2008 FUEL SPILL CONTINGENCY PLAN

MELIADINE EAST PROJECT
NUNAVUT TERRITORY

Meliadine Resources Ltd.
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Vancouver, B.C.
V7X 1L3

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I. INTRODUCTION

This document has been developed for Meliadine Resources Ltd. to provide an easy reference for information regarding the handling and storage of fuel and other materials at the site that may be hazardous to the safety of personnel or the environment. The document also details the procedures that should be followed and the responsibilities for personnel in the event of a spill during operations at the site. This document has been produced for an application by Meliadine Resources Ltd. to the Nunavut Water Board for a Water Use and Waste Disposal permit covering exploration activities at the Meliadine East project, located approximately 15 km north of the Hamlet of Rankin Inlet, Nunavut. The document will remain in effect for the term of the pending permits required for the project from KIA / NWB.

PURPOSE

This spill contingency plan is designed to promote environmental awareness and safety, as well as facilitate the efficient cleanup of spills that might occur during on going exploration programs at the site. This document covers incidents involving the following substances:

- P-50 Diesel
- Jet A and/or Jet B turbo fuel
- Hydraulic Oil
- Lube Oil
- Waste Oil
- Propane

Principal objectives of the Spill Contingency Plan are:

1. To provide readily accessible emergency information to cleanup crews, Meliadine East project personnel, KIA, and government agencies in the event of a spill.
2. To comply with federal and territorial regulations pertaining to the preparation of contingency plans and notification requirements.
3. To promote the safe and effective recovery of spilled materials.
4. To minimize the environmental impacts of spills to water and/or land.
5. To facilitate the management of wastes according to environmental legislation.

SCOPE

This plan addresses the organization of Meliadine Resources Ltd. Meliadine East Project spill response and related emergency measures. Alerting and notification procedures and cleanup strategies are outlined along with the duties and responsibilities of key spill response personnel. Emergency contacts are listed for Meliadine Resources Ltd., company contractors related to the site and local government agencies. Emergency response equipment is listed that is available immediately (should a spill occur) from local contractors, such as M&T Enterprises in Rankin Inlet.

Detailed information in support of this Spill Contingency Plan and ensuing spill response actions, is provided in the following appendices:

- Appendix A contains an up-to-date inventory of spill response equipment and kits.
- Appendix B contains risk assessment and preventive measures.
- Appendix C contains the Nunavut Spill Report Forms that are to be used to report spills.

SITE DESCRIPTION

The Meliadine East Project is located approximately 15 km north of the Hamlet of Rankin Inlet, Nunavut (Figure 1). The project is serviced by an exploration camp located at 62° 57' 24" N latitude and 91° 55' 10" W longitude (Figure 2). The camp is made up of a combination of plywood buildings, wood framed canvas tents and Weatherhaven structures. The camp is capable of accommodating approximately 15-20 persons. The transportation of fuel and heavy goods to the site is accomplished overland on a winter road from Rankin Inlet. The project is located on Inuit owned land (IOL RI-01) and land use activities are administered by the Kivalliq Inuit Association.

At present there are no bulk fuel storage facilities at the site. All fuel is stored in 205 litre drums.

INVENTORY OF PETROLEUM PRODUCTS

As of July 19, 2007, there are 44 drums (approx 9,020 litres) of diesel and five drums (1,025 litres) of Jet-B fuel stored at the site, along with 10 - 100 pound cylinders of propane. All empty drums and propane cylinders have been removed from the site.

TYPE AND AMOUNT OF SITE STORAGE DURING OPERATIONS

At present it is anticipated that approximately 36,000 litres (175 drums) of diesel fuel 31,000 litres (150 drums) of Jet-B aviation fuel will be required to complete the planned 2008 exploration at the site. M&T Enterprises has been contracted to transport this fuel overland to the site prior to spring break up in 2008.

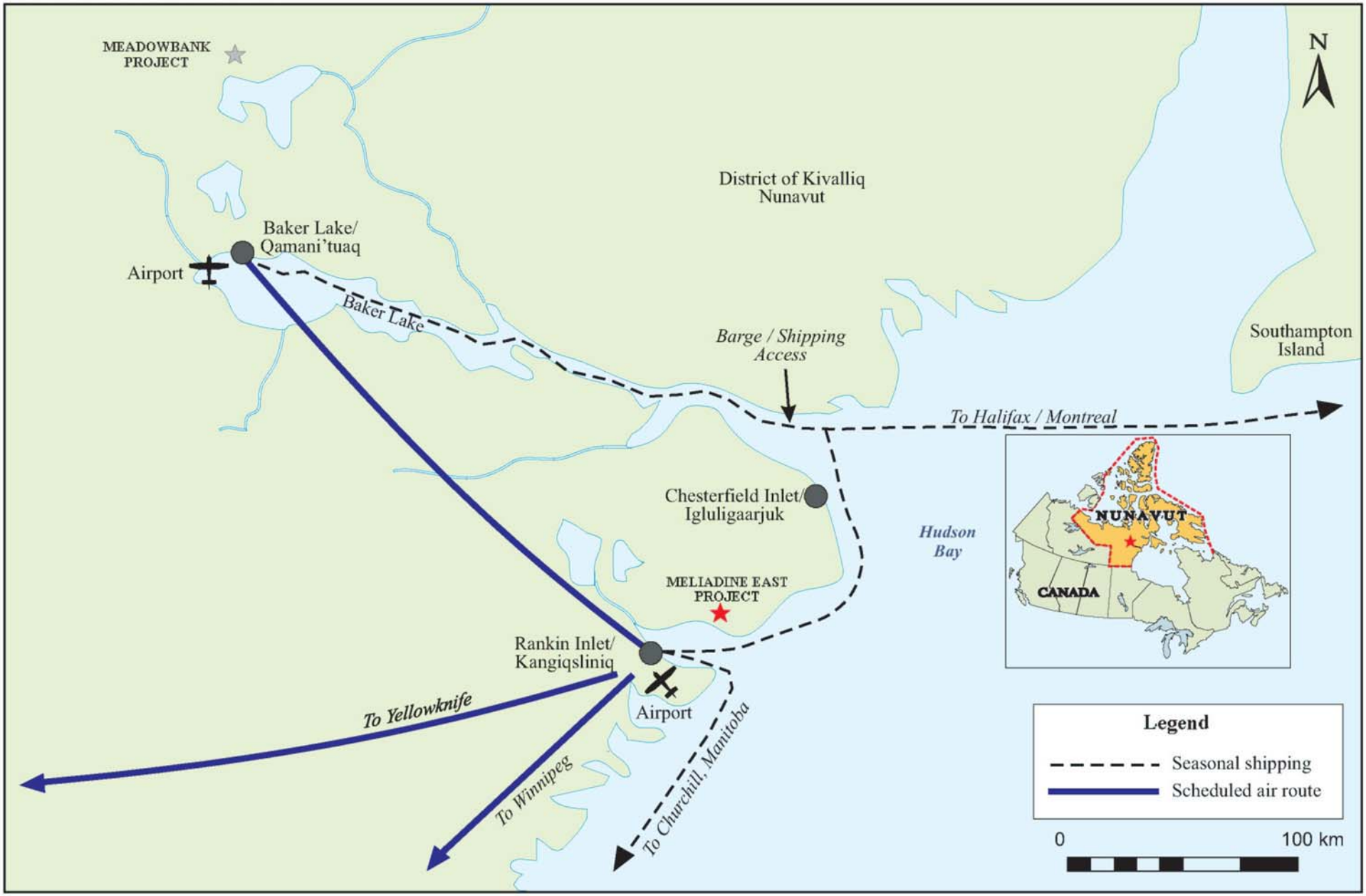
The above volume of fuel should only be stored at the site temporarily. It is currently anticipated that the majority of the fuel supply will be consumed during planned program, and therefore, only minimal supplies should remain at the site over the winter.

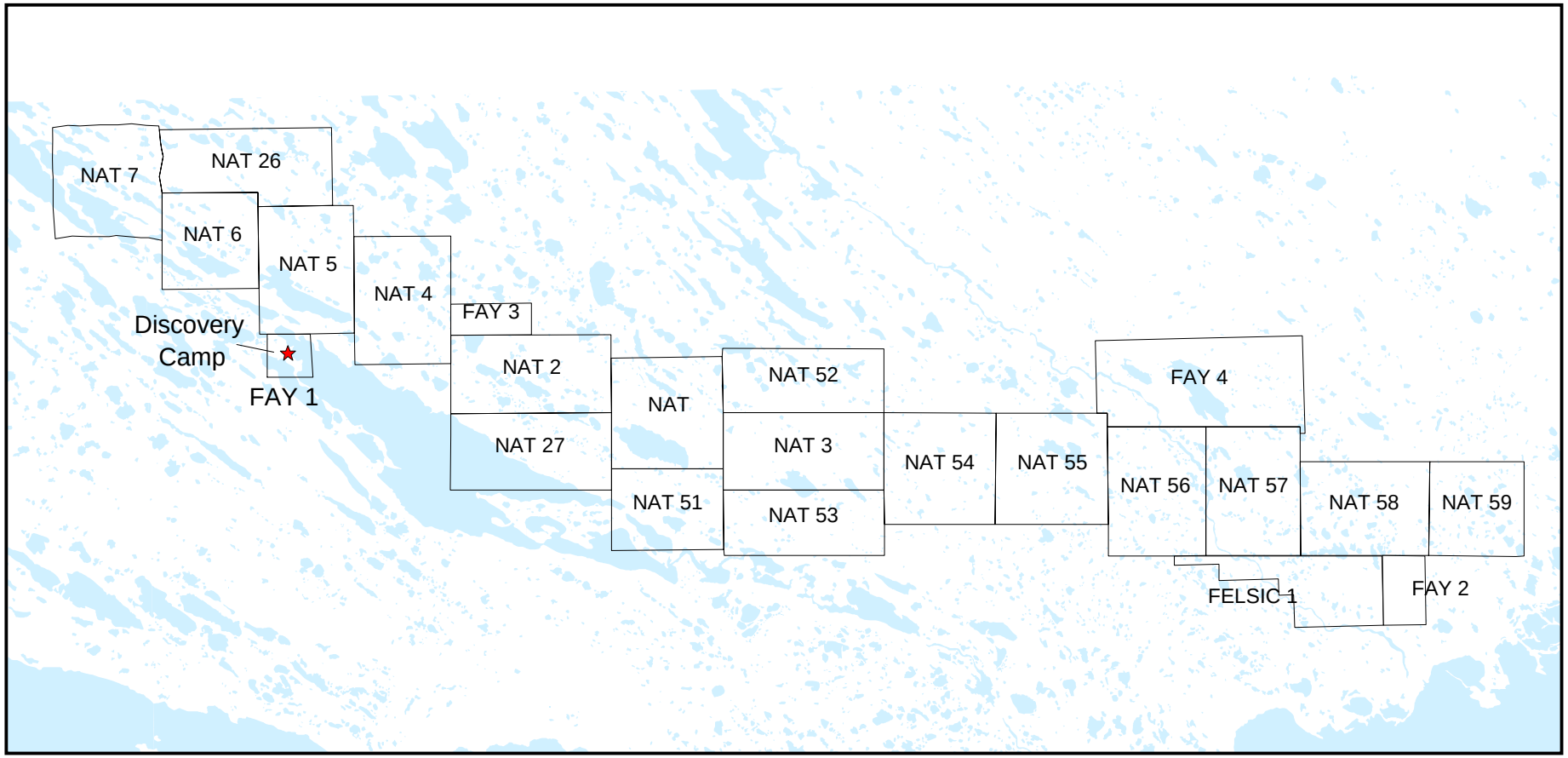
CONTACT INFORMATION

Corporate Contact: *Phone:* **720-946-1453** *Fax:* **720-946-1450**
Russ Cranswick, President

Meliadine East Site Contact: *Phone:* **604-241-4566** *Fax:* **604-241-4586**
Roger March, Project Manager (site phone numbers pending)

Figure 1: Project Location Map





MELIADINE RESOURCES LTD.

Meliadine East Property

LOCATION MAP

Scale: 1:200,000	N.T.S.: 55J13, 55J14	Date: October, 2006
Drawn by: RM	UTM NAD27 (Canada) 21S	Fig No. Figure 2
Filename:		

RESPONSIBILITIES

SHIPPER:

- Ensures proper loading and containment and documentation, which complies with TDG guidelines.
- Ensures goods are classified and labeled appropriately. Provide placards if required.
- Ensures safety at all times.
- Ensures proper communication with carrier.

CARRIER:

- Supervises and ensures proper loading and containment and documentation which comply with all TDG guidelines.
- Ensures correct volumes for transport, attach placards if necessary, maintains or replaces safety marks.
- Checks and delivers TDG manifest to receiver.
- Ensures safety of all personnel and equipment.

RECIEVER:

- Supervises unloading procedures.
- Complies with TDG guidelines.
- Ensures safety of containment facilities.
- Ensures maintenance of all pumps and loading / unloading equipment on site.
- Provides on-site emergency communications (telephone, radio).
- Completes regular site inspections of storage facilities.
- Records all shipment manifests.
- Keeps on-site inventory of all dangerous goods.
- Maintains safety procedures at all times.

SPILL SITE COORDINATOR:

- Supervises and organizes spill containment equipment and personnel.
- Reports to internal and external resources.
- Ensures proper safety equipment is available.
- Notifies all personnel of current hazards.
- Maintains proper safety procedures at all times.
- Must be compliant with all TDG guidelines.

II. SPILL RESPONSE ACTION PLAN

1. ALERT MELIADINE PERSONNEL:

SPILL OBSERVER report spill to:
IMMEDIATE SUPERVISOR or Camp manager

- Project Manager
- Contractors (clean up)

2. CONTAIN SPILL AND INITIATE CLEAN UP:

Spill response coordinated by Camp Manager (On-scene coordinator) or senior manager on site.

Camp manager – pending	Phone: 604-241-4566
Project Manager – Roger March	Phone: 604-241-4566

Note: Telephone numbers for the camp change year-to-year, but current numbers can be obtained through the number listed above.

The general procedure for the clean up of a spill is presented below.

- Identify the source of the spill and stop the flow (if safe to do so), extinguish or remove any possible source of ignition.
- Contain the spill to prevent further damage to the environment.
- Recover as much of the spilled substance as possible using absorbent matting and sphagnum moss. Collect contaminated materials in empty drums for incineration.
- Remove contaminated tundra, soils and snow (if applicable). Collect contaminated material in empty drums for incineration.

Detailed information on the procedures for dealing with spills of specific substances and the Material Safety Data Sheets for these substances are provided with the spill response guidelines presented in section III below.

3. REPORT SPILL TO THE REQUIRED AUTHORITIES:

An internal report should be completed for all spill incidents of any size at the site, detailing the source, size and cause of the spill and the clean up and remediation completed. Reporting to government agencies (listed below) is required for any spill in water or on ice and for any spills on land with a volume of 100 litres or more.

The reporting requirement applies equally to all substances covered by this contingency plan; fuels, hydraulic oil, lubricants, and waste oil.

All reports by telephone must be followed with a fax of the completed report form (see Appendix D for copies) to the number indicated on the reporting form.

Reporting and notification should be made by the first observer of the spill or the observer's supervisor immediately upon the spill being under control, or on failure to gain control of the situation. These agencies have experience in dealing with spills and may be able to offer expert advice and assistance in containing and clean up of larger spills.

NOTIFY AGENCIES:

Initial contacts:

24 HOUR NUNAVUT SPILL REPORT LINE	PHONE	(867) 920 8130
	FAX	(867) 873 6924
INAC Water Resources officer	PHONE	(867) 975 4298

Other Agencies:

KIVALLIQ INUIT ASSOCIATION	PHONE	(867) 645 2810
ENVIRONMENT CANADA – Iqaluit	PHONE	(867) 975 4644
	FAX	(867) 975 4594
ENVIRONMENT CANADA Enforcement 24 hr pager		(867) 920 5131
GN – Environmental Protection – Iqaluit	PHONE	(867) 975 5910
GN – Wildlife Officer – Baker Lake	PHONE	(867) 793-2944

4. RECORD THE FACTS Use Spill Report Form from Appendix D

NOTE:	If the On-Scene Coordinator is not available when a spill is detected then the spill **must be** reported directly to Nunavut 24-hour spill report line without delay.

III. SPILL RESPONSE – FUEL TYPE

The procedure of dealing with a spill is dependent on the type of material spilled. The following sheets summarize the correct procedures for dealing with spills of the materials transported and stored at the Meliadine East project site – gasoline, Jet A and Jet B aviation fuel, P-50 diesel (stove oil), propane and acetylene.

The MSDS sheets for each product are also included after the spill response information.

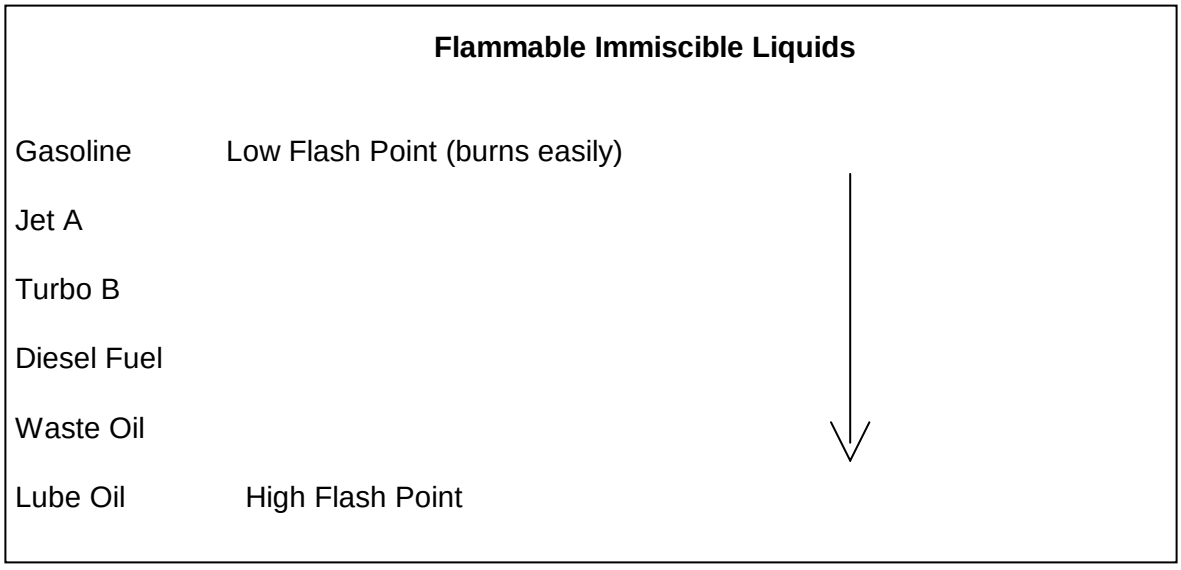
PRODUCT GUIDES

The materials included in this Plan can generally be divided into two categories:

- Flammable immiscible liquids
- Flammable compressed gases

A-1. Flammable Immiscible Liquids

These substances are all hydrocarbon-based and will ignite under certain conditions. Gasoline and aviation fuel pose the greatest fire (and safety) hazard and usually cannot be recovered when spilled on water. The remaining materials generally do not pose a hazard at ambient temperatures. They are all insoluble, float unless mixed into the water column and can be recovered when safety allows.



GASOLINE SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

GASOLINE FORMS VAPOURS THAT CAN IGNITE AND EXPLODE

NO SMOKING

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF GASOLINE IF SAFE TO DO SO

ON LAND
- Block entry into waterways by diking with earth, snow or other barrier(s).
- Do not contain spill if there is any chance of igniting vapours.
- On shop floors and in work/depot yards, apply particulate absorbents.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE
- Block entry into waterways by diking with snow or other barrier.
- Do not contain spill if there is any chance of igniting vapours.
- In work/depot yards, apply particulate absorbents.
- Snow has natural absorbent properties. Shovel contaminated snow into suitable container and use absorbent matting to remove gasoline from melt water.

ON MUSKEG
- Remove pooled gasoline with pumps, if safe to do so.
- Do not deploy personnel and equipment on marsh or vegetation.
- Low pressure flushing can be tried to disperse small spills.
- Use absorbent pads to withdraw surface contaminants.
- Collect and burn contaminated material ONLY in localized areas, e.g., trenches, piles, windrows or incinerator.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and digging.

ON WATER
- Contain or remove spills ONLY AFTER VAPOURS DISSIPATE.
- Use booms to protect water intakes.
- Skimming can be tried once light ends evaporate.

STORAGE/TRANSFER
- Store closed, labeled containers in cool, ventilated areas away from incompatible materials.
- Electrically ground containers and vehicles during transfer.

DISPOSAL

- Segregate waste types, if necessary.
- Place contaminated materials into marked containers.
- Consult camp manager on transportation and disposal requirements.

GASOLINE

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless Liquid (can be dyed)	FLASH POINT:	-50^{o} C
ODOUR:	Gasoline / Petroleum	FREEZING PT:	-60^{o} C
SOLUBILITY:	Insoluble	VISCOSITY:	Not viscous (< 1 cSt)
VAPOUR DENSITY:	Will sink to ground levels	SPECIFIC GRAVITY:	Floats on water (0.7 – 0.8)

SAFETY MEASURES

WARNINGS

- Vapours form instantaneously, and are heavier than air.
- Empty containers can contain explosive vapours.
- Vapours can travel to distant sources of ignition and flash back.
- Eye contact causes irritation.
- Material can accumulate static charges.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. Use water to cool containers exposed to fire.

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**GASOLINE, UNLEADED**
Synonym	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, Super Premium (94 RO)
Manufacturer	PETRO-CANADA P.O. Box 2844 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.

Code W102E

Validated on 6/9/2004.

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

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
Gasoline	8006-61-9	85-100	300 ppm (890 mg/m³)	500 ppm (1480 mg/m³)	Not established
Methyl tert-butyl ether	1634-04-4	0-15	40 ppm (144mg/m³)	Not established	Not established
Note: Petro-Canada does not use MTBE in the manufacturing of its gasoline, however MTBE can be introduced from time to time through the use of external gasoline blendstocks.					

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Possible cancer hazard. Inhalation of vapours can be irritating to respiratory tract and cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconciousness and possibly death. Skin and eye contact can cause irritation. Toxic if ingested. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. 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. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Flammable liquid (NFPA).	**Flammable Limits**	Lower: 1.3%; Upper: 7.6% (NFPA).
Flash Points	Closed Cup: -50 to -38°C (-58 to -36°F), ASTM D56 Standard Test Method for Flash Point by Tag Closed Tester.	**Auto-Ignition Temperature**	257°C (495°F) (NFPA).
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, flammable/combustible liquid (non-polar/water-immiscible). CAUTION: This product has a very low flash point, use of water spray when fighting fire may be inefficient. SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. DO NOT extinguish a leaking gas flame unless leak can be stopped. Shut off fuel to fire if it is possible to do so without hazard. 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. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. Avoid flushing spilled material into sewers, streams or other bodies of water. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings.		

Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 128, flammable/combustible liquid (non-polar/water-immiscible). Evacuate in a downwind direction for at least 300 meters (1000 feet). ELIMINATE ALL IGNITION SOURCES. Ventilate closed spaces before entering. By forced ventilation, maintain concentration of vapour below the range of explosive mixture. Avoid contact, fully-encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Stop leak if without risk. Use vapour suppressing foam or water spray to reduce vapours; it may reduce vapour, but it may not prevent ignition in closed spaces; isolate area until vapour has dispersed. Contain spill. Absorb with inert absorbents such as dry clay, or diatomaceous earth, or recover using electrically grounded explosion-proof pumps. Avoid inhaling dust of diatomaceous earth for it may contain silica (very fine particle size), making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Section 7. Handling and Storage

Handling	Keep away from heat, spark 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. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Wear proper protective equipment. 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	Store in cool, dry, isolated, well-ventilated area, and away from direct sunlight, sources of ignition and incompatibles. Flammable materials should be stored in a separate safety storage cabinet or room. Ground all equipment containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.

Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	Not available
Colour	Clear to slightly yellow, undyed liquid. May be dyed red for taxation purposes.	**Pour Point**	Not applicable.
Odour	Gasoline. MTBE has a terpene-like odour.	**Softening Point**	Not applicable.
Odour Threshold	Less than 1 ppm.	**Dropping Point**	Not applicable.
Boiling Point	25 to 220°C (77 to 428°F) Initial boiling point by ASTM D86 Standard Test Method.	**Penetration**	Not applicable.
Density	0.7 kg/L @ 15ºC (59ºF).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	3 to 4 (Air = 1) (NFPA).	**Ionicity (in water)**	Insoluble in water.
Vapour Pressure	<107 kPa @ 37.8ºC (100ºF)	**Dispersion Properties**	Not available
Volatility	Volatile.	**Solubility**	Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform, and benzene. Dissolves fats, oils and natural resins.

Section 10. Stability and Reactivity

Corrosivity	Non corrosive.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents, acids.	**Decomposition Products**	May release COx, NOx, phenols, polynuclear aromatic hydrocarbons, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry Skin contact, eye contact, inhalation, and ingestion.

Acute Lethality

Gasoline: Acute oral toxicity (LD50): 13 600 mg/kg (rat).
Acute dermal toxicity (LD50): >5000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >300 000 mg/m³/4h (rat).

MTBE: Acute oral toxicity (LD50): 29630 mg/kg (rat).
Acute dermal toxicity (LD50): >6800 mg/kg (rabbit).
Acute inhalation toxicity (LC50): 23 576 ppm/4h (rat).

Chronic or Other Toxic Effects

Dermal Route:	This product can cause skin irritation. Prolonged or repeated contact with skin may cause dermatitis.
Inhalation Route:	Inhalation of vapours can be irritating to repiratory tract and cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconciousness and possibly death.
Oral Route:	Swallowing or vomiting of the liquid may result in aspiration into the lungs. Can cause CNS depression. (See Inhalation Route for symptoms).
Eye Irritation/Inflammation:	Can cause irritation to the eyes.
Immunotoxicity:	Not available

Skin Sensitization:	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization:	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic:	This product is not considered to be a mutagen, based on the available data and the known hazards of the components.
Reproductive Toxicity:	This product is not considered to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotoxicity:	This product is not considered to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen. [Gasoline, MTBE]
Carcinogenicity (IARC):	IARC Group 2B: possibly carcinogenic to humans. [Gasoline]
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	Not available
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	Unleaded gasoline caused kidney effects in male rats and liver effects in female mice.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	Not available		

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	GASOLINE, 3, UN1203, PGII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations

CEPA: This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). EPA: All components of this formulation are listed on the US EPA-TSCA Inventory.

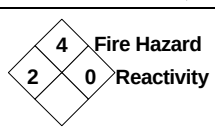
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Contains material which may cause cancer. CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F). CLASS: Irritating substance. CLASS: Target organ effects.
ADR (Europe) (Pictograms)	**NOT EVALUATED FOR EUROPEAN TRANSPORT** **NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.**	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	4
Reactivity	0

NFPA (U.S.A.)



Rating
0 Insignificant
1 Slight
2 Moderate

Personal Protection	H	**Specific hazard**	3 High 4 Extreme

Section 16. Other Information

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

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazardous Communication System
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Fuels & Solvents:
Western Canada, telephone: 403-296-4158; fax: 403-296-6551
Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 6/9/2004.

Data entry by Product Safety - RS.

JET A – SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF JET A IF SAFE TO DO SO

ON LAND
- Do not flush into ditches or drainage systems.
- Do not contain spill if there is any chance of igniting vapours.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with absorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Do not contain spill if there is any chance of igniting vapours.
- Remove minor spills with absorbent pads and/or snow.
- Scrape up and collect the contaminated snow – fuel mixture in suitable container for future disposal.

ON MUSKEG
- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled Jet B with pumps and skimmers if it is safe to do so.
- Flush with low-pressure water to herd Jet B to collection point.
- Use absorbent pads to withdraw surface contaminants.
- Collect and burn contaminated material ONLY in localized areas, e.g., trenches, piles, windrows or incinerator.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

ON WATER
- Contain spill ONLY AFTER VAPOURS DISSIPATE.
- Use spill containment boom to concentrate slicks for recovery.
- Do not deploy personnel and equipment onto mudflats or into wetlands.

STORAGE/TRANSFER
- Store closed, labeled containers outside away from flammable items.
- Electrically ground containers and vehicles during transfer.

DISPOSAL
- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult camp manager on disposal procedures.

JET A

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White or Pale Yellow liquid
ODOUR: Gasoline / Petroleum
SOLUBILITY: Negligible
VAPOUR DENSITY: Will sink to ground levels
FLASH POINT: 38^{o} C
FREEZING PT: -50^{o} C
VISCOSITY: Not viscous (<7 cSt)
SPECIFIC GRAVITY: Floats on water (0.81)

SAFETY MEASURES

WARNINGS

- Vapours form instantaneously, and are heavier than air.
- Low-lying areas can trap explosive vapours.
- Vapours can travel to distant sources of ignition and flash back.
- Eye contact causes irritation.
- Material can accumulate static charges.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.
- Use water to cool containers exposed to fire.

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	**B-3, D-2B, (D-2A)* (See Section 15)**		

Section 1. Chemical Product and Company Identification

Product Name	**JET A/A-1 AVIATION TURBINE FUEL**	**Code**	W213, SAP: 149
Synonym	Jet A-1; Jet A-1-DI; Aviation Turbine Kerosene (ATK); JP-8; NATO F-34; Jet F-34; Turbine Fuel, Aviation, Kerosene Type (CAN/CGSB-3.32)	**Validated on**	**11/8/2004.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Used as aviation turbine fuel. May contain a fuel system icing inhibitor. In the arctic, Jet A-1 may also be used as diesel fuel and heating oil.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
Complex misture of petroleum hydrocarbons (C9-C16)**(Kerosene) **Aromatic content is 25% maximum (benzene: nil).	8008-20-6	99.9	200 mg/m³ (***)	Not established	Not established
Fuel System Icing Inhibitor (FSII) (if added*): Diethylene Glycol Monomethyl Ether	111-77-3	≤0.15	Not established	Not established	Not established
Anti-static, antioxidant and metal deactivator additives. *Please note that Jet A-1-DI, JP-8, Jet F-34 and NATO F-34 all contain Fuel System Icing Inhibitor.	Not applicable	<0.1	Not applicable	Not applicable	Not applicable

Manufacturer Recommendation	***Application of this TLV is restricted to conditions in which there are negligible aerosol exposures.
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. May cause teratogenicity/embryotoxicity. Contact with this product may cause skin irritation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Quickly and gently, blot or brush away excess chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20-30 minutes, by the clock, while holding the eyelid(s) open.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Seek medical attention.
Note to Physician	Not available

Continued on Next Page

Section 5. Fire-fighting Measures

Flammability	Class II - combustible liquid (NFPA).	**Flammable Limits**	Lower: 0.7% Upper: 5%
Flash Points	Closed cup: >38°C (100.4°F). (Tag. Closed Cup)	**Auto-Ignition Temperature**	210°C (410°F)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Evacuate non-essential personnel. Extinguish all ignition sources. Ventilate area. Stop leak if safe to do so. Avoid contact with spilled material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Do not allow spilled material to enter sewer systems as vapours may accumulate and may cause an explosion/fire hazard. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. If spilled in a confined space, ensure appropriate confined space entry protocols are followed. Ensure clean-up personnel wear appropriate personal protective equipment. Collect used absorbent for later disposal. Use appropriate inert absorbent material to absorb spilled product. Do not use paper or other flammable materials to absorb product. Avoid breathing vapours or mists of material. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	COMBUSTIBLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Wear proper personal protective equipment (See Section 8). Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Avoid eye contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product.
Storage	Store away from heat and sources of ignition. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded. Keep container tightly closed. Store in dry, cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	As a minimum, safety glasses with side shields should be worn when handling this material.
Body	If this material may come into contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information).

Respiratory	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister with a dust, fume of mist filter (R, or P series) may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): polyvinyl alcohol (PVA) and fluoro-elastomer. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	1.0-1.9 cSt @ 40ºC (104ºF)
Colour	Clear and colourless.	**Pour Point**	<-51ºC (<-60ºF)
Odour	Kerosene-like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	150 to 300°C (302 to 572°F)	**Penetration**	Not applicable.
Density	0.8 to 0.82 (Water = 1)	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	4.5 (Air = 1)	**Ionicity (in water)**	Not available
Vapour Pressure	0.7 kPa at 20°C (5.25 mm Hg @ 68ºC)	**Dispersion Properties**	Not available
Volatility	Low than gasoline.	**Solubility**	Insoluble in water. Partially miscible in some alcohols. Miscible in other petroleum solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents , nitric acid, chlorosulfonic acid and calcium hypochlorite.	**Decomposition Products**	May release COx, NOx, SOx, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry Skin contact, eye contact, inhalation and ingestion.

Acute Lethality

Kerosene
Acute oral toxicity (LD50): >5000 mg/kg (rat).
Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >5000 mg/m³/4h (rat).

Diethylene Glycol Monomethyl Ether
Acute oral toxicity (LD50): 4140-5180 mg/kg (rat).
Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >50000 mg/m³/4h (rat).

Chronic or Other Toxic Effects

Dermal Route:	This product contains a component (at >= 1%) that can cause skin irritation (Kerosene, CASRN 8008-20-6). Therefore, this product is considered to be a skin irritant.
Inhalation Route:	Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; headache, nausea, dizziness, light-headedness and vomiting.
Oral Route:	Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure.
Eye Irritation/Inflammation:	Eye contact causes irritation.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.

Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product contains a component(s) at >= 0.1% that has been shown to cause teratogenicity and/or embryotoxicity in laboratory tests (Diethylene Glycol Monomethyl Ether, CASRN 111-77-3). Therefore, this product is considered to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	ACGIH A3: Confirmed animal carcinogen with unknown relevance to human (Kerosene, CASRN 8008-20-6)
Carcinogenicity (IARC):	IARC Group 3: Not classifiable as a human carcinogen (Kerosene, CASRN 8008-20-6).
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	Chronic exposure to some of the hazardous components of this product may result in damage to the following organs and/or systems: kidney.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	FUEL, AVIATION, TURBINE ENGINE, 3, UN1863, PGII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations

This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

The WHMIS classification of Jet A/A-1 is B3, D2B.
The WHMIS classification of Jet A/A-1-DI, JP-8, Jet F-34 and NATO F-34, which all contain FSII (Diethylene Glycol Monomethyl Ether), is B3, D2A, D2B.

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Combustible liquid having a flash point between 37.8ºC (100ºF) and 93.3ºC (200ºF). CLASS: Irritating material. Target Organ Effects* (Only applies to: Jet A/A-1-D1, JP8, Jet F-34 and NATO F-34)

ADR (Europe) (Pictograms) NOT EVALUATED FOR EUROPEAN TRANSPORT

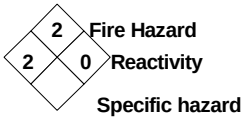
NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.

DOT (U.S.A) (Pictograms)

HMIS (U.S.A.)

Health Hazard	2/2*
Fire Hazard	2
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)



Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

References Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
CNS - Central Nervous System
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPA - Environmental Protection Agency
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazard Communication Standard
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
RTECS - Registry of Toxic Effects of Chemical Substances
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Internet: www.petro-canada.ca/msds

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

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - TLM on 11/8/2004.

Data entry by Product Safety - RS.

JET B – SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF JET B IF SAFE TO DO SO

ON LAND
- Do not flush into ditches or drainage systems.
- Do not contain spill if there is any chance of igniting vapours.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with absorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Do not contain spill if there is any chance of igniting vapours.
- Remove minor spills with absorbent pads and/or snow.
- Scrape up and collect the contaminated snow – fuel mixture in suitable container for future disposal.

ON MUSKEG
- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled Jet B with pumps and skimmers if it is safe to do so.
- Flush with low-pressure water to herd Jet B to collection point.
- Use absorbent pads to withdraw surface contaminants.
- Collect and burn contaminated material ONLY in localized areas, e.g., trenches, piles, windrows or incinerator.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

ON WATER
- Contain spill ONLY AFTER VAPOURS DISSIPATE.
- Use spill containment boom to concentrate slicks for recovery.
- Do not deploy personnel and equipment onto mudflats or into wetlands.

STORAGE/TRANSFER
- Store closed, labeled containers outside away from flammable items.
- Electrically ground containers and vehicles during transfer.

DISPOSAL
- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult camp manager on disposal procedures.

JET B

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White or Pale Yellow liquid FLASH POINT: -20 to -250^{o} C
ODOUR: Gasoline / Petroleum FREEZING PT: -18^{o} C
SOLUBILITY: Negligible VISCOSITY: Not viscous (0.6 cSt)
VAPOUR SPECIFIC
DENSITY: Will sink to ground levels GRAVITY: Floats on water (0.78)

SAFETY MEASURES

WARNINGS

- Vapours form instantaneously, and are heavier than air.
- Low-lying areas can trap explosive vapours.
- Vapours can travel to distant sources of ignition and flash back.
- Eye contact causes irritation.
- Material can accumulate static charges.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.
- Use water to cool containers exposed to fire.

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**JET B AVIATION TURBINE FUEL**	**Code**	W219 SAP: 150, 151, 152
Synonym	Jet B; Jet B DI; JP-4; Jet F-40; NATO F-40; Turbine Fuel, Aviation, Wide Cut Type (CAN/CGSB-3.22).	**Validated on**	**2/8/2005.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Used as aviation turbine fuel. May contain a fuel system icing inhibitor.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (W/W)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
Complex mixture of petroleum hydrocarbons (C6-C14).	64741-41-9	>99	Not established	Not established	Not established
Benzene	71-43-2	<0.5	0.5 ppm	2.5 ppm	Not established
Fuel System Icing Inhibitor (FSII) (if added*): Diethylene Glycol Monomethyl Ether	111-77-3	≤0.15	Not established	Not established	Not established
Anti-static, antioxidant, corrosion inhibitor and metal deactivator additives. * Please note that Jet B DI, JP-4, Jet F-40 and NATO F-40 all contain Fuel System Icing Inhibitor (FSII).corrosion inhibitor	Not applicable	<0.1	Not applicable	Not applicable	Not applicable

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Flammable liquid. Exercise caution when handling this material. Skin and eye contact can cause irritation. Inhalation of vapours can cause irritation of the respiratory tract and CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconciousness and possibly death. Aspiration into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. May cause cancer. May cause teratogenicity/embryotoxicity. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Quickly and gently blot or brush away chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately.
Skin Contact	Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with warm water and non-abrasive soap for 5 minutes or until chemical is removed.
Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Immediately transport victim to an emergency care facility.

Continued on Next Page

Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Repeat administration of water.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Flammable liquid (NFPA).	**Flammable Limits**	LOWER: 1.3% UPPER: 8% (NFPA)
Flash Points	CLOSED CUP: -31ºC (-24°F) (NFPA)	**Auto-Ignition Temperature**	240°C (464°F) (NFPA)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Evacuate non-essential personnel. Extinguish all ignition sources. Ventilate area. Stop leak if safe to do so. Avoid contact with spilled material. Do not allow spilled material to enter sewer systems as vapours may accumulate and may cause an explosion/fire hazard. If spilled in a confined space, ensure appropriate confined space entry protocols are followed. Ensure clean-up personnel wear appropriate personal protective equipment. Use appropriate inert absorbent material to absorb spilled product. Do not use paper or other flammable materials to absorb product. Collect used absorbent for later disposal. Avoid breathing vapours or mists of material. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	FLAMMABLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Wear proper personal protective equipment (See Section 8). Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product.
Storage	Store away from heat and sources of ignition. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded. Keep container tightly closed. Store in dry, cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	As a minimum, safety glasses with side shields should be worn when handling this material.
Body	If this material may come into contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information).
Respiratory	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister with a dust, fume of mist filter (R, or P series) may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): neoprene, polyvinyl alcohol (PVA), and fluoro-elastomer. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	Not available (similar to gasoline)
Colour	Clear and colourless.	**Pour Point**	Freezing Point: <-51ºC (<-60ºF) for Jet B/Jet B DI; <-58ºC (<-72ºF) for Jet Fuel F-40.
Odour	Gasoline like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	50 to 270°C (122 to 518°F)	**Penetration**	Not applicable.
Density	0.75 to 0.80 kg/L @ 15ºC (59ºF).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	3.5 (Air = 1)	**Ionicity (in water)**	Not available
Vapour Pressure	21 kPa (158 mmHg) @ 37.8ºC (100ºF).	**Dispersion Properties**	Not available
Volatility	Volatile.	**Solubility**	Insoluble in water. Partially miscible in some alcohols. Miscible in other petroleum solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Can react with strong oxidizing agents, uranium hexafluoride, diborane. Incompatible with halogens and halogen compounds.	**Decomposition Products**	May release COx, NOx, SOx, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.
Acute Lethality	Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below:

Based on toxicity of similar product.
Acute oral toxicity (LD50): >5000 mg/kg (rat).
Acute dermal toxicity (LD50): >5000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >5000 mg/m³/4h (rat).

Benzene
Acute oral toxicity (LD50): 930 mg/kg (rat).
Acute dermal toxicity (LD50): >9400 mg/kg (rabbit).
Acute inhalation toxicity (LC50): 13200 ppm/4h (rat).

Diethylene Glycol Monomethyl Ether
Acute oral toxicity (LD50): 4140-5180 mg/kg (rat).
Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >50000 mg/m³/4h (rat).

Chronic or Other Toxic Effects

Dermal Route:	Skin contact can cause irritation. Prolonged or repeated contact may defat and dry skin, and cause dermatitis.
Inhalation Route:	Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may lead to aspiration of the liquid, especially if vomiting occurs. This may result in chemical pneumonitis (inflammation of the lungs) and/or pulmonary edema (an accumulation of fluid in the lungs).
Eye Irritation/Inflammation:	Short-term exposure is expected to cause only slight irritation, if any.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	Benzene is tumorigenic by RTECS criteria.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product contains a component(s) at >= 0.1% that has been shown to cause teratogenicity and/or embryotoxicity in laboratory tests. Therefore, this product is considered to be a teratogen/embryotoxin [Diethylene Glycol Monomethyl Ether].
Carcinogenicity (ACGIH):	ACGIH A1: confirmed human carcinogen. [Benzene]
Carcinogenicity (IARC):	IARC Group 1: carcinogenic to Humans. [Benzene]
Carcinogenicity (NTP):	NTP Group 1: known to be a carcinogen. [Benzene]
Carcinogenicity (IRIS):	EPA/IRIS Class A: human carcinogen.
Carcinogenicity (OSHA):	Benzene is an OSHA known carcinogen.
Other Considerations	No additional remark.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	FUEL, AVIATION, TURBINE ENGINE, 3, UN1863, PGII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations

This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

Please contact Product Safety for more information.

DSD/DPD (Europe) Not evaluated.

HCS (U.S.A.)

CLASS: Contains material which may cause cancer.
CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F).
CLASS: Toxic.
CLASS: Irritating substance.
CLASS: Target organ effects.

ADR (Europe) (Pictograms)

NOT EVALUATED FOR EUROPEAN TRANSPORT

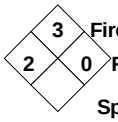
NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.

DOT (U.S.A) (Pictograms)

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	3
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)



Health **Fire Hazard** **Reactivity** **Specific hazard**

Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

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

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
CNS - Central Nervous System
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPA - Environmental Protection Agency
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazard Communication Standard
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
RTECS - Registry of Toxic Effects of Chemical Substances
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS

Prepared by Product Safety - JDW on 2/8/2005.

Internet: www.petro-canada.ca/msds **Fuels & Solvents:** **Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228** **Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385** **For Product Safety Information: (905) 804-4752**	**Data entry by Product Safety - JDW.**

DIESEL – P50 - SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF DIESEL IF SAFE TO DO SO

ON LAND
- Do not flush into ditches or drainage systems.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with absorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with absorbent pads and/or snow.
- Use ice augers and pump to recover diesel under ice.
- Slots in ice can be cut over slow moving water to contain oil.
- Burn accumulated diesel from the surface using Tiger Torches if feasible and safe to do so.
- Scrape up and collect the contaminated snow – fuel mixture in suitable container for future disposal.

ON MUSKEG
- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled diesel with pumps and skimmers.
- Flush with low-pressure water to herd diesel to collection point.
- Use absorbent pads to withdraw surface contaminants.
- Collect and burn contaminated material ONLY in localized areas, e.g., trenches, piles, windrows or incinerator.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

ON WATER
- Contain spill as close to release point as possible.
- Use spill containment boom to concentrate slicks for recovery.
- On small spills, use absorbent pads to pick up contained oil.
- On larger spills, use skimmer on contained slicks.
- Do not deploy personnel and equipment onto mudflats or into wetlands.

RIVERS & STREAMS
- Prevent entry into water, if possible, by building berm or trench.
- Intercept moving slicks in quiet areas using (absorbent) booms.
- Do not use absorbent booms/pads in fast currents and turbulent water.

STORAGE/TRANSFER

- Store closed, labeled containers outside away from flammable items.
- Electrically ground containers and vehicles during transfer.

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult camp manager on disposal procedures.

DIESEL P50
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White or Pale Yellow liquid; may be dyed.
ODOUR: Petroleum
SOLUBILITY: Negligible
VAPOUR DENSITY: Will sink to ground levels
FLASH POINT: 40^{o} C
FREEZING PT: -50^{o} C
VISCOSITY: Not viscous (1.8 cSt)
SPECIFIC GRAVITY: Floats on water (0.85)

SAFETY MEASURES

WARNINGS

- In warm temperatures, vapours form instantaneously, and are heavier than air.
- Eye contact causes irritation.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.
- Use water to cool containers exposed to fire.

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**DIESEL FUEL**	**Code**	W104, W293 SAP: 120, 121, 122, 287
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, Domestic Marine diesel LS, diesel -20°C (LS), LSD, Low Sulphur Diesel, dyed diesel, marked diesel, coloured diesel, Naval Distillate, Ultra Low Sulphur Diesel, ULS Diesel, Mining Diesel, Mining Diesel Special, Mining Diesel Special LS, High Flash Mining Diesel, Furnace Oil, Stove Oil.	**Validated on**	**2/6/2004.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining Diesel has a higher flash point requirement, for safe use in underground mines.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
1) Diesel oil.	68334-30-5	>99.9	100 mg/m³ (as total hydrocarbons) *	Not established	Not established
2) Proprietary additives. Aromatic content is 50% maximum (benzene: nil). Sulphur content is 0-0.50%.	Not available	<0.1	Not established	Not established	Not established

Manufacturer Recommendation	* Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. Contact with this product may cause skin and eye irritation. Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Class II - combustible liquid (NFPA).	**Flammable Limits**	LOWER: 0.7%, UPPER: 6% (NFPA)
Flash Points	Diesel Fuel: Closed Cup: >40ºC (>104ºF) Marine Diesel Fuel: Closed Cup: >60ºC (>140ºF) Mining Diesel: Closed Cup: 52ºC (126ºF)	**Auto-Ignition Temperature**	225ºC (437ºF)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container. Vapour explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), water vapour (H2O), smoke and irritating vapours as products of incomplete combustion. See Section 11 (Other Considerations) for information regarding the toxicity of the combustion products.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a moderate flash point above 40ºC: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Extinguish all ignition sources. Stop leak if safe to do so. Ventilate area. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Avoid contact with spilled material. Avoid breathing vapours or mists of material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Evacuate non-essential personnel. Ensure clean-up personnel wear appropriate personal protective equipment. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	COMBUSTIBLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated. Avoid confined spaces and areas with poor ventilation. Ensure all equipment is grounded/bonded. Wear proper personal protective equipment (See Section 8).
Storage	Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.	**Viscosity**	1.3 - 4.1 cSt @ 40ºC (104ºF)
Colour	Clear to yellow / brown (may be dyed for taxation purposes).	**Pour Point**	Variable, -50ºC to 0ºC (-58ºF to -32ºF)
Odour	Petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	150 - 371ºC (302-700ºF)	**Penetration**	Not applicable.
Density	0.80 - 0.85 kg/L @ 15ºC (59ºF)	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	4.5 (Air = 1)	**Ionicity (in water)**	Not applicable.
Vapour Pressure	Not available	**Dispersion Properties**	Not available
Volatility	Semivolatile to volatile.	**Solubility**	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	**Decomposition Products**	May release COx, NOx, SOx, H2S, H2O, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute oral toxicity (LD50): 7500 mg/kg (rat).
Chronic or Other Toxic Effects	
Dermal Route:	This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant. Prolonged or repeated contact may defat and dry skin, and cause dermatitis. (See Other Considerations)
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen. [Diesel oil] (See Other Considerations)
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.

Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer. Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	DIESEL FUEL, 3, UN1202, PGIII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Irritating substance. CLASS: Target organ effects. CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).
ADR (Europe) (Pictograms)	**NOT EVALUATED FOR EUROPEAN TRANSPORT** **NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.**	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	2
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)

Rating	
0	Insignificant
1	Slight
2	Moderate
3	High
4	Extreme

Section 16. Other Information

References Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials (
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)

DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazardous Communication System
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Internet: www.petro-canada.ca/msds

Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 2/6/2004.

Data entry by Product Safety - JDW.

A-2. Flammable Gases

These substances are all hydrocarbon-based and will easily ignite under virtually any conditions. This ease of ignition renders these substances extremely dangerous to deal with, and extreme caution is required when dealing with these substances.

ACETYLENE RESPONSE ACTIONS

GAS STORED IN CYLINDERS THAT EXPLODE WHEN IGNITED!

CONSIDER ACTION ONLY IF SAFETY PERMITS

KEEP ALL VEHICLES INCLUDING SNOWMOBILES AWAY FROM ACCIDENT AREA

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- Vapours cannot be contained when released.
- Water spray can be used to knock down vapours if there is NO chance of ignition.
- Small fires can be extinguished with dry chemical or CO.
- Personnel should withdraw immediately from area unless a small leak is stopped immediately after it has been detected.
- If tanks are damaged, gas should be allowed to disperse and no attempt at recovery should be made.
- Personnel should avoid touching release point on containers since frost quickly forms.
- Stay clear of tank ends.

ACETYLENE

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colourless Gas
ODOUR: Garlic – like
SOLUBILITY: Slightly soluble
VAPOUR DENSITY: Will sink to ground levels
FLASH POINT: -18^{o} C
FREEZING PT: -82^{o} C
VISCOSITY: n/a
SPECIFIC GRAVITY: (0.6) Liquid floats on water

SAFETY MEASURES

WARNINGS
- Vapours form instantaneously, and are heavier than air.
- Empty containers can contain explosive vapours.
- Vapours can travel to distant sources of ignition and flash back.
- Eye contact causes irritation.
- Material can accumulate static charges.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.
  Use water to cool containers exposed to fire

FaxBack Doc. # : 1009

AIR LIQUIDE

MATERIAL SAFETY DATA SHEET

PRODUCT INFORMATION

PRODUCT: Acetylene
TRADE NAME: Acetylene
CHEMICAL NAME: Acetylene
SYNONYMS: Ethyne
FORMULA: C_2H_2
CHEMICAL FAMILY: Alkyne
MANUFACTURER'S NAME: Air Liquide Canada Inc.
MANUFACTURER'S ADDRESS: 1250 René-Lévesque Blvd. West
Montréal (Québec) Canada H3B 5E6
SUPPLIER'S NAME: Air Liquide Canada Inc.
SUPPLIER'S ADDRESS: 1250 René-Lévesque Blvd. West
Montréal (Québec) Canada H3B 5E6
EMERGENCY PHONE NUMBER: (514) 878-1667
MOLECULAR WEIGHT: 26.04
PRODUCT USE: Fuel
PRODUCT IDENTIFICATION NUMBER: UN 1001, Acetylene, Dissolved

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Acetylene	100%	74-86-2	None	None

PHYSICAL DATA

PHYSICAL STATE: Gas
APPEARANCE: Pure acetylene gas is colorless with an ethereal odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.
ODOR: See above
ODOR THRESHOLD: Unknown
SPECIFIC GRAVITY (H_2O = 1): See Vapor Density (air = 1)
VAPOR PRESSURE: @ 15°C = 4378 kPa
VAPOR DENSITY (air = 1): 0.906
EVAPORATION RATE: Not Applicable (Gas)
BOILING POINT: Sublimation Point = -83.8°C

FREEZING POINT: Triple Point = -80.55°C
pH: Not applicable (Gas)
GAS DENSITY: 1.10 kg/m³ @ 15°C, 101.3 kPa
COEFFICIENT OF WATER/OIL DISTRIBUTION: @ 15°C, Bunsen Coefficient = 1.163

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY:	As a gas in air, oxygen or other oxidizers. GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURES ABOVE 207 kPa.
MEANS OF EXTINCTION:	Carbon Dioxide; dry chemical. Use water spray to cool surrounding containers. "Stop flow of gas before extinguishing fire".
FLASHPOINT AND METHOD OF DETERMINATION:	-17.8°C, CC
UPPER EXPLOSION LIMIT (% BY VOL):	80-100
LOWER EXPLOSION LIMIT (% BY VOL):	2.2
AUTO-IGNITION TEMPERATURE:	305°C
FLAMMABILITY CLASSIFICATION:	Class 1, Group A
HAZARDOUS COMBUSTION PRODUCTS:	None
EXPLOSION DATA:	Ignites by decomposition above 207 kPa
SENSITIVITY TO STATIC DISCHARGE:	Yes

REACTIVITY DATA

CHEMICAL STABILITY: See Explosion Data, above
INCOMPATIBLE MATERIALS: Oxygen and other oxidizers. Forms explosive acetylides with copper, mercury and silver.
CONDITIONS OF REACTIVITY: As a gas at normal pressures and temperatures.
HAZARDOUS DECOMPOSITION PRODUCTS: None other than metal acetylides.

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: None

SKIN ABSORPTION: None

EYE: None

INHALATION: Acetylene is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg. (ACGIH, 2003).

INGESTION: Unlikely route of entry (gas).

ACUTE OVER EXPOSURE EFFECTS: Inhalation: Low concentrations (10-20% in air) cause symptoms similar to that of being intoxicated. Higher concentrations so as to exclude an adequate supply of oxygen to the lungs cause unconsciousness and death.

CHRONIC OVER EXPOSURE EFFECTS: None

EXPOSURE LIMITS: A simple asphyxiant (ACGIH 1995-1996)

IRRITANCY OF PRODUCT: None

SENSITIZATION TO MATERIAL: None

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None

TERATOGENICITY, MUTAGENICITY: None

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Gloves: as required in welding. Eye Protection: Safety goggles or glasses. Other: Safety shoes, safety shower.

SPECIFIC ENGINEERING CONTROLS: Follow Air Liquide Canada's instructions for the maximum withdrawal rate for each size cylinder so that solvent is not withdrawn with the acetylene. Most metals, except silver, copper, mercury or brasses with more than 66% copper, are compatible (non corrosive) with acetylene.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.
Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on container or container valve, contact the closest Air Liquide Canada location.

WASTE DISPOSAL: Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labelled, with any valve outlet plugs or caps secured and valve protection cap in place to Air Liquide Canada for proper disposal. For emergency disposal, contact the closest Air Liquide Canada location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS. Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder

movement. Use a pressure reducing regulator when removing gas from the cylinder. DO NOT ALLOW THE FREE GAS TO EXCEED 207 kPa at 21.1°C. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Earth-ground and bond all lines and equipment associated with the acetylene system. Electrical equipment should be non-sparking or explosion proof.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

TDG CLASSIFICATION: 2.1

WHMIS CLASSIFICATION: A, B1, F

SPECIAL SHIPPING INFORMATION: Since acetylene cylinders contain a porous mass and a solvent in which the acetylene is dissolved, the cylinders should always be shipped in an upright position.

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in truncks of vehicles, enclosed vans, truck cabs or in passenggre compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

MSDS for: Acetylene / FaxBack Doc. # : 1009

FIRST AID MEASURES

SPECIFIC FIRST AID PROCEDURES: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ACETYLENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

INHALATION: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Medical assistance should be sought immediately.

EYE CONTACT: PERSONS WITH POTENTIAL EXPOSURE TO ACETYLENE SHOULD NOT WEAR CONTACT LENSES.

*Note: Acetylene is dissolved in acetone although the risk may be small, acetone has a defatting and drying effect.

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

SKIN CONTACT: Not applicable

MSDS for: Acetylene / FaxBack Doc. # : 1009

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 01/01/88

LAST REVISION DATE: 05/27/2004

FOR INFORMATION OR MSDS, CONTACT YOUR LOCAL A.L.C. OFFICE OR DISTRIBUTOR.

MAIN ALC SALES LOCATIONS:

Newfoundland	St.John's	Tel : 709 758-2765	Fax : 709 758-2800
Nova Scotia	Dartmouth	Tel : 902 468-5152	Fax : 902 468-5782
New Brunswick	Moncton	Tel : 506 857-3280	Fax : 506 857-9734
New Brunswick	Saint John	Tel : 506 634-8960	Fax : 506-646-1021
Quebec	Vanier	Tel : 418 683-1917	Fax : 418 683-7088
Montreal	Anjou	Tel : 514 356-7600	Fax : 514 351-0531
Toronto	Bramalea	Tel : 905 793-2000	Fax : 905 793-9257
Eastern Ontario	Oshawa	Tel : 905 576-1860	Fax : 905 571-3779
Lake Ontario	Burlington	Tel : 905 335-4877	Fax : 905 335-0301
South West Ontario	London	Tel : 519 455-3990	Fax : 519 455-3828
Northern Ontario	Sudbury	Tel : 705 674-7777	Fax : 705 674-0517
Manitoba & N.W. Ont.	Winnipeg	Tel : 204 989-9353	Fax : 204 779-1047
Saskatchewan	Saskatoon	Tel : 306 933-2722	Fax : 306 931-6641
Calgary	Calgary	Tel : 403 777-4700	Fax : 403 777-4727
Edmonton	Edmonton	Tel : 780 438-5600	Fax : 780 438-2801
Vancouver	Vancouver	Tel : 604 606-4300	Fax : 604 606-4246
Vancouver Island	Nanaimo	Tel : 250 758-1761	Fax : 250 758-1911
Okanagan	Kelowna	Tel : 250 769-4222	Fax : 250 769-7224

v2.0

PROPANE RESPONSE ACTIONS

GAS STORED IN CYLINDERS THAT EXPLODE WHEN IGNITED!

CONSIDER ACTION ONLY IF SAFETY PERMITS

KEEP ALL VEHICLES INCLUDING SNOWMOBILES AWAY FROM ACCIDENT AREA

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- Vapours cannot be contained when released.
- Water spray can be used to knock down vapours if there is NO chance of ignition.
- Small fires can be extinguished with dry chemical or CO.
- Personnel should withdraw immediately from area unless a small leak is stopped immediately after it has been detected.
- If tanks are damaged, gas should be allowed to disperse and no attempt at recovery should be made.
- Personnel should avoid touching release point on containers since frost quickly forms.
- Stay clear of tank ends.

PROPANE

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colourless Gas
ODOUR: Natural Gas odour
SOLUBILITY: Insoluble
VAPOUR DENSITY: Will sink to ground levels
FLASH POINT: -104^{o} C
FREEZING PT: -190^{o} C
VISCOSITY: n/a
SPECIFIC GRAVITY: Liquid floats on water

SAFETY MEASURES

WARNINGS
- Vapours form instantaneously, and are heavier than air.
- Vapours can travel to distant sources of ignition and flash back.
- Eye contact causes irritation.
- Material can accumulate static charges.
- Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Avoid frostbite burn to skin and eyes from contact with propane.
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

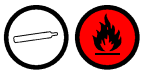
RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA in confined areas.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.

Use water to cool containers exposed to fire.

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	A, B-1		

Section 1. Chemical Product and Company Identification

Product Name	**PROPANE**	**Code**	W222 SAP: 169
Synonym	Propane HD-5, Propane commercial, Liquified Petroleum Gas (LPG), C3H8, CGSB Propane Grade 1, CGSB Propane Grade 2, odourized propane, stenched propane, automotive propane.	**Validated on**	**3/17/2004.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Propane is used as a fuel gas, refrigerant, automotive fuel and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
1) HD-5 Propane					
Propane	74-98-6	>90	2500 ppm	Not established	Not established
Propene	115-07-1	<5	Simple Asphyxiant	Not established	Not established
2) Commercial Propane					
Propane	74-98-6	>75	2500 ppm	Not established	Not established
Propene	115-07-1	<20	Simple Asphyxiant	Not established	Not established
3) Both grades may contain:					
Ethane	74-84-0	<6	Simple Asphyxiant	Not established	Not established
Butane +	106-97-8	<5	800 ppm	Not established	Not established

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	The product is contained under pressure. Do not puncture, incinerate or heat container as contents may explode. Flammable gas. Exercise caution when handling this material. Propane may displace oxygen and cause asphyxiation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Contact with gas or liquified gas may cause burns and frostbite to eyes and skin. Ingestion is not an expected route of exposure. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	Ingestion is not an applicable route of exposure for gases.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Class I - flammable gas (NFPA).	**Flammable Limits**	Lower: 2.1%; Upper: 9.5%, (NFPA).
Flash Points	CLOSED CUP: -104°C (-155°F).	**Auto-Ignition Temperature**	450°C (842°F), (NFPA).
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapours may generate static charge causing ignition. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapour explosion hazard indoors, outdoors or in sewers. Propane may form explosive mixtures with air.
Products of Combustion	Carbon oxides (CO, CO2), acrid smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG2000, GUIDE 115, Flammable Gas: CAUTION: This product has a low flash point, use of water spray when fighting fire may be inefficient. SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. DO NOT extinguish a leaking gas flame unless leak can be stopped. Shut off fuel to fire if it is possible to do so without hazard. 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. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings. Handle damaged cylinders with extreme care.		

Section 6. Accidental Release Measures

Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Evacuate non-essential personnel. Extinguish all ignition sources. Stop leak if safe to do so. Ventilate area. Ensure clean-up personnel wear appropriate personal protective equipment. Avoid breathing vapours of material. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	EXTREMELY FLAMMABLE GAS. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours. Wear proper personal protective equipment (See Section 8). Rapid escape of vapour may generate static charge causing ignition. Use spark-proof electrical equipment. Do not allow escaping compressed gas or liquid to come in contact with skin or eyes as it can cause frostbite. SPECIAL PRECAUTIONS: Sludges and tank scale from propane storage tanks, trucks and rail cars, and filters/screens may contain naturally occurring radioactive material ('NORM") in the form of lead 210. Similarily, equipment used for the transfer of propane such as product pipelines, pumps and compressors, may have detectable levels of radioactive lead 210 on inner surfaces. Workers involved in cleaning, repair or other maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for these activities, detailing appropriate occupational hygiene and disposal practices.
Storage	Store away from incompatible and reactive materials (See section 5 and 10). Store away from heat and sources of ignition. Store as flammable material. Compressed gases should be stored in a separate safety storage cabinet or room. Avoid direct sunlight. Keep container tightly closed. Store in dry, cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	Eye protection (i.e. safety glasses, safety goggles, and/or face shield) should be based on the condition of use. As a minimum, safety glasses with side shields should be worn when handling this material.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. Wear insulated gloves to prevent from frostbite.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Gas at room temperature; liquid when stored under pressure.	**Viscosity**	Not applicable.
Colour	Colourless.	**Pour Point**	Not applicable.
Odour	Propane is an odourless gas. Odourized propane will contain up to 28 g ethyl mercaptan per 1000 L of propane.	**Softening Point**	Not applicable.
Odour Threshold	Odour is not an adequate warning to prevent overexposure to propane. Prolonged exposure to mercaptans can cause olfactory desensitization.	**Dropping Point**	Not applicable.
Boiling Point	-42°C (-44°F)	**Penetration**	Not applicable.
Density	508 kg/m³ @ 15ºC (59ºF)	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	1.56 (air=1)	**Ionicity (in water)**	Not available
Vapour Pressure	10763 mmHg (1435 kPa) @ 38ºC (100ºF).	**Dispersion Properties**	Not available
Volatility	Volatile	**Solubility**	Slightly soluble in water.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents.	**Decomposition Products**	May release COx, acrid smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Inhalation, skin contact and eye contact.
Acute Lethality	Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below: Propene (115-07-1): Acute inhalation toxicity (LC50): >50000 ppm/4h (rat). Butane (106-97-8): Acute inhalation toxicity (LC50): 202000 ppm/4h (mouse).
Chronic or Other Toxic Effects	
Dermal Route:	Contact with gas or liquefied gas may cause burns and frostbite to the skin.
Inhalation Route:	Propane may displace oxygen and cause asphyxiation. Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion is not an applicable route of exposure for gases.
Eye Irritation/Inflammation:	Contact with gas or liquefied gas may cause burns and frostbite to the eyes.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as Group A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.

Continued on Next Page

Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	No additional remark.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	PROPANE, 2.1, UN1978 (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations

This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Flammable gas. CLASS: Compressed gas. CLASS: Target organ effects.
ADR (Europe) (Pictograms)	**NOT EVALUATED FOR EUROPEAN TRANSPORT** **NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.**	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	1*
Fire Hazard	4
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)

Rating	
0	Insignificant
1	Slight
2	Moderate
3	High
4	Extreme

Section 16. Other Information

References Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)

DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazardous Communication System
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Internet: www.petro-canada.ca/msds

Fuels & Solvents:
Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 3/17/2004.

Data entry by Product Safety - RS.

WASTE OIL - SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

Refer to Product Guide below for:
- Physical/Chemical Properties
- Response to Fires
- First Aid

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF LEAKING OIL IF SAFE TO DO SO

ON LAND
- Do not flush into ditches or drainage systems.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with absorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with absorbent pads and/or snow.
- Burn accumulated oil from the surface using Tiger Torches if feasible and safe to do so.
- Scrape up and collect the contaminated snow – fuel mixture in suitable container for future disposal.

ON MUSKEG
- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled oil with pumps and skimmers.
- Flush with low-pressure water to herd oil to collection point.
- Use absorbent pads to withdraw surface contaminants.
- Collect and burn contaminated material ONLY in localized areas, e.g., trenches, piles, windrows or incinerator.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

ON WATER
- Contain spill as close to release point as possible.
- Use spill containment boom to concentrate slicks for recovery.
- On small spills, use absorbent pads to pick up contained oil.
- On larger spills, use skimmer on contained slicks.
- Do not deploy personnel and equipment onto mudflats or into wetlands.

RIVERS & STREAMS
- Prevent entry into water, if possible, by building berm or trench.
- Intercept moving slicks in quiet areas using (absorbent) booms.
- Do not use absorbent booms/pads in fast currents and turbulent water.

STORAGE/TRANSFER
- Store closed, labeled containers outside away from flammable items.

- Electrically ground containers and vehicles during transfer.

DISPOSAL
- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult camp manager on disposal procedures.

WASTE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Black to brown liquid
ODOUR: Petroleum
SOLUBILITY: Generally insoluble
VAPOUR DENSITY: Few vapours emitted
FLASH POINT: 100 to 200^{o} C
FREEZING PT: -30 to -400^{o} C
VISCOSITY: Medium (200-300cSt)
SPECIFIC GRAVITY: Floats on water (0.9)

SAFETY MEASURES

WARNINGS
- Vapours are heavier than air but are unlikely to form.
- Toxic gas can form in fire and at high temperatures.
- CO, CO_2 and dense smoke are produced upon combustion.
- Oil mist or vapour from hot oil can cause irritation of the eyes and respiratory tract.

PERSONAL PROTECTION
- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Use of organic vapour cartridge respirator is highly unlikely.

PRECAUTIONS
- Avoid excessive heat, which can cause formation of vapours.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA and eye protection when responding to waste oil fires.
- Shut off fuel supply.
- Extinguish fire with CO_2, dry chemical, alcohol foam or water fog.

NOTE: Water or foam may cause frothing.
- Use water to cool containers exposed to fire.

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	**Not controlled**		

Section 1. Chemical Product and Company Identification

Product Name	**DURON* XL 0W-30 ENGINE OIL**	**Code**	420-050, DXL03
Synonym	RDL3293	**Validated on**	**8/9/2002.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	DURON* XL 0W30 is an engine oil for use in 4-stroke compression and spark ignition engines under extended ambient conditions, including temperatures below -40ºC. Mobile equipment applications include heavy duty highway and off-highway operations, as well as smaller trucks and cars. The product may also be used in many types of wet clutch transmissions and hydraulic systems.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (W/W)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
1) Mixture of severely hydrotreated and hydrocracked base oil, synthetic hydrocarbons and other proprietary, non-hazardous additives.	Mixture	100	5 mg/m³ (oil mist)	10 mg/m³ (oil mist)	Not established

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. 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 product may cause irritation of the breathing passages. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature.	**Flammable Limits**	Not available.
Flash Points	OPEN CUP: 231°C (447.8°F) (Cleveland)	**Auto-Ignition Temperature**	Fire Point: 249°C (480.2°F)
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, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO2), sulphur oxides (SOx), CaOx, ZnOx, smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	NAERG96, GUIDE 171, Substances (low to moderate hazard). If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. 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. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, water spray or CO2. LARGE FIRE: use water spray, fog or foam. 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.

Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if without risk. Contain spill. Absorb with inert absorbents, dry clay, or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Section 7. Handling and Storage

Handling	Avoid inhalation and skin contact especially when handling used oil. Keep away from sources of ignition. DO NOT reuse empty containers without commercial cleaning or reconditioning. 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 incompatibles.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	***The selection of personal protective equipment varies, depending upon conditions of use.***
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	**Viscosity**	69 cSt @ 40ºC
Colour	Amber.	**Pour Point**	<-51°C
Odour	Mild petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available.	**Dropping Point**	Not applicable.
Boiling Point	Not available	**Penetration**	Not applicable.
Density	0.8427 kg/L @ 15°C (59°F).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	Not available.	**Ionicity (in water)**	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	**Dispersion Properties**	Not available
Volatility	Non-volatile.	**Solubility**	Insoluble in water.

Section 10. Stability and Reactivity

Corrosivity	Copper corrosion, 3h, 100°C (ASTM D0130): 1a.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Incompatible with oxidizing agents, acids, halogens and halogen compounds.	**Decomposition Products**	COx, H2S, aldehydes, alkyl mercaptans, sulfides, methacrylate monomers, smoke and irritating vapours as products of incomplete combustion.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Based on toxicity of components. Acute oral toxicity (LD50): >5000 mg/kg (rat). Acute dermal toxicity (LD50): >2000 mg/kg (rabbit). Acute inhalation toxicity (LC50): >2500 mg/m³/4h (rat).
Chronic or Other Toxic Effects	
Dermal Route:	Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route:	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. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Oral Route:	Low toxicity; has laxative effect.
Eye Irritation/Inflammation:	Repeated or prolonged contact may cause transient irritation, but no permanent damage.
Immunotoxicity:	Not available.
Skin Sensitization:	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization:	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic:	Based on actual test results of base oils and results of similar products, severely hydrotreated base oils give negative results when tested for: (a) Salmonella Typhimurium TA98 using the Modified Ames Assay for Petroleum Product; (b) Salmonella-Escherichia coli/Mammalian-Microsome Reverse Mutation Assay (Ames test) with a Confirmatory Assay; (c) Structural Chromosomal Aberrations in Chinese Hamster Ovary (CHO) Cells.
Reproductive Toxicity:	This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotoxicity:	This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	Not available.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	All components listed in Annex 1 to which Note L applies, and contained in the product, have been shown to contain less than 3% DMSO extractables as measured by IP346.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available.	**Products of Biodegradation**	Not available.
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/used/waste oil may meet the requirements of a hazardous waste. 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**	Not applicable.

Section 15. Regulatory Information

Other Regulations

This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

Please contact Product Safety for more information.

DSD/DPD (Europe)	Not classified under the Dangerous Substances or Dangerous Preparations Directives.	**HCS (U.S.A.)**	Not controlled under the HCS (United States).
ADR (Europe) (Pictograms)	**NOT EVALUATED FOR EUROPEAN TRANSPORT** **NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.**	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	B

NFPA (U.S.A.)

Rating	
0	Insignificant
1	Slight
2	Moderate
3	High
4	Extreme

Section 16. Other Information

References

Available upon request.
* Marque de commerce de Petro-Canada - Trademark

Glossary

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ASTM - American Society for Testing and Materials
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CEPA - Canadian Environmental Protection Act
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CFR - Code of Federal Regulations
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CPR - Controlled Products Regulations
DOT - Department of Transport
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DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
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EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
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HMIS - Hazardous Material Information System
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IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
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NPRI - National Pollutant Release Inventory
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NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
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TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Internet: www.petro-canada.ca

Lubricants:
Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564
Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285
Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 8/9/2002.

Data entry by Product Safety - JDW.

IV. SPILL RESPONSE CONTACTS

Meliadine Resources Ltd., Meliadine East Project

TITLE	NAME	OFFICE	FAX
Corporate Office			
President	Russ Cranswick	(720) 946-1453	(720) 946-1450
On-Scene Coordinators			
Camp Manager	Pending		
Project Manager	Roger March	(604) 241-4566	(604) 241-4586
Government Agencies			
Water Resource Officer - INAC	Pat Larocque	(867) 975-4298	
Hazardous Materials Specialist – Environment Canada	Magnus Bourke	(867) 669-4729	
Hazardous Materials Officer – Environment Canada	David Tilden	(867) 669-4728	
Contractors			
Expediting/Transportation	M&T Enterprises	(867) 645-2778	(867) 645-2590

V. LOCAL TRANSPORTATION

Air Lines - Scheduled
Calm Air (Baker Lake) (867) 793-2873

Helicopters
Custom Helicopters (Rankin Inlet) Staff House (867) 645-3885
Hanger (867) 645-3939

Fixed wing aircraft (charter)
Tailwind Logistics (Thompson) (204) 679-1370

Overland Transportation –
M&T Enterprises (Rankin Inlet) (867) 645-2778

VI. EQUIPMENT SUPPLIERS

Frontier Mining - Yellowknife (867) 920-7617 (spill kits & various absorbents)

Acklands - Yellowknife (867) 873-4100 (spill kits & various absorbents)

VII. INTERNAL RESOURCES – MELIADINE RESOURCES LTD.

Senior Management - President

- Responsible for all communication with the media
- Ensures that all press releases are accurate and in accordance with company policy
- Coordinates and exercises overall direction to Spill Response Team in the case of a major spill

Project Manager

- Project Manager is responsible for the in-field operation of the Spill Response Team.
- Assists senior management in the preparation of news releases
- Updates and distributes Contingency Plan
- Ensures that there are follow up reports prepared on the spill event, clean-up and environmental impacts

Camp Manager

- Develops safe and effective spill management and prevention practices
- Responsible for management and regular inspection of fuel storage facilities at camp

Environmental Consultant

- Provides advisory services to the Spill Response Team as well as management

Legal Counsel

- Advises senior management and the project manager as requested on issues related to:
    - Legislative authority of various government agencies
    - Questions of due diligence
    - Costs/fines and liabilities, regulations including penalties associated with regulations
    - Consults with the corporate insurance coordinator and advises senior management on matters related to insurance

VIII. EXTERNAL RESOURCES – GOVERNMENT

Department of Indian and Northern Affairs (DIAND)

The Northern Affairs program of DIAND administers the Territorial Lands Act and Regulations. Through this legislation land use permits are issued. One of the conditions of land use permits is the requirement to report all spills to a 24 hour government run report line (867-920-8130). Land Use Permits may also address matters of environmental conservation and protection including waste disposal, sources of borrow materials, open pit mining, road alignments, land reclamation and closure requirements. Enforcement of the provisions of the land use permits is carried out by the Operations Division of DIAND through Resource Management Officers located at the District Offices.

Environment Canada (EC)

The Environmental Protection Service of Environment Canada administers the Canadian Environmental Protection Act (CEPA) and Section 36 of the Fisheries Act. For the latter this specifies that unless authorized by regulation, any effluents discharged into fish bearing water must be non-toxic. Environment Canada officials have in the past laid charges in the NWT under the Fisheries Act for spills of oil and other hazardous material.

EC is responsible for providing environmental advice to federal and territorial government agencies and for the preservation and enhancement of environmental quality.

Department of Fisheries and Oceans (DFO)

The Department of Fisheries and Oceans (DFO) administers the habitat protection provisions of the Fisheries Act. This includes provisions for prohibiting the blocking of fish passageways and the destruction of fish habitat. DFO operates under a Habitat Management Policy whereby the objective is to achieve a net gain of fish habitat within the NWT. On occasion DFO Inspectors visit spill sites to investigate possible impacts to fish habitat.

IX. TRAINING

All employees who deal with the handling of fuel at the site are trained and familiar with all spill response equipment, their location and accessibility. Employees are also familiar with the spill contingency plan, appropriate spill response methodologies and spill reporting requirements.

X. REFERENCES

Cumberland Resources Ltd. Spill Contingency Plan – Meadowbank Project, 2006.

WMC International Limited Transportation Spill Contingency Plan - Meliadine West Project. August, 1998.

BHP Diamonds Inc. Transportation Spill Contingency Plan. January 1997.

Department of Transportation. Environmental Guidelines for the Construction, Maintenance and Closure of Winter Roads in the Northwest Territories. Prepared by Stanley Associates Engineering Ltd. 1993.

Northwest Territories Water Board. Guidelines for Contingency Planning. 1987.

APPENDIX A - SPILL RESPONSE EQUIPMENT

DISCOVERY CAMP SITE

General Equipment:

A helicopter is stationed at the site is available to transport personnel and supplies if required. Transportation and logistical support is readily available from Rankin Inlet in the event of a spill. The community is a transportation and supply hub for the area and would be able to supply additional equipment and supplies if necessary. During winter operations, the site is also readily accessible from the town for the transportation of personnel and equipment to the site of a remote spill.

Spill Response Kits:

Meliadine Resources uses "Sphag Sorb" for spill response kits. This product is composed of dried and filtered sphagnum moss, which has the ability to absorb oils without absorbing water. Once used, Sphag Sorb can be safely disposed of in conventional land fill facilities since all oils will continue to be held within the capillaries of the peat moss until they naturally decompose. In addition, this product will not leach contaminants in landfill sites. For disposal of material from smaller spills, Sphag Sorb is ideal for incineration.

Spill Response Kits will be located near the fuel storage facilities at the Meliadine East Project. These response kits consist of the following equipment:

- 1 Case containing 30 Sphag Sorb pads (SS-PAD). Each pad can absorb approximately 5 - 7 litres of contaminant. These pads are to be used for cleaning up minor spills.

- ECP Emergency Spill Response Kits containing the following:
  - 1 - 72"X36"X33" safety yellow polyethylene containment kit with decals
  - 1 - bag activated Sphag Sorb, covers 40 cu. ft.
  - 1 - 22 SS 14 Sphag Sorb pillows
  - 1 - 4 litres Plug It emergency seal
  - 2 - pairs rubber gloves
  - 1 - pair chemical goggles
  - 5 - disposal bags
  - 1 - waterproof flashlight

- 2 shovels

- 2 rakes

- 2 waterproof flashlights

Rolls of absorbent matting are also available near all fuel storage and dispensing areas to clean up small spills.

Appendix B - Nunavut Spill Report Forms

NUNAVUT SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

ᓄᓇᕗᑦ ᑯᐃᓴᓄᑦ ᐅᓂᒃᑳᖅ (ᐅᖃᓗᐊᓂᐃᑦ, ᓴᓇᓪᓕᖅ, ᐊᑦᑕᕐᓇᖅᑐᑦ, ᐃᓕᓴᕐᓂᐃᑦ ᐅᑉᐹᓪᓕᖅ ᐊᓗᓚᖅᑐᑦ)

24-Hour Report Line 24-ᓄᑦ ᐃᒃᖃᓄᑦ ᐅᓂᒃᑲᐃᐅᔪᓐᓇᖅᑐᖅ ᐅᖃᓕᑦ

Phone/ᐅᖃᓕᐅᑦ **(867) 920-8130**

Fax/ᓱᒃᑐᒃᓴᑦ **(867) 873-6924**

A Report Date and Time ᐅᑉᓗᖅ ᓯᖓᖏᓚᑦᓗᓂ ᖃᓄᐃᓕᐊᖅᑎᑦᓗᒍ ᐅᓂᒃᑲᐅᑎᒋᐊᕐᓂᖅ	**B** Date and Time of Spill(if known) ᐅᑉᓗᖓ ᑯᐃᑎᑦᓗᒍ ᖃᓄᐃᓕᐊᖅᑎᑦᓗᒍᓗᒍ (ᖃᐅᔨᒪᓕᐅᕐᕕᑦ)	**C** ☐ Original Report ᓯᓚᑦᓂᖅᓯᒥ ᐅᓂᒃᑲᐅᓯᐅᔪᖅ ☐ Update No. _____ ᓂᒃᑲᐅᓯᐅᒃᖃᓂᖅᓯᖓ ᓇᓴᐅᑦ	Spill Number ᑯᐃᓚᑦ ᓇᓴᐅᑦ

D Location and Map Coordinates (if known) and Direction (if moving) ᓇᓂ ᑯᐃᓛᓇ ᐊᓇᓐᓚᐅᑦ ᓇᓴᐅᓪᓗᑎᑦ (ᖃᐅᔨᒪᓕᐅᕐᕕᑦ) ᐊᒻᒪᓗ ᓇᒧᓐᖓᐅᓪᓚᕐᓂᐊᓪᓚᖓᑦ (ᐃᖅᑲᖏᕐᕕᑦ)

E Party Responsible for Spill (Full Name and Address) ᑭᒃᑯᑦ ᑯᐃᑎᑦᑎᐊᓪᓚᑦ (ᐃᑎᑦ ᐊᒻᒪᓗ ᑐᕌᑎᖓ)

F Product(s) Spilled and Estimated Quantities(provide metric volumes/weights if possible) ᑭᓱᑦ ᑭᓱᓪᓗᓐᓂᑦ ᑯᐃᓚᑦ ᖃᓄᑎᓗ ᐊᖏᔪᖃᖅᓯᑦ (ᐊᖏᔪᖓ ᐅᑭᖏᑦᔪᖏᓪᓗᓐᓂᑦ ᐊᓯᓐᓇᖏᑦᑐᑦ)

G Cause of Spill ᑭᓱ ᑯᐃᐸᓯᑕᐅᓚᑦ

H Is Spill Terminated? ᑯᐃᔪᖅ ᓄᖅᖃᑕᐅᓚᑦ? ☐ Yes/ᐃ ☐ No/ᐊᒃᑲ	**I** If Spill is Continuing, Give Estimated Rate ᓯᓚ ᑯᐃᐸᑦ ᖃᓄᑎᑎ ᓯᑲᑲᑎᑎᖃᖅᑲᓐᓂᖅ	**J** Is Further Spillage Possible? ᑯᐃᐸᒃᖃᓗᐃᓪᓕᐅᑭᖃᖅᑐᑦ? ☐ Yes/ᐃ ☐ No/ᐊᒃᑲ	**K** Extent of Contaminated Area (in square metres if possible) ᖃᓄᖅ ᐊᖏᑎᑎᓚᓐ ᑯᐃᓴᐃᐅᔪᖅ (ᐅᐸᑐᖅᓯᒪᓗᒍ ᐊᐅᖏᓐᓇᖏᑦᑐᑦ)

L Factors Affecting Spill or Recovery(weather conditions, terrain, snow cover, etc.) ᑭᓱᑦ ᐱᐅᓯᑕᐅᓚᑦ ᑯᐃᐊᒍᑦ ᐅᑦᓓ ᐊᑲᑭᑕᐅᓕᓯᑎᓪᓗᒍ (ᓯᓚ ᖃᓄᐃᓕᓐᓂᓕᖅᓂᑦ, ᓄᓇ ᖃᓄᐃᓕᓐᓂᓕᖅᓂᑦ ᐊᐅᓵᐅᓯᒪᓕᖅᓂᑦ, ᐊᓯᖏᓪᓕᐅᕐᓂᖅᓂᑦ) .	**M** Containment (natural depression, dykes, etc.) ᐅᖃᓗᐊᓂᖃᖅᐸᑦ ᑭᓕᐊᓱᑦ ᐃᓯᖏᓐᓂᓯᓯᒪᔪᖅ (ᓄᓇᒥ ᐃᓯᖏᓐᓇᐃᑦ, ᐊᓯᖏᓐᓇᓕᐅᕐᓂᖅᓂᑦ)

N Action, if any, taken or Proposed to Contain, Recover, Clean Up or Dispose of Product(s) and Contaminated Materials
ᖃᓄᐃᓕᓴᐅᑉ, ᖃᓄᐃᓕᓴᐅᑎᑦᑕᖅᓯᑦ ᐅᑦᑐᓂ ᖃᓄᐃᓕᓴᐅᑎᑦᑕᖅᓯᑦ ᐊᑕᐅᓯᐱᑎᑕᐅᓚᓐᓂᒃ, ᓄᖅᖃᑎᑕᐅᓚᓐᓂᒃ, ᓴᓇᒪᓂᖏᑕᐅᑉ ᐅᑦᑐᓂ ᐃᑎᑕᐅᓂᐊᖅᓯᑦ ᐊᒻᒪᓗ (ᑯᐃᓚᑦᓗᓂᑦ) ᐊᒻᒪᓗ ᑯᐃᓴᐃᐅᔪᖅ.

O Do You Require Assistance? ᐃᑲᔪᖅᑕᐅᔨᓂᐊᖅᖃᖅᑐᑦ? ☐ No ᐊᒃᑲ ☐ Yes, describe: ᐃ, ᓇᓗᓇᐃᔨᔪᓗ	**P** Possible Hazards to Persons, Property or Environment e.g. fire, drinking water, fish or wildlife ᐊᑦᑕᓪᓗᐃᓪᓕᓇᖅᖃᖅᑐᑦ ᐃᓇᓐᓄᑦ, ᐱᖁᑎᑎᕈᑐᕐᓇᑦ ᐅᑦᑐᓂ ᐊᐊᑎᒻᒥ ᓄᑦᓂ - ᐃᑭᓪᓗᓄ, ᐃᒥᓪᒻᒥ ᓂᐅᖅᖃᖅᑕᐅᓄᑦᔪᑦᓗᓄ, ᐃᖅᓗᓯᓇᑦ ᐅᑦᑐᓂ ᓂᓪᔨᑎᓇᑦ

Q Comments and/or Recommendations ᐅᖅᐳᓴᓚᐃᑦ ᐊᒻᒪᓗ ᐅᑦᑐᓄᓪᓚᑦ ᖃᓄᐃᓕᑎᓪᓚᖅᓱᐅᓯᑦ

FOR SPILL LINE USE ONLY
ᐊᑐᖅᑕᐅᔪᓚᖅ ᑯᐃᓯᓇᑦ ᐅᖅᖃᓪᓚᕆᐊᖅᑕᕐᔪᓂᓂᐊᖅ

Lead Agency
ᐃᖅᖃᓇᐃᒃᖅᑐᓂᓪᓚᕆᔨᑦ ᑯᐃᔪᒥᒃ ᑲᒪᒋᔭᖅᖅᑐᑦ

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Spill Significance ᑯᐃᓴᑦ ᖃᓄᐃᓕᓐᓂᓐᖓ

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Lead Agency Contact and Time
ᐃᖅᖃᓇᐃᒃᖅᑐᓂᓪᓚᕆᔨᑦ ᑯᐃᔪᒥᒃ ᑲᒪᒋᔭᖅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖓ ᐊᒻᒪᓗ ᖁᔭᓕᐊᖅᑎᑦᓗᒍ

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Is this file now closed?
ᑕᑉᓇ ᐅᓂᒃᑳᓕᐅᔪᖅ ᒪᑐᐅᕐᓂᖅ? .....

Reported By ᐅᓂᒃᖅᑐᖅ	Position, Employer, Location ᖃᓄᐃᑐᒥᒃ ᐃᖅᖃᓇᐃᒃᖅᓂᒃ, ᐃᖅᖃᓇᐃᒃᖅᖁᔭᖓ, ᓇᓗ	Telephone ᐅᖃᓕᐅᑉ
Reported To ᐅᓂᐊᐅᔪᖅ	Position, Employer, Location ᖃᓄᐃᑐᒥᒃ ᐃᖅᖃᓇᐃᒃᖅᓂᒃ, ᐃᖅᖃᓇᐃᒃᖅᖁᑦᓖ, ᓇᓂ	Telephone ᐅᖃᓕᐅᑉ