GROUP PROJECTS

April 25, 2001

Mr. Philippe di Pizzo
Executive Director
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0E 1J0

Dear Mr. di Pizzo:

This letter is in reference to NWB License No. NWB2MEL0103, which was issued on March 2, 2001 to WMC International Ltd. for the Meliadine Lake Project.

Attached in duplicate are the Environmental Management and Fuel Spill Contingency Plans requested in Part G: item 2. These were put together in 1998 and have been reviewed annually by Mr. Ben Hubert to reflect changes in operation and / or technology. To date these reviews have indicated that no revision of the 1998 plans is necessary.

An Abandonment and Restoration Plan is currently being prepared and will be sent to your office within the six (6) month period of issuance of License No. NWB2MEL0103.

Your comments and questions are always welcome. Please do not hesitate to call either myself, Stuart Deveau or Joe Campbell at the WMC International Ltd. office at 613-727-3937 or Ben Hubert at 403-256-0017.

Sincerely,

Alan J. Sexton
Site Manager – Meliadine West Gold Project

cc. J. Campbell, B. Hubert, S. Deveau, K. Steeves, A. Burdon
Attachments: Fuel Spill Contingency Plan
Environmental Management System

WMC International Limited
Group Projects
Wesmeg

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A member of the WMC Limited group of companies

FUEL SPILL CONTINGENCY PLAN

I. INTRODUCTION

PURPOSE

This Transportation Spill Contingency Plan is designed to promote environmental awareness and safety, as well as facilitate the efficient cleanup of spills as the result of transportation incidents while in transit between Rankin Inlet and the WMC International Ltd. exploration site at Meliadine Lake involving the following substances:

- P-50 Diesel
- Jet A turbo fuel
- Hydraulic Oil
- Lube Oil
- Waste Oil
- Propane
- other materials hazardous to the safety of personnel and the environment

Principal objectives of the Spill Contingency Plan are:

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

SCOPE

This Plan addresses the organization of the WMC International Ltd. Meliadine West Gold 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 WMC International Ltd, WMC contractors, local government agencies, and the NWT Power Corporation in Rankin Inlet. Emergency response equipment is listed that is available immediately (should a spill occur) from local freighting contractors, such as M & T Enterprises and the NWT Power Corporation in Rankin Inlet.

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

- Appendix A contains summaries of physical / chemical properties and emergency response measures for hydrocarbon substances to be transported to the Meliadine exploration camp.
- Appendix B contains an up-to-date inventory of spill response equipment and kits available at various locations.
- Appendix C contains risk assessment and preventative measures.
- Appendix D contains NWT Spill Report Forms that are to be used to report spills.
- Appendix E contains a fuel storage monitoring plan.
- Appendix F contains fuel handling and fuel spill response training course outlines.

This Transportation Spill Contingency Plan is a companion to the WMC International Ltd. Exploration Division Draft Environmental Management System dated February, 1998.

WMC will be contracting out the delivery of fuel and lubricants to the exploration site. The contractors will be trained for spill response and have spill kits that complement this Transportation Spill Contingency Plan. In the event of a spill the contractor is expected to implement a spill response immediately with WMC's plan serving as a back-up.

WMC International Ltd. Statement of Environmental Policy

The Company is committed to achieving compatibility between economic development and the maintenance of the environment. It therefore seeks to ensure that throughout all phases of its activities, WMC personnel and contractors give proper consideration to the care of the flora, fauna, air, land and water, and to the community health and heritage which may be affected by these activities. To fulfill this commitment, the Company will observe all environmental laws, and, consistent with the principles of sustainable development, will:

- Progressively establish and maintain company-wide environmental standards for our operations throughout the world.
- Integrate environmental factors into planning and operating decisions and processes.
- Assess the potential environmental effects of our activities and regularly monitor and audit our environmental performance.
- Continually improve our environmental performance, including reducing the effect of emissions, developing opportunities for recycling, and more efficiently using energy, water, and other resources.
- Rehabilitate the environment affected by our activities.
- Conserve important populations of flora and fauna that may be affected by our activities.
- Promote environmental awareness among Company personnel and contractors to increase understanding of environmental matters.

Site Description

The winter transportation route for the WMC International Ltd. Meliadine West Gold Project begins at Rankin Inlet and ends at the exploration site (Figure 1;). The route includes a short distance of municipal road, sea ice on Hudson Bay, tundra and freshwater ice belonging to the Kivalliq Inuit Association and the lake ice of Meliadine Lake under federal jurisdiction. The Project Site is located at latitude 63 01 30 ' N latitude and 92 10 20' West longitude. The haul route distance from Rankin Inlet to the Meliadine Project exploration camp is 28 km.

RANKIN INLET CLIMATE PROFILE

Month	Mean Temp. (deg. C)	Mean Hourly Wind Speed (km/h)*	Blowing snow (days/mo)*	Mean Total Precip. (mm)
January	-32.2	24	16	6.9
February	-30.3	23	12	6.7
March	-25.6	22	13	14.1
April	-16.6	21	8	15.5
May	-6.7	20	4	17.9
June	. 3.4	18	-	34.1
July	. 9.7	21	-	39.9
August	. 9.0	24	-	59.5
September	. 3.0	26	-	48.0
October	-5.6	25	6	34.9
November	-18.5	23	12	22.1
December	-27.9	22	13	8.6

* wind direction is predominantly from the northwest

Data source: Canadian Climate Data, Environment Canada
Period of record: 1981 - 1993

WEATHER FORECASTS

In the event of a spill, current weather conditions can be obtained at the exploration camp from the camp manager or the project geologist on duty:

Phone 1 867 645 3308

Local weather forecast information is available by contacting the Rankin Inlet Flight Services Centre:

Phone 1 867 645 2773

and the Environment Canada Weather Forecast Centre:

Phone 1 900 565 5555

Meliadine Lake

Little Meliadine Lake

Meliadine River

Rankin Inlet

Hudson Bay

N

W E

S

0 5 km

Scale 1 : 85 000

LEGEND

- Existing exploration camp
- Existing road to Little Meliadine Lake
- Municipal quarry
- Current winter road

WMC International Limited
Group Projects - Wesmeg

MELIADINE PROJECT

Figure 1: General Location Map

Original sketch from: R.L.&L. Environmental Services Ltd.

II. SPILL RESPONSE ACTION PLAN

1. SPILL RESPONSE SEQUENCE

REPORT ALL SPILLS TO:

Exploration camp camp manager	Ph./Fax 867 645 3308
Senior project geologist on site	Ph./Fax 867 645 3308

The reporting requirement applies to all spills: on land, on water and on ice.

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 described below must be made by the first observer of the spill or the observer's superior immediately upon the spill being under control, or on failure to gain control of the situation.

2. ALERT WMC Personnel:

SPILL OBSERVER
- → IMMEDIATE SUPERVISOR or Meliadine Camp manager
  - → WMC Meliadine Project Manager
  - → Contractors (clean up)
  - → On-Scene spill response coordinator
  - → WMC Environmental Coordinator

3. NOTIFY AGENCIES:

24 HOUR NWT SPILL REPORT LINE	PHONE	1 867 920 8130
	FAX	1 867 873 6924
KIVALLIQ INUIT ASSOCIATION		1 867 645 2810
DIAND - Rankin Inlet		1 867 645 2831
Iqaluit		1 867 979 4405
Environment Canada - Yellowknife		1 867 920 6060
Fisheries and Oceans Canada		1 867 645 2871
GNWT DRWED - Rankin Inlet		1 867 645 5067
EMO - Rankin Inlet		1 867 645 5042; (645 3789 after work hours)

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 NWT 24-hour spill report line without delay.

INITIAL SPILL RESPONSE PRIORITIES

SAFETY FIRST

I. RESPOND QUICKLY

1 Identify the spilled material.
2 Ensure safety of yourself and others.
3 Shut off ignition sources - NO SMOKING.
4 Attend to Injured.
5 Assess the severity of the spill.
6 Call for assistance.
7 On-Scene Coordinator mobilizes Emergency Response Team.
8 Keep unnecessary people out of the area.
9 Wear impervious clothing, goggles, gloves.
10 Approach spill from upwind IF SAFE TO DO SO.
11 Stop product flow if possible.
12 Contain and recover spill as soon as possible.

II. RESPOND SAFELY

1 Do not contain gasoline or av gas if vapours might ignite.
2 Allow gasoline or av gas spills to evaporate.
3 See Appendix A - Product Guides for further information.

III. OBTAIN AND REPORT SPILL DETAILS

NWT Spill Report Forms are in Appendix D of this spill contingency and response plan.

DIESEL - P 50 - SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

- 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 sorbent 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 sorbent 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.

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.
- Burn only in localized areas, e.g., trenches, piles or windrows.
- 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 sorbent 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 (sorbent) booms.
- Do not use sorbent booms/pads in fast currents and turbulent water.

STORAGE / TRANSFER

- Store closed, labelled 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.

HYDRAULIC OIL SPILL RESPONSE ACTIONS
CONSIDER ACTION ONLY IF SAFETY PERMITS

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF HYDRAULIC 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Use ice augers and pump when feasible to recover oil under ice.
- Burning hydraulic oil will not likely be feasible.
- Mechanical removal (scraping) can be tried.

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.
- Minimize damage caused by equipment and excavation.
- Burning is not likely possible.

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

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

STORAGE / TRANSFER
- Store closed, labelled containers outside away from flammable items.
- Drums are likely to be used for containing collected hydraulic oil.

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

LUBE OIL SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF LUBE 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Burning is unlikely to be possible.
- Use ice augers and pump when feasible to recover oil under ice.

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.
- Burning is not likely to be possible.
- 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 sorbent pads to pick up contained oil.
- On larger spills, obtain and use skimmer on contained slicks.
- Do not deploy personnel and equipment on mudflats or wetlands.
- Remove contained oil with sorbent pads and/or skimmer.

RIVERS & STREAMS

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

STORAGE / TRANSFER

- Store closed, labelled 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 SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF WASTE 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Burning is unlikely to be possible.
- Use ice augers and pump when feasible to recover oil under ice.

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.
- Burning is not likely to be possible.
- 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 sorbent pads to pick up contained oil.
- On larger spills, obtain and use skimmer on contained slicks.
- Do not deploy personnel and equipment on mudflats or wetlands.
- Remove contained oil with sorbent pads and/or skimmer.

RIVERS & STREAMS

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

STORAGE / TRANSFER

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

DISPOSAL

- Segregate waste types
- Place contaminated materials into marked containers.
- Whenever possible suitable waste oils collected at the site will be disposed of by incineration.
- Consult camp manager on disposal procedures.

GASOLINE SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

GASOLINE FORMS VAPOURS THAT CAN IGNITE AND EXPLODE

NO SMOKING

- 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 sorbents.
- 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 sorbents.

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.
- Burn CAREFULLY only in localized areas, e.g., trenches, piles or windrows.
- 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, labelled 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.

JET A (AVIATION FUEL) SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

AV GAS FORMS VAPOURS THAT CAN IGNITE AND EXPLODE

NO SMOKING

- ELIMINATE IGNITION SOURCES
- STOP SOURCE OF JET A 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 sorbents.
- 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 sorbents.

ON MUSKEG
- Remove pooled av gas 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.
- Burn CAREFULLY only in localized areas, e.g., trenches, piles or windrows .
- 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, labelled 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 procedures.

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 in Appendix A 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 RESPONSE ACTIONS

GAS STORED IN CYLINDERS THAT EXPLODE WHEN IGNITED!

CONSIDER ACTION ONLY Y IF SAFETY PERMITS

KEEP ALL VEHICLES INCLUDING SNOWMOBILES AWAY FROM ACCIDENT AREA

Refer to Product Guide in Appendix A 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.

III. SPILL RESPONSE CONTACTS

WMC International Ltd., Meliadine Project

TITLE	NAME	OFFICE	FAX
On-Scene Coordinators			
Logistics	Jim Bernard	1613 727 3937	1 613 727 3970
Safety	Kirk Steeves	1613 727 3937	1 613 727 3970
Spill Cleanup Supervisors			
District Geologist	Alan Sexton	1613 727 3937	1 613 727 3970
Project Study Manager	Joe Campbell	1613 727 3937	1 613 727 3970
Environmental Coordinator	Ben Hubert	1 403 256 0017	1403 256 1228
	Residence	1 403 256 7114	1403 256 1228
CONTRACTORS			
M & T Enterprises Ltd.		1 867 645 2778	1 867 645 2590
Y & C Enterprises Ltd.		1 867 645 2546	1 867 645 2490
OTHERS			
NWT Power Corp.	Trevor Weir	1 867 645 5300	1 867 645 2487

EXTERNAL CONTACTS

CONTACT THE FOLLOWING NUMBER IMMEDIATELY:

1. GOVERNMENT 24-HOUR SPILL REPORT LINE	PH. (867) 920-8130 FAX (867) 873-6924

OTHER CONTACTS:	PHONE
KIVALLIQ INUIT ASSOCIATION - LAND MANAGEMENT	
Tongola Sandy - land use administrator/manager	1 867 645 2810
Ryan St. John - land use inspector	1 867 645 2810
GNWT	
EMO	1 867 645 5042 (645 3789 after working hours)
Harvey Gaukel, Hazardous Substance Specialist	
Environmental Protection Division	1867 873 7654
Department of Resources, Wildlife and Economic Development (DRWED)	
GOVERNMENT OF CANADA	
RCMP - Rankin Inlet	1 867 645 2822
DIAND - Rankin Inlet - Henry Kablalik	1 867 645 2831
Environmental Protection, Environment Canada	1 867 920 6060
Magnus Bourque, Hazardous Materials Officer	1 867 669 4729
Dave Tilden, Hazardous Materials Specialist	1 867 669 4728
Mgr, Fisheries & Oceans, Robert Luke - Rankin Inlet	1 867 645 2871
Gary Weber - Iqaluit	1 867 979 6274

LOCAL TRANSPORTATION

Helicopters			
CUSTOM HELICOPTERS	Staff House	1 867 645 3885	
	Hanger	1 867 645 3939	
Air Lines - Scheduled			
NWT Air - Dispatch		1 867 873 8021	
CalmAir		1 867 645 2900	
Bombardier			
Joe Kaludjak		1 867 645 2639	
Kowmuk's Taxi		1 867 645 3034	
Neighbouring Sites			
NWT Power Corp.- Rankin Inlet		1 867 645 5300	

EQUIPMENT SUPPLIERS

Frontier Mining - Yellowknife	1 867 920 7617	spill kits & various sorbents
Acklands - Yellowknife	1 867 873 4100	spill kits and various sorbents
Dupont -	1 613 348 3616	emergency response centre for personnel and material
Chemtrec	1 800 424 9300	Chemical Transportation Response Centre for personnel and material

IV. DUTIES AND RESPONSIBILITIES

The roles and responsibilities of WMC personnel, contractors, and Government are described on the following pages.

WMC and CONTRACTOR PERSONNEL

Spill Observer - anyone on haul route or at fuel cache at any time

- Assess the initial severity of the spill and safety concerns.
- Report all spills to Melaidine Camp manager immediately.
- Determine the source of the spill and stop or contain it, if possible.
- Participate in spill response as member of cleanup crew.

On-Scene Coordinator (OSC) - WMC Meliadine Camp Manager

- Immediately reports the spill to NWT 24-Hour Spill Report Line at (403) 920-8130.
- Records the time of the report, source of information and details on location, size, type of spill as well as any other information available on the spill report form.
- Oversees the cleanup operation until it is satisfactorily completed.
- Together with the Spill Cleanup Supervisor, decides if additional equipment is required to contain and clean up spills.
- Notifies government agencies, WMC Site Manager, Project Manager and Environmental Coordinator on spill details.
- Oversees completion and distribution of Spill Report. Ensures investigation identifies measures to prevent similar spills in future.
- Ensures Response Team is adequately trained in spill response.
- Organises training courses for spill response teams.

Spill Clean Up Supervisors

- Supervise spill cleanup crew.
- Assist in initial and ongoing response efforts.
- With work crew, take initial action to seal off the source and contain spill.
- Continue actions until relieved or supplemented by other Supervisor.
- Decide with On-Scene Coordinator if mobilization of additional equipment from Spill Response Organization or Contractor is warranted.
- Assess whether burning is a viable clean up measure; consult with regulatory authorities at spill site.

Spill Cleanup Crew (Emergency Response Team)

- conduct cleanup of spills under direction of Spill Cleanup Supervisor(s).
- Deploy booms, sorbents and other equipment and materials as required.
- Take appropriate response measures.
- Continue cleanup as directed by Spill Cleanup Supervisor until relieved.

Project Manager, Melaidine West Gold Project

- Responsible for all communication with the media.
- Ensures that all press releases are accurate and in accordance with company policy.
- Makes financial decisions on major expenses during large spill response.
- Initiates Mutual Aid Agreements if proper response requires outside assistance.

Environmental Coordinator

- Provides cleanup advice to the On-Scene Coordinator and Spill Cleanup Supervisor.
- Assists the Project Manager in the preparation of press releases.
- Develops safe and effective spill management and prevention practices.
- Provides advice to the Spill Cleanup Supervisor of storage and disposal options.
- Updates and distributes Contingency Plan.
- Ensures that there is follow up reports prepared on the spill event, clean up and environmental impacts.

Legal Counsel

- Advises the Project Manager and Environmental Coordinator 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 the Project Manager on matters related to insurance.

WMC Board of Directors

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

EXTERNAL RESOURCES

WMC Fuel Haul Contractors

- Ensure that their best effort is made to maintain spill equipment which shall be available and be applied to a spill incident on site when required.
- Initiates cleanup in the absence of WMC personnel, however caused.
- Reports all spills immediately to the WMC On-Scene Coordinator (OSC).
- Responsible for the training of their personnel on spill response.
- Develops and maintains company specific contingency plans for the WMC Meliadine West Gold Project which conforms to this WMC Spill Contingency Plan and related policies.

Environmental Consultants

- Provide advice to WMC on spill response strategies, counter measure technologies, impact assessments and post spill monitoring and site rehabilitation.

Neighbouring Operations

- Supply spill response equipment, materials and manpower, as required, when requested to do so.

EXTERNAL RESOURCES - Kivalliq Inuit Association and Nunavut Water Board

KIA

The WMC International Ltd. Melaidine West Gold exploration program is carried out on Inuit Owned Land administered and managed by the KIA. It has issued land use permits to WMC for the exploration activities. Inspectors from KIA routinely inspect land use sites for compliance to terms and conditions of permits. While KIA receives data from spills reported to the NWT Spill Line, it is expected that all spills on Inuit Owned Land be reported directly to KIA. The same form as used for the Spill Line may be used for reporting to KIA.

Nunavut Water Board

The Nunavut Water Board issues water licences under the Nunavut Land Claims Agreement. Conditions of the water licence usually include the authorized limits of water use, sources of water use, effluent discharge limits, monitoring and reporting requirements. As well, licenses are expected to require that Spill Contingency Plans be submitted for approval. Enforcement of the provisions of the water licence is carried out by Inspectors from the Water Resources Division (Department of Indian and Northern Affairs). Periodic inspections are conducted by water licence inspectors.

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 (403-920-8130). 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.

Inspection of WMC project activities located on Crown Land by Resource Management Officers is conducted periodically.

Environment Canada (EC)

The Environmental Protection and Conservation 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.

Government of Northwest Territories (GNWT) Department of Resources, Wildlife and Economic Development (DRWED)

The Environmental Protection Division of the DRWED is responsible for the Environmental Protection Act (EPA). Under this legislation, Spill Contingency Planning and Reporting Regulations for the NWT have been issued which requires:

a) a contingency plan be prepared and filed for facilities where petroleum, chemicals and other contaminants are stored; and
b) to report spills of contaminants in excess of specified quantities.

The EPA does not apply to any person who is authorized under a Federal or Territorial licence or permit. Since WMC operates under permits from both KIA, DIAND and the Nunavut Water Board, GNWT DRWED has jurisdiction limited to the transportation route outside KIA lands.

Inspectors appointed under the EPA can issue clean up orders for spills and other environmental incidents occurring on public lands in Nunavut.

Worker's Compensation Board (WCB)

The Prevention Division of the WCB is now responsible for the Mine Health and Safety Act and Regulations. WMC , in response to this legislation established a Emergency Response Team who have a major role in spill response events as well as other type of emergencies.

GNWT Department of Transportation

The Department of Transportation, Motor Vehicles Division, is responsible for administering the Transportation of Dangerous Goods Act and Regulations (NWT). The Department is also responsible for driver, vehicle and load safety under additional transport legislation.

GNWT Department of Safety and Public Services

This Department enforces compliance with technical safety legislation. Under the Work Site Hazardous Materials Information System (WHMIS) WMC is required to comply with material safety data sheets (MSDS) which outline specific storage and handling requirements of industrial materials that have a risk to worker health and the environment.

V. REFERENCES

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.

ACKNOWLEDGMENTS

WMC International Ltd. gratefully acknowledges the use of the BHP Diamonds Inc. Transportation Spill Contingency Plan which was used as the model and template in developing this plan for the Meliadine West Gold Project. The generosity of BHP Diamonds Inc. in providing their document is greatly appreciated.

APPENDIX A

PRODUCT GUIDES

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

- flammable immiscible liquids
- flammable compressed gases

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.

Flammable Immiscible Liquids	
Gasoline	Low Flash Point (burns easily)
Jet A	
Turbo B	
Diesel Fuel	
Waste Oil	
Lube Oil	High Flash Point

DIESEL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, yellow or red	FLASH POINT:	40 C (minimum)
ODOUR:	Petroleum	POUR POINT:	-50 to -6 C
SOLUBILITY:	Insoluble	VISCOSITY:	Not viscous
VAPOUR DENSITY:	Will sink to ground levels	SPECIFIC GRAVITY:	Floats on water (0.8 - 0.9)

SAFETY MEASURES

WARNINGS

- Vapours are heavier than air and form easily at high temperatures.
- Empty containers can contain explosive vapours.
- Toxic gases form upon combustion.
- 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, Viton and PVC are suitable materials (**DO NOT USE NATURAL RUBBER or NEOPRENE.**)
- 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, ozones, 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.

DIESEL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- **ELIMINATE IGNITION SOURCES.**
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

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

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- **Get prompt medical attention.**

HYDRAULIC OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Straw-yellow liquid	FLASHPOINT:	215 C
ODOUR:	Petroleum	POUR POINT:	-25 C
SOLUBILITY:	Generally insoluble	VISCOSITY:	Medium(265cSt @ 15 C)
VAPOUR DENSITY:	Few vapours emitted	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, nose, throat and lungs.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton are suitable materials **(DO NOT USE NATURAL RUBBER)**.
- 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, ozones, 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 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

HYDRAULIC OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER
- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes/marinas.

STORAGE & TRANSFER
- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL
- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

LUBE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Amber liquid
FLASHPOINT: 190 to 220 C
ODOUR: Petroleum
POUR POINT: -35 to -400 C
SOLUBILITY: Generally insoluble
VISCOSITY: Medium(255cSt @15 C)
VAPOUR DENSITY: Few vapours emitted
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, nose, throat and lungs.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile, PVC and Viton are suitable materials. (**DO NOT USE NATURAL RUBBER**.)
- 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, ozones, 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 lube 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.

LUBE OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with sorbent and/or peat moss.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER
- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER
- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL
- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

WASTE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Black to brown liquid	FLASHPOINT:	100 to 200
ODOUR:	Petroleum	POUR POINT:	-30 to -400
SOLUBILITY:	Generally insoluble	VISCOSITY:	Medium (200 - 300 cSt)
VAPOUR DENSITY:	Few vapours emitted	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.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile, PVC and Viton are suitable materials (**DO NOT USE NATURAL RUBBER.**)
- 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, ozones, 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 lube 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

WASTE OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

GASOLINE

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless liquid (can be dyed)	FLASH POINT:	-50 C
ODOUR:	Gasoline/Petroleum	FREEZING PT:	-60 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, Viton and PVC are suitable materials (**DO NOT USE NATURAL RUBBER or NEOPRENE.**)
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA, if circumstances warrant.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozones, 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.

GASOLINE
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Cover pools with foam to prevent vapour evolution if gasoline presents a fire hazard; otherwise allow vapours to dissipate.

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.**
- Protection booming can be considered for water intakes.

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

DISPOSAL
- Place contaminated materials into segregated marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

JET A
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White or pale yellow liquid
FLASH POINT: -20 to -250 C
ODOUR: Gasoline/Petroleum
FREEZING PT: -50 C
SOLUBILITY: Negligible
VISCOSITY: Not viscous (<7 cSt)
VAPOUR DENSITY: Will sink to ground levels
SPECIFIC GRAVITY: Floats on water (0.75 0.8)

SAFETY MEASURES

WARNINGS

- Vapours instantaneously form, 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 SCBA, if circumstances warrant.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, 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, AFFF foam or water fog.
- Use water to cool containers exposed to fire.

JET A
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- Block entry into waterways; do not flush into ditch/drain systems.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with sorbent or explosion-proof pump.
- Cover pools with foam to prevent vapour evolution if avgas presents a fire hazard; otherwise allow vapours to dissipate.

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **Contain or remove spills ONLY AFTER VAPOURS DISSIPATE.**
- Protection booming can be considered for water intakes.
- Recover slicks using skimmer and sorbent, if volumes warrant.

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

DISPOSAL
- Place contaminated materials in segregated, marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.

- Get prompt medical attention.

PROPANE
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless gas	FLASH POINT:	-104 C
ODOUR:	Natural gas odour	FREEZING PT:	-190 C
SOLUBILITY:	Insoluble	VISCOSITY:	n/a
VAPOUR DENSITY:	Will sink to ground levels	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, ozones, 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.

PROPANE
RESPONSE TO GAS RELEASES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS**

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.**

STORAGE & TRANSFER
- It is not possible to collect released material.

DISPOSAL
- Consult with environmental authorities if the disposal of any contaminated materials is required.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

ACETYLENE
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

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

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, ozones, 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.

ACETYLENE
RESPONSE TO GAS RELEASES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE RELEASES**

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE RELEASES**

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

DISPOSAL
- Consult with environmental authorities if the disposal of any contaminated materials is required.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform CPR if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

APPENDIX B

RESPONSE EQUIPMENT INVENTORY

RESPONSE EQUIPMENT INVENTORY

During the exploration phase of the project, spills occurring along the transportation route will be remedied by the appropriate personnel depending on the party responsible for the spill, the location of the spill, and the extend of the environmental threat. Larger spills will involve the coordination of WMC International personnel (including the Emergency Response Team), contractors, and WMC Mutual Aid Partners. For the purposes of listing response equipment, the equipment will be listed by contractor and site.

Mobile Equipment

Mobile equipment owned by **Y & C Enterprises** located in Rankin Inlet that can be used for spill countermeasures include:

- 1 740 Champion grader
- 1 backhoe
- 1 BW 75 compactor
- 1 tractor and end dump
- 1 Cat 950 loader
- 1 Cat 966 loader
- 1 Cat 966 loader
- 1 Cat D3 dozer
- 1 Cat D5 dozer
- 1 Cat D6E dozer
- 1 Cat D6D dozer
- 1 Cat D8K dozer
- 9 tandem dump trucks

1 5000 gal. skid mounted storage tank
1 trash pump

Mutual Aid Partners

In the event of a major spill requiring additional resources, equipment and manpower will be made available through mutual aid agreements with the Canadian Coast Guard, the Hamlet of Rankin Inlet and the NWT Power Corporation.

Canadian Coast Guard (CCG) - Rankin Inlet Inventory

Material from the CCG inventory at Rankin INLET is available on a cost recovery basis and will be
made available on request to the GNWT EMO representative who will be billed by CCG for material consumed and who will then bill WMC accordingly.

1500' X 24"	oil containment boom
6	boom towing devices
6	5/8" tow lines X 100' c/w snap hooks
6	anchoring devices
6	Danforth anchors (22 lbs)
6	3/8" X 75' trip lines
6	trip line marker buoys type mb40
8	bales disposable boom (8" X 10' X 4 lengths per bale)
9	bales sorbent pads (18" X 18" X 3/8" X 100 pads)
10	sorbent rolls (36" X 150' X 3/8")
5	boxes of oil snare
2	1000 gal. portatanks
1	Spate pump
2	lengths 3" oil resistant suction hose - 50' each.
2	lengths oil resistant discharge hose - 50" each.
1	TDS-118 light medium oil skimmer c/w diesel power pack
1	spare parts kit for TDS-118 skimmer
1	4Kva diesel generator
1	16' aluminum boat
1	25 hp outboard motor
2	3000 psi portable high pressure washer
2	sets portable lights (each set has 3 X 500 watt halogen lamps, spare bulbs, 100" ext. cord and carrying case)
2	coils 1/4" polypropylene rope (1200')
2	coils ½" polypropylene rope (600')
2	coils 5/8" polypropylene rope (600')
72	pair disposable coveralls
120	pair work gloves
12	hard hat liners
40	dust / mist disposable masks
40	pairs assorted rain gear
20	pair safety glasses
20	safety vests

20	pair sunglasses
2	20' steel ISO containers
1	tool box

Canadian Coast Guard
Hamlet of Rankin Inlet
NWT Power Corporation

APPENDIX C

RISK ASSESSMENT & PREVENTATIVE MEASURES

RISK ASSESSMENT & PREVENTATIVE MEASURES

The purpose of Risk Assessment and preventative Measures for the Transportation Contingency Plan is to identify potential problems, suggest preventative measures to minimize the possibility of a mishap, and outline contingency plans in place to deal with the mishap once it has occurred. A summary table is provided on the next page.

The number of accidents and resulting fuel spills will vary depending on a number of factors: human error, mechanical failure, road conditions, weather conditions, etc. Over the past 10 years, the number of truck spills on winter roads supplying mines has decreased (personnel communication with Regulatory Agencies & Trucking Contractors). This seems to be as a result, in large part, to posting and enforcing speed limits, and increased experience and training of drivers.

A mishap that could occur with the transportation of fuel and supplies can be separated into one of the following:

- A delta goes through the ice - leaking
- A delta goes through the ice - not leaking
- A delta is upset on land or ice - leaking
- A delta is upset on land or ice - not leaking

A delta going through the ice and leaking is expected to be rare event.

Generally, the prevention of mishaps (potential problems) are the same and can be grouped together, as in the table on the next page.

Table C - 1 Risk Assessment, Preventative Measures, and Contingency Plans

Potential Problem	Preventative Measure	Contingency Plan
Delta Mishap - general	Y & C is expected to enforce a safe operating code for all delta operators delivering fuel to the Strict rules of the road are enforced: no drinking is allowed on or around the transportation route, Drivers should be required to complete checklists and document all matters that require servicing & repair; mechanics should carry out the work as appropriate	Driver knows what to do: 1. The major freight carriers should have a contingency plan, For example Y & C Enterprises Ltd. 2. WMC will provide each vehicle that will haul fuel with a copy of this contingency plan. 3. Each driver should have a roll of plastic, shovel, and knife in order to contain small spills. Clear lines of communication: 1. Depending on the severity of the to ensure safety spill, notification follows the Transportation Spill Response Organization with the appropriate personnel contacted - External and Internal Response team know what do to: 1. Freight carriers have to demonstrate to WMC adequate spill response experience & training 2. WMC Emergency Response Team receives training as new members are added Approvals are obtained to burn spilled and recovered fuels at previously selected disposal sites - usually borrow pits.

APPENDIX D

SPILL REPORT FORMS

APPENDIX E : FUEL STORAGE MONITORING PLAN

The fuel storage monitoring plan will consist of the following daily and weekly inspections conducted by WMC personnal that have been trained in the use of fuel pumping equipment and fuel spill response.

The following inspections will be conducted and recorded on a daily basis:

1) All tanks, lines, pumps, hoses, valves and fittings will be inspected for leaks or damage.
2) Ensure proper fuel only is diepensed into the correct tanks and barrrels for use in the camp and associated exploration work.
3) Ensure that the "No Smoking" signs posted in the area of the fuel tanks are always clearly visible.
4) Ensure that all personnel on site abide by the "No Smoking" rule within the distances outlined in the regulations for fuel tanks.
5) Ensure all spill response equipment and PPE is clearly visible and easily accessed.

The following inspections will be conducted and recorded on a weekly basis:

1) Fuel levels in all primary tanks checked and compared against the fuel dispensed from each primary tank for each week.
2) Outer tanks checked for fuel leakage from the pimary tank.
3) Spill response equipment checked.
4) PPE checked.

APPENDIX F : FUEL HANDLING AND FUEL SPILL REPONSE TRAINING COURSE OUTLINES

AM SAFETY INSTITUTE LIMITED
"WORKPLACE SAFETY"
Occupational Health and Safety
Management, Consulting and Training

OIL SPILL TRAINING

Module 1 Introduction

Module 2 Federal and Provincial Regulations
(a) Introduction to WHMIS and its regulations
(b) Introduction to T.D.G. and its regulations

Module 3 Hazard Assessment and Controls
(a) Rankin Storage Facility
I. Tanks
II. Lines
III. Pumps- what type - safety precautions
IV. Hoses - fittings - leaks - damage - clean

(b) Transfer - Loading NO SMOKING
I. Mobile Unit - empty - choked - airvent/valve open - no leaks
II. Hoses - Static electricity
III. Valves - open before pumping
IV. Fixed containment
V. Portable containment
VI. Spill Kit - proper size - available
VII. Fire Extinguisher - correct type - large enough - full
VIII. Personal Protective Equipment - as per regulations
IX. TDG labels and documentation
X. What happens to the product in the hose after disconnecting ???

(c) In Transit
I. Valves - shut and locked
II. Vents - shut and locked
III. Portable Spill kit
IV. Portable Fire Extinguisher - correct type - large enough - full

(d) Fuel Transfer - Unloading - NO SMOKING
I. Mobile Unit - chocked - un-movable
II. Valves - unlocked and open before pumping
III. Vents - unlocked and open before pumping
IV. Fuel unloading - static electricity
V. Fixed containment
VI. Check load will go into assigned tank
VII. Check load will go into CORRECT tank
VIII. PPE
IX. Portable containment

Phone: 902-468-6232 110 Thorne Avenue *Fax: 902-468-6765*
Dartmouth, N.S. B3B 1Y5

(e) Fixed Tanks
- I. Hoses and Lines - leaks - damage
- II. Pump - type - leaks
- III. Spill Kit

Module 4 Spill Cleanup

(a) Safety Overview
- I. Site Orientation
- II. General safety guidelines
- III. Buddy system
- IV. Universal hand signals

(b) Characteristics of Petroleum Products
- I. General hazards of petroleum products
- II. MSDS's
- III. Properties of petroleum
- IV. Petroleum vapours
- V. Controlled sites
- VI. Confined spaces
- VII. Systems of exposure
- VIII. Hydrogen sulphide
- IX. Exposure to petroleum products
- X. Inhalation
- XI. Aspirations
- XII. Ingestion
- XIII. Skin contact
- XIV. Warming fires
- XV. Smoking
- XVI. Lighters and matches
- XVII. Electronic equipment

(c) Personal Protective Equipment
- I. Types of PPE
- II. Decontamination and inspection

(d) Working Environment
- I. Common injury causes
- II. Shoreline terrain
- III. Poor weather conditions
- IV. Hypothermia
- V. Heat exhaustion
- VI. Heatstroke
- VII. Noise exposure
- VIII. Wildlife
- IX. Drugs, alcohol and unauthorized firearms

(e) Equipment and Transportation
- I. Helicopters and fixed wing craft
- II. Boat and water operations
- III. Equipment transportation
- IV. Hand tools
- V. Hand tolls basic Do's and Don'ts
- VI. Rakes
- VII. Shovels
- VIII. Collection bags
- IX. Machetes and axes
- X. Peaveys
- XI. Pitch forks

Module 5 Transportation of Dangerous Goods
(a) Refresher

Course Outline (TDG)

Objectives

Upon completion of this course, you will:

- **know your responsibilities as a carrier**
- **recognize labels and placards**
- **use the Driver's Handbook as a reference manual**
- **use a checklist before accepting dangerous goods**
- **have a list of products showing the shipping name, classification and PIN**
- **meet the training requirements of TDG**

Content

Introduction
- background and purpose of the Regulations
- training and certification
- enforcement
- definitions
- shipper's and carrier's responsibilities

Classification
- 9 classes of dangerous goods
- divisions, packing groups, subsidiary classifications
- reference list of common products

Packaging
- Packaging Standards
- Re-Packaging after spill or leak

Safety Marks
- location, replacement, removal
- labels and markings
- placards and panels

Documentation
- information required on shipping document
- location and distribution
- "empty" containers
- waste manifest

Dangerous Occurrences
- definition of "dangerous occurrence"
- responsibilities for reporting

Special Requirements
- inter-modal and trans-border shipments
- consumer commodities and limited quantities – exemptions, permits, and amendments
- explosives, radioactives and PCBs

Dangerous Goods Examples

	Shipping Name	Class	Compatibility Group	U.N.#
Class 1	Flares, surface	1.1	G	0418

	Shipping Name	Class	P.I.N	Packing Group
Class 2	Butane	2.1	UN1011	
	Nitrogen	2.2	UN1066	
	Cyanogen, gas	2.3 (2.1)	UN1026	
	Ammonia, anhydrous, liquefied	2.4 (9.2)	UN1005	
Class 3	Gasoline	3	UN1203	II
	Methanol	3 (6.1)	UN1230	II
	Turpentine	3	UN1299	III
Class 4	Magnesium	4.1	UN1869	III
	Potassium sulphide	4.2	UN1382	II
	Calcium carbide	4.3 (9.2)	UN1402	II
Class 5	Ammonium nitrate fertilizers	5.1	UN2067	III
	Organic peroxide, type B, liquid	5.2 E	UN3101	II
Class 6	Potassium cyanide	6.1 (9.2)	UN1680	I
	Infectious substances, affecting humans	6.2	UN2814	
Class 7	Radioactive material, excepted package, instruments	7	UN2910	
Class 8	Sodium hydroxide, solid *or* Caustic Soda, solid	8 (9.2)	UN1823	II
Class 9	White asbestos	9.1	UN2590	III
	Aluminum sulphate, solid	9.2	NA9078	III

Revised March 1994

ENVIRONMENTAL MANAGEMENT SYSTEM

EXPLORATION FIELD OPERATIONS

ENVIRONMENTAL MANAGEMENT SYSTEM

MELIADINE WEST GOLD PROJECT

EXPLORATION DIVISION
WMC INTERNATIONAL LIMITED - AMERICAS
FEBRUARY, 1998

1 of 2

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1. WMC INTERNATIONAL LIMITED STATEMENT OF ENVIRONMENTAL POLICY

The Company is committed to achieving compatibility between economic development and the maintenance of the environment. It therefore seeks to ensure that throughout all phases of its activities, WMC personnel and contractors give proper consideration to the care of the flora, fauna, air, land and water, and to the community health and heritage which may be affected by these activities. To fulfill this commitment, the Company will observe all environmental laws, and, consistent with the principles of sustainable development, will:

- Progressively establish and maintain company-wide environmental standards for our operations throughout the world.
- Integrate environmental factors into planning and operating decisions and processes.
- Assess the potential environmental effects of our activities and regularly monitor and audit out environmental performance.
- Continually improve our environmental performance, including reducing the effect of emissions, developing opportunities for recycling, and more efficiently using energy, water, and other resources.
- Rehabilitate the environment affected by our activities.
- Conserve important populations of flora and fauna that may be affected by our activities.
- Promote environmental awareness among Company personnel and contractors to increase understanding of environmental matters.

2. INTRODUCTION

This EMS focuses on those exploration activities that pose a direct risk to the environment. It is proposed as a generic EMS that bears on the basic operational elements of a mineral exploration program from the earliest stage (background research) through to a production feasibility study, but does not include a test mine.

The various stages of mineral exploration represent varying degrees of risk to the environment. The environmental management system (EMS) that follows is patterned on the ISO 14000 model. This EMS is based in the WMC International Ltd. environmental policy; it identifies legal obligations that must be met; it identifies operational aspects that have the potential to put the environment at risk; it identifies actions required for reducing impact and assigns responsibility for action required for effective implementation; it establishes a framework for records management; it identifies measures that if implemented will ensure continuous improvement in reducing and eliminating environmental impact from land use activities required for mineral exploration.

2.1 GUIDING PRINCIPLE

Mineral exploration activities will be conducted in a manner that will not result in long term terrain disturbance and /or changes to water quality in the watersheds where the exploration and related land use activities are conducted.

2.2 KEY DEFINITIONS

Environment - surroundings in which the exploration program operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.

Environmental aspect - the elements of the exploration program's activities, operations or services that does or can potentially interact with the environment.

Environmental impact - any change to the environment, whether adverse or beneficially, fully or partially resulting from the exploration program's activities, operations or services.

Environmental management system (EMS) - that part of the overall management system that includes organization structure, planning activities, responsibilities, practises, procedures, processes, and resources for developing, implementing, achieving, reviewing and maintaining the WMC International Ltd. environmental policy.

Exploration - all those land use (including water) activities that are required to find and define minerals in their natural state.

Long term - is defined as follows in an ecosystem specific context:

desert and tundra ecosystems -	25 years
temperate grassland and forest -	10 years
rainforest ecosystems -	5 years

2.3 APPLICATION

It is the responsibly of every regional manager to ensure that all persons responsible for field activities are knowledgeable of the scope and intent of this EMS. The activities of every WMC International Ltd. exploration program shall be conducted in compliance with this EMS, including the actions of contractors and sub-contractors. A copy of the completed project specific EMS is to be available at the exploration site along with the project's safety and emergency procedures manual.

3. PRELIMINARY PROFILE OF EXPLORATION PROJECT ENVIRONMENT

Upon taking a land position for exploration purposes the site(s) to be included in the exploration program shall be described and documented as required in the Exploration Lands Environmental Profile. In a joint venture where WMC is taking responsibility for an ongoing exploration program, it may be necessary to complete this data set and perform an environmental audit before closing a deal. The information required to complete this data set shall be assembled before WMC establishes a physical presence on the land. It shall be reviewed and updated annually.

Responsibility: lands manager, project geologist, environmental coordinator with the lands manager taking lead responsibility.

Record depository: lands file (HQ), project file (HQ) and field office project EMS file.

3.1 REGULATORY CONSIDERATIONS

The appropriate obligations register shall be appended to every project specific EMS.

A log shall be established that identifies all the licences and permits required for the exploration program and all related activities. This log shall specify the name of the permit, the name of the issuing agency, the expiry date of the permit, and the date that an application for a renewal or replacement should be submitted.

Responsibility: lands manager and project geologist with lands manager taking lead responsibility

Record depository: project lands file at HQ and in field copy of project EMS.

3.2 PROPERTY / PROJECT NAME Meliadine West Gold Project

Date: Form completion 19 January, 1998
Follow-up review

by Ben Hubert;
relationship to project Coordinator, Environment and Community Relations (consultant)

3.3 PROPERTY LOCATION

Country Canada, **Province / State** Nunavut,

County / Township n/a, **lat/long** 63 01 30N X 92 10 20W

NTS / mapping ref. 55N/1 and 55K/16 (1:50,000)

3.4 REGULATORY

Enumerate statutes, their mandates and requirements; see also obligations register for your jurisdiction.

Nunavut regulatory regime

Nunavut Land Claims Agreement

A new territory of Nunavut will be created on April 1, 1999 which will effectively divide the Northwest Territories into two separate jurisdictions with Nunavut in the Eastern Arctic and the Northwest Territories in the Western Arctic. Nunavut will be created as a result of the Nunavut Land Claims Agreement ("NLCA"). The aims of the NLCA are to bring certainty to ownership and use of land and resources, ensure participation by the Inuit in decisions effecting utilization and conservation of land, water and resources, confirm Inuit wildlife and harvesting rights, provide financial compensation and economic development opportunities for the Inuit, and encourage self reliance and promote cultural and well being of the Inuit. Under the NLCA some of the land within Nunavut is subject to rules and regulations relating to environmental management of such land. Such management is effected through "co-management institutions" established under the NLCA. These institutions are made up of equal numbers of members appointed by the Minister of the Department of Indian and Northern Affairs, upon nomination by Inuit and other members appointed at the government's discretion. Note that federal implementing legislation in respect of these institutions has not yet been enacted.

Nunavut Planning Commission

The NPC has broad responsibility for planning policies and objectives for Nunavut, for the establishment of land use plans for the territory, and for determining whether project proposals conform to those plans. To date no land use plans have been fully approved. The NPC also has a monitoring function in respect of the ecosystemic and socioeconomic environment in Nunavut.

Nunavut Impact Review Board

NIRB has responsibility for development impact and screens all project proposals in Nunavut whether they are on crown lands or on Inuit Owned Lands ("IOLs"). NIRB is authorized to recommend a public review by a NIRB review panel or a federal environmental panel of these proposals if it considers that they are likely to have a significant environmental or socioeconomic impact or cause significant public concern in Nunavut. Upon completion of the review process, NIRB will issue a project certificate which may contain terms and conditions. NIRB does not have a mandate for setting requirements for socioeconomic benefits.

Nunavut Water Board

The NWB has responsibility for water management and reviews and approves all water uses and disposal of waste in water in Nunavut. The NWB is required to hold a public hearing before approving an application for water use unless no public concern is expressed in connection with

the application.

Nunavut Wildlife Management Board

The NWMB has responsibility for wildlife management. It is responsible for approving Conservation Areas, endangered species, advising NPC about planning for wildlife management zones and advising other agencies regarding mitigation measures and compensation for damage to wildlife habitat. However, it has no direct regulatory role *vis-a-vis* mining development. Under the NLCA, Inuit are entitled to access to leased lands for wildlife harvesting purposes.

Surface Rights Tribunal

SRT has responsibility for granting entry and access onto IOLs and for determining the amount and allocation of compensation to the surface title holder. It also has authority to determine compensation payable for wildlife compensation claims. It may hold hearings in connection with compensation.

The NLCA provides a process through which Inuit organizations can be designated to discharge specified duties. Nunavut Tungavik Inc. ("NTI") has authority for managing the subsurface rights on IOLs within Nunavut. Regional associations have authority for managing surface rights and granting land use permits.

Permits required for mineral exploration pursuant to the NLCA:

Land use

- permit required for all commercial activities on Inuit Owned Land; permit valid for two year period with provision for one year extension with new application required for continued activities.
- apply to Kivalliq Inuit Associations.

  Required performance: to meet the terms and conditions of permit.

Water

- all water use in Nunavut requires a license from Nunavut Water Board
  Required performance: to meet the terms and conditions of the license
  Any activity that may damage fish habitat should first obtain an authorization from the Federal Department of Fisheries and Oceans. This relates to land use that requires the drainage of lakes or the disturbance of lake and stream beds.

Air n/a
Permit required
Source
Required performance

Mine Development

The necessary permits and licences to construct and operate a mine will not be issued until

an Inuit Impact and Benefit Agreement (IIBA) is negotiated and agreed upon with the appropriate Designated Inuit Organisation (DIO) as required by Article 26 of the NLCA.

Other:

Federal Crown Land

- land use application to be submitted to Department of Indian Affairs and Northern Development (DIAND) in Yellowknife pursuant to the Territorial Land Act and Territorial Land Use Regulations.
- all applications for land use in Nunavut are screened for environmental effects by the Nunavut Impact Review Board; allow at least 6 weeks for review and processing applications.

Required performance: as per terms and conditions of permit

3.5 ENVIRONMENTAL SETTING

Climate - Rankin Inlet

Month	Mean Temp. (deg. C)	Mean Hourly Wind Speed (km/h)*	Blowing snow (days/mo)*	Mean Total Precip. (mm)
January	-32.2	24	16	6.9
February	-30.3	23	12	6.7
March	-25.6	22	13	14.1
April	-16.6	21	8	15.5
May	-6.7	20	4	17.9
June	3.4	18	-	34.1
July	9.7	21	-	39.9
August	9.0	24	-	59.5
September	3.0	26	-	48.0
October	-5.6	25	6	34.9
November	-18.5	23	12	22.1
December	-27.9	22	13	8.6

* Wind direction is predominantly from the northwest
Data source: Canadian Climate Data, Environment Canada, Rankin Inlet.
Period of record: 1981 - 1993

Prior land use

Has an environmental audit been completed - Y / N ; is one required - Y / N ?

> Note: An environmental audit shall be conducted on all lands that have had previous activities that had the potential to place basic environmental elements at risk. An environmental land use audit should include an examination of the exploration lands for compliance to current statutory requirements as well as WMC requirements as reflected by this EMS.

An audit of the camp and all land based drill sites in the exploration area was completed prior to WMC taking responsibility for these lands in June 1995. See report by Hubert and Associates Ltd. in Meliadine West Project file in headquarters.

Status of surface lands - unoccupied crown / occupied crown / **patented: ownership known** - **Y** / N.

These are Inuit Owned Lands pursuant to the Nunavut Land Claims Agreement between the Inuit of Nunavut and Her Majesty in right of Canada.

current land use: subsistence hunting, trapping and fishing, and recreation for residents of Rankin Inlet and Chesterfield Inlet

Land owner:	**Name**	Kivalliq Inuit Association
	Postal address	PO Box 340 Rankin Inlet, Nunavut X0C 0G0
	Ph.	867 645 2810
	Fax	867 645 2348
	E-mail	

Maps available

topographic Y / N
habitat type Y / N
forest type Y / N
land use Y / N
aerial photography Y / N / on file in WMC project office Y / N

Prior mineral exploration/mining activity - Y / N ; type - prospecting / exploration / mining;

Past impact- exploration: cut lines and clearings - Y / N; trenching - Y / N ; drilling - Y / N;
camps - Y / N **garbage dumps - Y / N**
mining: pits - Y / N **ramps - Y / N**
shafts - Y / N
tailings - Y / N: stable Y / N, vegetative cover _____%
waste rock dumps Y / N
placer operations Y / N
comment: The condition of Inuit Owned Land is in compliance with all applicable laws, regulations and related permits

Other land use activity

Forestry - current / past; cutting rights in place Y / N
Quarrying - current / past
Hunting - resident / tourism
Fishing - resident recreational / resident commercial / tourism
Trapping - current / past
Cottages - seasonal / year round
Snowmobile trails Y / N .
Other
Comment

Regional land / water use plan in place - Y / N / NA

Land use plan classification of exploration lands: no special classification assigned

Land management agency name:	Kivalliq Inuit Association, Rankin Inlet, Nunavut
contact name:	Tongola Sandy # 867 645 2810
title:	Chief Lands Officer

Public interest groups active locally - (list names with phone numbers if possible)

Conservation-naturalist

- World Wildlife Fund at the territorial level - no known local activities
- Canadian Arctic Resources Committee - no known local activities
- Community Land and Resources Committee - established by the Kivalliq Inuit Association to work with land manager to review land use applications for use of KIA lands; contact through KIA Land Office 867 645 2810.

Fish and game

- Hunters and Trappers Organisation - a designated Inuit Organisation under the NLCA concerned with renewable resources and land use; contact executive secretary 867 645 2350.
- Keewatin Wildlife Federation active at regional level; contact executive director 867 857 2695.
- Nunavut Wildlife Management Board created under land claim active at territorial level on wildlife management and habitat concerns; contact executive director 867 979 5007.
- Qaminirjuaq and Beverly Caribou Management Board active over the range of these two caribou herds including NWT, Manitoba and Saskatchewan provincial governments; contact executive secretary 613 733 2007.

Snowmobile club n/a

Outfitters n/a

Prospectors n/a

Chamber of Mines active at the territorial level; contact general manager 867 873 5891.

Chamber of Commerce n/a

Other _____

Is property within the range of, or in the habitat of an endangered species - Y / N ;
species _____

National historic sites - on / near property n/a
distance _____**km,**

Local heritage sites - on / near property **name:** Meliadine Territorial Park
distance 10 **km,**
Meliadine Territorial Park, managed by the Municipality of Rankin Inlet contains numerous prehistoric Inuit dwellings; several archaeological sites are documented in the records of the Archaeological Survey of Canada near Meliadine Lake NW of camp; others (Inukshuit) are known near Noble Lake.

WATERSHED ISSUES

3.6 WATER MANAGEMENT AGENCY NAME Nunavut Water Board

Contact name Phillipe diPizzo, Executive Director; # 867 360 6369

River basin name Meliadine River with an outflow into Peter Lake of the Diana River basin.

Part of a Heritage River system - Y / N ;

Is property within the basin of a municipal water source - Y / N .

Is water monitoring network in place Y / N ; for - quantity / quality

Sampling for water quality done by Comaplex in 1994 with baseline studies initiated by WMC in 1997; water balance studies for water flow initiated by WMC in 1997, Diana River has been monitored for annual flow since early 1980's.

Other active industries on watershed - specify indicating where in relation to property - upstream / downstream

Mineral exploration by Comaplex and Cumberland, including diamond drilling is underway on lands east of Meliadine West Gold Project, some of which may occur within the Meliadine Basin.

3.7 LOCAL INFRASTRUCTURE

Surface access to property - all season road Y / N - winter only / summer only
comment
aircraft access - float plane potential on property Y / N
helicopter clearing on property Y / N
comment helicopters and float planes are based in Rankin Inlet.

distance to rail n/a **km; port** 30 **km; airport** 25 **km**
comment: port can accommodate deep draft vessels up to 20,000 T.
airport can accommodate commercial jets.
Utilities - power - available - Y / N ; distance from property to line 25 **km**
telephone - available - Y / N ;

3.8 ABORIGINAL PEOPLES

This land area is covered by the Nunavut Land Claims Agreement (NLCA)

Is the land on an Indian Reserve? Y / N

Is this area under aboriginal treaty? Name /number n/a

Is this area under an aboriginal claim - Y / N ? Active negotiations underway Y / N ?

Aboriginal communities with land use interests:

Name: Ranm
-10
kin Inlet **Pop:** 2,135 in 1996
Contact: John Hickes, **Title:** Mayor.
867 645 2895
Name: Chesterfield Inlet **Pop:** 350 in 1996
Contact: Anthem Kadjuk, **Title:** Mayor
867 898 9969

Known sacred or archaeological sites on / near property - Y / N

Archaeological sites know to be along Meliadine Lake; remnants of numerous prehistoric dwellings within Meliadine Territorial Park along Melaidine River near its outflow to Hudson Bay; Inukshuit known to occur at height of land near Noble Lake, SE of Meliadine camp.

A traditional knowledge study is underway as part of the Meliadine West Project environmental baseline studies.

4. FIELD OPERATIONS

4.1 PROSPECTING AND STAKING

Prospecting expeditions should be undertaken only on the basis that no long term sign of prospecting activities would remain in the event that a land position were not taken.

4.1.1 Fuel caches

For prospecting expeditions requiring fuel to be placed in the prospecting area, cache sites shall be selected that are at least 10 m lateral and at least 1 m vertical from the nearest water body or water course.

All fuel and other materials cached shall be clearly labelled as to contents and the WMC person (including name, address and phone number) responsible.

All caches placed more than 30 days prior to planned use shall be inspected by a person independent of the party placing the cache. A report with photographs and map locations shall be provided the WMC person responsible for the prospecting expedition.

All empty fuel drums and related litter shall be removed on conclusion o f the expedition. If staking is to follow prospecting, fuel remaining shall be moved to a suitable location at least 30 m

from the nearest natural water body or water course. If no land position is taken, all remaining fuel shall be removed.

4.1.2 Sampling and staking

Biodegradable materials should be used to identify locations of collected samples.

Staking shall be conducted by the prescribed methods with materials as prescribed. In situations that allow discretion in the use of materials, native or biodegradable materials should be used to identify claim boundaries.

4.2 ACCESS

a. Access to the lands under exploration shall be achieved with as little disturbance to the natural environment as possible. Permanent infrastructure (ie prepared airstrips and roads) should not be developed in support of an exploration program. The time frames for rehabilitation for specific ecosystems should be used as a guide when planning access and logistics generally, for the exploration program. Surface access through water courses and riparian habitats is to be avoided.

   Aspect: land use

   Responsibility: Project geologist

b. The use of helicopter in servicing exploration camps and activities shall avoid passing over sites and areas occupied by a domestic or recreational domicile, or any worksite.

   Aspect: disturbance

   Responsibility: Camp manager and project geologist

c. Aircraft serving an exploration program shall maintain altitudes of 300 m when transiting over areas occupied by breeding/nesting waterfowl or concentrations of game animals.

   Aspect: disturbance

   Responsibility: Camp manager and project geologist

4.3 WATER QUALITY BASELINE

Samples to establish pre program water quality in the area of the exploration program shall be collected from water bodies and water courses on and / or downstream of the exploration activities **before** drilling activities are undertaken.

Aspect: land use

Responsibility: Project geologist and environmental coordinator

Record repository: Project's water quality baseline file.

4.4 FIELD CAMPS

4.4.1 Siting

a. All potential sites for camps and fuel caches shall be examined for the presence of cultural and / or archaeological remains of significance and where such are noted these should be examined by a professional before the site is disturbed or occupied by WMC.

Aspect: land use

Responsibility: project geologist and environmental coordinator.

Record depository: camp and HQ project land use file

b. Camps should be sited on elevated and well drained ground. Where soils are such that foot traffic between camp structures causes disturbance that may not self rehabilitate, walkways (board walks) should be laid down.

Aspect: land use

Responsibility: project geologist and health and safety coordinator or environmental coordinator.

4.4.2 Water supply

a. For camp locations where water quality is unknown, analyses for metals, organics, bacteria, and water borne parasites (where applicable) shall be completed and reviewed with local health officials or other competent professional, prior to deployment of field staff. Please refer to Appendix One for Canadian drinking water standards.

Aspect: potable water use

Responsibility: health and safety coordinator and / or camp manager.

Record depository: original in camp "Environmental Health" file; one copy in HQ Project Environmental Health file.

b. During camp operations and following temporary closure of the camp, potable water storage vessels and raw water sources should be checked regularly for harmful bacteria and water borne parasites.

Water samples for similar analyses shall be taken immediately upon gastro-intestinal complaints of camp residents.

Aspect: potable water use

Responsibility: camp manager

Record depository: camp Environmental Health file.

4.4.3 Sewage

a. Structures for ablution shall be either pit privies in suitable soils and where ground water conditions are such that there is no risk of contamination to the potable water source, or facilities that allow for approved disposal or incineration of accumulated excrement in combustible containment (ie Pacto).

Aspect: sewage disposal

Responsibility: camp manager

b. Grey water should be disposed into a primary treatment mechanism or sump suitably located to avoid risk of contamination of potable water source.

Aspect: sewage disposal

Responsibility: camp manager

4.4.4 Garbage

a. All camps should install incinerators for disposal of combustible garbage. Small camps (up to 15 persons) can use passive incinerators where fuel oil is added to the garbage and suspended (in a fuel drum) above an air source in a metal basket or grill work (see Appendix Two for sketch). All non combustibles should preferably be removed to a community or other approved disposal site, or alternatively where terrain conditions permit, buried below grade near the camp and covered with a minimum of 1 metre of local soil and/or granular material or as specified in permit terms and conditions of the local land use authority where these are more stringent.

Aspect: garbage and litter

Responsibility: camp manager

b. Kitchen refuse and other putrescible waste will be stored in scavenger proof containers, and at camps located within the ranges of bears incinerated daily.

Aspect: garbage

Responsibility: camp manager

c. Every effort will be taken to prevent scavengers from obtaining food at exploration camps and the deliberate feeding of wild carnivores (bears, foxes, wolves, weasels and other mustelids) is strictly prohibited.

Aspect: garbage

Responsibility: camp manager

d. Every building, shelter and work station in the camp will be equipped with a suitably sized metal garbage receptacles and ash trays where appropriate.

Aspect: garbage and litter

Responsibility: camp manager

e. There will be regular litter collection in the general area of the camp and equipment marshalling areas to gather and dispose accumulated and wind blown litter including cigarette butts.

Aspect: litter

Responsibility: camp manager

4.4.5 Hunting and fishing

a. All recreational fishing shall be conducted within the requirements of the law respecting licences and possession limits; it is strongly recommended that fishing be strictly recreational, that only barbless hooks be used, that all fish that could survive be released and a "catch and release" policy be adhered to by all camp occupants.

Aspect: natural fish populations

b. Firearms in camp shall be stored in secure space under the control of the camp manager and be used only for controlling nuisance wildlife. Hunting by exploration camp personnel while on a tour of duty while exploration activities are in progress shall be prohibited with no exceptions.

Aspect: wildlife and safety

Responsibility: camp manager and chief geologist

4.4.6 Power generation

a. Genset(s) should be in a shelter and set on a base that includes a structure or drip pan to contain drips, leaks and spills of fuel and lubricants.

Aspect: fuel spills

Responsibility: camp manager

b. All day tanks and temporary fuel storage vessels for the genets will be equipped with fluid level indicators and be set in or over drip pans that have the capacity to contain drips and leaks from the lines and pumps serving the genset.

Aspect: fuel spills

Responsibility: camp manager

4.5 FUEL AND LUBRICANTS

4.5.1 Spill Reporting

a. All fuel spills including those of contractors will be reported to appropriate land use authorities and internally to Manager, WMC International Ltd. Exploration Division - Americas (Appendix 3). In the absence of a prescribed form, the information reported should include that requested by the form shown in Appendix Three.

Aspect: fuel spills

Responsibility: camp manager and project manager

Record depository: camp fuel spills file and Project fuels spill file in HQ.

4.5.2 Fuel resupply and transport

a. All fuel shipments received will be logged as received and recorded as to method of on-site storage and location (ie. bulk tank # ____, or drum cache).

Aspect: fuel haul and storage

Responsibility: camp manager

Records depository: camp fuel delivery file

b. All drummed fuel received will be inspected for shipping damages prior to placing in cache with all dented drums set aside for immediate use. Bungs on all refilled drums (unsealed) will be checked for tightness prior to or immediately on placement in the fuel cache.

Aspect: fuel storage

Responsibility: camp manager

c. All conveyances transporting fuel in drums shall carry basic fuel spill clean-up equipment at all times; all conveyances transporting bulk fuel will be operated only by appropriately trained operators and carry basic fuel spill clean-up equipment at all times.

Aspect: fuel haul

Responsibility: health and safety coordinator and camp manager

d. All fuel haul contractors and their operators will receive and be briefed as to the requirements of the transportation and spill contingency plan - Appendix Four.

Aspect: fuel haul

Responsibility: health and safety coordinator and camp manager

4.5.3 Fuel Storage

a. All fuel storage sites shall be at least 30 metres from any natural water body or water course and be located in or above a natural depression or otherwise be prepared site to contain accidental spills and leaks.

b. No vessels larger than 205 L (1 barrel) may be used for long term fuel / lubricant storage without secondary containment provided.

c. Fuel caches for drummed fuel will be laid down in rows of two drums. drums will be set so that bungs are in the horizontal (quarter to 3) position with enough space between rows for walking and handling leaking drums.

d. Storage vessels larger than 205 L will be double walled (CSA or ULC approved) or will be placed on or in a containment structure with a volume equal to the volume of the vessel; or in the case of multiple vessels 150% of the largest vessel in the fuel dump.

Aspect: fuel storage

Responsibility: camp manager and health and safety coordinator or environmental coordinator

e. Every fuel storage vessel for each fuel type will be checked for leaks every day and a fuel cache check sheet completed (Appendix 3).

Aspect: fuel storage

Responsibility: camp manager

Record depository: camp fuel cache inspection file

f. All fuel storage vessels will be clearly marked as to contents.

Aspect: fuel storage

Responsibility: camp manager

g. All fuel types will be stored by type in separate locations.

Aspect: fuel storage

Responsibility: camp manager

h. All fuel storage sites will have a basic fuel spill and clean-up kit. (Please see Appendix Five for details.)

Aspect: spill response

Responsibility: camp manager

i. All fuel transfer sites will have designated vessels to receive fuel remaining in pumps and hoses as well as remnants from "empty" barrels and larger storage vessels. Fuels accumulated in these designated vessels will be used for incinerating camp garbage.

Aspect: fuel transfers

Responsibility: camp manager

j. All barrels will be completely empty of fuel prior to return or refill.

Aspect: fuel handling

Responsibility: camp manager

k. All tanks for stationary engines and heating devices will be equipped with shut off valves.

Aspect: fuel transfers

Responsibility: camp manager

l. All storage tanks for stationary engines or heating appliances will be equipped with fluid level indicators and be set into or over drip pans that have the capacity to contain leaks and spills from pumps and/or lines servicing the tank.

Aspect: fuel transfers

Responsibility: camp manager

m. All mobile equipment will be maintained and refuelled by procedures that prevent fuel and lubricant spills and leakage.

Aspect: fuel transfers

Responsibility: camp manager

n. All lubricants will be clearly marked with individual lubricant type stored together and clearly separate from other lubricant types. Lubricant storage to be in locations that will contain leakage from lubricant containers or be lined with absorbent matting for the same purpose.

Aspect: lube storage

Responsibility: camp manager

o. All used lubricants including those from contractors' equipment will be collected and disposed of by approved means where facilities are available and by dilution with incineration fuels where approved facilities are not available.

Aspect: used lube disposal

Responsible: camp manager

p. Prior to seasonal shutdown of exploration camps all main valves on fuel tanks will be closed. Valves on tanks larger than 205 L will be locked. Each barrel in the fuel cache will be checked for loose bungs. Partial barrels will be set up on a slant so melt water cannot seep through bung seals. Each of these activities are to be checked off on a "camp closure" check sheet.

Aspect: fuel storage

Responsibility: camp manager

Record depository: camp's "camp closure" file -See Appendix Six for a camp closure checklist.

4.6 CAMP REMOVAL AND RECLAMATION

4.6.1 Salvage

a. All equipment, structures and material that can be salvaged in a cost effective manner for subsequent use in company activities in the region or elsewhere shall be salvaged and placed into storage, with accurate inventory recorded, at a location approved for such use by the appropriate local land use authority.

Aspect: land use clean-up

Responsibility: Health and Safety Coordinator and the camp manager.

Records depository: HQ "project inventory control" files

b. All structures and material not cost effective for salvage for future company needs shall be offered "as is where is" to local contractors and suppliers who worked with the company in the course of the exploration program. All transfers of structures requiring removal or continued land tenure at the original site must have the prior formal approval of the appropriate land use authority.

Aspect: land use clean-up

Responsibility: Lands manager and / or Environmental Coordinator

Records depository: HQ "project land use" file.

c. All site "final" clean-up shall be undertaken only under "summer" conditions. All combustible scrap shall be burned and the ashes raked for removal of metal fasteners and other non-combustibles; all non-combustibles shall be removed to an approved disposal site or buried and covered with at least 1 metre of local soil or granular material on site on the formal approval of appropriate land use authorities.

Aspect: land use clean-up

Responsibility: Health and Safety Coordinator and / or Environmental Coordinator

Records depository: HQ "project land use" file.

d. on the completion of site clean-up all sites with terrain disturbance shall be contoured with local material as appropriate to prevent surface erosion or unnatural ponding; mulch and slow release fertilizer (as appropriate) shall be placed over the area of disturbance and adjacent vegetated areas. Photographs shall be taken and the site revisited (as appropriate) on the first, third and fifth anniversaries (with photographs taken) of the clean-up activities. If appropriate, more fertilizer should be applied as required. Sites that show only dead vegetation without terrain disturbance (under buildings) shall be fertilized.

Aspect: land use site rehabilitation

Responsibility: Environmental coordinator

Records depository: HQ project land use file.

4.7 MINERAL EXPLORATION FIELD WORK

4.7.1 Stakeholder / community relations

a. Prior to establishing field camps, the project geologist and environmental coordinator shall determine individuals and interests that may be directly affected by the exploration program and shall review with these parties the exploration details as these are known at the time as well as the WMC International Ltd. policies and practises that govern the manner by which exploration is executed. A record of the discussions is to be maintained that indicates the date, venue, person(s) and issues discussed.

   Aspect: stakeholder communications

   Responsibility: Project geologist and environmental coordinator

   Record depository: HQ project file; field stakeholder relations file.

4.7.2 Cultural and / or archaeological issues

a. The project geologist will be responsible for becoming knowledgeable on the signs of historical and prehistoric human occupation for the area of the project so that artifacts and cultural remains of significance can be identified during the course of the exploration program. Marshalling the available information shall be the responsibility of the environmental / community relations coordinator who may require an overview study of a professional in areas of high cultural and / or archaeological potential.

   Aspect: research and training

4.7.3 Sampling

a. To the extent possible, sampling and mapping shall be completed without the need to leave non-biodegradable materials in the natural environment. In cases where exotic materials are placed in the field to identify a location, such location shall be recorded for subsequent removal of all exotic materials unless such exotic materials are biodegradable.

   Aspect: prospecting

   Responsibility: project geologist

   Record depository: camp "field clean-up" file.

b. In circumstances that require digging and trenching, all disturbed materials shall be returned to the original point of source in a manner that prevents risk of damage or injury to persons and equipment that might travel over the site by ATV or other conveyance; and to prevent erosion of surface materials. Where appropriate, mulch and granular, slow release fertilizer should be applied to sites where significant disturbance to vegetation occurred.

Aspect: prospecting

Responsibility: project geologist

4.7.4 Gridding

a. To the extent possible, grids shall be established with a minimum, and wherever possible - without, the use of stakes and pickets. Where these materials are necessary their location shall be recorded for subsequent clean-up as agreed upon with the land management agency and/or other parties with a direct interest in the exploration lands.

   Aspect: geological mapping

   Responsibility: project geologist

   Record depository: camp "field clean-up" file.

4.7.5 Drilling

The details of this EMS pertaining to drilling shall be obligatory for drilling contractors as appropriate.

a. The natural environment in the vicinity of a drill site is not to be treated as an ash tray or garbage can. Every drill shall be equipped with ash trays and garbage receptacles and prior to release of the drilling contractor's obligations, all litter and garbage is to be removed from the drill site with only a collar at ground level, collar ID and cuttings being the acceptable surface sign of a completed drill site.

   Aspect: drilling

   Responsibility: (contractor's) drilling supervisor and project geologist.

   Record depository: drill site inspection form

Drilling - from land

b. All drill sites shall be confined to an area as small as possible within the limits dictated by safety and efficiency. All set up configuration in relation to water bodies and water courses shall be reviewed in advance, especially with respect to placement of fuel tanks and draining of drilling fluids.

   Aspect: drilling

   Responsibility: drilling supervisor and project geologist

c. All drilling operations will have on hand the basic fuel / lubricant clean-up kit.

Aspect: drilling

Responsibility: drilling supervisor and project geologist.

d. No fuel storage or handling vessels greater that 25 L capacity at a drill site shall be within 10 m of a natural water body or water course.

Aspect: drilling

Responsibility: drilling supervisor and project geologist.

e. Water pumps shall be placed in trays or on platforms lined with absorbent matting placed under the motor and pump assembly to capture all fuel and lubricant spills and leaks. (This applies equally to both summer and winter setups including setups on ice platforms.)

Aspect: pumping

Responsibility: drilling supervisor and project geologist.

f. Exploration activities that require terrain alteration like diamond drilling will contain the area of disturbance to a minimum and on removal of rigs will apply granular, slow release fertiliser and where necessary mulch to enhance revegetation of the area and the cuttings. Reseeding is not recommended unless the seed to be used has been collected locally or is a seed mixture approved by local land use authorities for the purpose and the area. (See Appendix Seven for rehabilitation procedures and drill site inspection and rehabilitation check sheet).

Aspect: drill site rehabilitation

Responsibility: drilling superintendent and project geologist

g. The drainage from a drill site will be trained or dyked (with sand bags if necessary) to prevent suspended solids and sediments from entering directly any nearby water body or natural water course.

Aspect: drilling

Responsibility: drilling superintendent and project geologist.

Drilling over water

h. When drilling from a floating platform (including ice), the platform will be covered with absorbent matting where ever required to catch fuel and lubricant drips and leaks; all drilling fluids will be recirculated and solids collected for on land disposal at a location approved by

local land use authorities.

Aspect: drilling

Responsibility: drilling superintendent and project geologist

4.7.6 Core storage

a. All core will be set up on a firm and level base that can serve as long term storage as required. Wherever possible core storage should be arranged in a north / south orientation to allow sunshine into the alleys and so promote melting, drying and overall plant growth.

Aspect: land use - core storage

Responsibility: project geologist

b. On camp shut down and permanent abandonment the core racks will be secured for long term stability and boarded up with plywood or prepared for long term storage as required by the land use permit if more stringent conditions apply.

Aspect: land use - core storage

Responsibility: project geologist

4.7.7 Rock chemistry

a. Where an exploration project shows high potential for production and progresses to a prefeasibility study, rock samples of every major rock type in the mineral deposit shall analysed for acid / base generation and neutralisation potential.

Aspect: rock chemistry baseline research

Responsibility: project geologist

Record depository: HQ rock quality and base line data files

5. **SUMMARY** (for internal use only) **Date:** January 27, 1998

Action (including estimates of time and money) required by WMC to bring lands to compliance with:

current regulatory obligations
none
WMC exploration EMS requirements
review fuel handling and storage procedures and make changes accordingly

major environmental issues of public concern *(please be specific):

public / private / commercial land use
none have emerged in community meetings to date; economic opportunities from activities on Inuit Owned Land will be a challenge for negotiating an IIBA.
public / private / commercial / municipal water use
fish habitat will become an issue if lakes are to be drained or dedicated to tailings disposal.
conservation
none have emerged during community meetings and no major issues are expected.
transportation and related infrastructure
an all weather road will be required to cross Inuit Owned Land, including a bridge over the Meliadine River, the cheapest route would be the current road trail to the river which passes through a Territorial Park.
wilderness
no issues have emerged to date and none are expected.
wildlife
no issues have emerged to date and none are expected.
fish
some habitat loss should be expected.
aboriginal land claim
all lands and waters affected by the Meliadine West Gold Project are subject to the provisions of the NLCA.
aboriginal land use
an issue that will be addressed in the course of negotiating an IIBA.

Are the interests of the aboriginal communities in harmony or in conflict with each other?
No competing interests have been noted during community consultations to date.

Overall Assessment
There are no show stoppers in this project given diligence in matters of environmental protection effort and community participation in economic benefits.

* **major problem** is defined as a problem that could delay approval of a project, despite the best technical and public relations effort by WMC in preparing for the project's environmental and regulatory review.

APPENDICES

Appendix One: Canadian Drinking Water Standards

Appendix One:

Canadian Drinking Water Standards:
Summary of Guidelines for Chemical & Physical Parameters

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
aldicarb + metabolites	0.009		
aldrin + dieldrin	0.0007		
arsenic		0.025	
atrazine + metabolites		0.005	
azinphos-methyl	0.02		
barium	1.0		
bendiocarb	0.04		
benzene	0.005		
benzo[a]pyrene	0.000 01		
boron		5	
bromoxynil		0.005	
cadmium	0.005		
carbaryl	0.09		
carbofuran	0.09		
carbon tetrachloride	0.005		
chloramines	3.0		
chloride			≤250
chlorpyrifos	0.09		
chromium	0.05		
colour			≤15 TCU[2]
copper[3]			≤1.0
cyanazine		0.01	
cyanide	0.2		

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
diazinon	0.02		
dicamba	0.12		
dichlorobenzene, 1,2-	0.20		≤0.003
dichlorobenzene, 1,4-	0.005		≤0.001
dichloroethane, 1,2-		0.005	
dichloroethylene, 1,1-	0.014		
dichloromethane	0.05		
dichlorophenol, 2,4-	0.9		≤0.0003
dichlorophenoxyacetic acid, 2,4- (2,4-D)		0.1	
diclofop-methyl	0.009		
dimethoate		0.02	
dinoseb	0.01		
diquat	0.07		
diuron	0.15		
ethylbenzene			≤0.0024
fluoride	1.5		
glyphosate		0.28	
iron			≤0.3
lead[3]	0.010		
malathion	0.19		
manganese			≤0.05
mercury	0.001		
methoxychlor	0.9		
metolachlor		0.05	
metribuzin	0.08		
monochlorobenzene	0.08		≤0.03

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
nitrate	45[4]		
nitrilotriacetic acid (NTA)	0.4		
odour			Inoffensive
paraquat (as dichloride)		0.01[5]	
parathion	0.05		
pentachlorophenol	0.06		≤0.030
pH			6.5-8.5[6]
phorate	0.002		
picloram		0.19	
selenium	0.01		
simazine		0.01	
sodium			≤200
sulphate			≤500
sulphide (as H_2S)			≤0.05
taste			Inoffensive
temperature			≤15°C
terbufos		0.001	
tetracholoroethylene	0.03		
tetrachlorophenol, 2,3,4,6-	0.1		≤0.001
toluene			≤0.024
total dissolved solids (TDS)			≤500
trichloroethylene	0.05		
trichlorophenol, 2,4,6-	0.005		≤0.002
trifluralin		0.045	
trihalomethanes (total)		0.1	
turbidity	1 NTU[7]		≤5 NTU[3,7]

Parameter	MAC (mg/L)	IMAC (mg/L)	AO (mg/L)
uranium	0.1		
vinyl chloride	0.002		
xylenes (total)			≤0.3
zinc[3]			≤5.0

Notes:

1. Summary paragraphs for all the parameters in this table may be found in Section 4.6 of Source document.
2. TCU = true colour unit.
3. At the point of consumption.
4. Equivalent to 10 mgn as nitrate-nitrogen.
5. Equivalent to 0.007 mg/L for paraquat ion.
6. No units.
7. NTU = nephelometric turbidity unit.

MAC	maximum allowable concentrations
IMAC	interim maximum allowable concentrations
AO	aesthetic objective

Source: Health Canada, 1996. Guidelines for Canadian Drinking Water Quality. Sixth Edition. 90 pp.

Appendix Two: Field Incinerator Design

drawing for simple incinerator to be added

Appendix Three: Fuel Storage Monitoring and Fuel Spill Reporting Form

FUEL STORAGE MONITORING PLAN

The fuel storage monitoring plan will consist of the following daily and weekly inspections conducted by WMC personnel that have been trained in the use of fuel pumping equipment and fuel spill response.

The following inspections will be conducted and recorded on a daily basis:

1. All tanks, lines, pumps, hoses, valves and fittings will be inspected for leaks or damage.
2. Ensure proper fuel only is dispensed into the correct tanks and barrels for use in the camp and associated exploration work.
3. Ensure that the "No Smoking" signs posted in the area of the fuel tanks are always clearly visible.
4. Ensure that all personnel on site abide by the "No Smoking" rule within the distances outlined in the regulations for fuel tanks.
5. Ensure all spill response equipment and PPE is clearly visible and easily accessed.

The following inspections will be conducted and recorded on a weekly basis:

1. Fuel levels in all primary tanks checked and compared against the fuel dispensed from each primary tank for each week.
2. Outer tanks checked for fuel leakage from the primary tank.
3. Spill response equipment checked.
4. PPE checked.

WMC LOSS CONTROL FUEL SPILL REPORTING FORM

(INTERNAL USE ONLY)

Non-Compliance Category:

Location:

Summary of Non-Compliance:

Law/Regulation Breached:

Status:

Progress on Resolving the Issue:

Expenditure:

Anticipated Compliance Date:

Officer(s) Responsible:

Appendix Four: Fuel Management Contingency Plan

FUEL TRANSPORT CONTINGENCY PLAN

WMC INTERNATIONAL LIMITED

MELIADINE WEST PROJECT

I. INTRODUCTION

PURPOSE

This Transportation Spill Contingency Plan is designed to promote environmental awareness and safety, as well as facilitate the efficient cleanup of spills as the result of transportation incidents while in transit between Rankin Inlet and the WMC International Ltd. exploration site at Meliadine Lake involving the following substances:

- P-50 Diesel
- Jet A turbo fuel
- Hydraulic Oil
- Lube Oil
- Waste Oil
- Propane
- other materials hazardous to the safety of personnel and the environment

Principal objectives of the Spill Contingency Plan are:

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

SCOPE

This Plan addresses the organization of the WMC International Ltd. Meliadine West Gold 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 WMC International Ltd, WMC contractors, local government agencies, and the NWT Power Corporation in Rankin Inlet. Emergency response equipment is listed that is available immediately (should a spill occur) from local freighting contractors, such as M & T Enterprises and the NWT Power Corporation in Rankin Inlet.

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

- Appendix A contains summaries of physical / chemical properties and emergency response measures for hydrocarbon substances to be transported to the Meliadine exploration camp.
- Appendix B contains an up-to-date inventory of spill response equipment and kits available at various locations.
- Appendix C contains risk assessment and preventative measures.

- Appendix D contains NWT Spill Report Forms that are to be used to report spills.
- Appendix E contains a fuel storage monitoring plan.
- Appendix F contains fuel handling and fuel spill response training course outlines.

This Transportation Spill Contingency Plan is a companion to the WMC International Ltd. Exploration Division Draft Environmental Management System dated February, 1998.

WMC will be contracting out the delivery of fuel and lubricants to the exploration site. The contractors will be trained for spill response and have spill kits that complement this Transportation Spill Contingency Plan. In the event of a spill the contractor is expected to implement a spill response immediately with WMC's plan serving as a back-up.

WMC International Ltd. Statement of Environmental Policy

The Company is committed to achieving compatibility between economic development and the maintenance of the environment. It therefore seeks to ensure that throughout all phases of its activities, WMC personnel and contractors give proper consideration to the care of the flora, fauna, air, land and water, and to the community health and heritage which may be affected by these activities. To fulfill this commitment, the Company will observe all environmental laws, and, consistent with the principles of sustainable development, will:

- Progressively establish and maintain company-wide environmental standards for our operations throughout the world.
- Integrate environmental factors into planning and operating decisions and processes.
- Assess the potential environmental effects of our activities and regularly monitor and audit our environmental performance.
- Continually improve our environmental performance, including reducing the effect of emissions, developing opportunities for recycling, and more efficiently using energy, water, and other resources.
- Rehabilitate the environment affected by our activities.
- Conserve important populations of flora and fauna that may be affected by our activities.
- Promote environmental awareness among Company personnel and contractors to increase understanding of environmental matters.

SITE DESCRIPTION

The winter transportation route for the WMC International Ltd. Meliadine West Gold Project begins at Rankin Inlet and ends at the exploration site (Figure 1; Page 5). The route includes a short distance of municipal road, sea ice on Hudson Bay, tundra and freshwater ice belonging to the Kivalliq Inuit Association and the lake ice of Meliadine Lake under federal jurisdiction. The Project Site is located at latitude 63 01 30 ' N latitude and 92 10 20' West longitude. The haul route distance from Rankin Inlet to the Meliadine Project exploration camp is 28 km.

Figure 1
Site Map

SITE DESCRIPTION (continued)

Rankin Inlet Climate Profile

Month	Mean Temp. (deg. C)	Mean Hourly Wind Speed (km/h)*	Blowing snow (days/mo)*	Mean Total Precip. (mm)
January	-32.2	24	16	6.9
February	-30.3	23	12	6.7
March	-25.6	22	13	14.1
April	-16.6	21	8	15.5
May	-6.7	20	4	17.9
June	. 3.4	18	-	34.1
July	. 9.7	21	-	39.9
August	. 9.0	24	-	59.5
September	. 3.0	26	-	48.0
October	-5.6	25	6	34.9
November	-18.5	23	12	22.1
December	-27.9	22	13	8.6

* wind direction is predominantly from the northwest
Data source: Canadian Climate Data, Environment Canada
Period of record: 1981 - 1993

WEATHER FORECASTS

In the event of a spill, current weather conditions can be obtained at the exploration camp from the camp manager or the project geologist on duty:

Phone 1 867 645 3308

Local weather forecast information is available by contacting the Rankin Inlet Flight Services Centre:

Phone 1 867 645 2773

and the Environment Canada Weather Forecast Centre:

Phone 1 900 565 5555

II. SPILL RESPONSE ACTION PLAN

1. SPILL RESPONSE SEQUENCE

REPORT ALL SPILLS TO:

Exploration camp camp manager	**Ph./Fax 867 645 3308**
Senior project geologist on site	**Ph./Fax 867 645 3308**

The reporting requirement applies to all spills: on land, on water and on ice.

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 described below must be made by the first observer of the spill or the observer's superior immediately upon the spill being under control, or on failure to gain control of the situation.

2. ALERT WMC Personnel:

SPILL OBSERVER
- → IMMEDIATE SUPERVISOR or Meliadine Camp manager
  - → WMC Meliadine Project Manager
  - → Contractors (clean up)
  - → On-Scene spill response coordinator
  - → WMC Environmental Coordinator

3. NOTIFY AGENCIES:

24 HOUR NWT SPILL REPORT LINE	PHONE	**1 867 920 8130**
	FAX	**1 867 873 6924**
KIVALLIQ INUIT ASSOCIATION		**1 867 645 2810**
DIAND - Rankin Inlet		1 867 645 2831
Iqaluit		1 867 979 4405
Environment Canada - Yellowknife		1 867 920 6060
Fisheries and Oceans Canada		1 867 645 2871
GNWT DRWED - Rankin Inlet		1 867 645 5067
EMO - Rankin Inlet		**1 867 645 5042;**
		(645 3789 after work hours)

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 NWT 24-hour spill report line without delay.**

INITIAL SPILL RESPONSE PRIORITIES

SAFETY FIRST

I. RESPOND QUICKLY

1 Identify the spilled material.
2 Ensure safety of yourself and others.
3 Shut off ignition sources - NO SMOKING.
4 Attend to Injured.
5 Assess the severity of the spill.
6 Call for assistance.
7 On-Scene Coordinator mobilizes Emergency Response Team.
8 Keep unnecessary people out of the area.
9 Wear impervious clothing, goggles, gloves.
10 Approach spill from upwind **IF SAFE TO DO SO.**
11 Stop product flow if possible.
12 Contain and recover spill as soon as possible.

II. RESPOND SAFELY

1 Do not contain gasoline or av gas if vapours might ignite.
2 Allow gasoline or av gas spills to evaporate.
3 See Appendix A - Product Guides for further information.

111. OBTAIN AND REPORT SPILL DETAILS

NWT Spill Report Forms are in Appendix D of this spill contingency and response plan.

DIESEL - P 50 - SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS!

- **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 sorbent 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 sorbent 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.

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.
- Burn only in localized areas, e.g., trenches, piles or windrows.
- 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 sorbent 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 (sorbent) booms.
- Do not use sorbent booms/pads in fast currents and turbulent water.

STORAGE / TRANSFER

- Store closed, labelled 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.

HYDRAULIC OIL SPILL RESPONSE ACTIONS
CONSIDER ACTION ONLY IF SAFETY PERMITS

- **ELIMINATE IGNITION SOURCES**
- **STOP SOURCE OF HYDRAULIC 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE
- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Use ice augers and pump when feasible to recover oil under ice.
- Burning hydraulic oil will not likely be feasible.
- Mechanical removal (scraping) can be tried.

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.
- Minimize damage caused by equipment and excavation.
- Burning is not likely possible.

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

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

STORAGE / TRANSFER
- Store closed, labelled containers outside away from flammable items.
- Drums are likely to be used for containing collected hydraulic oil.

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

LUBE OIL SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

- **ELIMINATE IGNITION SOURCES**
- **STOP SOURCE OF LUBE 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Burning is unlikely to be possible.
- Use ice augers and pump when feasible to recover oil under ice.

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.
- Burning is not likely to be possible.
- 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 sorbent pads to pick up contained oil.
- On larger spills, obtain and use skimmer on contained slicks.
- Do not deploy personnel and equipment on mudflats or wetlands.
- Remove contained oil with sorbent pads and/or skimmer.

RIVERS & STREAMS

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

STORAGE / TRANSFER

- Store closed, labelled 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 SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

- **ELIMINATE IGNITION SOURCES**
- **STOP SOURCE OF WASTE 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 sorbent pads.
- On tundra use peat moss and leave to degrade if feasible to do so.

ON SNOW & ICE

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Burning is unlikely to be possible.
- Use ice augers and pump when feasible to recover oil under ice.

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.
- Burning is not likely to be possible.
- 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 sorbent pads to pick up contained oil.
- On larger spills, obtain and use skimmer on contained slicks.
- Do not deploy personnel and equipment on mudflats or wetlands.
- Remove contained oil with sorbent pads and/or skimmer.

RIVERS & STREAMS

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

STORAGE / TRANSFER

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

DISPOSAL

- Segregate waste types
- Place contaminated materials into marked containers.
- Whenever possible suitable waste oils collected at the site will be disposed of by incineration.
- Consult camp manager on disposal procedures.

GASOLINE SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

GASOLINE FORMS VAPOURS THAT CAN IGNITE AND EXPLODE

NO SMOKING

- **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 sorbents.
- 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 sorbents.

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.
- Burn CAREFULLY only in localized areas, e.g., trenches, piles or windrows.
- 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, labelled 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.

JET A (AVIATION FUEL) SPILL RESPONSE ACTIONS

CONSIDER ACTION ONLY IF SAFETY PERMITS

AV GAS FORMS VAPOURS THAT CAN IGNITE AND EXPLODE

NO SMOKING

- **ELIMINATE IGNITION SOURCES**
- **STOP SOURCE OF JET A 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 sorbents.
- 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 sorbents.

ON MUSKEG
- Remove pooled av gas 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.
- Burn CAREFULLY only in localized areas, e.g., trenches, piles or windrows .
- 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, labelled 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 procedures.

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 in Appendix A 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 RESPONSE ACTIONS

GAS STORED IN CYLINDERS THAT EXPLODE WHEN IGNITED!

CONSIDER ACTION ONLY Y IF SAFETY PERMITS

KEEP ALL VEHICLES INCLUDING SNOWMOBILES AWAY FROM ACCIDENT AREA

Refer to Product Guide in Appendix A 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.

III. SPILL RESPONSE CONTACTS

WMC International Ltd., Meliadine Project

TITLE	NAME	OFFICE	FAX
On-Scene Coordinators			
Logistics	Jim Bernard	1613 727 3937	1 613 727 3970
Safety	Kirk Steeves	1613 727 3937	1 613 727 3970
Spill Cleanup Supervisors			
District Geologist	Alan Sexton	1613 727 3937	1 613 727 3970
Project Study Manager	Joe Campbell	1613 727 3937	1 613 727 3970
Environmental Coordinator	Ben Hubert	1 403 256 0017	1403 256 1228
	Residence	1 403 256 7114	1403 256 1228
CONTRACTORS			
M & T Enterprises Ltd.		1 867 645 2778	1 867 645 2590
Y & C Enterprises Ltd.		1 867 645 2546	1 867 645 2490
OTHERS			
NWT Power Corp.	Trevor Weir	1 867 645 5300	1 867 645 2487

EXTERNAL CONTACTS

CONTACT THE FOLLOWING NUMBER IMMEDIATELY:

1. GOVERNMENT 24-HOUR SPILL REPORT LINE	PH. (867) 920-8130 FAX (867) 873-6924

OTHER CONTACTS:	PHONE
KIVALLIQ INUIT ASSOCIATION - LAND MANAGEMENT	
Tongola Sandy - land use administrator/manager	1 867 645 2810
Ryan St. John - land use inspector	1 867 645 2810
GNWT	
EMO	**1 867 645 5042** **(645 3789 after working hours)**
Harvey Gaukel, Hazardous Substance Specialist	
Environmental Protection Division	1867 873 7654
Department of Resources, Wildlife and Economic Development (DRWED)	
GOVERNMENT OF CANADA	
RCMP - Rankin Inlet	1 867 645 2822
DIAND - Rankin Inlet - Henry Kablalik	1 867 645 2831
Environmental Protection, Environment Canada	1 867 920 6060
Magnus Bourque, Hazardous Materials Officer	1 867 669 4729
Dave Tilden, Hazardous Materials Specialist	1 867 669 4728
Mgr, Fisheries & Oceans, Robert Luke - Rankin Inlet	1 867 645 2871
Gary Weber - Iqaluit	1 867 979 6274

LOCAL TRANSPORTATION

Helicopters			
CUSTOM HELICOPTERS	Staff House	1 867 645 3885	
	Hanger	1 867 645 3939	
Air Lines - Scheduled			
NWT Air - Dispatch		1 867 873 8021	
CalmAir		1 867 645 2900	
Bombardier			
Joe Kaludjak		1 867 645 2639	
Kowmuk's Taxi		1 867 645 3034	
Neighbouring Sites			
NWT Power Corp.- Rankin Inlet		1 867 645 5300	
EQUIPMENT SUPPLIERS			
Frontier Mining - Yellowknife		1 867 920 7617	spill kits & various sorbents
Acklands - Yellowknife		1 867 873 4100	spill kits and various sorbents
Dupont -		1 613 348 3616	emergency response centre for personnel and material
Chemtrec		1 800 424 9300	Chemical Transportation Response Centre for personnel and material

IV. DUTIES AND RESPONSIBILITIES

The roles and responsibilities of WMC personnel, contractors, and Government are described on the following pages.

WMC and CONTRACTOR PERSONNEL

Spill Observer - anyone on haul route or at fuel cache at any time

- Assess the initial severity of the spill and safety concerns.
- Report all spills to Melaidine Camp manager immediately.
- Determine the source of the spill and stop or contain it, if possible.
- Participate in spill response as member of cleanup crew.

On-Scene Coordinator (OSC) - WMC Meliadine Camp Manager

- Immediately reports the spill to NWT 24-Hour Spill Report Line at (403) 920-8130.
- Records the time of the report, source of information and details on location, size, type of spill as well as any other information available on the spill report form.
- Oversees the cleanup operation until it is satisfactorily completed.
- Together with the Spill Cleanup Supervisor, decides if additional equipment is required to contain and clean up spills.
- Notifies government agencies, WMC Site Manager, Project Manager and Environmental Coordinator on spill details.
- Oversees completion and distribution of Spill Report. Ensures investigation identifies measures to prevent similar spills in future.
- Ensures Response Team is adequately trained in spill response.
- Organises training courses for spill response teams.

Spill Clean Up Supervisors

- Supervise spill cleanup crew.
- Assist in initial and ongoing response efforts.
- With work crew, take initial action to seal off the source and contain spill.
- Continue actions until relieved or supplemented by other Supervisor.
- Decide with On-Scene Coordinator if mobilization of additional equipment from Spill Response Organization or Contractor is warranted.
- Assess whether burning is a viable clean up measure; consult with regulatory authorities at spill site.

Spill Cleanup Crew (Emergency Response Team)

- conduct cleanup of spills under direction of Spill Cleanup Supervisor(s).
- Deploy booms, sorbents and other equipment and materials as required.
- Take appropriate response measures.
- Continue cleanup as directed by Spill Cleanup Supervisor until relieved.

Project Manager, Melaidine West Gold Project

- Responsible for all communication with the media.
- Ensures that all press releases are accurate and in accordance with company policy.

- Makes financial decisions on major expenses during large spill response.
- Initiates Mutual Aid Agreements if proper response requires outside assistance.

Environmental Coordinator

- Provides cleanup advice to the On-Scene Coordinator and Spill Cleanup Supervisor.
- Assists the Project Manager in the preparation of press releases.
- Develops safe and effective spill management and prevention practices.
- Provides advice to the Spill Cleanup Supervisor of storage and disposal options.
- Updates and distributes Contingency Plan.
- Ensures that there is follow up reports prepared on the spill event, clean up and environmental impacts.

Legal Counsel

- Advises the Project Manager and Environmental Coordinator 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 the Project Manager on matters related to insurance.

WMC Board of Directors

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

EXTERNAL RESOURCES

WMC Fuel Haul Contractors

- Ensure that their best effort is made to maintain spill equipment which shall be available and be applied to a spill incident on site when required.
- Initiates cleanup in the absence of WMC personnel, however caused.
- Reports all spills immediately to the WMC On-Scene Coordinator (OSC).
- Responsible for the training of their personnel on spill response.
- Develops and maintains company specific contingency plans for the WMC Meliadine West Gold Project which conforms to this WMC Spill Contingency Plan and related policies.

Environmental Consultants

- Provide advice to WMC on spill response strategies, counter measure technologies, impact assessments and post spill monitoring and site rehabilitation.

Neighbouring Operations

- Supply spill response equipment, materials and manpower, as required, when requested to do so.

EXTERNAL RESOURCES - Kivalliq Inuit Association and Nunavut Water Board

KIA

The WMC International Ltd. Melaidine West Gold exploration program is carried out on Inuit Owned Land administered and managed by the KIA. It has issued land use permits to WMC for the exploration activities. Inspectors from KIA routinely inspect land use sites for compliance to terms and conditions of permits. While KIA receives data from spills reported to the NWT Spill Line, it is expected that all spills on Inuit Owned Land be reported directly to KIA. The same form as used for the Spill Line may be used for reporting to KIA.

Nunavut Water Board

The Nunavut Water Board issues water licences under the Nunavut Land Claims Agreement. Conditions of the water licence usually include the authorized limits of water use, sources of water use, effluent discharge limits, monitoring and reporting requirements. As well, licenses are expected to require that Spill Contingency Plans be submitted for approval. Enforcement of the provisions of the water licence is carried out by Inspectors from the Water Resources Division (Department of Indian and Northern Affairs). Periodic inspections are conducted by water licence inspectors.

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 (403-920-8130). 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.

Inspection of WMC project activities located on Crown Land by Resource Management Officers is conducted periodically.

Environment Canada (EC)

The Environmental Protection and Conservation 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.

Government of Northwest Territories (GNWT) Department of Resources, Wildlife and Economic Development (DRWED)

The Environmental Protection Division of the DRWED is responsible for the Environmental Protection Act (EPA). Under this legislation, Spill Contingency Planning and Reporting Regulations for the NWT have been issued which requires:

a) a contingency plan be prepared and filed for facilities where petroleum, chemicals and other contaminants are stored; and
b) to report spills of contaminants in excess of specified quantities.

The EPA does not apply to any person who is authorized under a Federal or Territorial licence or permit. Since WMC operates under permits from both KIA, DIAND and the Nunavut Water Board, GNWT DRWED has jurisdiction limited to the transportation route outside KIA lands.

Inspectors appointed under the EPA can issue clean up orders for spills and other environmental incidents occurring on public lands in Nunavut.

Worker's Compensation Board (WCB)

The Prevention Division of the WCB is now responsible for the Mine Health and Safety Act and Regulations. WMC , in response to this legislation established a Emergency Response Team who have a major role in spill response events as well as other type of emergencies.

GNWT Department of Transportation

The Department of Transportation, Motor Vehicles Division, is responsible for administering the Transportation of Dangerous Goods Act and Regulations (NWT). The Department is also responsible for driver, vehicle and load safety under additional transport legislation.

GNWT Department of Safety and Public Services

This Department enforces compliance with technical safety legislation. Under the Work Site Hazardous Materials Information System (WHMIS) WMC is required to comply with material safety data sheets (MSDS) which outline specific storage and handling requirements of industrial materials that have a risk to worker health and the environment.

V. REFERENCES

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.

ACKNOWLEDGMENTS

WMC International Ltd. gratefully acknowledges the use of the BHP Diamonds Inc. Transportation Spill Contingency Plan which was used as the model and template in developing this plan for the Meliadine West Gold Project. The generosity of BHP Diamonds Inc. in providing their document is greatly appreciated.

APPENDIX A

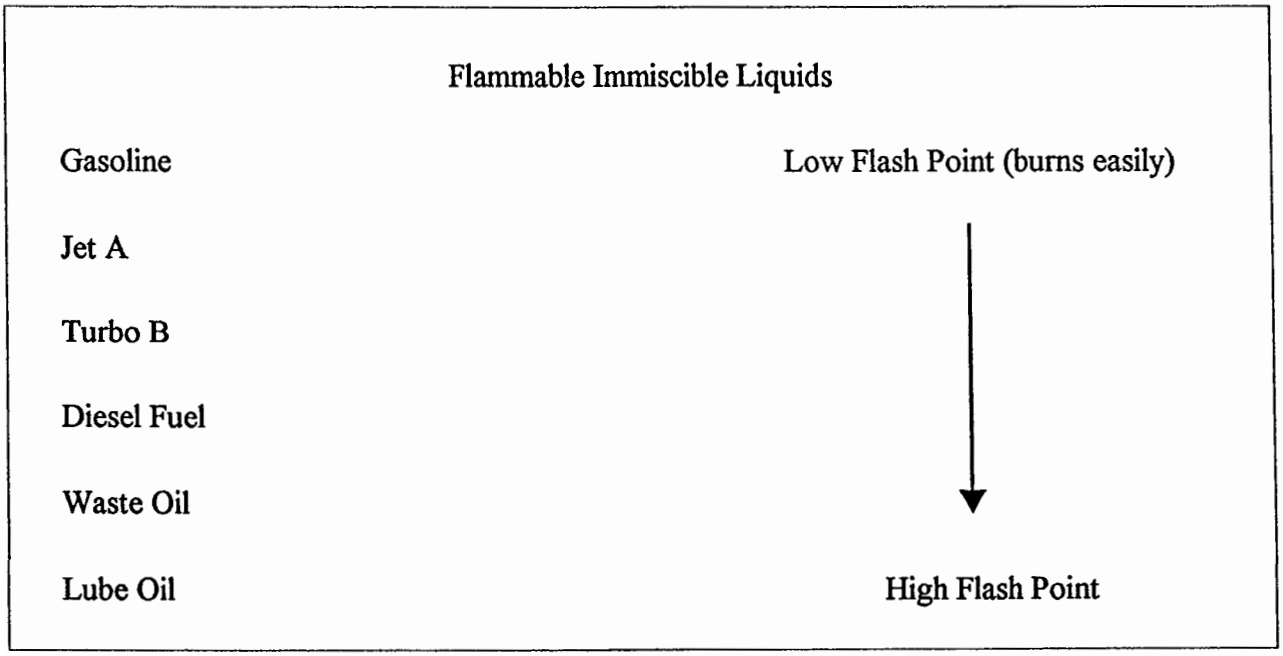
PRODUCT GUIDES

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

- flammable immiscible liquids
- flammable compressed gases

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.



DIESEL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, yellow or red	FLASH POINT:	40°C (minimum)
ODOUR:	Petroleum	POUR POINT:	-50 to -6°C
SOLUBILITY:	Insoluble	VISCOSITY:	Not viscous
VAPOUR DENSITY:	Will sink to ground levels	SPECIFIC GRAVITY:	Floats on water (0.8 - 0.9)

SAFETY MEASURES

WARNINGS

- Vapours are heavier than air and form easily at high temperatures.
- Empty containers can contain explosive vapours.
- Toxic gases form upon combustion.
- 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, Viton and PVC are suitable materials (**DO NOT USE NATURAL RUBBER or NEOPRENE.**)
- 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, ozones, 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.

DIESEL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- **ELIMINATE IGNITION SOURCES.**
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

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

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- **Get prompt medical attention.**

HYDRAULIC OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Straw-yellow liquid	FLASHPOINT:	215°C
ODOUR:	Petroleum	POUR POINT	-25°C
SOLUBILITY:	Generally insoluble	VISCOSITY:	Medium (265cSt @ 15°C)
VAPOUR DENSITY:	Few vapours emitted	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, nose, throat and lungs.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton are suitable materials **(DO NOT USE NATURAL RUBBER)**.
- 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, ozones, 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 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

HYDRAULIC OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes/marinas.

STORAGE & TRANSFER

- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

LUBE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Amber liquid	FLASHPOINT:	190 to 220°C
ODOUR:	Petroleum	POUR POINT:	-35 to -400°C
SOLUBILITY:	Generally insoluble	VISCOSITY:	Medium (255cSt @15°C)
VAPOUR DENSITY:	Few vapours emitted	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, nose, throat and lungs.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile, PVC and Viton are suitable materials. **(DO NOT USE NATURAL RUBBER.)**
- 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, ozones, 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 lube 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.

LUBE OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with sorbent and/or peat moss.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

WASTE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Black to brown liquid	FLASHPOINT:	100 to 200°C
ODOUR:	Petroleum	POUR POINT:	-30 to -400°C
SOLUBILITY:	Generally insoluble	VISCOSITY:	Medium (200 - 300 cSt)
VAPOUR DENSITY:	Few vapours emitted	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.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile, PVC and Viton are suitable materials **(DO NOT USE NATURAL RUBBER.)**
- 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, ozones, 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 lube 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

WASTE OIL
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- Prevent additional discharge of oil.
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.

ON WATER

- Use booms to contain and concentrate spill.
- Remove spill using sorbent, skimmer or vacuum truck.
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.

DISPOSAL

- Segregate waste types.
- Place contaminated materials into marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

GASOLINE

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless liquid (can be dyed)	FLASH POINT:	-50°C
ODOUR:	Gasoline/Petroleum	FREEZING PT:	-60°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, Viton and PVC are suitable materials **(DO NOT USE NATURAL RUBBER or NEOPRENE.)**
- Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA, if circumstances warrant.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozones, 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.

GASOLINE
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND

- **ELIMINATE IGNITION SOURCES.**
- Do not flush into ditch/drainage systems.
- Block entry into waterways.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with peat moss and/or sorbent pads.
- Cover pools with foam to prevent vapour evolution if gasoline presents a fire hazard; otherwise allow vapours to dissipate.

ON WATER

- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.**
- Protection booming can be considered for water intakes.

STORAGE & TRANSFER

- Store closed, labelled containers in cool, ventilated areas away from incompatible materials.
- Electrically ground containers & vehicles during transfer.

DISPOSAL

- Place contaminated materials into segregated marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES

- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN

- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION

- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION

- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

JET A
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	White or pale yellow liquid	FLASH POINT:	-20 to - 250°C
ODOUR:	Gasoline/Petroleum	FREEZING PT:	-50°C
SOLUBILITY:	Negligible	VISCOSITY:	Not viscous (<7 cSt)
VAPOUR DENSITY:	Will sink to ground levels	SPECIFIC GRAVITY:	Floats on water (0.75 0.8)

SAFETY MEASURES

WARNINGS

- Vapours instantaneously form, 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 SCBA, if circumstances warrant.

PRECAUTIONS

- Monitor for explosive atmosphere.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, 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, AFFF foam or water fog.
- Use water to cool containers exposed to fire.

JET A
RESPONSE TO SPILLS
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- Block entry into waterways; do not flush into ditch/drain systems.
- Contain spill by diking with earth, snow or other barrier.
- Remove minor spills with sorbent or explosion-proof pump.
- Cover pools with foam to prevent vapour evolution if avgas presents a fire hazard; otherwise allow vapours to dissipate.

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **Contain or remove spills ONLY AFTER VAPOURS DISSIPATE.**
- Protection booming can be considered for water intakes.
- Recover slicks using skimmer and sorbent, if volumes warrant.

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

DISPOSAL
- Place contaminated materials in segregated, marked containers.
- Consult with environmental authorities during final disposal.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

PROPANE
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless gas	FLASH POINT:	-104°C
ODOUR:	Natural gas odour	FREEZING PT:	-190 °C
SOLUBILITY:	Insoluble	VISCOSITY:	n/a
VAPOUR DENSITY:	Will sink to ground levels	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, ozones, 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.

PROPANE
RESPONSE TO GAS RELEASES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS**

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.**

STORAGE & TRANSFER
- It is not possible to collect released material.

DISPOSAL
- Consult with environmental authorities if the disposal of any contaminated materials is required.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

ACETYLENE
TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colourless gas	FLASH POINT:	-18°C
ODOUR:	Garlic - like	FREEZING PT:	-82°C
SOLUBILITY:	Slightly soluble	VISCOSITY	n/a
VAPOUR DENSITY:	Will sink to ground levels	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, ozones, 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.

ACETYLENE
RESPONSE TO GAS RELEASES
CONSIDER ACTION ONLY IF SAFETY PERMITS!

ON LAND
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE RELEASES**

ON WATER
- **ELIMINATE IGNITION SOURCES.**
- **DO NOT ATTEMPT TO CONTAIN OR REMOVE RELEASES**

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

DISPOSAL
- Consult with environmental authorities if the disposal of any contaminated materials is required.

FIRST AID

EYES
- Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes while holding the eyelids open.
- Remove contact lenses, if exposed to vapours or liquid.
- Get prompt medical attention.

SKIN
- Remove and launder contaminated clothing.
- Wash skin thoroughly with soap and water.
- Get medical attention.
- Discard saturated leather articles.

INHALATION
- Move victim to fresh air.
- Perform artificial respiration if victim not breathing.
- Provide oxygen if victim is having difficulty breathing.
- Get prompt medical attention.

INGESTION
- DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration.
- Get prompt medical attention.

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**	File # W104
		DSL	On the DSL.
Synonym	Diesel 50, Diesel 50 LS, #1 Diesel , #1 Diesel LS, Diesel LC, Seasonal Diesel, Seasonal Diesel LS, Diesel AA, Domestic Marine Diesel, International marine Diesel, Seasonal Diesel Locomotive, Dosmestic Marine diesel LS, disesel -20°C (LS), Mining Diesel Special, Mining Diesel Special LS.	**TSCA**	On TSCA inventory list.
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.		

Section 2. Composition and Information on Ingredients

Name	CAS #	% (V/V)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Mixture of petroleum distillates. Aromatic content is 50% maximum (benzene: nil). * Notice of Intended Change (1996): 350 mg/m³, A3.	68334-30-5	100	Not established*	Not established	Not established

Manufacturer Recommendation	Petro-Canada recommends an allowable exposure of 350 mg/m³ when handling Diesel fuel. Consult local authorities for acceptable exposure limits.
Other Exposure Limits	Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Inhalation of vapours or mist in high concentration may cause headaches, nausea, dizziness, drowsiness, unconsciousness and passing out. May irritate skin, eyes and respiratory tract. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. Allow the victim to rest in a well ventilated area. If the victim is not breathing, perform mouth-to-mouth resuscitation. If resuscitation is required, physician assessment mandatory.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Physician assessment mandatory.
Note to Physician	Monitor blood gases to assure adequate ventilation. If vital signs become abnormal or symptoms develop obtain a chest x-ray.

Continued on Next Page

Section 5. Fire-fighting Measures

Flammability	Combustible liquid.	**Flammable Limits**	LOWER: 0.7%, UPPER: 6%
Flash Points	CLOSED CUP (tag): 52°C (126°F) for Mining Diesel Special and Mining Diesel special-LS. 40°C (104°F) for others.	**Auto-Ignition Temperature**	225°C (437°F)
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.	**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.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S); smoke and irritating fumes as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, flammable/combustible liquid (non-polar/water-immiscible). 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. 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. Remove the leaking container to an open area and allow it to bleeds off into the atmosphere. 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 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	Keep away from heat, spark, open flames and other sources of ignition. Use explosion-proof ventilation to prevent vapour accumulation. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Avoid contact with skin and eyes. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated and well-ventilated area. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	
Eyes	Wear safety glasses or chemical splash goggles in case of splashing.
Body	Wear long sleeved clothing to minimize skin contact.

Continued on Next Page

Respiratory	When exposure is likely to exceed recommended exposure limit (see section 2), use NIOSH approved respiratory equipment. Respiratory should be selected based on the form and concentration of contaminant in air (refer to NIOSH Pocket Guide for chemical Hazard for respirator selection). In order to determine the concentration of the contaminant, air sampling is RECOMMENDED AND SHOULD BE PERFORMED BY A HEALTH & SAFETY SPECIALIST (AS PER THE NIOSH Manual of analytical Methods for method of measurement). If air sampling is not practical and concentration is unknown, use positive pressure self-contained breathing apparatus (SCBA). Contact appropriate HEALTH & SAFETY personnel or supplier for assistance.
Hands	For casual contact, PVC gloves are suitable. For direct contact for more than 2 hours, Viton or Nitrile gloves are recommended.
Feet	Safety boots or shoes.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.	**Viscosity**	Not applicable.
Colour	Clear to yellow. Low sulphur diesel fuels are colourless to light yellow / brown, and are not dyed. Regular sulphur diesel fuels (>0.05wt.% Sulphur) may be colourless to yellow / brown. This product may be dyed purple or red for taxation purposes.	**Pour Point**	Not applicable.
Odour	Mild petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available.	**Dropping Point**	Not applicable.
Boiling Point	150°C (302°F)	**Penetration**	Not applicable.
Density	0.85 kg/L @ 15°C (Water = 1).	**Oil / Water Dist. Coeff.**	Not available.
Vapour Density	4.5 (Air = 1)	**Ionicity (in water)**	Not available.
Vapour Pressure	1.0 kPa @ 20°C (7.5 mmHg @ 68°F).	**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 applicable		
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	Strong acids, peroxides, alkalis, oxidizing agents (chlorine, oxygen)	**Decomposition Products**	Releases of COx, NOx, SOx, H2S, smoke and irritating fumes when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute oral toxicity (LD50): 12,000 mg/kg/rat.
Chronic or Other Toxic Effects	
Dermal Route:	Repeated exposure would produce drying and cracking or defatting dermatitis. Dermal primary skin irritation score (Draize) = 6.8; moderately to extremely irritating (rabbit),dose: 500 uL/24h.
Inhalation Route:	Central nervous system depression.
Oral Route:	Aspiration of the solvent into the lung may produce a potentially fatal chemical pneumonitis.
Eye Irritation/Inflammation:	Eye irritation index (Draize) = 0; non irritating (rabbit).
Immunotoxicity:	No studies were found.
Skin Sensitization:	It is not a skin sensitizer in guinea pig.
Respiratory Tract Sensitization:	No studies were found.
Mutagenic:	No evidence.
Reproductive Toxicity:	No evidence.
Teratogenicity/Embryotoxicity:	No evidence.
Carcinogenicity (ACGIH):	ACGIH Notice of Intended Changed (1996): proposed A3: animal carcinogen.
Carcinogenicity (IARC):	Group 3: cannot be classified as to carcinogenicity to humans.
Carcinogenicity (NTP):	No studies were found.
Carcinogenicity (IRIS):	No studies were found.
Carcinogenicity (OSHA):	No studies were found.
Other Considerations	Preexisting eye, skin, respiratory, neurological, liver or kidney conditions may be aggravated by exposure to this product.

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Section 12. Ecological Information

Environmental Fate	Biodegradable.	**Persistance/ Bioaccumulation Potential**	High potential to bioconcentrate in aquatic organisms, but it may not be important due to high metabolism.
BOD5 and COD	BOD5 : 5.3 ug/ml (C16), biodegradable.	**Products of Biodegradation**	Not available.
Additional Remarks	If released to soil, diesel fuel will strongly adsorb. It may biodegrade in water and soil or volatilize from water (half-life of 4.4 to 4.8 hrs from a model river) and moist soil surfaces, but adsorption may attenuate the rate of these processes.		

Section 13. Disposal Considerations

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

Section 14. Transport Information

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

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 CEPA-DSL, and USEPA-TSCA. This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in CERCLA (40 CFR 302.4). Not listed in EPCRA or SARA Title III, Section 302/304/311/312/313 (40 CFR 355/370/372). Not listed in RCRA (40CFR 261.33). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
DSD/DPD (Europe)	10- Flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/38- Irritating to eyes and skin. **HCS (U.S.A.)**
ADR (Europe) (Pictograms)	 **DOT (U.S.A) (Pictograms)** 

HMIS (U.S.A.)

Health Hazard	1
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.

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ASTM - American Society for Testing and Materials
ADR - Agreement on Dangerous goods by Road (Europe)
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 - Chemical Hazard Information and Packaging Approved Supply List
COD - Chemical Oxygen Demand
CPR - Controlled Products Regulation
DOT - Department of Transportation (U.S.A.)
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substance 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
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

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Information Contact	**Petro-Canada** **Product Safety Coordinator** **(403) 296-4410**	**Prepared by McBride on 3/17/97.** **Data entry by May Chau.**

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**GASOLINE, UNLEADED**	**Code**	File # W102E
		DSL	Listed on DSL.
Synonym	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, SuperGreen 94, SuperClean, WinterGas, SummerGas, Supreme.	**TSCA**	Listed on TSCA Chemical Inventories.
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	Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.		

Section 2. Composition and Information on Ingredients

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

Manufacturer Recommendation	Petro-Canada recommends a working guideline of 1 ppm (3.2 mg/m³) of benzene for 8 hours time weighted average when handling product which may contain benzene; 300 ppm (890 mg/m³) for 8 hours time weighted average and 500 ppm (1480 mg/m³) for short term exposure limit based on ACGIH TLV for gasoline. Consult local authorities for acceptable exposure limits.
Other Exposure Limits	Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Inhalation of vapours or mist may cause irritation of nose and throat; headache, nausea, vomitting, dizziness, fatique, light-headedness, reduced coordination and unconciousness; central nervous system depressant; kidney and liver damage from long-term exposure. May be narcotic in high concentrations. Skin contact may cause drying, cracking, defatting, or inflammation of skin. Prolonged or repeated contact with skin may cause dermatitis. Eye contact may cause irritation, but no permanent damage. Overexposure due to ingestion is unlikey for adults since taste and smell limit the amount swallowed. Harmful or fatal if swallowed. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. DO NOT use an eye ointment. Seek medical attention if irritation persists.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Get medical attention if redness or irritation occurs.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting without supervision of medical personnel, because of danger of aspirating liquid into lungs. Seek immediate medical attention.
Note to Physician	Prevent further absorption by administer charcoal slurry, aqueous or mixed with saline cathartic or sorbitol. The FDA suggested 240 mL of diluent/30 g of charcoal. Usual charcoal dose is 30 to 100 g in adults, 15 to 30 g in children and 1 to 2 g/kg in infants. Gastric decontamination to prevent absorption is important following a substantial recent ingestion. Is most effective if initiated within 30 minutes. Gastric lavage should only be done after endotracheal intubation in view of the risk of aspiration which can cause serious chemical pneumonitis for which antibiotic and corticosteroid therapy may be indicated. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Evaluate renal and hepatic function. Monitor EKG and vital signs regularly.

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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), Tag, ASTM D56. (NFPA).	**Auto-Ignition Temperature**	257°C (495°F) (NFPA).
Fire Hazards in Presence of Various Substances	Easily ignites under almost all normal temperature conditions. Extremely flammable in presence of open flames, sparks, shocks, heat, oxidizing materials. Vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks), and may travel considerable distance to sources of ignition and flash back.	**Explosion Hazards in Presence of Various Substances**	Excessive heat. Do not cut, weld, heat, or drill empty container. Containers may explode in heat of fire. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO2), smoke and irritating fumes 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 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. Remove the leaking container to an open area and allow it to bleeds off into the atmosphere. 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 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	Keep away from heat, spark, open flames and other sources of ignition. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. In case of insufficient ventilation, wear suitable respiratory 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	During storage, transit and cooling of fuel, solvent vapour may accumulate in enclosed spaces such as tank cars. Store in approved vented containers in cool, dry, isolated, well-ventilated area, and away from strong oxidizing agents. Storage warehouse, or area should be explosion-proof, comply with NFPA 30 "Flammable and Combustible Liquid Code" and clearly labelled "Toxic Chemical".

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Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineering controls, to keep airborne concentration below the allowable threshold limit value, adequate oxygen (at least 18% by volume), and flame-proof electrical switches and lighting system. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	
Eyes	Face shield or chemical splash goggles in case of splashing.
Body	Wear long sleeved clothing to minimize skin contact.
Respiratory	When exposure is likely to exceed recommended exposure limit (see section 2), use NIOSH approved respiratory equipment. Respirator should be selected based on the form and concentration of contaminant in air (refer to NIOSH Pocket Guide for Chemical Hazard for respirator selection). In order to determine the concentration of the contaminant, air sampling is RECOMMENDED AND SHOULD BE PERFORMED BY A HEALTH & SAFETY SPECIALIST (AS PER THE NIOSH Manual of analytical Methods for method of measurement). If air sampling is not practical and concentration is unknown, use positive pressure self-contained breathing apparatus (SCBA). Contact appropriate HEALTH & SAFETY personnel or supplier for assistance.
Hands	For casual contact, polyvinyl alcohol (PVA) gloves are suitable. For direct contact for more than 2 hours, nitrile or viton gloves are recommended.
Feet	Safety boots or shoes.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	0.6 cSt.
Colour	Clear, undyed liquid. Tax exempt product may be dyed red or purple.	**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°C (77°F)	**Penetration**	Not applicable.
Density	0.7 kg/L @ 15°C (59°F).	**Oil / Water Dist. Coeff.**	Not available.
Vapour Density	3 to 4 (Air = 1) (NFPA).	**Ionicity (in water)**	Insoluble in water.
Vapour Pressure	Down to 55 kPa in summer, and up to 107 kPa in winter, at 37.8°C (100°F).	**Dispersion Properties**	Not available.
Volatility	Volatile 100% (v/v) or 100% (w/w).	**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	Extremely reactive or incompatible with oxidizing agents (nitric acid, sulfuric acid, chlorine, ozones, peroxides, etc.) which cause detonation on contact.	**Decomposition Products**	Releases of COx, NOx, SOx, H2S, smoke and irritating fumes when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute oral toxicity (LD50): 18750 mg/kg (rat).
Chronic or Other Toxic Effects	
Dermal Route:	Dermal primary skin irritation score (Draize) = 0.98; mildly irritating (rabbit). Prolonged exposure to skin may cause chapping or possibly dermatitis.
Inhalation Route:	Dose: 2056 ppm/6h/rat/78W-I – kidney tumors. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood forming system (particularly bone marrow), and serious blood disorders, such as aplastic anemia and leukemia.
Oral Route:	Dose: 5 ml/kg/rat/2W-I, produced changes in urine composition.
Eye Irritation/Inflammation:	Vapours or mist may irritate eyes. Can cause severe irritation and swelling of eye tissues (conjunctivitis).

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Immunotoxicity:	No studies were found.
Skin Sensitization:	No studies were found.
Respiratory Tract Sensitization:	No studies were found.
Mutagenic:	Benzene is tumorigenic by RTECS criteria.
Reproductive Toxicity:	No studies were found.
Teratogenicity/Embryotoxicity:	Benzene--Dose: 150 ppm (rat/inhalation/24h/7-14 days of pregnancy) -- abnormal development of the musculoskeletal system.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen.
Carcinogenicity (IARC):	Group 2B: possible carcinogenic to humans.
Carcinogenicity (NTP):	No studies were found.
Carcinogenicity (IRIS):	Not available
Carcinogenicity (OSHA):	Not available
Other Considerations	Long term exposure to high concentration of gasoline can damage kidney in male rats. NIOSH-X, carcinogen defined with no further categorization.

Section 12. Ecological Information

Environmental Fate	Volatilizes and disperses rapidly. Volatilation is expected to be the dominant fate process.	**Persistance/ Bioaccumulation Potential**	Floats on water. May be dangerous to aquatic life in high concentrations.
BOD5 and COD	BOD5: 8%.	**Products of Biodegradation**	Not available.
Additional Remarks	Base on properties of hydrocarbons, if released to soil, lighter components will evaporate and be photo-oxidezed by atmospheric reaction with OH radicals. Higher molecular weight components may also be subject to photo-oxidation but will also adsorb to soil and sediment. It may biodegrade in water and soil or volatilize from water (half-life of 4.4 to 4.8 hrs from a model river) and moist soil surfaces, but adsorption may attenuate the rate of these processes.		

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	Shipping Name: Gasoline; UN 1203; Class 3; Packing Group II; Label required: Flammable liquid.	**Special Provisions for Transport**	099 Not acceptable for transport by passenger ship.

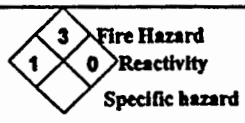
Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on CEPA-DSL, and USEPA-TSCA. This product contain benzene, a carcinogen, which is required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in CERCLA (40 CFR 302.4). Listed in EPCRA or SARA Title III, Section 302/304/311/312/313 (40 CFR 355/370/372) for benzene. Not listed in RCRA (40CFR 261.33). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.		
DSD/DPD (Europe)	5- Heating may cause an explosion. 12- Extremely flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/37/38- Irritating to eyes,respiratory system and skin. 40- Possible risks of irreversible effects. 45- May cause cancer.	**HCS (U.S.A.)**	DANGEROUS MAY CAUSE CANCER. Flammable liquid having a flash point lower than 37.8°C (100°F).
ADR (Europe) (Pictograms)		**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2
Fire Hazard	4
Reactivity	1
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.

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ASTM - American Society for Testing and Materials
ADR - Agreement on Dangerous goods by Road (Europe)
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 - Chemical Hazard Information and Packaging Approved Supply List
COD - Chemical Oxygen Demand
CPR - Controlled Products Regulation
DOT - Department of Transportation (U.S.A.)
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substance 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
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

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

Prepared by Admin-M on 6/24/97.

Data entry by May Chau.

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**	200-000-1, 200-000-2, File # W222
		DSL	On the DSL.
Synonym	Propane HD-5, Propane commercial, Dimethylmethane, Propyl hydride, Liquified Petroleum Gas (LPG), Alkane, C3H8.	**TSCA**	On TSCA inventory list.
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 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

Name	CAS #	% (V/V)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Propane ***	74-98-6	>90	Simple asphyxiant ***	Not applicable	Not applicable
Propylene */**	115-07-1	<5	Simple asphyxiant	Not applicable	Not applicable
Butane	106-97-8	<3	800 ppm	Not applicable	Not applicable
Ethyl mercaptan	75-08-1	<50 ppm	0.5 ppm	Not applicable	Not applicable

* Propane commercial contains more propylene.
** Propylene may not be present.
*** Notice of Intended Change 1996: 2500 ppm (4508 mg/m3)

Manufacturer Recommendation	Petro-Canada recommends a maximum exposure level of 1000 ppm (1800 mg/m³) for 8 hours time weighted average when handling propane based on OSHA PEL for simple asphyxiant.
Other Exposure Limits	Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	The health effects caused by exposure to propane are much less serious than its fire and explosion risk. Propane is essentially nontoxic in concentrations less than the lower explosive limit, but at very high concentrations it is a simple asphyxiant and displaces oxygen from the breathing atmosphere. Lack of oxygen may cause dizziness, headaches, diminished awareness, faulty judgement, increasing fatique, impaired muscular coordination progressing to convulsions, coma and death. A person working around propane in an enclosed space or in close proximity to a propane source (filling cylinders, purging lines and lighting / adjusting pilot lights, etc) who feels "light-headed", "dizzy", "drunken", or a little intoxicated should realize this effect may be due to a dangerously high level of propane vapours (in the explosive range) and go immediately into fresh air. Direct contact with escaping gas or liquefied gas can result in freezing burns or frost bite to skin and eyes. For more information, refer to Section 11.

Section 4. First Aid Measures

Eye Contact	If the eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with running water for at least 15 minutes, keeping eyelids open. If irritation, pain, swelling, or crying has occurred, get medical attention.
Skin Contact	If frostbite has occurred, do not rub the affected areas or flush them with water, but thaw frosted parts by soaking in water. In order to prevent further tissue damage, do not attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.
Inhalation	Evacuate the victim to fresh air at once. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Keep the victim warm and at rest. Seek medical attention as soon as possible.
Ingestion	Since the product is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider first to look at the preventive measures in case of inhalation.
Note to Physician	Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Monitor blood gases to assure adequate ventilation. If vital signs become abnormal or symptoms develop obtain a chest x-ray.

Continued on Next Page

Available in French

Section 5. Fire-fighting Measures

Flammability	Class I - flammable gas (NFPA).	**Flammable Limits**	LOWER: 2.1%, UPPER: 9.5%
Flash Points	CLOSED CUP:-104.4°C (-156°F).	**Auto-Ignition Temperature**	450°C (842°F)
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**	Can react vigorously with oxidizing materials. Severe explosion hazard when exposed to chlorine dioxide. Vapour explosion hazard indoors, outdoors or in sewers. Do not cut, weld, heat, drill or pressurize empty container.
Products of Combustion	Burns with a luminous, smoky flame. Carbon oxides (CO, CO2), smoke and irritating fumes as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 115, Flammable Gas: 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. SMALL FIRE: use DRY chemicals, foam, 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	NARG96, Guide 115, flammable gas. ELIMINATE ALL IGNITION SOURCES. Ventilate closed spaces before entering. Avoid contact, fully-encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Stop leak if without risk. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the leaking container to an open area and allow it to bleeds off into the atmosphere. Use water spray to reduce vapours; isolate area until gas has dispersed. For spill or leak: isolate in all directions at least 50 to 100 meters (160 to 330 feet), then evacuate in a downwind direction for at least 800 meters (0.5 miles). 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, open flames and other sources of ignition. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Keep away from incompatibles such as oxidizing agents (peroxides, chlorine). Avoid inhalation of vapours and skin or eyes contact with liquid. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods. 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. Similarly, 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	Compressed gases should be stored in a separate safety storage cabinet or room. Store in cool, well-ventilated area away from direct sunlight or heat radiation. Use explosion proof electrical equipment.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, adequate oxygen (at least 18% by volume), and flame-proof electrical switches and lighting system. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to the work-station location.
Personal Protection	
Eyes	Face shield or chemical splash goggles in case of splashing.
Body	Wear appropriate loose clothing with closed neck and long sleeves to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid.
Respiratory	When exposure is likely to exceed recommended exposure limit (see section 2), use NIOSH approved respiratory equipment. Respirator should be selected based on the form and concentration of contaminant in air (refer to NIOSH Pocket Guide for Chemical Hazard for respirator selection). In order to determine the concentration of the contaminant, air sampling is RECOMMENDED AND SHOULD BE PERFORMED BY A HEALTH & SAFETY SPECIALIST (AS PER THE NIOSH Manual of analytical Methods for method of measurement). If air sampling is not practical and concentration is unknown, use positive pressure self-contained breathing apparatus (SCBA). Contact appropriate HEALTH & SAFETY personnel or supplier for assistance.
Hands	Wear insulated gloves to prevent from frostbite.
Feet	Safety boots or shoes.

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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	Odourless gas in natural state at any concentration. Propane sold for fuel use has an odourant added which is commonly a mercaptan, which has an odour similar to "rotten eggs" or "skunk".	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 (-43.6°F) @ 1 atm.	Penetration	Not applicable.
Specific Gravity	0.51 Kg/L @ 15°C (Water = 1).	Oil / Water Dist. Coeff.	Log Kow: 2.36; mobile.
Vapour Density	1.56 @ 0°C (32°F), 1.8 @ 20°C (68°F), Air = 1.	Ionicity (in water)	Not applicable.
Vapour Pressure	<10763 mmHg @ 100°F (<1435 kPa @ 38°C).	Dispersion Properties	Not available.
Volatility	Volatile	Solubility	62 ppm in water at 25°C (77°F), slightly soluble in acetone. Soluble in benzene, ether, alcohols, chloroform.

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	Highly reactive with oxidizing agents (peroxides, chlorine).	Decomposition Products	Releases of COx, smoke and irritating fumes when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Inhalation, skin contact and eye contact.
Acute Lethality	Simple asphyxiant. LC50 (inhalation/human): no effect for 10,000 ppm (1%) break exposure; slight dizziness in a few minutes at 100,000 ppm (10%).
Chronic or Other Toxic Effects	
Dermal Route:	Low dermal penetration. Skin irritation has not been shown even with twice daily application for 12 weeks in humans volunteers.
Inhalation Route:	Subchronic inhalation studies in monkeys shown no evidence of organs toxicity or abnormalities.
Oral Route:	No studies were found.
Eye Irritation/Inflammation:	No evidence.
Immunotoxicity:	No studies were found.
Skin Sensitization:	No studies were found.
Respiratory Tract Sensitization:	No studies were found.
Mutagenic:	Not mutagenic in the Salmonella typhimurium/microsome assay (Ames test).
Reproductive Toxicity:	No studies were found.
Teratogenicity/Embryotoxicity:	No studies were found.
Carcinogenicity (ACGIH):	Simple asphyxiant.
Carcinogenicity (IARC):	No studies were found.
Carcinogenicity (NTP):	No studies were found.
Carcinogenicity (IRIS):	No studies were found.
Carcinogenicity (OSHA):	No studies were found.
Other Considerations	Acts as a simple asphyxiant -- inert gas or vapour. The narcotic or intoxicated effect of a simple asphyxiant may impaired a person's judgement, but it temporary and will rapidly disappear in fresh air. Persons with anemia or other conditions of reduced oxygen-carrying capacity may be more sensitive.

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Section 12. Ecological Information

Environmental Fate	Volatilizes and disperses rapidly. Volatilation is expected to be the dominant fate process.	**Persistance/ Bioaccumulation Potential**	Propane is readily biodegraded by soil bacteria (Microbacterium vaccae). The degradation of propane is similar to the degradation of fatty acids
BOD5 and COD	Not available.	**Products of Biodegradation**	Not available.
Additional Remarks	Henry's Law constants for propane has been calculated to be 7.07x10-1 atm-m³/mole @ 25°C. These mean that propane may rapidly volatilize from water and moist soil to the atmosphere. The estimated half-life for evaporation of propane from a model river (1m deep flowing 1m/s with a wind speed of 3 m/s) and a model pond are 1.9 hr and 2.3 days, respectively.		

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	Shipping name : Propane or Liquefied *Petroleum Gas; UN 1978 or UN 1075, Class* 2.1; Label required: Flammable gas.	**Special Provisions for Transport**	102 Add "SPECIAL COMMODITY" to *document if in car load, container load by rail.* Acceptable modes of transportation: air (cargo only), rail, road and water. Not acceptable for transport by passenger aircraft.

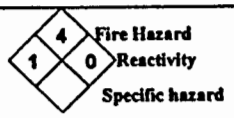
Section 15. Regulatory Information

Other Regulations	All components of this formulation are listed in the Domestic Substances List (DSL-Canadian) and in the Toxic Substances Control Act Inventory (TSCA-U.S.). This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in EPCRA or SARA Title III, Section 313, Toxic Chemicals (40 CFR 355). Not listed in CERCLA (40 CFR 302.40). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.
DSD/DPD (Europe)	2- Risk of explosion by shock, friction, fire or other sources of ignition. 13- Extremely flammable liquefied gas. 16- Explosive when mixed with oxidizing substances. 20/21- Harmful by inhalation and in contact with skin. 35- Causes severe burns.
DSD/DPD (Europe) (Pictograms)	
DOT (U.S.A) (Pictograms)	

HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	4
Reactivity	0
Personal Protection	d

NFPA (U.S.A.)



Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

References Available upon request.

Glossary

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ASTM - American Society for Testing and Materials
ADR - Agreement on Dangerous goods by Road (Europe)
BOD5 - Biological Oxygen Demand in 5 days
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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
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

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FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act		WHMIS - Workplace Hazardous Material Information System
Information Contact	**Petro-Canada** **Product Safety Coordinator** **(403) 296-4410**	**Prepared by May on 18/03/97.** **Data entry by May Chau.**

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name **JET A/A-1 AVIATION TURBINE FUEL**

Code	File # W213
DSL	On the DSL.
Print Date: 12/2/97.	

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

Synonym Jet A-1, Jet A-1 DI, Aviation Turbine Kerosene (ATK), International Jet A-1, International A-1 DI,JP-8, F-34, Turbine Fuel, Aviation, Kerosene Type (CAN/CGSB-3.23), Fuel Oil No. 1.

Chemical Name Not applicable.

Chemical Family Petroleum hydrocarbons

Chemical Formula Not applicable.

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).

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

Material Uses Use as aviation turbine fuel. May contain a fuel system icing inhibitor.

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	**CAS #**	**TLV-TWA(8 h)**	**STEL**	**CEILING**	**% (V/V)**
Complex mixture of petroleum hydrocarbons (C9-C16)*	8008-20-6	Not established	Not established	Not established	99.9
Anti-static, antioxidant and metal deactivator additives.	Not applicable	Not applicable	Not applicable	Not applicable	0.1
*Aromatic content is 25% maximum (benzene: nil). May contain icing inhibitor (<0.15%).					

Section 3. Hazards Identification.

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

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

Section 4. First Aid Measures

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

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

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

Hazardous Inhalation No additional remark.

Ingestion DO NOT induce vomiting because of danger of aspirating liquid into lungs. Get immediate medical attention.

Hazardous Ingestion Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed.

Section 5. Fire-fighting Measures

The Product is:	Class II - combustible liquid (NFPA).
Auto-Ignition Temperature	>245°C (>472°F)
Flash Points	OPEN CUP: >38°C (>100.4°F) (ASTM D56, Tag).
Flammable Limits	LOWER: 1.2%, UPPER: 6%
Products of Combustion	Carbon oxides (CO, CO2), smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids. May accumulate static charges which may cause spark.
Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, drill, or pressurize empty container. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back.
Fire Fighting Media and Instructions	DOT Guide 26, flammable/combustible material. Keep upwind. Isolate hazard area. SMALL FIRE: Use DRY chemicals, foam, CO2, water spray or fog. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire and disconnect all ignition sources if it is possible to do so without risk. Stay away from ends of tanks. Cool containers with water from maximum distance until well after fire is out. Avoid spraying water directly into storage containers due to danger of boilover. Try to cover spilled liquid with foam. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. DO NOT flush spilled material into sewers, streams, or other bodies of water. Respiratory, eye and body protection are required for fire fighting personnel. Self-contained breathing apparatus (SCBA) is required if approaching the fire from downwind, or to enter enclosed areas or buildings.
Special Remarks on Fire Hazards	No additional remark
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures

Small Spill	Check with applicable jurisdictions for specific disposal requirements of material and empty containers. Evacuate personnel. Avoid contact. Use full protective equipment and breathing apparatus. Eliminate ignition sources. Shut off source of spill. Absorb with inert absorbent such as clay, and or diatomaceous earth, commericial sorbents, or recover using electrically grounded explosion-proof pumps. Place absorbent in closed metal containers. DO NOT FLUSH TO SEWER. Large spills may be pumped from upwind locations using vacuum trucks and extended hoses. Large pools may be covered with foam to prevent vapour evolution. Immediate shut down and evacuation if wind shifts. Constant monitoring is required.
Large Spill	No additional remark.

Section 7. Handling and Storage

Handling	Keep away from sources of ignition. In case of insufficient ventilation, wear suitable respiratory equipment. Electrically ground/bond during the pumping or transfer to avoid static accumulation. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Precautions should be taken to minimize skin contact and inhalation. High standards of personal hygiene are necessary. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area and away from oxidizing agents. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Chemical splash goggles in case of splashing. Wear long sleeved clothing to minimize skin contact. Be sure to use a MSHA/NIOSH approved respirator or equivalent when ventilation is inadequate. Full-faced self-contained breathing apparatus or air supplied (when concentrations exceed 100 ppm (525 mg/m³). For direct contact of more than 2 hours -- VITON or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	8-hour TLV-TWA of 350 mg/m³ recommended by Petro-Canada based on ACGIH's Notice of Intended Changes (1996) for Kerosene/diesel fuel.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.
Dropping Point	Not applicable.
Penetration (@ 25°C)	Not applicable.
Boiling Point	160°C (320°F) - 300°C (572°F).
Melting Point	Not applicable.
Specific Gravity	0.84 g/L @ 15°C (Water = 1).
Vapor Pressure	0.70 kPa @ 20°C (5.25 mmHg @ 68°F).
Vapor Density	4.5 (Air = 1)
Volatility	Lower than gasoline.
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Log Kow: 3.3 - 5.25; mobile.
Viscosity (@ 40 °C)	<8 cSt @ -20°C (-4°F).
Solubility	Insoluble in water, alcohol, acids, alkalies; soluble in oil turpentine, petroleum, carbon disulphide, chloroform, ether, and acetone.

Odor	Kerosene-like.
Taste	Not applicable.
Color	Colorless.

Section 10. Stability and Reactivity

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

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Toxicity to Animals	*Acute oral toxicity (LD50): 15 000 mg/kg (rat).
Chronic Effects on Humans	Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation. Prolonged or repeated contact with skin may cause irritation and possibly dermatitis.
Other Toxic Effects on Humans	This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours, or mists, inhalation of this product may cause irritation of the breathing passages, headaches, nausea, dizziness, blurred vision, fatigue, tremors, convulsions, shortness of breath or loss of consciousness. Defatting or drying of skin. Vapours may irritate eyes. Aspiration into lungs may cause chemical pneumonitis. For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	*Based on API Project #1443 on Jet Fuel A, which quotes oral rat LD50 >25 ml/kg. Dermal primary skin irritation score (Draize) = 1.96; mildly irritating (rabbit). Eye irritation index (Draize) = 2.67; mildly irritating (rabbit).
Special Remarks on Chronic Effects on Humans	Preexisting eye, skin, respiratory, neurological, liver or kidney conditions may be aggravated by exposure to this product.
Special Remarks on Other *Toxic Effects on Humans*	No additional remark.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks on the Products of Biodegradation	Not readily biodegradable. Potential for bioaccumulation.

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	Shipping Name: Fuel, aviation, turbine engine; UN 1863; Class: 3; Packing Group: III; Label required: Flammable liquid.
Special Provisions for Transport	Acceptable modes of transportation: air, rail, road and water.

Section 15. Regulatory Information and Pictograms

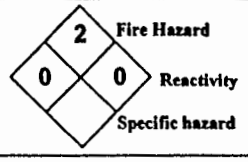
Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on CEPA-DSL, and USEPA-TSCA. This product is not known to contain any of the carcinogens required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in CERCLA (40 CFR 302.4). Not listed in EPCRA or SARA Title III, Section 302/304/311/312/313 (40 CFR 355/370/372). Not listed in RCRA (40CFR 261.33). Not listed as hazardous chemical in CHIP96-Approved Supply List (675/548/EEC). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.	
Other Classifications	**WHMIS (Canada)**	B-3, D-2B
	DSD/DPD (EEC)	10- Flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/38- Irritating to eyes and skin.

WHMIS (Canada) (Pictograms)

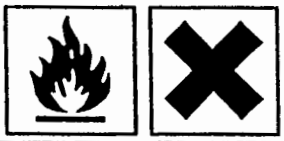
HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	2
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)



DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Section 16. Other Information

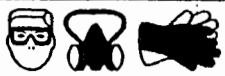
References	Available upon request.
Other Special Considerations	DO NOT SIPHON BY MOUTH OR USE AS A CLEANING SOLVENT.

Prepared by May on 5/16/96.	**Data entry by May Chau.**
	Print Date: 12/2/97.

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

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name JET B AVIATION TURBINE FUEL

Code	File # W219
DSL	Listed on DSL.
Print Date: 12/2/97.	

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

Synonym Jet B, Jet B DI, International Jet B, International Jet B DI, Jet Fuel JP-4, Jet Fuel F-40; Turbine Fuel, Aviation, Wide Cut Type (CAN/CGSB-3.22).

Chemical Name Not applicable.

Chemical Family Petroleum hydrocarbons.

Chemical Formula Not applicable.

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).

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

Material Uses Used as aviation turbine fuel. May contain a fuel system icing inhibitor.

Section 2. Composition/Information on Ingredients

		Exposure Limits (ACGIH)			
Name	CAS #	TLV-TWA(8 h)	STEL	CEILING	% (V/V)
Complex mixture of aliphatic and aromatic hydrocarbons (C6-C14).	64741-41-9	300 ppm (gasoline)	500 ppm (gasoline)	Not established	>99
Additives: anti-oxidant, anti-static, corrosion and/or icing inhibitors.	Not applicable	Not established	Not established	Not established	<0.2

Section 3. Hazards Identification.

Potential Acute Health Effects Inhalation of vapours or mist may cause irritation of nose and throat; headache, nausea, vomitting, dizziness, fatique, light-headedness, reduced coordination and unconciousness; central nervous system depressant; kidney and liver damage from long-term exposure. May be narcotic in high concentrations. Skin contact may cause drying, cracking, defatting, or inflammation of skin. Prolonged or repeated contact with skin may cause dermatitis. Eye contact may cause irritation, but no permanent damage. Overexposure due to ingestion is unlikey for adults since taste and smell limit the amount swallowed. Harmful or fatal if swallowed. For more information, refer to Section 11.

Potential Chronic Health Effects Kidney and liver damage may result from long-term exposure.

Section 4. First Aid Measures

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

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

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

Hazardous Inhalation No additional remark.

Ingestion Gastric decontamination to prevent absorption is important following a substantial recent ingestion. Is most effective if initiated within 30 minutes. DO NOT induce vomiting without supervision of medical personnel, because of danger of aspirating liquid into lungs. Seek immediate medical attention.

Hazardous Ingestion Seek medical attention. Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed. Harmful or fatal if swallowed.

Section 5. Fire-fighting Measures

The Product is:	Flammable liquid (NFPA).
Auto-Ignition Temperature	240°C (464°F)
Flash Points	Open Cup:-25°C (-13°F), ASTM D92, Cleveland.
Flammable Limits	Lower: 1.3%; Upper: 7.6% (NFPA).
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating fumes as products of incomplete combustion.
Fire Hazards in Presence of Various Substances	Easily ignites under almost all normal temperature conditions. Extremely flammable in presence of open flames, sparks, shocks, heat, oxidizing materials. Vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks), and may travel considerable distance to sources of ignition and flash back.
Explosion Hazards in Presence of Various Substances	Excessive heat. Do not cut, weld, heat, or drill empty container. Containers may explode in heat of fire. Runoff to sewer may create fire or explosion hazard.
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable/combustible liquid (non-polar/water-immiscible). 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. 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.
Special Remarks on Fire Hazards	Vapor may travel considerable distance to source of ignition and flash back.
Special Remarks on Explosion Hazards	No additional remark.

Section 6. Accidental Release Measures

Small Spill	Check with applicable jurisdictions for specific disposal requirements of material and empty containers. Evacuate personnel. Avoid contact. Use full protective equipment and breathing apparatus. Eliminate ignition sources. Shut off source of spill. Absorb with inert absorbent such as clay, and or diatomaceous earth, commericial sorbents, or recover using electrically grounded explosion-proof pumps. Place absorbent in closed metal containers. DO NOT FLUSH TO SEWER. Large spills may be pumped from upwind locations using vacuum trucks and extended hoses. Large pools may be covered with foam to prevent vapour evolution. Immediate shut down and evacuation if wind shifts. Constant monitoring is required.
Large Spill	No additional remark.

Section 7. Handling and Storage

Handling	Keep away from sources of ignition. In case of insufficient ventilation, wear suitable respiratory equipment. HANDLE AS EXTREMELY FLAMMABLE LIQUID. Electrically ground/bond during the pumping or transfer to avoid static accumulation. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Precautions should be taken to minimize skin contact and inhalation. High standards of personal hygiene are necessary. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Store in tightly closed containers in cool, dry, isolated and well-ventilated area. Ground all equipments containing material.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation, or other engineer controls, to keep airborne concentration below the allowable threshold limit value. Make-up air should always by supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	Chemical splash goggles in case of splashing. Wear long sleeved clothing to minimize skin contact. Be sure to use a MSHA/NIOSH approved respirator or equivalent when ventilation is inadequate. Full-faced self-contained breathing apparatus or air supplied (when concentrations exceed 300 ppm. For direct contact of more than 2 hours -- VITON or NITRILE gloves are recommended.
Personal Protection in Case of a Large Spill	No additional remarks
Exposure Limits	Petro-Canada recommends a working guideline of 1 ppm (3.2 mg/m³) of benzene for 8 hours time weighted average when handling product which may contain benzene; 300 ppm for 8 hours time weighted average and 500 ppm for short term exposure limit when handling Jet B. Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.
Dropping Point	Not available.
Penetration (@ 25°C)	Not available.
Boiling Point	50°C (122°F) to 243°C (470°F).
Melting Point	Not available.
Specific Gravity	0.75 to 0.80 kg/L @ 15°C (59°F).
Vapor Pressure	21 kPa (158 mmHg) @ 37.8°C (100°F).
Vapor Density	3.5 (Air = 1)
Volatility	Volatile 100% (v/v) or 100% (w/w).
Odor Threshold	Not available.
Oil / Water Dist. Coeff.	Not measurable.
Viscosity (@ 40 °C)	Not available.
Solubility	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Odor	Petroleum like.
Taste	Not available.
Color	Clear and colorless.

Section 10. Stability and Reactivity

Stability	The product is stable.		
Instability Temperature	Not available.		
Conditions to Avoid	Stable under normal storage and use. Sources of ignition. Heating greatly increases fire and explosion hazards.		
Incompatibility with Various Substances	Extremely reactive or incompatible with oxidizing agents.	**Decomposition products:**	COx, SOx, paritally oxidized hydrocarbons, smoke on combustion.
Corrosivity	Not applicable		
Special Remarks on Reactivity	Avoid: nitric acid, sulfuric acid, chlorine, ozones, peroxides, etc., which cause detonation on contact.		
Special Remarks on Corrosivity	No additional remark.		

Section 11. Toxicological Information

P ·s of Entry	Skin contact, eye contact, inhalation and ingestion.
icity to Animals	Acute oral toxicity (LD50): 14000 mg/kg (Rat).
Chronic Effects on Humans	Kidney and liver damage may result from long-term exposure.
Other Toxic Effects on Humans	Inhalation of vapours or mist may cause irritation of nose and throat; headache, nausea, vomitting, dizziness, fatique, light-headedness, reduced coordination and unconciousness; central nervous system depressant; kidney and liver damage from long-term exposure. May be narcotic in high concentrations. Skin contact may cause drying, cracking, defatting, or inflammation of skin. Prolonged or repeated contact with skin may cause dermatitis. Eye contact may cause irritation, but no permanent damage. Overexposure due to ingestion is unlikey for adults since taste and smell limit the amount swallowed. Harmful or fatal if swallowed. For more information, refer to Section 11.
Special Remarks on Toxicity to Animals	This product contains a small quantity of benzene, which is a suspect human carcinogen.
Special Remarks on Chronic Effects on Humans	No additional remark.
Special Remarks on Other Toxic Effects on Humans	No additional remark.

Section 12. Ecological Information

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

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	Shipping Name: Fuel, aviation, turbine engine; UN 1863; Class: 3; Packing Group: III; Label required: Flammable liquid.
Special Provisions for Transport	No additional remark.

Section 15. Regulatory Information and Pictograms

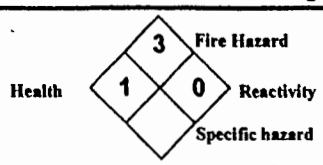
Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on CEPA-DSL, and USEPA-TSCA. This product may contain trace benzene, a carcinogen, which is required to be listed under OSHA hazard communication standard, 29 CFR 1910.1200 (U.S.). Not listed in CERCLA (40 CFR 302.4). Listed in EPCRA or SARA Title III, Section 302/304/311/312/313 (40 CFR 355/370/372) for benzene. Not listed in RCRA (40CFR 261.33). Please note that the chemical identity of some or all of the ingredients that may be listed herein is confidential business information and is being withheld as permitted by 29 CFR 1910.1200 and various State Right to Know Laws.	
Other Classifications	WHMIS (Canada)	B-2, D-2B
	DSD/DPD (EEC)	5- Heating may cause an explosion. 12- Extremely flammable. 18- In use, may form flammable/explosive vapor-air mixture. 36/37/38- Irritating to eyes, respiratory system and skin. 40- Possible risks of irreversible effects.

WHMIS (Canada) (Pictograms)

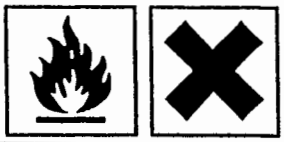
HMIS (U.S.A.)

Health Hazard	1
Fire Hazard	3
Reactivity	0
Personal Protection	h

NFPA (U.S.A.)



DSD/DPD (Europe) (Pictograms)



TDG (Canada) (pictograms)

DOT (U.S.A) (Pictograms)

Protective Clothing (Pictograms)

Section 16. Other Information

References	Available upon request.
Other Special Considerations	Note 1: * Contains trace amounts of conventional gasoline additives such as antioxidant, anti-static additive and icing inhibitor (2-Methoxyethanol). Note 2: ** Petro-Canada recommendation. Note 3: Avoid breathing vapours. Avoid contact with skin and eyes. Avoid aspiration.

Prepared by Admin-M on 6/24/97.	**Data entry by May Chau.**
	Print Date: 12/2/97.

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

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

APPENDIX B

RESPONSE EQUIPMENT INVENTORY

RESPONSE EQUIPMENT INVENTORY

During the exploration phase of the project, spills occurring along the transportation route will be remedied by the appropriate personnel depending on the party responsible for the spill, the location of the spill, and the extend of the environmental threat. Larger spills will involve the coordination of WMC International personnel (including the Emergency Response Team), contractors, and WMC Mutual Aid Partners. For the purposes of listing response equipment, the equipment will be listed by contractor and site.

Mobile Equipment

Mobile equipment owned by **Y & C Enterprises** located in Rankin Inlet that can be used for spill countermeasures include:

- 1 740 Champion grader
- 1 backhoe
- 1 BW 75 compactor
- 1 tractor and end dump
- 1 Cat 950 loader
- 1 Cat 966 loader
- 1 Cat 966 loader
- 1 Cat D3 dozer
- 1 Cat D5 dozer
- 1 Cat D6E dozer
- 1 Cat D6D dozer
- 1 Cat D8K dozer
- 9 tandem dump trucks
- 1 5000 gal. skid mounted storage tank
- 1 trash pump

Mutual Aid Partners

In the event of a major spill requiring additional resources, equipment and manpower will be made available through mutual aid agreements with the Canadian Coast Guard, the Hamlet of Rankin Inlet and the NWT Power Corporation.

Canadian Coast Guard (CCG) - Rankin Inlet Inventory

Material from the CCG inventory at Rankin INLET is available on a cost recovery basis and will be
made available on request to the GNWT EMO representative who will be billed by CCG for material consumed and who will then bill WMC accordingly.

1500' X 24"	oil containment boom
6	boom towing devices
6	5/8" tow lines X 100' c/w snap hooks
6	anchoring devices
6	Danforth anchors (22 lbs)
6	3/8" X 75' trip lines
6	trip line marker buoys type mb40
8	bales disposable boom (8" X 10' X 4 lengths per bale)
9	bales sorbent pads (18" X 18" X 3/8" X 100 pads)
10	sorbent rolls (36" X 150' X 3/8")
5	boxes of oil snare
2	1000 gal. portatanks
1	Spate pump
2	lengths 3" oil resistant suction hose - 50' each.
2	lengths oil resistant discharge hose - 50" each.
1	TDS-118 light medium oil skimmer c/w diesel power pack
1	spare parts kit for TDS-118 skimmer
1	4Kva diesel generator
1	16' aluminum boat
1	25 hp outboard motor
2	3000 psi portable high pressure washer
2	sets portable lights (each set has 3 X 500 watt halogen lamps, spare bulbs, 100" ext. cord and carrying case)
2	coils 1/4" polypropylene rope (1200')
2	coils ½" polypropylene rope (600')
2	coils 5/8" polypropylene rope (600')
72	pair disposable coveralls
120	pair work gloves
12	hard hat liners
40	dust / mist disposable masks
40	pairs assorted rain gear
20	pair safety glasses
20	safety vests
20	pair sunglasses
2	20' steel ISO containers
1	tool box

APPENDIX C

RISK ASSESSMENT & PREVENTATIVE MEASURES

RISK ASSESSMENT & PREVENTATIVE MEASURES

The purpose of Risk Assessment and preventative Measures for the Transportation Contingency Plan is to identify potential problems, suggest preventative measures to minimize the possibility of a mishap, and outline contingency plans in place to deal with the mishap once it has occurred. A summary table is provided on the next page.

The number of accidents and resulting fuel spills will vary depending on a number of factors: human error, mechanical failure, road conditions, weather conditions, etc. Over the past 10 years, the number of truck spills on winter roads supplying mines has decreased (personnel communication with Regulatory Agencies & Trucking Contractors). This seems to be as a result, in large part, to posting and enforcing speed limits, and increased experience and training of drivers.

A mishap that could occur with the transportation of fuel and supplies can be separated into one of the following:

- A delta goes through the ice - leaking
- A delta goes through the ice - not leaking
- A delta is upset on land or ice - leaking
- A delta is upset on land or ice - not leaking

A delta going through the ice and leaking is expected to be rare event.

Generally, the prevention of mishaps (potential problems) are the same and can be grouped together, as in the table on the next page.

Table C - 1 Risk Assessment, Preventative Measures, and Contingency Plans

Potential Problem	Preventative Measure	Contingency Plan
Delta Mishap - general	Y & C is expected to enforce a safe operating code for all delta operators delivering fuel to the Strict rules of the road are enforced: no drinking is allowed on or around the transportation route, Drivers should be required to complete checklists and document all matters that require servicing & repair; mechanics should carry out the work as appropriate	Driver knows what to do: 1. The major freight carriers should have a contingency plan, For example Y & C Enterprises Ltd. 2. WMC will provide each vehicle that will haul fuel with a copy of this contingency plan. 3. Each driver should have a roll of plastic, shovel, absorbent material, metal buckets and knife in order to contain small spills. Clear lines of communication: 1. Depending on the severity of the to ensure safety spill, notification follows the Transportation Spill Response Organization with the appropriate personnel contacted - External and Internal Response team know what do to: 1. Freight carriers have to demonstrate to WMC adequate spill response experience & training 2. WMC Emergency Response Team receives training as new members are added Approvals are obtained to burn spilled and recovered fuels at previously selected disposal sites - usually borrow pits.

APPENDIX D

SPILL REPORT FORMS

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

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Northwest Territories

24-Hour Report Line
24-ᓄᑦ ᐃᑲᕐᕿᓄᑦ ᐅᓂᒃᑳᖅᑎᐅᔪᓐᓇᖅᑐᖅ ᐅᖄᓚᐅᑦ
Phone/ᐅᖄᓚᐅᑦ (403) 920-8130
Fax/ᓱᑲᑦᑐᒃᑯᑦ (403) 873-6924

A Report date and time	**B** Date and time of spill (if known)	**C** ☐ Original report ☐ Update no. ____	Spill number

D Location and map coordinates (if known) and direction (if moving)

E Party responsible for spill

F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)

G Cause of spill

H Is spill terminated? ☐ yes/ᐄ ☐ no/ᐋᒃᑲ	**I** If spill is continuing, give estimated rate	**J** Is further spillage possible? ☐ yes/ᐄ ☐ no/ᐋᒃᑲ	**K** Extent of contaminated area (in square metres if possible)

L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.)	**M** Containment (natural depression, dykes, etc.)

N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials

O Do you require assistance? ☐ no/ᐋᒃᑲ ☐ yes, describe:	**P** Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife

Q Comments and/or recommendations

FOR SPILL LINE USE ONLY

Lead Agency

Spill significance

Lead Agency contact and time

....

....

....

Is this file now closed? ☐ yes/ᐄ ☐ no/ᐋᒃᑲ

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Reported to	Position, Employer, Location	Telephone

APPENDIX E

FUEL STORAGE MONITORING PLAN

The fuel storage monitoring plan will consist of the following daily and weekly inspections conducted by WMC personnel that have been trained in the use of fuel pumping equipment and fuel spill response.

The following inspections will be conducted and recorded on a daily basis:

1. All tanks, lines, pumps, hoses, valves and fittings will be inspected for leaks or damage.
2. Ensure proper fuel only is dispensed into the correct tanks and barrels for use in the camp and associated exploration work.
3. Ensure that the "No Smoking" signs posted in the area of the fuel tanks are always clearly visible.
4. Ensure that all personnel on site abide by the "No Smoking" rule within the distances outlined in the regulations for fuel tanks.
5. Ensure all spill response equipment and PPE is clearly visible and easily accessed.

The following inspections will be conducted and recorded on a weekly basis:

1. Fuel levels in all primary tanks checked and compared against the fuel dispensed from each primary tank for each week.
2. Outer tanks checked for fuel leakage from the primary tank.
3. Spill response equipment checked.
4. PPE checked.

APPENDIX F

FUEL HANDLING AND FUEL SPILL RESPONSE

TRAINING COURSE OUTLINES

AM SAFETY INSTITUTE LIMITED
"WORKPLACE SAFETY"
Occupational Health and Safety
Management, Consulting and Training

OIL SPILL TRAINING

Module 1 Introduction

Module 2 Federal and Provincial Regulations
(a) Introduction to WHMIS and its regulations
(b) Introduction to T.D.G. and its regulations

Module 3 Hazard Assessment and Controls
(a) Rankin Storage Facility
I. Tanks
II. Lines
III. Pumps- what type - safety precautions
IV. Hoses - fittings - leaks - damage - clean

(b) Transfer - Loading NO SMOKING
I. Mobile Unit - empty - choked - airvent/valve open - no leaks
II. Hoses - Static electricity
III. Valves - open before pumping
IV. Fixed containment
V. Portable containment
VI. Spill Kit - proper size - available
VII. Fire Extinguisher - correct type - large enough - full
VIII. Personal Protective Equipment - as per regulations
IX. TDG labels and documentation
X. What happens to the product in the hose after disconnecting ???

(c) In Transit
I. Valves - shut and locked
II. Vents - shut and locked
III. Portable Spill kit
IV. Portable Fire Extinguisher - correct type - large enough - full

(d) Fuel Transfer - Unloading - NO SMOKING
I. Mobile Unit - chocked - un-movable
II. Valves - unlocked and open before pumping
III. Vents - unlocked and open before pumping
IV. Fuel unloading - static electricity
V. Fixed containment
VI. Check load will go into assigned tank
VII. Check load will go into CORRECT tank
VIII. PPE
IX. Portable containment

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Dartmouth, N.S. B3B 1Y5

(e) Fixed Tanks
- I. Hoses and Lines - leaks - damage
- II. Pump - type - leaks
- III. Spill Kit

Module 4 Spill Cleanup

(a) Safety Overview
- I. Site Orientation
- II. General safety guidelines
- III. Buddy system
- IV. Universal hand signals

(b) Characteristics of Petroleum Products
- I. General hazards of petroleum products
- II. MSDS's
- III. Properties of petroleum
- IV. Petroleum vapours
- V. Controlled sites
- VI. Confined spaces
- VII. Systems of exposure
- VIII. Hydrogen sulphide
- IX. Exposure to petroleum products
- X. Inhalation
- XI. Aspirations
- XII. Ingestion
- XIII. Skin contact
- XIV. Warming fires
- XV. Smoking
- XVI. Lighters and matches
- XVII. Electronic equipment

(c) Personal Protective Equipment
- I. Types of PPE
- II. Decontamination and inspection

(d) Working Environment
- I. Common injury causes
- II. Shoreline terrain
- III. Poor weather conditions
- IV. Hypothermia
- V. Heat exhaustion
- VI. Heatstroke
- VII. Noise exposure
- VIII. Wildlife
- IX. Drugs, alcohol and unauthorized firearms

(e) Equipment and Transportation
- I. Helicopters and fixed wing craft
- II. Boat and water operations
- III. Equipment transportation
- IV. Hand tools
- V. Hand tolls basic Do's and Don'ts
- VI. Rakes
- VII. Shovels
- VIII. Collection bags
- IX. Machetes and axes
- X. Peaveys
- XI. Pitch forks

Module 5 Transportation of Dangerous Goods
(a) Refresher

Appendix Five: Fuel Spill Response Kit

Appendix Five

Basic Contents of Fuel Spill Response Kit

1. Absorbent pads or sheets
2. Disposable protective gloves
3. Disposable protective coveralls.
4. Sorbent disposal bags.

Appendix Six: Camp Closure Checklist

Appendix Six

Camp Closure Checklist

1. Incinerate all combustible garbage.
2. Salvage or incinerate all freezable/putrescible kitchen goods.
3. Drain all water lines and pumps.
4. Closer and lock all supply valves at fuel storage tanks.
5. Fill all fuel day tanks to 95% capacity.
6. Shut off and lock all fuel lines to heaters, furnaces and generators.
7. Drain fuel lines and dispose accumulated fluids in incinerator.
8. Set all partially used fuel barrels on end and slanted so that melt water can not seep into drum.
9. Check all bungs on drums with fuel.

Appendix Seven: Drill Site Rehab Procedure

Appendix Seven

Drill Site Rehab Procedure

1. Allow site to drain before initiating rehab efforts.
2. Remove all garbage and debris that may have emerged from cuttings during drainage and settling of mud cake.
3. Open bale of peat and distribute over mud cake and incorporate into mud by raking orstomping.
4. Broadcast 5 kg. of N-P-K 20-20-20 (or equivalent ratio) slow release granular fertilizer over mud cake and adjacent area.
5. Check drill site completion form (attached).

6. (a) Fertilizer combination must be 1:1 N:P (ie 20-20; 15-05; 05-15)

(b) ignore the 3rd number in the Formula

7. 5 Kg per drill site = 10m x 10m only over part of Tundra disturbed by set up and if thick sludge

8. Peat - 1 bale per drill hole ∴ 2 bales in site if sump set up