SPILL PREVENTION AND RESPONSE PLAN

Kahuna Property

Kodiak Copper Corp.

Original Version Submitted: November 2015
Effective Date: May 30, 2022

Prepared By: Kodiak Copper Corp.
(formerly Dunnedin Ventures Inc.)
Suite 1020-800 West Pender Street
Vancouver, BC, V6C 2V6

Table of Contents

List of Tables

Appendices

1 Introduction

This Spill Prevention and Response Plan (SPRP) was originally submitted in 2015 and has been updated as of March 31, 2022. The Kahuna Diamond Property is located between the communities of Rankin Inlet (Kangiqliniq) and Chesterfield Inlet (Igluligaarjuk) in the Kivalliq Region of Nunavut (Appendix A). A copy of this plan will be kept in the office at site and at the head office in Vancouver. Copies of this plan may be obtained from Kodiak Copper Corp. (Kodiak) (formerly Dunnedin Ventures Inc.).

Kodiak exploration activities on the Kahuna Property are permitted under CIRNAC Land Use Permit N2018C0022, KIA Land Use Licence KVL315B01, KIA Land Use Licence KVR16F01 and NWB Water Licence 2BE-KDP1722. Activities permitted include rock, till and soil sampling, prospecting and geological mapping, ground geophysical surveying, diamond drilling, reverse circulation drilling, bulk sampling and the operation of the Kahuna Field Camp.

1.1 Corporate Details

Kodiak Copper Corp.
Suite 1020- 800 West Pender Street
Vancouver, British Columbia, V6C 2V6
Tel: (604) 646-8351
Fax: (604) 646-4526
www.kodiakcoppercorp.com

Main Contact List

Andrew Berry (VP Operations)	(604) 765-1892
Jeff Ward (VP Exploration)	(604) 646-4538
Claudia Tornquist (CEO & President)	(604) 657-1225
Emily McNie (Geologist)	(604) 646-8352
Kahuna Camp (during operations)	(403) 668-8612

1.2 Purpose and Scope

Kodiak Copper Corp. has prepared this SPRP for drilling, bulk sampling, exploration activities and field camp operations being undertaken on the Kahuna Diamond Property. The purpose of this document is to provide a plan of action in the event of a hazardous spill and to mitigate, to the fullest extent possible, the risk of environmental contamination from the accidental release of deleterious materials by providing clear procedures for their storage and handling as well as clear plans of action in the case of such a release. This plan demonstrates that Kodiak has appropriate response procedures and measures in place to effectively contain and recover spills in an efficient manner.

Kodiak Copper Corp. will take every reasonable precaution towards ensuring the protection and conservation of the natural environment, the safety and health of Kodiak employees and contractors and protecting the community at large from harmful effects of its materials and operations.

1.3 Project Description

The Kahuna Diamond Property currently covers 66 mineral claims (100% and 50% ownership) covering approximately 820.3 square kilometres (Appendix A). Due to the transition to online map staking as of January 30, 2021, Kahuna Diamond Property claims currently have overlapping units on Nunavut Map Selection. Claim boundaries will be adjusted to remove overlapping units once all issue dates are reached. Claims are located on NTS map sheets 055O/02, 055O/03, 055O/04, 055O/05, 055O/06, 055O/07, 055J/13, 055J/14, 055N/01 and 055N/08 (Figure 2). The southern boundary of the property adjoins the north boundary of subsurface Inuit Owned Land (IOL) parcel RI-01, approximately 40 kilometres northeast

of Rankin Inlet. The northeast corner of the property is located approximately 15 kilometres southwest of Chesterfield Inlet. The Property extends north, south, east and west between Latitudes 62°59'30" and 63°15' 30" North and Longitudes 90°44' and 91°49' West. A total of 45 mineral claims have surface rights that are within, or partially within, the boundaries of surface Inuit Owned Land parcel CI-15.Exploration and camp activities on the Kahuna Property are permitted under CIRNAC Land Use Permit N2018C0022, KIA Land Use Licence KVL315B01, KIA Land Use Licence KVR16F01 and NWB Water Licence 2BE-KDP1722.

1.4 Facilities

1.4.1 Field Camp

The Kahuna Field Camp is located on Crown Lands approximately 40 kilometres northeast from Rankin Inlet and 50 kilometres southwest from Chesterfield Inlet at 575,975mE and 6,990,875mN in Zone 15, UTM NAD83. The camp will operate seasonally from early-March through late-September.

The Kahuna Camp application was approved by CIRNAC on March 8, 2018 and NWB on April 23, 2018 and is authorized under CIRNAC Land use Permit N2018C0022 and NWB Water Licence 2BE-KDP1722.

The Kahuna Camp is located on Crown Land on mineral claim K90309 (KH 46). Kodiak transferred ownership of this claim to Solstice Gold Corp. on August 31, 2018 after the establishment of the Kahuna Camp. The camp is co-owned by both Kodiak and Solstice and is used as a base of operations for both companies.

The Kahuna Camp can accommodate 20 people and is comprised of:

- 1 - Kitchen Tent
- 1 - Office Tent
- 1 - Dry Tent
- 1 - Core Logging Tent
- 1 - Utility Tent
- 1 - Toilet Facility (Pactos)
- 7 - Crew Accommodations (1 tent will house the First Aid Attendant and First Aid Equipment)
- 1 - Generator Shack
- 1 - Portable Fuel-Fired Incinerator
- 2 – 5m x 20m Arctic Grade Containment Berms

Structures are a combination of WeatherPort vinyl tents, canvas prospectors' tents and small plywood structures. All fuel storage and usage areas will be located at least 31 metres from any water body or drainage course.

At the end of the 2018 field season, plywood structures were left standing and ready for use for Kodiak's future field programs. All WeatherPort vinyl tents and canvas tent covers were removed from camp for the fall and winter shut down period and will be erected during camp re-establishment in early-March, annually. The camp will be fully closed and dismantled upon completion of all exploration activities. The site will then be reclaimed and restored to its original state. The camp has not been utilized as a base of operations since 2018.

1.4.2 Fuel Storage

Kodiak is permitted to store up to 310 drums of fuel at the Kahuna Camp fuel cache. The main cache site is located approximately 60 metres west of the Kahuna Camp at 576065mE 6990845mN UTM Zone 15, UTM NAD83. The site offers an ideal smooth, sand covered, flat surface with no hazardous rocks or vegetation to perforate the berm membrane.

The majority of fuel to be cached on the property is transported via Challenger and/or Bombardier and cargo sled during winter months on the overland winter trail. Additional fuel may be delivered to site via helicopter during the summer months.

A main fuel cache is located on the west side of the Kahuna Camp at 576065mE 6990845mN UTM Zone 15, UTM NAD83. Kodiak is permitted the following amounts:

- 150 – 205 L drums of diesel fuel
- 150 – 205 L drums of jet fuel
- 10 – 205 L drums of gasoline
- 20 – 100 lb cylinders of propane

All fuel drums are stored in Arctic grade secondary containment berms equipped with Spilfyter RailMat 3 ply hydrocarbon absorbent fabric and Rain Drain hydrocarbon filters for water drainage. All fuel storage berms, fuel drums, fuel transfer and fuel staging areas are located a minimum 31 metres from any water body or drainage course. All fuel storage berms, fuel drums, fuel transfer and fuel staging areas will be inspected regularly during operations and will be equipped with easily visible and readily available spill kits.

Empty drums will be drained and stored in a designated area and will be removed from the property regularly to be transported south for recycling or disposal at an authorized facility. Kodiak will endeavor to consume the majority of the cached fuel by the end of each season. Please refer to the "Fuel Management Plan" for more information.

Temporary supply caches of less than nine drums will be located at drill sites and bulk sampling sites to maintain operations of diamond drilling equipment and bulk sampling equipment, respectively.

Chemicals and hazardous materials that may be located on the Kahuna Property include limited volumes of motor oil and hydraulic oil, cleaners, batteries, electronics, fluorescent light bulbs/tubes and small quantities of hydrochloric acid. All such materials will be stored in their original containers. Refer to the Material Safety Data Sheets (MSDS; Appendix C) or the "Waste Management Plan" for the types, quantities and method of storage and Appendix A for the camp layout map showing the storage locations of chemicals and hazardous materials.

Fuel caches will be located more than 31 metres (100 feet) from the normal high-water mark of any body of water in compliance with CIRNAC Land Use Permits and KIA Land Use Licences. Temporary fuel caches will be contained in a portable fuel containment berms. Fuel cache inspections will occur on a regular basis during operations for leaks, damaged or punctured drums.

Empty fuel drums will be backhauled to Rankin Inlet by Challenger or Bombardier and sled during the winter months and by helicopter during summer operations. The government of Nunavut Department of Environment monitors the movement of hazardous waste, including waste fuel. This is done through a tracking document known as a Waste Manifest. The Waste Manifest must and will accompany all shipments.

All fuels for exploration purposes, i.e., Jet B, gasoline and diesel are stored in 205 litre (45 gal) metal drums. Propane is stored in standard 100lb propane tanks. A spill kit will be located at each fuel cache.

1.5 Equipment

Equipment currently permitted for use on the Kahuna Property is included in Table 1 below.

TABLE 1: EQUIPMENT LIST

Type	Size	Purpose
Helicopter - 1	A Star, Long Ranger (or similar)	Transportation - crews & equipment
Core Drill heli-portable - 1	Boyles 17A or equivalent	Drill testing
Snow Machine - 4	Small to mid-size	Transportation
Water Pump - 2	Gasoline powered	Water supply for drill & field camp
Excavator - 1	Cat 314C Excavator or equivalent	Extract Bulk Sample
RC/RAB/Air Track Drill - 1	Scout or Hornet	Exploration/bulk sampling/blast holes
Caterpillar Challenger 65s - 4 (alternatively Bombardiers B12s or Muskegs)	100 HP, with steel sleds	Mobilize/Demobilize drill, fuel, equipment & bulk sample, drill moves
Generators -2	20Kw and 12 Kw	Power generation

2 Predicted Environmental Impacts

All hazardous materials pose a threat to the environment if spilled. The following list outlines potential environmental impacts of hazardous materials stored on site:

- Gasoline may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Gasoline volatizes quickly and can be explosive and a fire hazard in the event of a spill.

- Diesel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Diesel volatizes comparatively slowly but represents a fire hazard in the event of a spill.

- Jet fuel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Jet fuel volatizes relatively quickly and represents a fire hazard in the event of a spill.

- Propane may be harmful to wildlife and the surrounding environment, and it has the potential to accumulate in the environment. Propane is highly volatile. In the event of a spill it represents an extreme explosive hazard.

- Oils and greases may be harmful to wildlife and aquatic life. They are not readily biodegradable; their volatility is low, and they have the potential for bioaccumulation in the environment.

3 Preventative Measures

The following actions are a proactive approach to environmental stewardship. These actions minimize the potential for spills during fuel handling, transfer and storage.

1. Use fuel transfer hoses with cam lock mechanisms.
2. Carefully monitor fuel content in the receiving container during fuel transfer. Always have fuel absorbent pads on hand while transferring fuel.
3. Clean up drips and minor spills as they happen.
4. Regularly inspect drums, tanks and hoses for leaks or potential to leak and for proper storage.
5. Create fuel caches in natural depressions that are located a minimum of 31 metres from the normal high-water mark of any water body nearby.
6. Train personnel, especially those who will be operators, in proper fuel handling and spill response procedures.

3.1 Petroleum and Chemical Product Storage

Kodiak Copper Corp. has established a main fuel cache at the Kahuna Camp. Temporary supply caches of nine drums or less will be located at drill sites and bulk sampling sites to maintain operations of drilling equipment and bulk sampling equipment, respectively. Fuel caches will be in accordance with CSA approved methods of storage of drummed product. Inspections of the fuel caches will be conducted during each visit. There will be a spill kit at each fuel cache location.

Preventative measures for the storage of petroleum and chemical products include:

Fuel and Chemical Storage

- All fuels and other hazardous materials will be stored in secondary containment (“berms”).
- All secondary containment will be capable of holding 110 percent of the volume of the largest fuel reservoir that is housed within the secondary containment.
- All secondary containment will be of sufficient height and depth to hold any potential spill or failure.
- Secondary containment berms will be made of material (Arctic Grade) that is sufficiently durable to withstand Nunavut’s climate and the natural terrain.
- Secondary containment berms will be equipped with hydrocarbon filtration systems (rain drains)

to safely remove water that is collected inside the berms.

- Secondary containment berms will be inspected daily during operations.
- Within the secondary containment berms fuel drums will be stored in rows on their sides with bungs facing at the 3:00 and 9:00 position.
- All drums, tanks and hoses will be regularly inspected for leaks.
- Propane cylinders will be stored standing up and away from any potential sources of ignition.
- Drummed fuel used for heating tents will be placed in secondary containment.
- All fuel storage sites will be located a minimum of 31 metres from the normal high-water mark of any water body and will be inspected regularly.
- Spill Kits will be placed and will be easily identifiable with clear signage at each fuel storage site.
- "NO SMOKING" signs will be erected at each fuel storage area.
- Smoking, open flame and any potential sources of ignition are prohibited within 31 metres of any fuel storage site.
- Empty fuel drums will be removed from site regularly.

Hazardous Materials Storage

Hazardous materials that may be located on the Kahuna Property include small amounts of hydrochloric acid, cleaners, batteries, electronics, fluorescent light bulbs/tubes, motor oil, antifreeze and hydraulic oil. Materials will be stored in the generator shed away from weather and in their original containers. Containers will be inspected to ensure they are sound, sealable, and not damaged or leaking. Please refer to the Waste Management Plan for details on the disposal of Hazardous Materials. All hazardous material spills will be treated according to the Spill Response Action Plan in Section 5 below.

A limited inventory of motor oil and hydraulic oil will be located in the generator shed at the Kahuna Camp. These products typically come in 1 litre or 4 litre jugs and will be stored in a drip tray with a spill kit nearby. Hydrochloric acid is used for core logging in very small amounts (<0.5 litre) and will be kept in a sealed container in the core shack. Cleaners (solvents) will be kept in a designated area in their original containers. Antifreeze typically comes in 1 litre or 4 litre jugs and will be stored in a drip tray in the drill shack with a spill kit nearby.

3.2 Petroleum Product Handling and Transfer

Manual and electric powered pumps, along with the appropriate filtration devices, are used for the transfer of petroleum products.

Cigarette smoking, sparks, open flame, and any other potential ignition sources are prohibited from any fuel storage and fuel transfer site at all times. As a general guideline, all equipment is to be turned off during refueling. A spill kit will be stored in areas of storage and refueling.

Preventative mitigation measures include:

Handling and Transfer

- Fuel transfer hoses with cam lock mechanisms to prevent leakage are used.
- Fuel absorbent pads are placed appropriately to protect from drips and spills.

- Personnel will carefully monitor fuel content in the receiving vessel during transfer and always have absorbent pads available while transferring fuel.
- Any drips or leakages are cleaned immediately.
- All operating personnel will be trained in proper fuel handling and spill response procedures.
- Smoking, open flame and any potential sources of ignition are prohibited within 31 metres of any fuel storage site and fuel transfer locations.
- "NO SMOKING" signs will be erected at each fuel transfer area.
- Equipment maintenance and servicing will be conducted in designated areas. Equipment will be underlain by absorbent pads and spill trays for lubricant changes.
- Funnels will be used to reduce the potential for spillage.
- Waste oils and fluids will be collected in sealed 20 litre pails and will be labelled appropriately and stored in secondary containment berms.
- Empty fuel drums will be removed from site regularly.
- All other transfers will be completed within designated areas within in secondary containment. When secondary containment is not practical (e.g., adding hydraulic oil to the helicopter), absorbent pads will be used to protect from drips and spills.

3.3 Petroleum Product Transport

Shipper

- Ensures proper loading, restraint, containment, and documentation, which complies with TDG (Transportation of Dangerous Goods) guidelines.
- Ensures that goods are classified and labelled appropriately. Provide placards if required.
- Ensures safety at all times.
- Ensures proper communication with carrier.

Carrier

- Supervises and ensures proper loading, restraint, containment, and documentation, which complies with TDG guidelines.
- Ensures correct volumes for transport, attach placards if required.
- Checks and delivers TDG manifest to receiver.
- Ensures safety of all personnel and equipment.

Receiver

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

On-Site Coordinator

- Supervises and organizes spill containment equipment and personnel.
- Reports to internal/external parties.
- Ensures proper safety equipment is available.
- Notifies all personnel of current hazards.
- Provides adequate training for safety and material handling.
- Maintains proper safety procedures at all times.
- Must be compliant with all TDG guidelines.

3.4 Petroleum Product Transport – Overland Winter Trail

The following mitigation measures are employed to prevent a spill during the transfer of petroleum products by Bombardier/Challenger and cargo sleds while utilizing the Overland Winter Trail between Rankin Inlet and the Kahuna Camp.

- Drums are inspected prior to loading.
- Drums are loaded standing vertically with bungs up to prevent rolling.
- Drums are secured in place with ratchet straps.
- A 55 gallon spill kit (capable of holding 110 percent of the volume of the largest fuel reservoir) accompanies each fuel shipment.
- The Bombardier cargo sleds can hold a maximum of 15 drums (205L each) for a total of 3075 litres ($3.075m^3$).
- In the event of a spill on the overland winter trail, the Kahuna Camp has containment bags capable of handling $30m^3$ that will be flown via helicopter to the site of the spill.
- Drivers stay on the main trail to ensure safe ice thickness and the smoothest drive possible.
- Kodiak equips drivers with satellite phones and InReach devices to maintain communication in the event of a spill.
- Drivers are local Rankin Inlet and Chesterfield Inlet residents with extensive experience on the overland winter trail.

The containment bags are suitable for transporting contaminated materials, including soils, by helicopter from the spill site to a staging site where they can be placed into drums for transportation to an approved facility for disposal.

3.5 Spill Equipment

Complete spill kits are kept on hand at all times at the base of operations and where hazardous materials are being stored. Spill kits contain:

1 – 360 litre/79 gallon or 250 lite/55 gallon polyethylene over-pack drum
4 – Oil sorbent booms (5” X 10’)
100 – Oil sorbent sheets (16.5” X 20” X 3/8”)
1 – Drain cover (36” X 36” X 1/16”)
1 – Caution tape (3” X 500’)
1 – 1 lb. plugging compound
2 – Pairs Nitrile gloves
2 – Pairs Safety goggles

2 – Pairs Tyvek coveralls
1 – Instruction booklet
10 – Printed disposable bags (24" X 48")
1 – Shovel

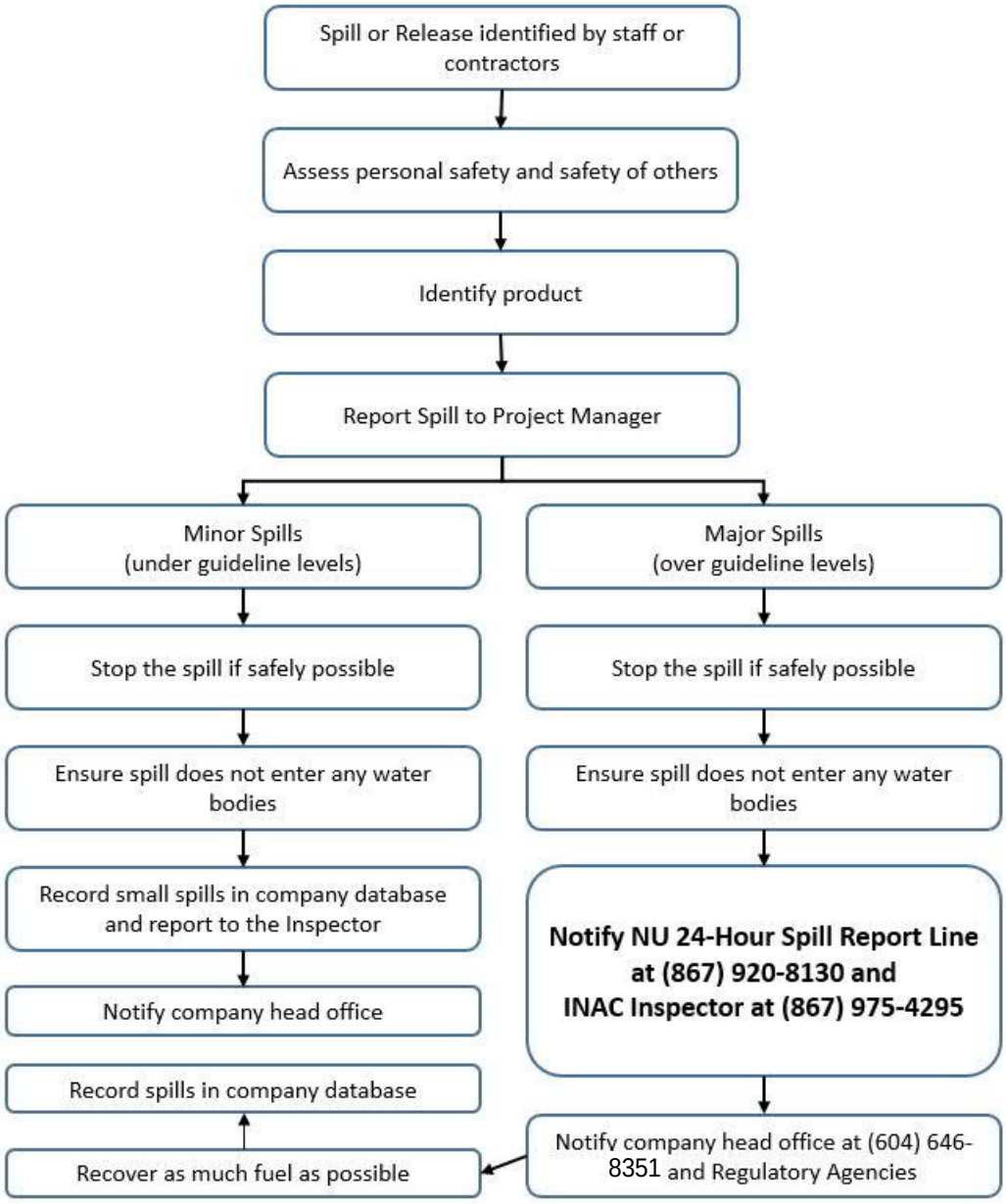
Kodiak will have a minimum of 30 containment bags ($1m^3$ each) on site during operations to ensure adequate containment of any material that requires removal due to a spill. The containment bags are suitable for transporting contaminated materials, including soils, by helicopter from the spill site to a staging site where they can be placed into drums for transportation to an approved facility for disposal.

Spill kits are located at all fuel berms, fuel storage, fuel handling and transfer stations, and at drill sites. In the event a damaged or leaking drum is noted, at least one empty fuel drum in good condition will be located at each fuel cache to facilitate a transfer of contents into a secure container. Extra absorbent pads will be kept with the helicopter and in any area where refuelling, transferring and/or handling is done.

4 Response Organization

In the case of any spill or environmental emergency, it is necessary to react in the most immediate, safe, and environmentally responsible manner. No spill or incident is so minor that it can be ignored, and every spill must be reported. Communications are essential when located in a remote area. A summary of available communication equipment is provided in section 4.4.

The follow flow chart depicts spill response organization, as well as the chain of command for responding to a spill or release.



4.1 Basic Steps – Spill Procedures

The basic steps of the response plan are as follows:

1. *Ensure* the safety of all persons at all times.
2. *Identify* and find the spill substance and its source, and, if possible, stop the process or shut off the source.
3. *Inform* the immediate supervisor or his or her designate at once, so that he/she may take appropriate action. Appropriate action includes the notification of a government official, if required; Spill Report forms are included at the back of this plan.
4. *Contain* the spill or environmental hazard, as per its nature, and as per the advice of CIRNAC Water Resources Inspector as required.
5. *Implement* any necessary cleanup or remedial action.

4.2 Basic Steps - Chain of Command

1. Immediately notify the Kodiak Copper Corp. Head office (604) 646-8351 and report to the 24-Hour Spill Line at (867) 920-8130 (Fax: 867-873-6924), CIRNAC Land Use Resource Management Officer (867) 645-2840 and KIA Land Use Inspector (867) 645-5735.
2. A Spill Report Form (Appendix A) is filled out as completely as possible after contacting the 24-Hour Spill Line and Jeff Ward, VP Exploration, Kodiak Copper Corp. (604) 763-8723; or Andrew Berry, VP Operations, Kodiak Copper Corp. (604) 765-1892.

4.3 Spill Response/Reporting Contact Information

Table 2: Contact List

CONTACT	CONTACT NUMBER (Tel / Cell)
Claudia Tornquist, CEO & President, Kodiak Copper Corp.	(604) 657-1225 (cell)
Jeff Ward, VP Exploration, Kodiak Copper Corp.	(604) 763-8723 (cell)
Andrew Berry, VP Exploration, Kodiak Copper Corp.	(604) 765-1892 (cell)
24 Hour Emergency Spill Line	(867) 920-8130 (phone) (867) 873-6924 (fax)
Atuat Shouldice, CIRNAC Resource Management Officer (Rankin Inlet) CIRNAC Rankin Inlet Office Omer Pasalic, Spills, Senior Inspector, CIRNAC	(867) 645-2840 (867) 645-2830 (867) 222-2744
KIA Land Use Inspector (Rankin Inlet)	(867) 645-5735
Custom Helicopters	(204) 338-7953 (24 Hours)
Rankin Inlet Hospital	(867) 645-8300 (Office Hours) (867) 645-6700 (24 Hours)
Rankin Inlet RCMP; Office Hours / Emergency	(867) 645-1111 (Emergency) (867) 645-0123 (Office Hours)

4.4 Communications

Communications are essential when using isolated camps with aircraft support. Crew members must be taught how to use all of the communication equipment in camp. There are three types of communication that will be used at the Kahuna Property field camp: Infosat digital satellite data / phone link, Iridium satellite phones, hand-held VHF radios and Garmin inReach devices. A summary of communication equipment procedures is below.

To use the Infosat satellite phone: (Digital data / phone link - base camp system)

- Dial as for a regular push button telephone.

To use an Iridium satellite phone:

- Press power button to turn unit.
- Unfold antenna and allow it to stand vertically.
- Ascertain 3 to 5 bar signal strength.
- Dial as for a regular push button telephone.
- Press send.

Hand-held VHF radio: (personal communication with appropriate frequencies)

- Channels will be established and designated during field operations.
- Press transmit button on side of unit to talk.
- Remove pressure from transmit button to receive.

Garmin inReach devices:

- Important contacts are programmed into the contact list.
- Send messages like you do a text on your mobile phone.
- In the event of an emergency, there is an SOS button on the right side of the device that will initiate emergency response.

5 Spill Response Action Plan

5.1 Potential Spill Hazards

The following is a list of potential spill hazards:

- Drummed products have the potential to leak or rupture. This includes drums of Jet A, Diesel, Gasoline, Waste Fuel, and Waste Oil. Ensure bungs are sealed properly.
- Propane cylinder leaks may occur at the valves. All cylinders are secured at all times. Full fuel cylinders are always stored in the upright position.
- Wheeled vehicles and equipment, aircraft (fixed and rotary wing), diamond drill, reverse circulation drill/air track drill, Caterpillar Challenger/Bombardier, snowmobiles, generators,

pumps. Incidents involving leaking or dripping fuels and oils may occur due to malfunctions, impact damage, and lack of regular maintenance, improper storage, or faulty operation.

Incidents involving leaking or dripping fuels and oils may occur due to malfunctions, impact damage, and lack of regular maintenance, improper storage or faulty operation. Regular inspection and maintenance in accordance with recognized and accepted standard practices at all fuel caches, reduces the risks associated with the categories listed above.

Spill response training is provided to all personnel with particular attention to those personnel who handle fuels and other petroleum products. This training will include a presentation, review of spill kit contents and their use and reporting.

Spill Kits will be located at the field camp and all fuel caches and drill shacks. A description of contents is listed in Section 3.4.

5.2 Initial Action Procedures

1. First steps to take when a spill occurs:

- Ensure your own safety and that of others around you, beginning with those nearest to the scene.
- Control danger to human life, if necessary.
- Identify the source of the spill.
- Notify your supervisor, request assistance if needed.
- Assess whether or not the spill can be readily and safely stopped.
- Contain or stop the spill at the source, if possible, by following these actions.
    - If filling is in progress, STOP AT ONCE.
    - Close or shut off valves.
    - Place plastic sheeting at the foot of the tank, barrel, or piece of equipment to prevent seepage into the ground or runoff of fuel.
    - Use absorbent materials (sheets, pads, booms) to absorb and contain the fuel spill.

2. Secondary steps to take:

- Determine status of the spill event.
- If necessary, transfer fuel from a damaged and/or leaking drum or tank into a refuge container.
- Notify the 24-hour Spill Report Line and receive further instructions from the appropriate contact agencies.
- Complete and fax a copy of the Spill Report Form.
- Notify permitting authorities.
- If possible, resume cleanup and containment.

5.3 Spill Response Actions – Diesel Fuel, Jet Fuel, Hydraulic Oil & Lubrication Oil

Take action only if safety permits – stop the source flow if safe to do so and eliminate all ignition sources. Never smoke when dealing with these types of spills.

Advice on spill containment and cleanup may be obtained from CIRNAC Resource Management Officer.

Spills on Land

- Build a containment berm using peat, native soil or snow down slope of the seepage or spill.
- Place a tarp at the foot of the berm to allow the fuel to pool for collection and removal. If there is a large volume of spilled product, pump the liquid into empty drums for sealing and disposal.
- Remove the spill by using absorbent pads or excavating the soil or gravel. Petroleum product sheen on vegetation may be controlled by applying a thin dusting of ultra-dry absorbent (e.g. Multi Sorb) to the ground cover. Multi Sorb can also be used to scrub the rock surface.
- Contaminated soil and saturated material will be placed in empty drums or containment bags and shipped from the site for proper disposal. Contact regulatory agencies for approval before commencing removal of any soil, gravel, or vegetation.

Spills on Water

- Deploy hydrophobic (water repellent) absorbent pads on the water to capture small spills. Hydrophobic pads readily absorb hydrocarbons. Alternatively, an ultra-dry absorbent designed for use on water-based spills may be deployed.
- For larger spills, ready several empty drums to act as refuge containers for the spill.
- Use containment booms on the water surface to "fence in" the spill area gradually and to prevent it from spreading.
- Absorbent booms can be deployed to encircle and then absorb any hydrocarbon spillage that may have escaped the containment boom.
- Once a boom has been secured, a skimmer may be brought on site to aid in capture of the hydrocarbons. Once captured, the product should be pumped to the empty fuel drums and prepared for proper disposal.

Spills on Snow and Ice

- Build a containment berm using snow around the spill.
- Remove spill using absorbent pads or particulate sorbent material.
- Shovel or scrape contaminated snow and ice into plastic buckets with lids, empty 205L drums or containment bags.

Spills on Muskeg

- Do not deploy personnel and equipment on marsh or vegetation.

- Remove pooled oil with sorbent pads and/or skimmer.
- Flush with low pressure water to herd oil 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.

Storage and Transfer

All contaminated water, ice, snow, soil, and clean up supplies will be temporarily stored in closed, labelled containers. All containers will be stored in a well-ventilated area away from incompatible materials.

Disposal

Any contaminated material will be shipped from site to an appropriate and approved facility. The DOE monitors the movement of hazardous wastes from generators, carriers to receivers, through a tracking document (Waste Manifest). A Waste Manifest will accompany all movements. Kodiak Copper Corp. was issued NU Waste Generator Number NUG 100065 on May 16, 2018, by the Department of Environment.

Bioremediation

At the advice, discretion and approval of land use inspectors and permitting or licensing authorities' bioremediation, or land farming, may be implemented to treat certain contaminated soils temporarily contained in sealed drums on the property. Bioremediation is performed in biotreatment cells or the upper soil zone. Contaminated soils or sediments are incorporated into non contaminated soils and periodically turned over or tilled to aerate the mixture.

This technique has been successfully used for years in the management and disposal of oily sludge and other petroleum refinery wastes. In situ systems have been used to treat near surface soil contamination for hydrocarbons. The equipment employed in land farming is typical of that used in agricultural operations. These land farming activities cultivate and enhance microbial degradation of hazardous compounds.

Land treatment of petroleum products has been successfully utilized at numerous contaminated sites. It has been demonstrated that gasoline, jet fuel, and heating oil are extensively degraded when affected soils were treated with fertilizer, lime, and simulated tilling.

5.4 Spill Response Actions - Propane

CAUTION EXPLOSIVE. Take action only if safety permits – stop the source flow if safe to do so and eliminate all ignition sources. Never smoke when dealing with these types of spills.

On Land
Do not attempt to contain the propane release.

On Water
Do not attempt to contain the propane release.

On Ice and Snow

Do not attempt to contain the propane release.

General

- It is not possible to contain vapours 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 of CO_2.
- 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 recovery attempt should be made. Personnel should avoid touching release point on containers since frost forms very rapidly.
- Keep away from tank ends.

Storage and Transfer

It is not possible to contain vapours when released.

5.5 Spill Response Actions - Chemical Spills

- Assess the hazard of the spilled material. REFER TO THE MSDS SHEETS.
- Assemble the necessary safety equipment before response.
- Apply absorbents to soak up liquids.
- Place plastic sheeting over solid chemicals, such as dusts and powders, to prevent their disbursement by wind or investigation by birds or other mammals.
- Neutralize acids or caustics. Place spilled material and contaminated cleanup supplies in an empty refuge drum and seal for disposal.
- Contact the 24-Hour Spill Line.

5.6 Spill Response Actions - Loss of External Load

The loss of external loads of fuel, oil or chemicals from aircraft or winter vehicle (Bombardier/Challenger) may result in the failure of the container that held the product. Immediate response is required.

- Mark the loss target with GPS coordinates and relay to the base of operations immediately. Include the quantity and type of load lost. If required, additional containment bags will be brought to the site of the spill.
- Note whether the load was dropped onto soil, rocks, water, or snow and from what height. Determine if the container failed.
- Base of operations will contact the 24-Hour Spill Line.
- Administer appropriate procedure for Spills on Land, Water, Ice or Snow.

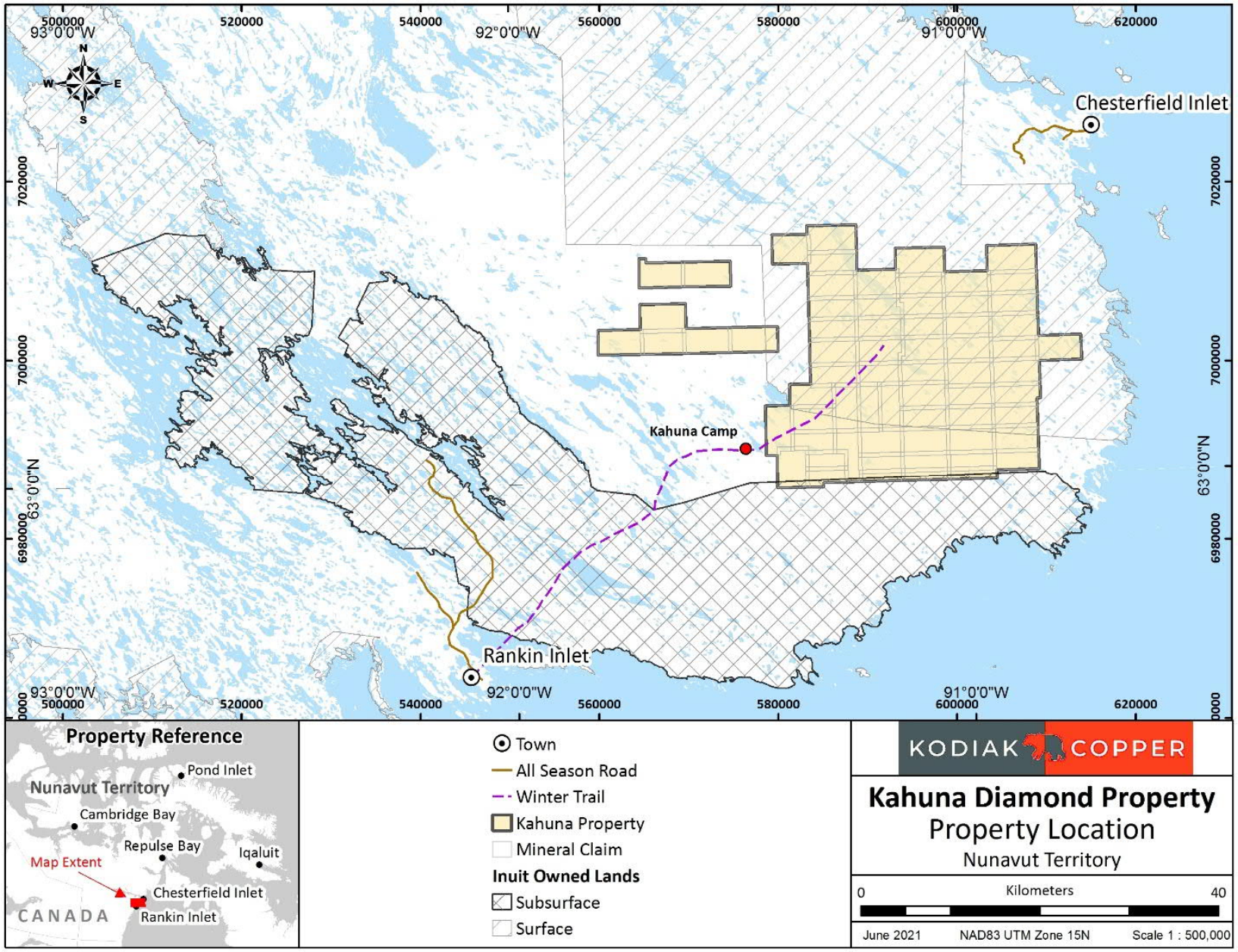
6 Training

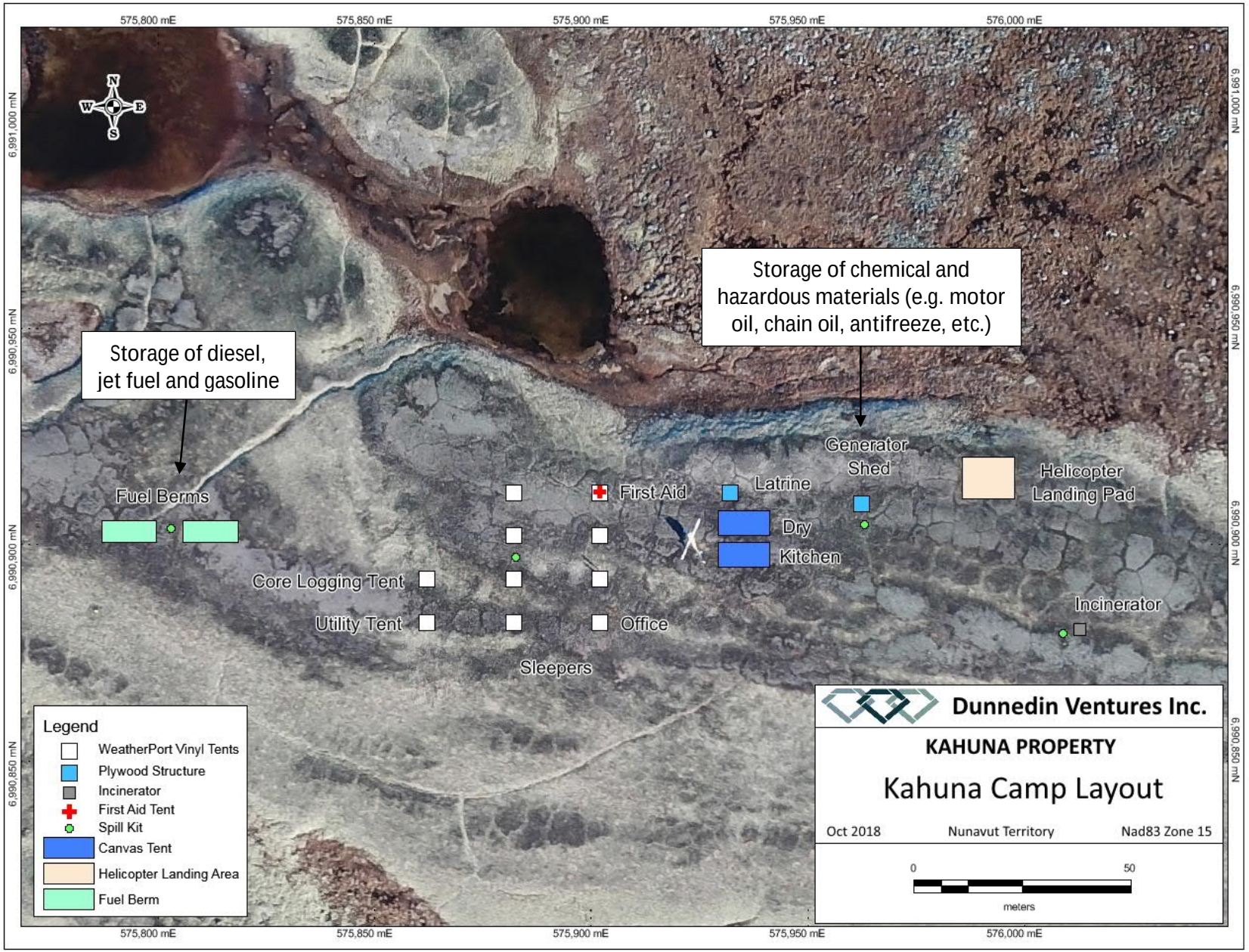
All employees and contractors are required to be familiar with the Kahuna Property Spill Prevention and Response Plan and will also be trained for initial spill response methods.

All employees and contractors of Kodiak Copper Corp. will be trained in internal policies, management plans, standard operating procedures and made familiar with the Terms and Conditions of the project's licences and permits. Every person arriving at the Kahuna Property will undergo an orientation session which includes information on health, safety, and environmental responsibilities and stewardship.

APPENDIX A

MAPS


500000
520000
540000
560000
580000
600000
620000
93°0'0"W
92°0'0"W
91°0'0"W
N
S
E
W
7020000
7000000
6980000
63°0'0"N
Chesterfield Inlet
Kahuna Camp
Rankin Inlet
Property Reference
Nunavut Territory
Pond Inlet
Cambridge Bay
Repulse Bay
Iqaluit
Map Extent
Chesterfield Inlet
Rankin Inlet
CANADA
Town
All Season Road
Winter Trail
Kahuna Property
Mineral Claim
Inuit Owned Lands
Subsurface
Surface
KODIAK COPPER
Kahuna Diamond Property
Property Location
Nunavut Territory
0
Kilometers
40
June 2021
NAD83 UTM Zone 15N
Scale 1 : 500,000


575,800 mE
575,850 mE
575,900 mE
575,950 mE
576,000 mE
6,991,000 mN
6,990,950 mN
6,990,900 mN
6,990,850 mN
N
W
E
S
Storage of diesel, jet fuel and gasoline
Storage of chemical and hazardous materials (e.g. motor oil, chain oil, antifreeze, etc.)
Fuel Berms
First Aid
Latrine
Generator Shed
Helicopter Landing Pad
Dry
Kitchen
Core Logging Tent
Utility Tent
Office
Sleepers
Incinerator
Legend
WeatherPort Vinyl Tents
Plywood Structure
Incinerator
First Aid Tent
Spill Kit
Canvas Tent
Helicopter Landing Area
Fuel Berm
Dunnedin Ventures Inc.
KAHUNA PROPERTY
Kahuna Camp Layout
Oct 2018
Nunavut Territory
Nad83 Zone 15
0
50
meters

APPENDIX B

NUNAVUT SPILL REPORT FORM

AND

GUIDE TO COMPLETE THE SPILL REPORT FORM

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT,	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ OR UPDATE # TO THE ORIGINAL SPILL REPORT	

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR **OCEAN**
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION **Station operator**	EMPLOYER	LOCATION CALLED **Yellowknife, NT**	REPORT LINE NUMBER **(867) 920-8130**

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			

Instructions for Completing the NT-NU Spill Report Form

Spills of hazardous substances can be reported by calling the NT-NU Spill Report Line at (867) 920-8130. Collect calls are accepted. As an alternative, the Spill Report form can be filled out and e-mailed as an attachment to spills@gov.nt.ca. Receipt of e-mail transmissions should be verified with a follow-up telephone call to the Spill Line. Completed forms can also be faxed to the Spill Line at (867) 873-6924.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. *Please do not fill in the Report Number:* the spill line will assign a number after the spill. is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This needs to be filled in only if the activity has been licensed by the Nunavut Water Board or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the community where the spill occurred. For remote locations, identify the most prominent geographic feature, such as a lake or mountain or the distance and direction from the nearest community
E. Geographic Coordinates	This needs to be filled out if the spill occurred outside of an established community such as at a mine site. The location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	Identify the person or party who owned or was in control of the substance at the time it was spilled. In the case of a spill from a ship or vessel, include the name of the ship or vessel. Include full address, telephone number and e-mail. Use box K if there is insufficient space. *Note that the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.*
G. Contractor involved?	Were there any other parties or contractors involved? (e.g. a construction company who is working on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and is responding to the spill).
H. Product Spilled	Identify the product spilled. Most commonly this is gasoline, diesel fuel or sewage. Use the chemical name of the substance and, where possible, identify the product using the four digit UN number (e.g. UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B). Avoid trade names.

I. Spill Source	Identify the source of the spill (e.g. truck, ship, home heating fuel tank) and the cause (e.g. fuel tank overfill, leaking tank, ship ran aground, traffic accident, vandalism, storm). Provide an estimate of the extent of the contaminated area (e.g. 10 m^2)
J. Factors Affecting Spill	Identify any factors which might make it difficult to clean up the spill (e.g. rough terrain, bad weather, remote location, lack of equipment). Do you require advice and assistance with the cleanup? Identify any hazards to persons, property or environment (e.g. a gasoline spill beside a daycare centre would pose a safety hazard to children). Use box K if there is insufficient space.
K. Additional Information	Provide any additional pertinent details about the spill. State what action is being taken to clean up the spill, dispose of spilled material or notify affected parties. Attach additional sheets to the spill report if necessary. Number the pages in the same format found in the lower right hand corner of the spill form (e.g. Page 1 of 2). **Number the pages to ensure that recipients can be certain they received all pertinent documents.** If only the Spill Report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	*Leave Blank. This box is for Spill Line use only.*

APPENDIX C

MSDS SHEETS

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: November 14, 2003
Supersedes: May 31, 2000
MSDS Number: 08509

1. PRODUCT INFORMATION

Product Identifier: MARVELUBE WR2 GREASE

Application and Use:
Lubricating grease

Product Description:

A grease, a mixture of lubricating oil, soap and additives.

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: >20.00 cSt at 40 deg C
Vapour Density: >5
Boiling Point: not available
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: 182 deg C DROP
Odour Threshold: not available
Vapour Pressure: <1 kPa at 38 deg C
Density: 0.91 g/cc at 15 deg C
Appearance/odour: Black paste, petroleum odour.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.
High pressure greasing equipment is capable of injecting grease under the skin which may have severe health consequences.

INGESTION:

Low toxicity.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 3160 mg/kg	(Rabbit)
Inhalation	:	LC50 > 5000 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In case of adverse exposure to vapours, mists and/or fumes formed at elevated temperature, or by mechanical action, immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.
Consult a physician immediately if the material is injected under the skin from the misuse of high pressure greasing equipment.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye

contact is avoided.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth.
Allow material to solidify and scrape up. Place material in suitable containers for recycle or disposal.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 204 deg C COC ASTM D92

Autoignition: 227 deg C Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

REVISION SUMMARY:
Since 31 May 2000, this MSDS has been revised in Section(s):
3, 7

10. PREPARATION

Date Prepared: November 14, 2003
Prepared by: Lubricants & Specialties

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: May 13, 2003
Supersedes: April 12, 2000
MSDS Number: 08265

1. PRODUCT INFORMATION

Product Identifier: UNIVIS N 68

Application and Use:
Hydraulic fluid

Product Description:

A lubricating oil consisting of a mixture of saturated and unsaturated hydrocarbons derived from paraffinic distillate, and additives.

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State:	Liquid
Specific gravity:	not available
Viscosity:	68.00 cSt at 40 deg C
Vapour Density:	not available
Boiling Point:	not available
Evaporation rate:	<0.1 (1= n-butylacetate)
Solubility in water:	negligible
Freezing/Pour Point:	-36 deg C ASTM D97
Odour Threshold:	not available
Vapour Pressure:	<0.1 kPa at 20 deg C
Density:	0.88 g/cc at 15 deg C
Appearance/odour:	Yellow oil, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.

INGESTION:

Low toxicity.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products,

the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 3160 mg/kg	(Rabbit)
Inhalation	:	LC50 > 5000 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

Vapour pressure of this material is low and as such inhalation under normal conditions is usually not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.
Where concentrations in air may exceed the occupational exposure limits

given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth.
Recover by pumping or by using a suitable absorbant.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 190 deg C COC ASTM D92

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

REVISION SUMMARY:
Since 12 April 2000, this MSDS has been revised in Section(s):
3, 7

10. PREPARATION

Date Prepared: May 13, 2003
Prepared by: Lubricants & Specialties
IMPERIAL OIL

Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**FUEL SYSTEM TREATMENT**	**Code**	FST
Synonym	Not available	**Validated on**	5/12/2004.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	A fuel system treatment that cleans fuel systems to improve performance in gasoline engines.		

Section 2. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
1) Stoddard Solvent	8052-41-3	30-60%	100ppm	Not established	Not established
2) Isopropanol	67-63-0	30-60%	200ppm	400ppm	Not established
3) 1, 2, 4-Trimethylbenzene	95-63-6	0.01-0.1%	Not established	Not established	Not established
4) Xylene (mixed isomers)	1330-20-7	0.01-0.1%	100ppm	150ppm	Not established

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

Section 3. Hazards Identification.

Potential Health Effects	Flammable liquid. Exercise caution when handling this material. Contact with this product may cause skin irritation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. May cause teratogenicity/embryotoxicity. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Quickly and gently blot or brush away chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the chemical is removed, while holding the eyelid(s) open. Obtain medical attention immediately.
Skin Contact	Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with warm water and non-abrasive soap for 5 minutes or until the chemical is removed. Remove contaminated clothing, shoes, and leather goods (e.g. watchbands, belts, etc.). If breathing is stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.
Inhalation	If breathing is stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.
Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz.) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. If breathing is stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Flammable.	**Flammable Limits**	LOWER: 0.9% UPPER: 12%
Flash Points	CLOSED CUP: 13°C (55.4°F) (TCC)	**Auto-Ignition Temperature**	Unknown

Fire Hazards In Presence of Various Substances	Flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapours may form explosive mixtures with air. Sensitive to static discharge.
Products of Combustion	Carbon oxides (CO, CO2), acrid smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG2000, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a moderate flash point above 40°C: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

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

Section 7. Handling and Storage

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

Section 8. Exposure Controls/Personal Protection

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

Section 9. Physical and Chemical Properties

Physical State and Appearance	Liquid.	**Viscosity**	Not available
Colour	Yellow.	**Pour Point**	Not applicable.
Odour	Alcohol like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	83°C (181.4°F)	**Penetration**	Not applicable.
Density	0.79 @ 15°C	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	>1	**Ionicity (in water)**	Not available
Vapour Pressure	Not available Evaporation rate: <1 (Ether=1)	**Dispersion Properties**	Not available
Volatility	>95% (VOCs)	**Solubility**	Negligible.

Section 10. Stability and Reactivity

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

Section 11. Toxicological Information

Routes of Entry

Skin contact, eye contact, inhalation and ingestion.

Acute Lethality

Acute toxicity information is not available for the product as a whole, therefore, data for the hazardous ingredient is provided below:

Stoddard Solvent (8052-41-3):
Acute Oral toxicity (LD50): >5000 mg/kg (rat)
Acute Dermal toxicity (LD50): >3000 mg/kg (rabbit)
Acute Inhalation toxicity (LC50): >1300 ppm/4h (rat)

Isopropanol (67-63-0):
Acute Oral toxicity (LD50): 5000 mg/kg (rat)
Acute Dermal toxicity (LD50): 12,800 mg/kg (rabbit)
Acute Inhalation toxicity (LC50): 17,000 ppm/4h (rat)

1, 2, 4-Trimethylbenzene (95-63-6):
Acute Oral toxicity (LD50): 5000 mg/kg (rat)
Acute Inhalation toxicity (LC50): 18,000 mg/m³/4h (rat)

Xylene (mixed isomers) (1330-20-7):
Acute Oral toxicity (LD50): 1590 mg/kg (rat)
Acute Dermal toxicity (LD50): >1,700 mg/kg (rabbit)
Acute Inhalation toxicity (LC50): 4785 ppm/4h (mouse)

Chronic or Other Toxic Effects

Dermal Route:

This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant.

Inhalation Route:

Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Frequent or prolonged inhalation of this product may lead to absorption of this product in harmful amounts which may have adverse effects on the: kidneys.

Oral Route:

Ingestion of this product may cause gastro-intestinal irritation. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may lead to aspiration of the liquid, especially if vomiting occurs. This may result in chemical pneumonitis (inflammation of the lungs) and/or pulmonary edema (an accumulation of fluid in the lungs).

Eye Irritation/Inflammation:

This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.

Immunotoxicity:

Not available

Skin Sensitization:

Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.

Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product contains a component(s) at >= 0.1% that has been shown to cause teratogenicity and/or embryotoxicity in some laboratory tests at non-maternally toxic doses. Therefore, this product is considered to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as Group A1, A2, or A3 carcinogens by ACGIH.
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	No additional remark.

Section 12. Ecological Information

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

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	FLAMMABLE LIQUIDS, N.O.S. (Isopropanol), Class 3, UN 1993, PGII (CL-TDG)	**Special Provisions for Transport**	This product may be shipped as a Limited Quantity if the volume is ≤1L and in accordance with the Limited Quantity Provisions, (CL-TDG).

Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.		
DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Combustible liquid. CLASS: Irritating substance. CLASS: Target organ effects.
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	3
Reactivity	0
Personal Protection	h, p, u

NFPA (U.S.A.)

Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

References Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

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

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

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

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - TLM on 5/12/2004.

Data entry by Product Safety - RS.

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: November 06, 2002
Supersedes: November 01, 2002
MSDS Number: 00826

1. PRODUCT INFORMATION

Product Identifier: MIDDLE DISTILLATE
ESSO MARINE GAS OIL (DYED OR CLEAR)
ESSO RAILROAD DIESEL (DYED OR CLEAR)
HEATING OIL (DYED OR CLEAR)
DIESEL (DYED OR CLEAR)
DIESEL QUALITY FURNACE FUEL (DYED OR CLEAR)
DIESEL QUALITY HEATING OIL (DYED OR CLEAR)
ESSO DIESEL (DYED OR CLEAR)
ESSO DIESEL QUALITY COMMERCIAL FUEL (DYED OR CLEAR)
ESSO DIESEL QUALITY FURNACE FUEL
ESSO DIESEL QUALITY HEATING OIL
ESSO FURNACE FUEL (DYED OR CLEAR)
ESSO HEATING OIL (DYED OR CLEAR)
ESSO MARINE DIESEL FUEL (DYED OR CLEAR)
ESSO RAILROAD DIESEL FUEL #3 (DYED OR CLEAR)
ESSO TOBACCO CURING OIL
FUEL OIL 75
FUEL OIL 76
DIESEL MARINE (DYED OR CLEAR)
DIESEL MARINE GAS OIL (DYED OR CLEAR)
FURNACE (DYED OR CLEAR)
DIESEL MARINE - POUR DEPRESSED (DYED OR CLEAR)
NO.2 FUEL OIL
NAVAL FUEL OIL 3-GP-11M (DYED)
ESSO DIESEL FUEL LS
DIESEL LOW SULFUR (DYED OR CLEAR)
NO.2 FUEL OIL FOR EXPORT
DIESEL FOR EXPORT (DYED OR CLEAR)
FURNACE TOBACCO CURING OIL
DIESEL NAVAL 3GP-11 (DYED OR CLEAR)
DIESEL NAVAL 3GP-15 (DYED OR CLEAR)
DIESEL LOW SULFUR RAIL (DYED OR CLEAR)
DIESEL LOW SULFUR DYED EP
DIESEL RAIL (DYED OR CLEAR)
DIESEL RAIL #3 (DYED OR CLEAR)
DIESEL RAIL #3 (HD) (DYED OR CLEAR)
DIESEL LOW SULFUR (032) (DYED OR CLEAR)

FURNACE URBAN (DYED OR CLEAR)
DIESEL (032) (DYED OR CLEAR)
DIESEL LOW SULFUR (EXP DYED)
FURNACE FUEL (032) DYED
DIESEL LOW SULFUR (EXPORT)
MARINE GAS OIL
MDO - MARINE DIESEL OIL 3 CST (CLEAR)

Application and Use:
Multi-purpose fuel

Product Description:

A complex mixture of aliphatic, olefinic, naphthenic and aromatic hydrocarbons.

REGULATORY CLASSIFICATION

WHMIS:
Class B, Division 3: Combustible Liquids.
Class D, Division 2, Subdivision B: Toxic Material

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):

Shipping Name:	FUEL OIL
Class:	3
Packing Group:	III
PIN Number:	UN1202
Marine Pollutant:	N

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

---

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #

Fuel Oil No.2	>99.9 V/V	68476-30-2

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: 0.820 to 0.900 at 15.5 deg C
Viscosity: 1.30 cSt at 40 deg C
to 11.00 cSt at 40 deg C
Vapour Density: 4
Boiling Point: 150 to 370 deg C
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -4 deg C -39 (RANGE)
Odour Threshold: not available
Vapour Pressure: 4 kPa at 38 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Irritating.

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

Lifetime skin painting tests indicate that materials of similar composition have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 2000 mg/kg	(Rabbit)
Inhalation	:	LC50 > 2500 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer Recommends:
100 ppm based on composition.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety goggles, long sleeves, and chemical-resistant gloves.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Do not handle or store near an open flame, sources of heat, or sources of ignition.
Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: >40 deg C PMCT ASTM D93

Autoignition: NA Flammable Limits: LEL: 0.7% UEL: 6.5%

GENERAL HAZARDS:

Combustible Liquid; may form combustible mixtures at or above the flash point.
Toxic gases will form upon combustion.
Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

REVISED.

10. PREPARATION

Date Prepared: November 06, 2002
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: April 06, 2002
Supersedes: January 08, 1999
MSDS Number: 08259

1. PRODUCT INFORMATION

Product Identifier: UNIVIS N 32

Application and Use:
Hydraulic fluid

Product Description:

Mixture of paraffinic and naphthenic hydrocarbons (saturated and unsaturated), and additives.

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State:	Liquid
Specific gravity:	not available
Viscosity:	32.00 cSt at 40 deg C
Vapour Density:	not available
Boiling Point:	229 to 512 deg C
Evaporation rate:	<0.1 (1= n-butylacetate)
Solubility in water:	negligible
Freezing/Pour Point:	-42 deg C ASTM D97
Odour Threshold:	not available
Vapour Pressure:	<1 kPa at 38 deg C
Density:	0.87 g/cc at 15 deg C
Appearance/odour:	Yellow oil, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.

INGESTION:

Low toxicity.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 3160 mg/kg	(Rabbit)
Inhalation	:	LC50 > 5000 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

Vapour pressure of this material is low and as such inhalation under normal conditions is usually not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth.
Recover by pumping or by using a suitable absorbant.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 165 deg C COC ASTM D92

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.

Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

THREE YEAR WHMIS REVIEW.

10. PREPARATION

Date Prepared: April 06, 2002
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario

M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: April 06, 2002
Supersedes: January 08, 1999
MSDS Number: 08258

1. PRODUCT INFORMATION

Product Identifier: UNIVIS N 22

Application and Use:
Hydraulic fluid

Product Description:

Mixture of paraffinic and naphthenic hydrocarbons (saturated and unsaturated), and additives.

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #

Not applicable

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 22.00 cSt at 40 deg C
Vapour Density: not available
Boiling Point: 229 to 512 deg C
Evaporation rate: <0.1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -48 deg C ASTM D97
Odour Threshold: not available
Vapour Pressure: <1 kPa at 38 deg C
Density: 0.87 g/cc at 15 deg C
Appearance/odour: Yellow oil, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.

INGESTION:

Low toxicity.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 3160 mg/kg	(Rabbit)
Inhalation	:	LC50 > 5000 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

Vapour pressure of this material is low and as such inhalation under normal conditions is usually not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
Do not handle or store near an open flame, sources of heat, or sources of ignition.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth.
Recover by pumping or by using a suitable absorbant.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 150 deg C COC ASTM D92

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide under thermal decomposition.

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

THREE YEAR WHMIS REVIEW.

10. PREPARATION

Date Prepared: April 06, 2002
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division

111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

Date Prepared: November 14, 2003
Supersedes: September 17, 1998
MSDS Number: 08366

1. PRODUCT INFORMATION

Product Identifier: UNIREX LOTEMP MOLY GREASE

Application and Use:
Lubricating grease

Product Description:

A grease, a mixture of lubricating oil, soap and additives.

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL), exempt, or have been notified under CEPA.

TDG INFORMATION (RAIL/ROAD):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: <20.00 cSt at 40 deg C
Vapour Density: not available
Boiling Point: not available
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: 245 deg C ASTM D97
Odour Threshold: not available
Vapour Pressure: 0.002 kPa at 20 deg C
Density: 0.92 g/cc at 15 deg C
Appearance/odour: Black paste, petroleum odour.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.
High pressure greasing equipment is capable of injecting grease under the skin which may have severe health consequences.

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 3160 mg/kg	(Rabbit)
Inhalation	:	LC50 > 5000 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For insoluble Molybdenum compounds, 10 mg/m3.
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In case of adverse exposure to vapours, mists and/or fumes formed at elevated temperature, or by mechanical action, immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.
Consult a physician immediately if the material is injected under the skin from the misuse of high pressure greasing equipment.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon

conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth.
Allow material to solidify and scrape up. Place material in suitable containers for recycle or disposal.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: >110 deg C COC ASTM D92 est.baseoil

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Decomposes; flammable/toxic gases will form at elevated temperatures (thermal decomposition).

Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

Fumes, smoke, carbon monoxide and sulphur oxides in case of incomplete combustion

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

REVISION SUMMARY:

Since 17 September 1998, this MSDS has been revised in Section(s):
1, 7

10. PREPARATION

Date Prepared: November 14, 2003
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

Superior Propane Inc. MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT INFORMATION

Product Name: Propane
Trade Name: LPG (Liquified Petroleum Gas), LP-Gas
Chemical Formula: C_3H_8

WHMIS CLASSIFICATION
Class A - Compressed Gas
Class B, Division 1 - Flammable Gas

Supplier: Superior Propane Inc.
1111 - 49th Avenue N.E.
Calgary, AB T2E 8V2
Business: (403) 730-7500

Local Market Emergency Number: _____
(Non Medical)

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

SECTION 2 – HAZARDOUS INGREDIENTS

COMPONENTS	CAS NO.	% Volume (v/v)	LD50
Propane	74 -98-6	90% - 99%	Not Applicable
Propylene	115 -07-1	0% - 5%	Not Applicable
Ethane	74 -84-0	0% - 5%	Not Applicable
Butane and heavier hydro carbons	106 -97-8	0% - 2.5%	Not Applicable

Occupational Exposure Limit:
Based upon animal test data, the acute toxicity of this product is expected to be inhalation: 4 hour LC50 = 280,000 ppm (Rat).
Note: Composition is typical for HD-5 Propane per The Canadian General Standard Board CGSB 3.14 National Standard of Canada. Exact composition will vary from shipment to shipment.

SECTION 3 – CHEMICAL AND PHYSICAL DATA

Form: Liquid and vapour while stored under pressure.
Boiling Point: -42°C @ 1 atm.
Freezing Point: -188°C
Evaporation Rate: Rapid (Gas at normal ambient conditions).
Vapour Pressure: 1435 kPa (maximum) @ 37.8°C
Vapour Density: 1.52 (Air = 1)
Coefficient of Water/Oil Distribution: Not available.
pH: Not available.

Solubility in water: Slight, 6.1% by volume @ 17.8°C
Specific Gravity: 0.51 (water = 1)
Appearance/Odour: Colourless liquid and vapour while stored under pressure. Colourless and odourless gas in natural state at any concentration. Commercial propane has an odourant added, ethyl mercaptan, which has an odour similar to boiling cabbage.*
Odour Threshold: 4800 ppm

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

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flash Point: -103.4°C
Method: Closed cup.
Flammable Limits: Lower 2.4%, Upper 9.5%
Auto Ignition Temperature: 432°C
Products Evolved Due To Heat Or Combustion: Carbon monoxide can be produced when primary air and secondary air are deficient while combustion is taking place.
Fire and Explosive Hazards: Explosive air-vapour mixtures may form if allowed to leak to atmosphere.
Sensitivity To Impact: No.
Sensitivity To Static Discharge: Yes.

Fire Extinguishing Precautions: Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated. If gas has not ignited, liquid or vapour may be dispersed by water spray or flooding.
Special Fire Fighting Equipment: Protective clothing, hose monitors, fog nozzles, self-contained breathing apparatus.

SECTION 5 – REACTIVITY DATA

Stability: Stable.
Conditions To Avoid: Keep separate from oxidizing agents. Gas explodes spontaneously when mixed with chloride dioxide.
Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains and openings to building.

Hazardous Decomposition Products: Deficient primary and secondary air can produce carbon monoxide.
Hazardous Polymerization: Will not occur.