
Other Special Considerations	No additional remark.
Prepared by McBride on 06/09/95.	**Data entry by McBride.**
	Print Date: 12/12/95.
Information Contact	**Petro-Canada** **Product Safety Coordinator** **(403) 296-4410**

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.

Appendix B
NWT Spill Report Form

Northwest Territories

N.W.T. SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

ᓄᓇᕗᑦ ᐃᐊᓗᓕ ᐅᓂᒃᑳᖅ (ᑎᓴᓯᒪᓂᖅ, ᑲᓱᓕ, ᐊᑦᑕᓇᖅᑐᑦ ᐃᓕᓴᕐᑎᑦ ᐅᑦᑕᓕ ᐊᒻᒪᓗᑦ)

24-hour Report Line
24-ᓂᑦ ᐃᑲᖅᓭᓂᑦ ᐅᓂᒃᑳᕐᓂᐊᕐᓇᖅᑐᖅ ᐅᖃᓕᑦᑎᐅᑦ
Phone/ᐅᖃᓕᒫᑦ (403) 920-8130
Fax/ᓯᑲᑐᒃᓴᑦ (403) 873-6924

A Report date and time
ᐅᑎᓪᓗᒍ ᓯᕗᓪᓕᔪᓄᑦ ᖃᓄᐃᓕᐊᑎᒻᒥᓪᓗᐊ ᐅᓂᖃᐅᑎᕐᓂᖅᐸᑦ

B Date and time of spill (if known)
ᐅᑎᓪᓗᒍ ᐃᐊᑎᑦᓪᓗᐊ ᖃᓄᐃᓕᐊᑎᒻᒥᓪᓗᐊᓪ (ᖃᐅᔨᓪᓚᕆᐅᑉᑕᖅᑐᑦ)

C Original report / ᓯᑐᓂᒃᑯᓕᒥ ᐅᓂᖃᐅᔨᓂᐊᕐᓇᖅ
Update no. ᐅᓂᖃᐅᔨᓂᐊᕐᓇᖅ ᓇᓕᐅᑦ ____

Spill number
ᐃᐊᓕᑦ ᓇᓕᐅᑦ

D Location and map coordinates (if known) and direction (if moving)
ᓇᓂ ᐃᐊᓕ ᑐᓚᓗ ᓂᓇᓪᓓᑦ ᓇᓕᐅᑎᒍᑦ (ᖃᐅᔨᓪᓚᕆᐅᑉᑕᖅᑐᑦ) ᑐᓚᓗ ᓇᒥᓴᒃᓴᓂᓪᓚᕆᓚᓪᓚᓕᓪᓚᑦ (ᐃᓕᓴᕐᓂᖅᑐᑦ)

E Party responsible for spill
ᑭᖑᑦ ᐃᐊᑎᕐᑎᑦ

F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)
ᑭᓯᑦ ᑭᓯᓪᓗᓂᑦ ᐃᐊᓕᑦ ᖃᓄᑎᓗ ᑐᒃᑯᓂᖅᑐᑦ (ᑐᒃᑯᓂᖅ ᐅᖄᓚᓂᖅᓯᓂᓪᓗᓂᑦ ᑲᔪᓐᓇᖅᑐᑦ)

G Cause of spill
ᑭᓯ ᐃᐊᓵᔪᑕᑦ

H Is spill terminated?
ᐃᐊᔪᖅ ᓄᖅᑲᖅᑎᑕᐅᓪ?
[ ] yes/ Δ [ ] no/ ᐊᖅ

I If spill is continuing, give estimated rate
ᓯᓂ ᐃᐊᓵᔪᑦ ᖃᓄᑎᒥ ᓯᓚᑦᑎᑎᖅᓯᓪᓚᔪᑦ

J Is further spillage possible?
ᐃᐊᓴᖅᓂᑐᐃᓐᓇᓚᒃᖃᖅᑐᑦ?
[ ] yes/ Δ [ ] no/ ᐊᖅ

K Extent of contaminated area (in square metres if possible)
ᖃᓄᖅ ᑕᕐᕈᑎᑦ ᐃᐊᓴᐃᓕᔪᓐ (ᐅᓪᑐᓕᓯᒪᓚᑲᒍ ᑲᔪᓐᓇᖅᑐᑦ)

L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.)
ᑭᓯᑦ ᐱᓵᔪᑕᑦ ᐃᐊᔪᓕᑦ ᐅᓪᓕᑐᓂ ᑕᕐᑭᓚᑕᓐᓇᓯᓪᓗᑦ ᓂᓪ ᖃᓄᐃᓕᓴᓐᓇᓂᖃᖅᑎᑦ, ᓂᓪ ᖃᓄᐃᓕᓴᓐᓇᓂᖃᖅᑎᑦ ᑲᐅᕐᓗᐃᑦᑐᓕᓐᓇᓂ, ᑲᓯᕈᓗᐃᑦᑐᓕᓐᓇᓂ)

M Containment (natural depression, dykes, etc.)
ᐅᖄᓚᖅᑐᖅᐸᑦ ᑭᓪᓕᑦᑕᓚᓯᒪᔪᖅ (ᓂᓀᒥ ᐃᓚᖅᑎᐃᑦ, ᑲᓯᕈᓗᐃᑦᑐᓕᓐᓇᓂ)

N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials
ᖃᓂᐃᓕᓴᐅᑦ, ᖃᓂᐃᓕᓴᐅᓕᕐᓂᑦ ᐅᑎᓗ ᖃᓂᐃᓕᓴᐅᓕᕐᓂᓕᕐᓂᑦ ᑕᑎᐅᔪᖅᑎᑎᑎᑕᐅᓚᓯᓪᓚ, ᓄᖅᖃᖅᑎᑎᑕᐅᓚᓪᓚ, ᓴᓗᒪᓂᖅᑎᑕᐅᑦ ᐅᑎᓗ ᐃᓕᑎᑕᐅᓚᓪᓚᑦ ᐊᑐᓕᖅᑎᑦ (ᐃᐊᔪᓪᓗᐊᓂᑦ) ᑭᒪᓗ ᐃᐊᓵᔪᑕᑦ.

O Do you require assistance?
ᐃᖃᓗᓐᓂᕐᒪᑦᑎᓐᓂᖅᓯᐅᓪ?
[ ] no ᐊᖅ [ ] yes, describe: Δ - ᓄᓇᕗᑦ

P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife
ᑲᑎᒪᔨᓄᑦ ᐃᓄᐃᑦ ᑕᕐᕈᑎᑦ ᑎᑎᕋᖅᑕᑦ ᐃᓄᓐᓄᑦ. ᐱᖓᓱᓕᕆᔨᓄᑦ ᐅᑉᑕᓕ ᑕᒪᑎᒍᑦ ᓯᓚᓗ - ᐃᑭᓐᓄᓂ, ᐃᒥᓐᒧᑦ ᓂᐅᖄᓚᕐᓂᑯᓯᒪᔪᓂ, ᐃᖃᓄᐃᓕᓄᑦ ᐅᑎᓗ ᓂᓪᓚᕆᐅᑉᑕᖅᑐᑦ

Q Comments and/or recommendations ᐅᖃᐅᓯᖏᓐᓂᑦ ᑭᒪᓗ ᐅᑉᑕᓕᓐᓂᑦ ᖃᓄᐃᓕᓴᐅᑎᓪᓗᐊᓕᕐᓂᖅ

FOR SPILL LINE USE ONLY
ᑕᑯᓚᑕᐅᔪᖏᓐᓄᑦ ᐃᐊᓵᔪᑦ ᐅᖃᓄᐃᓕᐅᑎᑦᓴᓇᑕᒪᓐᓇᖅ

Lead Agency
ᐃᓐᖃᓇᐃᖅᓯᓂᓚᓐᓂᐊᑦ ᐃᐊᔪᓕᐅᑦ ᑲᒪᒋᔭᖃᓐᓂᑦ-

Spill significance
ᐃᐊᔪᑦ ᖃᓄᐃᓕᓴᐅᓚᖅ.

Lead Agency contact and time
ᐃᓐᖃᓇᐃᖅᓯᓂᓚᓐᓂᐊᑦ ᐃᐊᔪᓕᐅᑦ ᑲᒪᒋᔭᖃᓐᓂᑦ ᖃᐅᔨᓴᖃᖅᑐᓕᕐᓂᖅ ᑭᒪᓗ ᖃᓄᐃᓕᓴᐅᓕᕐᓂᑦ

Is this file now closed?
ᑕᒪᓐ ᐅᓂᖃᓇᐃᖅᓯᓪ ᒪᑐᐃᑦᑕ?

Reported by ᐅᓂᖃᖅᑐᓕ	Position, Employer, Location ᖃᓄᐃᓕᑐᑦ ᐃᓐᖃᓇᐃᖅᓯᒪᓂᖅ, ᐃᓐᖃᓇᐃᖅᓯᓂᑲᓐᓂᖅ, ᓇᓗ	Telephone ᑎᖅᑲᓕᑦ
Reported to ᑭᖑᓂᑦ ᐅᓂᖃᖅᑎᑕᐅᓪᓚᖅ	Position, Employer, Location ᖃᓄᐃᓕᑐᑦ ᐃᓐᖃᓇᐃᖅᓯᒪᓂᖅ, ᐃᓐᖃᓇᐃᖅᓯᓂᑲᓐᓂᖅ, ᓇᓗ	Telephone ᑎᖅᑲᓕᑦ

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